



PUNJAB REPORT

IN REPLY TO

THE INQUIRIES ISSUED

BY

THE FAMINE COMMISSION.

VOLUME I.



Lahore:

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PREFACE.

THE inquiries of the Famine Commission, to answer which this report has been prepared, form the first paper in the volume. Following it, will be found a letter addressed by the Secretary of the Commission to the Punjab Government; and the instructions which that Government thereon issued for the preparation of these papers.

Pursuant to those instructions a considerable portion of the replies to the 1st Chapter of the inquiries have been prepared by me; but the chapter contains a number of papers furnished by Deputy Commissioners and Settlement Officers and other gentlemen. The authorship of papers not supplied by myself is distinctly stated in the heading of each.

The authorship of the replies of Chapters II, III, and IV, is similarly indicated.

In preparing the replies to the first chapter, where the question under reply covered subjects dependent rather on opinion than on statistics, I have given as far as possible the views of the Financial Commissioner. And in such cases I have so framed the text, as to make it clear that his views are being stated.

FINANCIAL COMMISSIONER'S OFFICE,
LAHORE:
January 1879.

}
E. WACE, MAJOR,
Deputy Commissioner.

P. S.—While these papers were passing through the press, and before the replies to Section 3 of Chapter III and to Chapter IV had been completed, the Financial Commissioner, Mr. Gore Ouseley, under whose control they had been drawn up, died on the 4th January 1879. Consequently, the replies to Chapter IV and to Section 3 of Chapter III are not so complete as they would have been but for this lamented occurrence.

The views expressed in these papers, as those of the Financial Commissioner, were dictated by Mr. Ouseley.

INQUIRIES ISSUED BY THE FAMINE COMMISSION.

PRELIMINARY OBSERVATIONS.

The Commission has been led to the conclusion that the most convenient way of commencing their inquiries will be to frame a series of questions, answers to which they would desire to obtain before proceeding to form opinions on the matters submitted for their judgment.

The questions now circulated form a part of such a series. It is not anticipated that full and trustworthy answers to all these questions could be obtained from all parts of India within the necessarily limited time over which their inquiry could be reasonably prolonged. But so far as such answers can be got, they will be of great value, and the attempt to collect them from the parts of the country to which the present inquiry chiefly refers, may be made as far as practicable.

Under these circumstances the Governments of the Madras and Bombay Presidencies and of certain selected Provinces in the Bengal Presidency, have been addressed with a view to their taking such steps as appear to them best calculated to supply the desired information so far as it seems possible to obtain it within a definite period. At the same time the questions are published so that the opportunity may be given to any one interested in the inquiry (not officially called on to do so) to supply answers if he feels so disposed. Any such answers should be addressed to the Secretary to the Famine Commission.

It is not necessary that every one who answers these questions should attempt to answer them all. It will be more advantageous to the Commission if each person answers those questions regarding which he has most practical experience, or to which he has devoted special attention.

Every gentleman who answers these questions, or any of them, is requested to preface his replies by stating in a precise manner, what District he proposes to write of, and what is the nature of his connection with or knowledge of that district, over what length of time it has extended, and specially what opportunities he has had for observing famines, and what experience in carrying out measures of famine relief.

SIMLA:
The 22nd June 1878. }

C. A. ELLIOTT,
Secretary to the Famine Commission.

CHAPTER I.

CONDITION OF THE COUNTRY AND PEOPLE.

WHAT is the normal system of rain-fall in your Province ? From what quarter does the rain come, and in what months does it fall ? Give any returns you possess showing the average amount gauged in each month ; and state whence they are obtained, and how the registers of rainfall are kept. Within what limits can the rainfall vary without doing serious injury ? What is the amount of rainfall for each month, and for the whole year, which, judging from past experience, you consider to be sufficient for agricultural necessities ? What are the different agricultural operations depending on the due arrival of each of the expected monsoons or seasonal rains ? What is the effect on the crops of the failure of any of these elements of rainfall, and what is the combination of circumstances under which the worst results have been produced ? So far as necessary differences in the several Districts should be distinguished and separate returns supplied for them.

2. What part of the country is most subject to famine and freest from it, and why ? What is known as to past famines, their causes, their dates, their extent locally, and their severity as tested by prices, mortality, loss of revenue and expenditure on relief ? Give, as far as possible, precise figures. Has the Province suffered from any other destructive calamity, such as floods, frost, hail, locusts, blight, &c., to such an extent as to produce distress amounting to famine or to create any general and widespread failure of the crop ? To what extent do famines in any past period appear to have affected the general condition of the country, and how long has the effect lasted ? Has the condition of the country improved in spite of such calamities ? What is the normal increase in the population of the country, and how far has it been affected and kept down by famine ? What are the facts on which your opinion on these last points is based ?

3. Give any statistics you possess as to the average area in each District under cultivation yearly, distinguishing food crops from others ; the average amount of the chief food-grains produced per acre ; the total consumption in the District of such grains ; the surplus that remains for export, or the deficiency that has to be supplied by import in ordinary years. How are these statistics collected, what amount of reliance may be placed on them, and what suggestions can you make for their improvement ? If you have no statistics on these subjects, give any approximation or estimate you can.

4. What area of your Province and of its several Districts is protected from drought in an average year by irrigation from wells, tanks or jhils, canals, or channels from rivers ? To how much of this area is the protection complete and permanent, and how much is dependent on the local rain ? How much of the area so protected is devoted to food crops, and what is the total amount of produce from that area ? What is the effect of irrigation of crops (other than food crops) in adding to the powers of the population to resist famine ? Supposing canals, tanks, wells, and jhils to be utilized to the utmost extent and kept in the highest possible order, what extent of the country would be protected from drought in a year when there was a failure of the rain ?

5. What grains form the staple food of your people ? When are they sown and harvested, and what are the critical times at which rain is essential to each of them, or at which a failure or an excessive fall of rain may be mischievous or ruinous ?

6. What proportion of the cultivated land and what class of crops is manured yearly, and what is the average weight of manure given to the acre—(1) in land constantly manured ; (2) in land occasionally manured ? If there is any customary rotation of crops or fallows, state it.

7. Have any attempts been made by the Government or private persons to improve agriculture in your Province, either in the way of introducing new or improved implements, or new staples, or improved seed, or better methods of cultivation, or better breeds of cattle, and so forth ? and with what result ? Have you any suggestion to make for such improvement ? Is there any Government model farm in your Province ? Or have any estates

under the management of Government or of the Court of Wards been used for the object of making experiments or setting examples of improved agriculture? If so, state the system of management, whom they were placed under, and what the results, financial and agricultural, have been? Have any improvements been made in the breed of cattle, in the forms of ploughs, carts, sugar-mills, or any other agricultural instruments, or in the mode of drawing water from wells? Have any agricultural exhibitions been held in your Province, and have you observed that any good result has been obtained from them? Was anything exhibited the imitation or adoption of which would have been useful to and practicable by the ordinary cultivator? And, if so, was there any willingness to imitate or adopt such improvements? Have you observed that there has been any deterioration of the soil, or that crops are worse than they used to be within your own experience? Does any such question specially arise in case of irrigated land? State specifically on what facts you base your replies. Where there is any popular belief in such deterioration, state what facts are adduced in support of it.

8. What proportion of your population is agricultural, that is, either directly engaged in the cultivation of the soil, solely or in combination with some other occupation, or deriving their chief income from the land? And of this class what proportion live entirely by the profits of the cultivation of their own land, and what proportion support themselves wholly or in part by field labour for others?

9. What is the ordinary economic condition of the portion of the agricultural population directly engaged in the cultivation of the land and possessing any proprietary or occupancy interest in land? Illustrate your reply by giving the actual facts as to a few typical instances of such persons taken from four or five different villages in several Districts of your Province. State with regard to each, what area of land he holds for tillage or grazing, what his family consists of, what amount of food-grain and what value of other produce he raises on an average off his land in a year, what rent or revenue or cesses he pays for his land, what expenses he incurs in hired labour (other than his own labour and that of his family), what amount he spends in a year in purchases of necessaries which he cannot produce on his land, what kind of house he lives in, how many rooms it possesses, and how many out-houses, what quantity of cattle or other live-stock he possesses, what other property, and what stock of grain. How does he dispose of any surplus income, whether by hoarding or lending his money, or investing it in ornaments, or spending it on marriage ceremonies, or otherwise? What are his debts, and to what are they commonly due? State what proportion of the agriculturists of your District you believe to be in debt, and what proportion their average indebtedness bears to their average yearly income. Endeavour to obtain the opinions on these points of well informed and trustworthy native residents of different Districts, and in submitting such opinions explain the position of your informants, and the probable means at their command of forming correct conclusions.

10. Describe the tenures of land (proprietary and occupancy) which are most common, and as nearly as you can the area of cultivated land held by each kind of tenure. How far does the character of the tenure appear to affect the economic condition of the person holding it? Are there any conditions of tenure (such for instance as unrestricted freedom of transfer) which might be changed with advantage to the holder and without injury to other parties?

11. Are the holders of the above tenures in the habit of carrying out material improvements, such as digging wells, or channels necessary in order to use the water in a canal? Are their actions in this respect affected most by the security or insecurity of their tenure, or by their wealth or poverty? Or are there any other reasons which hinder such investments of their labour and capital? What have been the effects of recent Land Improvement Acts? Have they tended to enlarge or narrow the making of advances by Government? Does the condition of the country render it desirable that the operation of these Acts should be facilitated or their scope enlarged, and are there any apparent difficulties in the way of doing this that could be removed? Is the demand for interest on Government advances obstructive or prohibitory?

12. How far is the landowner's or the cultivator's readiness to improve the land checked by any operation of the law? Is the digging of wells checked in any such way? How far does the expectation of having to pay increased revenue or rent in consequence of any improvement check the execution of improvements?

13. What is the general incidence of land revenue on the cultivated area, both for the arable land as a whole and for the different classes of such land (irrigated, dry, &c.)? What proportion does such revenue bear to the value of the gross produce? Is the incidence on the various classes of land fairly distributed, or would you propose any re-adjustment of it? When was the assessment fixed? Has there been any practical difficulty in realizing the land revenue as now assessed? At what dates are the instalments of revenue payable, and what relation do these bear to the ordinary periods of harvest or of realization of rents, as the case may be? Do the several instalments bear a fair proportion to the value of the several harvests from which the revenue or rent has to be made good? What rate of interest, if any, is charged on land revenue in arrear?

14. What is the average price of land per acre? What amount of land on an average is sold every year for arrears of revenue and for decrees of Court? What quantity of land has been transferred in your District to non-agricultural and non-resident landlords?

15. What are the wages usually paid to hired field labourers? Are they paid in kind or money? Give the rates as far as you can for the chief kinds of labour in ordinary years. Is the hired labourer usually able to subsist with fair ease on the grain or other payments he receives at harvest and other periods during the intervals between such payments, or is he frequently forced to borrow and forestall future payments?

16. What is the normal rate of prices of each of the chief staples of food in certain typical Districts? What is the usual variation between the prices at harvest time and other times of the year? What rise in price would indicate the approach of alarming scarcity? In past times of severe scarcity what effect has been produced on prices; has the rise been sudden or gradual, and has it affected one staple more than another? Or has the rise been of such a character as to tend to equalise the prices of all staples?

17. What is the state of your Province as to the activity of commerce? Has it an energetic and enterprising trading class? Do any of the Districts subsist mainly on its own resources, and export or import little? Or is there an active and constant ebb and flow of trade?

18. What are the facts in your Province as regards the means of communication? Do bridged and metalled roads connect all the important centres of trade that should be thus connected? Are the roads in good working order and sufficient for the traffic on them or not? Are they open through the year, or closed for wheeled traffic in the rains? Is the ordinary means of conveyance by wheeled carriage, or by pack-bullocks; and if by wheeled carriage, is there a sufficient number of carts in the District for all its wants? What is the ordinary cost per mile of conveying one ton of merchandize either by wheeled or by pack carriage?

19. To what extent are railways developed in your Province? What Districts are not traversed by them, and what distances have to be gone to reach the railways from the Districts furthest from them? Are any Districts so much isolated as to make it desirable to extend railways to them to facilitate the introduction of food in time of famine? Has the effect of the existing railways been to equalise prices and stimulate trade to any important extent? Give any facts that support this view.

20. If there is water communication in your District, give an account of it: what kinds of boats are used, what their number is, what the nature is of the traffic they convey; state whether the navigation is capable of any improvement, and whether it is conducted on natural channels, or by canals, and if by the latter, under what regulations? What is the ordinary cost per mile of boat carriage for one ton?

21. Is there any portion of your Province into which by reason of the want, or the badness, of the roads or other means of access, or of local or temporary disturbing causes of weather, &c., it might be impossible or difficult for unassisted trade in time of scarcity to throw enough grain to feed (say) one quarter of the population for six months? If there is such a part, state where it is, what is its area and population, and what are the special difficulties to be overcome, and how they might best be removed.

22. To what extent has telegraphic communication been established between the chief towns of your Province? Having in view the value of rapid communication in time of distress, are there any important lines which it might be desirable to construct?

23. Has there been within the historic period any sensible denudation of the forest in, or bordering on, your Province? Can it be tested by statistics showing over how much

area forest or scrub jungle has been cut down? Can you state any specific facts which lead you to think that such deforestation has caused injurious effects in any way, either in respect to the fall of rain, or the abundance or permanence of water in streams, or wells or the subsoil, or the denudation of the surface soil so as to render it unfit for cultivation? And what injury has been produced, and to what extent? Can you adduce any direct evidence that such injury as you think has been caused by the clearing of forest, has been remedied by its reproduction? If you think the clearing has been injurious, what steps would you propose to take towards reboisement? Should it be done by artificial planting, or by conservation of the tract, so as to keep out cattle-grazing and fires? Can such conservation be effected without interfering with any vested rights of the people, or with their consent, if interference is necessary? Which of the two methods would be easiest, cheapest, quickest, of operation, and most effectual? To what extent and on how large an area could either method be followed?

24. Can any estimate be made of the number and proportion of deaths which are the inevitable consequence of famine, not being due directly to starvation, but to such privations as adults in health can bear with safety but which prove fatal to children or the old and sickly; or to such diseases as follow in the train of famine from eating unwholesome food, roots, berries, leaves, &c., or rise from other and obscure causes like cholera and fever commonly concomitant on famine? What statistics exist as to past famines to show the depopulation that they have caused, and how far it is due to an increased death-rate, to emigration, or to a decreased birth-rate? If any special census was taken after the famine, state whether any trustworthy information was obtained as to the different classes of population which have suffered most; whether the early stages of a famine affect certain classes more, or less, severely than its later stages; whether the loss of life has been greater among males or females, among adults or children, to what extent the birth-rate has been affected; and how far local influences, peculiarities of administration, or tenure, climate, soil, water, density of population, systems of cultivation, &c., have tended to mitigate or intensify the inevitable effects of scarcity.

25. If no such census was taken, state what information is to be got from the mortuary returns for the period embraced by the last famine in your Province as compared with those for ordinary periods, and what conclusions may be drawn from those returns.

26. It has been laid down by the Government of India as a settled principle that local financial responsibility should be enforced in the case of a famine as far as possible. With this view special taxation has recently been imposed on the country, the proceeds of which the Government has proposed to apply as a mutual assurance fund, which will be available for the benefit of the people on whom the calamity of famine may actually fall. But it has been recognized that it would be preferable if some portion of this taxation could be made more strictly local, both in its levy and its application to relief purposes. Can you suggest any way by which it might be rendered practicable to provide that where State funds have been expended on the relief of famine, such expenditure should be recovered from the locality which has benefitted by it under any system of (taxation in modification of or in substitution for that recently adopted and not in addition to it) in a manner that should bring into operation a sense of local responsibility, first in the direction of securing the lives of the people, and second of protecting them from unnecessary expenditure on relief? How could such a principle be applied to a smaller area than that of a Province or Presidency? Could the expenditure in a single District, or sub-division of a District, be recovered from that District or sub-division by such special taxation wholly or in part, or under any special circumstances, or in reference to any class of the community requiring relief, leaving a smaller or larger portion of the charge to be made good from the Province or Presidency at large, or from the resources of the Government of India? Could any plan be suggested under which, subject to similar limitations, a municipality might be required to bear the cost of feeding its own poor? What kind of special local taxation should be adopted for this purpose? What would be the probable effect (1) on the minds of the people, (2) on the temper of the officials, of the knowledge that the cost of famine relief expended on their behalf or by them, would have to be recouped by local taxation? Is there any reason to suppose that the sense of local responsibility, if it could be brought to bear, would not operate beneficially in the case of relief of the distressed portion of the population in India?

CHAPTER . II.

RELIEF DURING EARLIEST STAGES OF DISTRESS.

1. How does distress consequent on drought first make itself felt among the people, and how is it first brought to the notice of the District Officers? What are the indications by which the district officer would judge whether the distress is due to temporary or local scarcity, or is likely to be the fore-runner of very severe general distress ending in famine? What steps should be taken to ensure that such indications are brought to his notice? To what extent does the existing District organization suffice to ensure early and trustworthy reports, and if not sufficient, what other measures are suggested as requisite?
2. Which classes of the rural population are first affected by serious failure of crops likely to produce famine? In what way are they affected, and how is the effect manifested? Do the early applicants for relief consist of whole families or of isolated individuals? Are all sexes and ages equally represented, or do women and children preponderate among them? So far as the applicants are field labourers deprived of employment, does this arise, because the employers have no money or grain to spend on wages, or because there is nothing to do in the fields?
3. What classes of the urban population are the first to feel the effects of famine, and in what way do these effects operate on them, and how do they manifest themselves? How may they best be watched and met in their first stage?
4. There is a considerable number of poor and infirm persons, who in ordinary years are supported by their richer relations and friends or caste fellows, and of habitual mendicants, but who become claimants of State relief when scarcity or famine arises. What is, approximately, the proportion of this class to the total population, and at what stage do the springs of private charity begin to dry up?
5. It is obvious that if an accurate forecast of the condition of the people during the approaching season, following any more or less serious failure of the ordinary harvest, could be made by the District Officer, it would be of great utility; in what way could he make it, and on what data should his calculations be based? Suppose for instance that he estimates that half the average food-crop has been lost: for the support of how many people does the balance that is saved suffice? How are the rest of the people to be fed? He must form an estimate of the food-stocks in the country and of the power of trade to bring in more. Supposing these two elements sufficient to supply what is wanted, there would be no famine of food. But there may be lack of money to purchase food; how is an estimate to be framed of the number of persons who would probably be able to purchase, and of the number who must be assisted by the State, either by employment which will bring them wages, or by food if they cannot work? These would consist mainly of the classes indicated in questions 2, 3, 4, *viz.*, the field labourers, the urban poor, and infirm dependants or mendicants. What numbers approximately of these classes would you expect to have on your hands if the food-crops in your District failed to the extent of $\frac{1}{3}$, $\frac{1}{2}$, or $\frac{2}{3}$? and if this happened in two consecutive years?
6. What measures should the District Officer adopt for relief, supposing that he believes the distress to be temporary, or is not satisfied that it is indicative of approaching famine? Should applicants be first employed as far as practicable on the ordinary works in progress, whether under provincial or local officers, or under agents of the Public Works Department or Municipalities? Under what tests should applicants be admitted? Under what circumstances may it be desirable to open special works? How should such special works be arranged? Whether so as to collect the applicants in comparatively large numbers at a few localities, or to give them employment in smaller bodies at many places in the distressed region and in the vicinity of their homes? May such works be best placed under the Public works Department or under Civil supervision? State the arguments in favour of, and against, either course. How may the Public Works Officers be best placed in communication with the District Officers for these purposes? How should the Public Works Officers be guided in their selection of works for relief? And on whom should the responsibility rest in the District, for seeing that all needful steps are taken by all branches of the public service concerned?

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24. Can any estimate be made of the number and proportion of deaths which are the inevitable consequence of famine, not being due directly to starvation, but to such privations as adults in health can bear with safety but which prove fatal to children or the old and sickly; or to such diseases as follow in the train of famine from eating unwholesome food, roots, berries, leaves, &c., or rise from other and obscure causes like cholera and fever commonly concomitant on famine? What statistics exist as to past famines to show the depopulation that they have caused, and how far it is due to an increased death-rate, to emigration, or to a decreased birth-rate? If any special census was taken after the famine, state whether any trustworthy information was obtained as to the different classes of population which have suffered most; whether the early stages of a famine affect certain classes more, or less, severely than its later stages; whether the loss of life has been greater among males or females, among adults or children, to what extent the birth-rate has been affected; and how far local influences, peculiarities of administration, or tenure, climate, soil, water, density of population, systems of cultivation, &c., have tended to mitigate or intensify the inevitable effects of scarcity.

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26. It has been laid down by the Government of India as a settled principle that local financial responsibility should be enforced in the case of a famine as far as possible. With this view special taxation has recently been imposed on the country, the proceeds of which the Government has proposed to apply as a mutual assurance fund, which will be available for the benefit of the people on whom the calamity of famine may actually fall. But it has been recognized that it would be preferable if some portion of this taxation could be made more strictly local, both in its levy and its application to relief purposes. Can you suggest any way by which it might be rendered practicable to provide that where State funds have been expended on the relief of famine, such expenditure should be recovered from the locality which has benefitted by it under any system of (taxation in modification of or in substitution for that recently adopted and not in addition to it) in a manner that should bring into operation a sense of local responsibility, first in the direction of securing the lives of the people, and second of protecting them from unnecessary expenditure on relief? How could such a principle be applied to a smaller area than that of a Province or Presidency? Could the expenditure in a single District, or sub-division of a District, be recovered from that District or sub-division by such special taxation wholly or in part, or under any special circumstances, or in reference to any class of the community requiring relief, leaving a smaller or larger portion of the charge to be made good from the Province or Presidency at large, or from the resources of the Government of India? Could any plan be suggested under which, subject to similar limitations, a municipality might be required to bear the cost of feeding its own poor? What kind of special local taxation should be adopted for this purpose? What would be the probable effect (1) on the minds of the people, (2) on the temper of the officials, of the knowledge that the cost of famine relief expended on their behalf or by them, would have to be recouped by local taxation? Is there any reason to suppose that the sense of local responsibility, if it could be brought to bear, would not operate beneficially in the case of relief of the distressed portion of the population in India?

SECTION 1.

2. The first division of relief-works for unskilled labourers may be into works supervised by officers of the Public Works Department, and works supervised by the Civil Officers: the former will generally be works of greater permanent utility, requiring more skilled supervision, and taking a longer time to complete; the latter will usually be less important, less generally useful, and simpler in character. State what are the circumstances under which either class of work is preferable. Referring to the consideration mentioned in para. 7 of the Resolution of the 16th May 1878, quoted in the margin, state also if you consider that there is any class of labourers to whom the one kind of work is more suitable than the other, and what are your reasons for this division.

"Officers trained in the Public Works Department should possess the knowledge and experience necessary for keeping order among crowds of relief labourers, for exacting from them adequate tasks, and for turning their work to the best advantage; but works conducted under their agency are not free from the danger of providing insufficiently for those who are feeble, or unable to give a fair return of labour. District Officers, without professional training, do not ordinarily possess the above qualifications in the same degree, and are commonly occupied with other duties. On the other hand, it is peculiarly the province of District Officers to make arrangements for receiving applicants, and admitting them to relief, for classifying them according to their strength and capacity for labour, for organising them into gangs, and thus encouraging members of the same village to keep together."

State what are the circumstances under which either class of work is preferable. Referring to the consideration mentioned in para. 7 of the Resolution of the 16th May 1878, quoted in the margin, state also if you consider that there is any class of labourers to whom the one kind of work is more suitable than the other, and what are your reasons for this division.

3. Relief-works, again, may be conveniently divided into small and large: that is to say, works employing (say) 300 or 500 labourers for about one month only, and works employing a larger number of labourers for a longer period. Though this division generally corresponds with the division into Civil and Public Works Department works, it does not necessarily do so: a small work might be under a Public Works Department Officer, and a large one under a Civil Officer. State under what circumstances you consider small works to be admissible, and what the advantages and disadvantages attached to them are, at different periods of a famine.

4. The three main tests hitherto adopted to justify the admission of persons to relief-works are:—

THE DISTANCE TEST.—Under which the need of relief is proved by willingness to go a certain distance to obtain it.

THE WAGE TEST.—Under which the need of relief is proved by willingness to accept a wage which is little more than a bare subsistence.

THE LABOUR TEST.—Under which the need of relief is proved by willingness to do a fair day's work according to the strength of the labourer.

Would you propose to adopt any other tests than these? If so, describe them. Would you reject applicants for labour, because their appearance, clothing, or the ornaments they wear, do not indicate penury? If so, would you do this equally at the beginning, during the height, and in the decline of a famine?

5. *The Distance Test.*—State how this test has been applied within your experience of famine, and how you think it should be applied. What amount of distance has been considered sufficient for the test? Was it enough that the labourers should have to go some distance to and from the work? Or was it insisted on that they should live away from their homes? If A is a work near village Z, and B is another work 10 miles off, have the inhabitants of Z been refused admittance at A, and directed to go to B? If so, what measures were taken to ensure that they did go to B? If the test has been relaxed, state under what circumstances. Has the test been effectual, and has it kept away persons who were not in distress? Has it been too severe and kept away people who were in distress? What modifications would you, from the experience now gained, propose in applying the test?

6. *The Wage Test.*—Where relief is given in the form of money wages, the wage will be chiefly based on the quantity, kind, and price of food required to support life, with a margin for condiments and contingencies. What are the assumptions as to the quantities of food to be given to labourers of different ages, sexes, and capacities for labour, and the extra allowance for condiments, &c? Have you any data by which to test the accuracy or error of the assumption made as to the quantity of food required? State your experience as to the physical condition of labourers who have for some time subsisted on any given relief wage, giving the amount of that wage, and the quantity of food it supplies? What have you ascertained as to the actual kind and quantity of food purchased by labourers with their wage? How is the price ascertained of the standard kind of food on which the wage is based? How would you, with your present experience, formulate the conditions of the wage test?

7. What is the best way of paying wages, daily or less frequently ; at morning before work begins, during the day, or at evening when work is over ; by calling out nominal rolls or by tickets, or by a combination of these ? To whom should the payment of wages be entrusted ? Explain the system of supervision most approved by experience, of checking payments, and of preventing laxity and fraudulent practices in the disbursement of wages ? Have labourers been paid in grain, or partly in grain and partly in money ? Under what circumstances is this desirable, and, if necessary, how is it best arranged ? Have wages ever been paid by tickets, on presentation of which at a trader's shop food would be delivered ? What would you advise in this respect ?

8. What system do you recommend to prevent frauds by persons on the works, such as the receipt of wages by those who have not worked ? What steps should be taken in the case of persons who have been absent at any of the roll-calls, or who have worked part of the day, but not all of it, or who, having worked during the day, are accidentally absent when wages are paid ?

9. What wage should be given to those who are prevented from working by sickness, (1) when there is a hospital attached to the work, (2) when there is none ?

10. *The Labour Test.*—What are the principal descriptions of work on which fixed daily tasks are applicable, and what tasks have been insisted on ? How are the labourers classified according to their physique ; by whom and in how many classes ? What steps are taken for raising labourers from one class to another, according as their physique improves, or *vice versa* ? How are they ganged, and into how large gangs ? How is their work measured up ; by whom, and how often ? How are they punished for not completing their tasks ? What steps should be taken to test the report of the measuring official, to secure that the labourers are justly punished or deservedly paid in full ? What steps are necessary to compel persons receiving relief to work ? In those sorts of work on which it is impossible to apply the task test, what test can be applied to ensure that the labourers earn their wage properly ?

11. Under what conditions, if any, is payment by piece-work practicable on relief-works, that is, payment for quantity of work done at a fixed rate, irrespective of the amount of daily earnings ? What are the advantages and disadvantages of the system ? When it is advantageous, how can it be best adopted on a large scale, and what precautions would be necessary to prevent its abuse ?

12. What is the best form of hut for labourers on a relief-work, and what the best method of arranging them in a camp ? What is the cost of hutting per head ? Should the huts be erected by specially hired labour or by the relief labourers themselves ? What points require consideration in selecting a site for such a camp ? What sanitary arrangements should be prescribed in it, especially as regards latrines ? What establishment is necessary to look after these arrangements ? What Police or other establishment is necessary to preserve discipline and to prevent robberies ? How should this be organized ?

13. What arrangements do you recommend for a Bazar ? Should an arrangement be made with one man to supply the labourers on certain specified terms, or should any traders who wish to do so be permitted to open shops ? If the supply of traders is for any cause insufficient, what steps should be taken to induce persons to open shops, or otherwise to provide for the sale of food, &c. ? Where should the Bazar be located ? Should the huts be erected for the traders at the cost of Government or at their own cost ? Should any supervision be exercised over what they sell (for instance, to exclude luxuries or unwholesome food), or over the prices at which they sell ? And, if so, in what way ? Should they be allowed to keep their shops open all the day, or only when the labourers are off work ?

14. In what cases, should a hospital be attached to a relief-work ? What system of sanitary inspection of the labourers is desirable ? How far should the sick be treated without being sent to hospital ? If there is no hospital, what arrangements should be made for those who fall sick ? When a hospital is necessary, what should be the shape and material of the sheds, what space should be allowed to each patient, what clothing, bedding, &c., what provision should be made, and what class of people entertained for cooking and nursing ? What professional supervision should be provided over the Hospital Assistant ? What authority should be exercised over him by the Public Works Department Officer, or the Civil Officer in charge of the work, if there is one ?

15. What system do you recommend for the admission of applicants for relief on works for securing that no hindrances are placed in the way of their coming, and no bribes taken for admission? How would you provide for classifying them and placing them on gangs? If payment is not made daily, how would you arrange for their receiving advances till the first wage-day comes round? And, if paid daily, what pay should be given to those who come on during the day and work for a broken period?

16. What Registers should be kept up of the number and classes of persons on the works, the numbers who are daily admitted, or who leave, the wages paid, the number punished by fine, the quantity and value of the work done?

17. Describe the organization of a well-managed relief work, the number of gangmen and of labourers in each gang, of overseers over the gangmen, of registering clerks and paying clerks or cashiers, and how the upper supervising staff is constituted. State also in what form, and at what periods, progress and other reports are sent up to higher authorities?

18. What arrangements would you propose for discharging labourers from relief-works when the famine is declining, or over, or when the work is closed? Has it been customary to give money to persons discharged, to enable them to reach their homes and start again in their ordinary way of life? How have persons been dealt with who to the end continue in a physical state in which they are unable to support themselves?

19. Has it been found that persons after admission to relief-works wilfully desert from them, and to what extent do such desertions commonly indicate excessive severity in the application of tests or insufficiency of food, or improper treatment of other sorts? Are they often due to other causes, and if so what? How should such results be guarded against? Under what circumstances would you recommend moving bodies of men to works over considerable distances? Should this ever be done as a preventive measure to weed out those who are not in absolute want of relief or only as a step that is expedient for the sake of transferring them from less useful to more useful work, or to admit of their being more easily fed or supervised, or to prevent sickness and the like? If the distance is more than one day's march, what arrangements should be made for hutting them for the night and for paying them or feeding them on the march? Narrate the history of any case within your knowledge in which more than 500 people were moved, or attempted to be moved, more than 20 miles, and state any difficulties the movement involved, and how they might best be avoided.

20. Under what circumstances should a Civil officer be associated with a Public Works Department officer in the management of a relief-work? What is the proper field of duties of the Civil officer? What parts of the duties should be wholly under him, and what parts should be entirely beyond his sphere? If it is proper for him in any way to interfere with or control the discipline of the labourers, the management of the camp and bazar, the tasking, the measuring, and the payment of wages; state how this can best be done without undue friction and annoyance.

21. Besides the persons to whom employment is given with the special object of affording them relief, the Public Works Department usually employs on the works it carries out, a large number of both skilled and unskilled labourers, who are dependent for their regular livelihood on the receipt of wages more or less all through the year. State how the continued employment of these may best be made compatible with relief labour if the works on which this class of men is employed are closed or turned into relief-works.

22. Have you had experience of any kind of relief-work other than earth-work? If so, describe it. Has any attempt been made to employ artisans, such as weavers, smiths, carpenters, &c., in pursuing their own professions, and with what success? In the case of weaving or spinning, when raw material is given out, and thread or cloth received back, is it best to pay the difference of price between the raw and the worked-up material, or to pay daily wages to the workers? State your views as to the best method of distributing the raw material, and exacting a proper tale of work, and make any general suggestions on this subject that occur to you.

SECTION 2.

Gratuitous relief.

23. The commonest mode of administering gratuitous relief is through the poor-house. What is the proper situation for a poor-house so as to secure accessibility, discipline, space, water, and proximity to food-supply? Is an enclosure wall or fence necessary, and of what should it be made? What total area is desirable in proportion to the whole number of inmates? What shape and material are best for the huts, and what sleeping space (in superficial area) should be provided for each inmate? How may they best be arranged with a view to ventilation, &c.? How should the latrines be placed and managed? What is the maximum number you would accommodate in one poor-house? How should the inmates be separated and classed together, so as to provide for the requirements of caste, for the keeping of families together, and for the separation of the sexes in the case of persons who do not belong to families?

24. What should be the conditions of admission to relief in a poor-house? The usual conditions are (1) inability to work on a relief-work; (2) willingness to reside within the enclosure; (3) willingness to accept cooked food. Under what, if any, circumstances may these be relaxed, or may the food be distributed without residence, or may uncooked food be given? What arrangements should be made for the admission of applicants, and to whom should the duty of selection be assigned?

25. Under what circumstances does it appear desirable that entry into a poor-house should be made compulsory on persons who appear to be starving or to be in such a state of want as to show that relief in some form is essential to the preservation of their lives? and under what circumstances would you allow them the discretion of refusing to submit to this? If compulsion is used to take them in, what steps are required to ensure their stopping there? How should such a rule be applied to vagrants, and how to persons on relief-works, or seeking relief otherwise? Does it appear necessary or expedient to obtain legislative authority for such action as may be desirable in these respects? If so, suggest what seems most suitable. Would there be any special objections to such legislation, having in view the risk of exciting fears in the population, or for other reasons?

26. What ration should be given to the ordinary inmates of a poor-house, and what special diet to those who are much reduced by innutrition? Have you any experience of the effects of the ration for adults which consists of 1 lb of raw flour with condiments? What is the proper quantity of condiments? State the results of your experience as fully as possible, whether this ration has or has not shown itself sufficient to support life.

27. Give as fully as possible your views as to the organization of a poor-house. State how the food should be purchased and stored, what stock-register of it should be kept, and by whom, how given out to be ground, what the grinding task should be, how it should be received back and tested when ground, how given out to the cooking department; how information is to be given to the store-keeper or the head of the cooking department as to the number of rations required for adults and children, for ordinary, special, or sick paupers; in what way and in what vessels the food should be cooked, with how much water and fuel, what the weight of the cooked ration should be, whose duty it should be to test it, how it should be served out to the people, what discipline should be enforced among them while it is being served out and eaten? What precaution should be taken to see that it is eaten when received and not sold or exchanged, and that the children's portions are not taken from them by their parents or other adults? Under what circumstances should warm clothing be given, of what description, and at what probable cost per head? State what the rules of the poor-house should be as to the hours of rising, ablution, calling the roll-call, distributing food, going to and returning from work, and going to sleep? What arrangements should be made for personal ablution and washing clothes? What supervision is necessary to separate and take in time to hospital those who begin to sicken, or to distribute medicine to such as require it but are not sick enough for hospital? State what work the paupers can be set to, what is most suitable for what cases, and how labour is to be enforced. What establishment is required (per hundred paupers) for cooking, grinding, sweeping the enclosures, cleaning the latrines, maintaining discipline, fetching water or wood or grass for thatching, removing the sick to hospital, or carrying out and burying the dead? To what extent may such duties be performed by the stronger of the paupers, and in case suitable persons cannot conveniently be obtained from among them, how should the necessary establishment be paid? What amount of general supervision is

necessary? What registers should be kept up as to cash outgoings, stores in stock and issued, daily numbers fed, and daily expenditure of food, sickness, and death?

28. Refer to the questions regarding a hospital attached to a relief-work, and consider how far the arrangements suitable for such an establishment would also be applicable to a hospital attached to a poor-house. If any difference of system seems desirable, state in detail what seems requisite.

29. What system would you pursue for drafting into a relief-work those inmates of a poor-house who recover strength and health there, and become fit for labour?

30. There are two classes who ordinarily receive gratuitous relief without being inmates of poor-houses. The first is parda-nashin or gosha women. What test can be applied to prove their necessity? Would you enquire into their cases through an official or a non-official? Supposing they have hitherto been dependent on a person who now refuses to support them, would you admit them to relief or require him to support them if he is able to do so, (1) if they have close natural ties to him, (2) if they have not? Supposing the necessity of relieving them to be established, how would you relieve them, with money or food, or by giving work, such as cotton to spin or grain to grind? How often should this relief be given, and in what quantity? When, and under what circumstances should this relief cease? Have cases occurred in which dependants of persons in easy circumstances have claimed or obtained relief, and how have such cases been dealt with?

31. Another class consists of the sick, infirm, cripples and bed-ridden folk in towns or villages, who cannot leave their homes. How would you organise a system for relieving them? How enquire into and ascertain their cases? How convey relief to them when they are put on the registers, and what relief should it be? When should relief of this kind be closed?

32. What has been held to be the duty of Government in respect to orphans or deserted children, and what appears to be the correct principle to follow? What number of such children have been thrown on the State during the recent famine? What arrangements have heretofore been made for receiving and supporting them, and what has been their ultimate destination? What have been the practical results of the measures thus taken in the past? What appears to be the best system to adopt in the future?

33. Another form of relief, independent of a labour test, is by purchasing grain and selling it at or below cost price, and consequently below the retail market rate. Was this measure resorted to in your district, under what circumstances, and with what results? Do you consider that there are any conditions under which it is proper for Government to have recourse to such a step? (This question does not refer to the propriety of Government importation generally, but of importing or purchasing in order to sell cheaper than the market rate).

SECTION 3.—Miscellaneous.

34. State as nearly as practicable the proportion that the whole number of persons that were in receipt of relief in any form in your district on a selected day, or on the average of some week, when the recent famine was at its height, bears to the whole population. Of the whole number so receiving relief, what were the proportions under the following heads:—

1. ON RELIEF-WORKS	...	...	...	{ Adult males.
			...	{ " females.
			...	{ Children.
2. ARTISANS SPECIALLY EMPLOYED (IF ANY) AS SUCH	...	...	...	{ Adult males.
			...	{ " females.
			...	{ Children.
3. IN POOR-HOUSES (RESIDENT)	...	...	...	{ Adult males.
			...	{ " females.
			...	{ Children.
4. RELIEVED NON-RESIDENT (PARA. 30)	...	...	...	{ Adult males.
			...	{ " females.
			...	{ Children.
5. RELIEVED IN VILLAGES (PARA. 31)	...	...	...	{ Adult males.
			...	{ " females.
			...	{ Children.
6. OTHERS, NOT RESIDENT	...	...	...	{ Adult males.
			...	{ " females.
			...	{ Children.

35. Has Government ever attempted to organise emigration, permanent or temporary, from districts suffering from famine to other parts of India or foreign countries as a relief measure? If so, with what success? Under what circumstances could any such emigration be organised or encouraged? To what extent has emigration been resorted to by the people voluntarily? Have any gone beyond sea? Have any permanently gone off to settle in other parts of India? How many (approximately) left their district on a temporary expedition to search for food or employment elsewhere during the recent famine? Did they go alone or with all members of the family, and with their cattle and property? Where did they go to, and were their hopes of alleviating their distress realised? How many (approximately) have not come back, and how many are supposed to have died?

36. If famine-stricken people begin to emigrate to a part where it is known they would not find things better than in the country they left, or if they wander aimlessly from their homes, settling nowhere, should steps be taken to stop this, and how? Would you employ the police under any circumstances to turn them back, or to compel them to go to relief-works or poor houses? Or would you let them learn by their own experience? If they crowd into a town, say the head-quarters of the district or the province, would you do anything to stop them on the way or to prevent their begging and straggling about the town when they get there? Refer to para. 25 in answering this question, and add anything that seems requisite in relation to the points now raised.

37. Is it a recognized feature of the Revenue administration in your district to give relief by the remission or suspension of the demand for land revenue when the crops fail? If there are any established rules, quote them. Is the land revenue assessment based on the principle that profits of good years should cover losses in bad years? Is it assumed that a sufficient margin of profit is left to the landholders to admit of the regular payment of the revenue under all vicissitudes of season, or only in the ordinary fluctuations that occur, excluding seasons of extreme drought? What is the practical state of the case? How far is it found to be possible to collect the land revenue in a year when the crops have totally failed, without pressing unduly on the land-owners? What amount of failure of crops is held to justify what amount of leniency in collection? Where the occupier of land pays rent to a landlord, how is the payment of such rent affected by failure of crops, and to what extent does the remission or suspension of land revenue lead to corresponding treatment of rent? What are the arguments in favour of giving relief in the form of remission or suspension, respectively? To what extent has it been customary in actual practice in your district or province to remit or to suspend in such cases? Up to what limits do you consider that it is practicable to recover in future years, the postponed demand of bad years, or does suspension practically mean remission in all but a few cases?

38. Is the duty of searching out distress in time of famine in the villages and the peoples' homes one that properly belongs to Government, or is it sufficient for Government to offer means of obtaining relief, and to expect that the famine-stricken will come of themselves and make use of those means? If it is proper to depute special officers to inspect villages and urge the people to accept the relief offered, what steps do you consider necessary for strengthening the ordinary district staff and enabling them to carry out this duty? What class of officers should be selected for such duties, and what areas assigned to them? May these officers best be servants of Government, or should they be taken from the non-official class? What should be their precise duties, and what supervision should be provided to see that they carry out those duties? At what period may it become expedient to organize such an extra famine establishment? To what extent, and under what general circumstances, has there been any tendency on the part of the people in distress to reject measures of relief offered to them? Where determined disinclination has been shown by any portion of the population to leave their villages and go to relief-works or poor-houses, what has been the probable cause of such a state of things? Can it be traced to improper arrangements for the reception of applicants for relief, or for admitting them to employment on works, to an insufficient allowance of food, or wages, or to any such causes? Can any other causes be named which may have conduced to the disinclination to seek relief, such as physical prostration, or habitual want of confidence in officials, &c.?

39. Did you in the recent famine lay in any stores of Government grain for the purpose of feeding labourers or inmates of poor-houses? Was anything done to stimulate trade by offering advances of money or any kind of assistance or bonus to merchants? Did the Government purchase grain, import it, and sell it again to the general

public with the object of keeping the local markets supplied? If any such measures were taken, state the circumstances under which the transactions occurred, the reasons which led you and your superior officers to think them necessary, the manner in which grain was purchased and imported, the quantity, cost, and price at which it was disposed of, and the monetary gain or loss realised; or the nature of the advance or bonus given to traders: whether it checked private imports; also the general effect of the whole transaction. If you did not take any such step, do you now consider that it would have been better to do so? If you did it, or it was done, do you think any error was committed in so acting? And generally what are the conditions under which such measures are proper and necessary?

40. Do you consider that the events of the last famine have shown that the system of Civil Administration in your District is strong enough to bear the unusual strain laid upon it, or that any defects have been discovered which might be obviated? Is the area of your District too large for one man to supervise, or of a convenient size? Are your official relations with the Officers of the Public Works Department in your District, such as are most conducive to the carrying on of relief-work? What staff of Civil Officers have you to carry out your orders, and what duties and responsibilities attach to each? Is that staff of the proper strength and organized in the best possible way, or can you suggest any improvements? Have your native subordinates, as a class, shewn energy, capacity, humanity, and physical activity in carrying out relief measures, or have they been wanting in these qualities? Give a general outline of the manner in which the relief operations in your District were conducted. To what extent did your control go, to what extent was there local independence of action? How was the chain of responsibility maintained between the superior and subordinate officers? How far were you yourself controlled in the Relief Administration, and how far left to act on your own discretion.

41. Through what channels have orders relating to Famine Relief reached you from the Government? If references were sent by you, and orders received by you from the Government or its representative in the Famine Department direct, state whether you think that course operated well, whether the necessary business was rapidly conducted with consistency and precision, and with due attention to the exigencies of special circumstances and localities, &c.? Do you think this course best, or that the work would have been more effectually done had there been an official (whether Commissioner or Member of the Revenue Board, or by whatever name called) who should have been in administrative charge of a group of Districts, and would thus have become acquainted with their wants and circumstances by personal inspection? If, on the other hand, you received the orders of the head of the Government through any intermediate authority, state if, in your opinion, there were any disadvantages attaching to this course, such as weakening the sense of personal responsibility in the Local Executive Officers, delay in replying to references, or want of uniformity of method in different parts of the Province, and so forth?

42. Under what financial control were the operations placed as to the supply of funds and authority to spend money, or sanction and commence works? State generally the system adopted, and what you think of it? Mention if any irregularities or frauds took place in the application of money, or were supposed to have taken place, and how and to what extent? Is it anywhere currently reported that any persons of any class engaged in the relief operations have become subsequently enriched, or is there reason to think that speculation or malversation were rare and exceptional? Were sufficient means available for checking the expenditure and rendering and auditing the accounts? How was this part of the operations conducted, and with what general results; has the whole of the outlay been satisfactorily accounted for or not, and if not, what deficiencies have arisen and in what manner, and how have they been dealt with?

43. What do you consider the proper field for private charity in the beginning, at the height and in the decline of a famine? To what objects should it be applied, and through what channels? Should the funds be expended by Government servants who are also at the same time carrying out relief measures? Should they be expended in saving life and giving food? Or should that be left entirely to Government, and the charitable funds confined to other objects, such as setting people up again in their pre-famine position, starting them again with a little capital, and thus assisting them with appurtenances which, though not luxuries, are not absolute necessities of life?

44. What has the effect of famine been in your experience on the subsequent condition of a District? Where villages were deserted, have they been permanently depopulated,

or has the population returned to them? Has much land been thrown out of cultivation, and for how long has this decrease in the cultivated area continued? Has it been due to want of cultivators, of plough bullocks, or of capital and of seed grain?

45. In the case of the recent famine, what effects, such as those just referred to, have been produced? How many villages have been deserted, how many have been seriously affected; what is the reduction in the area under cultivation now compared with what it was two years ago? How many holdings have been abandoned? Have the landlords, or ryots with whom the settlements are made, been permanently impoverished in a serious degree? Is there any reason to anticipate increased difficulty in realizing rents or land-revenue for the next few years by reason of the recent pressure, if the seasons are favourable? What proportions of landlords or ryots are likely to be dispossessed of their holdings through the action of the Revenue or Civil Courts, as a consequence of distress produced by the famine? Has the agricultural population which has no beneficial interest in the land suffered more in proportion than other classes?

CHAPTER IV.

FAMINE PREVENTION.

Preparation of schemes of work for future use.

1. After 1868 the Government of India gave instructions that schemes of works should be prepared, suitable for execution in the event of famine. Were such schemes ever prepared? If so, have they been found of practical use during the recent pressure?
2. Do there appear to be any difficulties in the way of keeping up such schemes in a form which will be really useful in the future?
3. What classes of works would be included in them? Would the works differ in character from the ordinary works of utility brought forward for execution from time to time? And if so, how? Give a practical example of works now considered suitable to be taken up as elements of such a scheme in two or three Districts, if possible.
4. Should the works in such a scheme be looked on as immediately available for giving employment as relief-works at the discretion of the Local Governments, or under what circumstances might the authority of the Government of India be held to be required?
5. If severe drought calling for the employment of labour on a very large scale, and in an exceptional manner, occurs at comparatively long intervals, how will it be best practicable to arrange for suitable projects, which, though suspended, must yet be fit for early execution? On whom should the responsibility of maintaining such schemes in an efficient state rest, and how could it be enforced?
6. What number of persons is likely to be thrown on relief-works in an extreme case, and how should such a scheme be framed as to indicate what portions of it should be taken up on any particular occasion, in order to provide for the employment of the anticipated numbers, and for the length of time required?
7. Should the works include only such as had been sanctioned for construction under regular rules on such subjects, or would it under any circumstances be right to include in such a scheme large works to which sanction had not been given on account of their doubtful financial value, and their not being of a character that would justify their execution under ordinary circumstances? How far might there be risk of the Government being led into unprofitable expenditure in the completion of works of this sort begun under plea of famine pressure?
8. Is it probable that the amount of work executed by unskilled labour on any large work during the pressure of famine would be such that the exclusion of the expenditure on it would reduce the ultimate cost of such a work in any important degree, so as to be likely to render it remunerative, though if otherwise executed, it would not have been remunerative? Can any illustration be given of such a case as that last referred to?
9. Could large works not sanctioned by proper authority, for whatever reason, be properly included in the scheme of works, and if so, what preliminary steps should be regarded as requisite before actually putting them in hand if severe scarcity arose?

10. Considering the circumstances under which labour is applied on relief-works, is the risk of waste by reason of there being no regularly prepared scheme ready really great? Is there danger, in the absence of suitable projects ready for immediate execution, of the suffering population being left without proper relief until the necessary relief-works have been prepared for execution? How far might the intelligent action of the several branches of the Public Works Department be made to supply, from among projects in course of execution, or ripe for it, what was requisite? Could this end be sufficiently secured by distinctly making the Public Works Department responsible for bringing forward suitable works whenever pressure from scarcity arose; and, so far as was necessary and practicable, setting aside or postponing the ordinary work not suitable for relief purposes?

11. Has there been practical difficulty in finding suitable relief-works during the recent pressure? If so, where and how? Make any suggestions on the subject of providing relief-works which may aid in meeting the difficulties that are found to arise in practice.

IRRIGATION WORKS.

12. What is the capital expended to date in the construction of the principal canals in your Province, and what the yearly interest on that capital? What is the annual cost of maintenance? What is the present acreage irrigated? From this calculate the several corresponding rates per acre. What is the average local value per acre of the chief crops raised by irrigation from these canals? What is the difference between this and the average value of such crops raised without irrigation?

13. What is the amount per acre paid for the use of water for the chief crops by the occupier in the shape of water-rate? What is the ordinary increased rent on irrigated over unirrigated land? What is paid by the proprietor per acre in the shape of land revenue or owner's rate? Is there any reason why a proprietor, whether paying land revenue or not, the yearly value of whose lands is increased by irrigation from canals constructed and maintained at the public cost, should not contribute to the State in return for the advantage he thus obtains? What seems to be the best way of obtaining such a contribution from him; first, where the land revenue is liable to revision; secondly, where it has been permanently settled; and thirdly, where the land is not charged with revenue?

14. In what way, and under what law, are the canal dues recovered in your District? Has there been found to be any difficulty in applying the law in any particular, and if so, how? And what better system can be suggested? It is commonly said that water is used in too lavish a manner by agriculturists when the charge is made on the irrigated area, or otherwise than by the quantity supplied. Is this the case, and what remedies can be applied? Will raising the water-rate have the effect of preventing this? To what extent is this likely to have a tendency to throw the poorer crops out of cultivation, or to confine irrigation to the more paying crops? Is water charged for by quantity, and can this be done? Is it ever charged for on a contract system, a whole village or the proprietors or cultivators of a certain portion of the village lands paying a lump sum periodically for the water supplied to those lands through a given aperture? Is this system a good one? What are the difficulties attending it? Where it is adopted, what arrangement is made for distributing the water among the cultivators? Have complaints practically arisen where the system has been in force, and how could they best be guarded against? Does there appear to be any objection to making such a system of contract compulsory where the general advantage of the cultivating community calls for increased economy in the use of a limited supply of water?

15. Having reference to the margin of profit on irrigated crops commonly left to a cultivator after payment of the existing water-rates, could these rates be increased without trenching unduly on that margin of profit? How would raising the water-rates operate on a cultivator under a lease, and how on the revenue-paying proprietor if it took place during the currency of the lease or settlement respectively?

16. How are the statistics of irrigation recorded, and are revenue reports of the chief irrigation works prepared by the canal administration, and in what form? Do you think them necessary? To what extent do you think the record of such statistics valuable or necessary for the proper administration of irrigation works? To what degree of detail may the record usefully go, and how may the facts be best collected and recorded?

17. What evidence is there as to any mischief being caused by canal irrigation, such as by increasing sickness or injury to the land by raising the water-level, or production of efflorescent surface salts, &c. ? To what extent has drainage accompanied, or ought drainage to accompany, canal irrigation ? Has the Provision of needful drainage been neglected ? Is additional drainage needed to meet the effect of the increased quantity of water thrown on the surface, or to remove obstructions caused by canals, channels, water-courses, &c.

18. Has canal irrigation anywhere been combined with attempts to improve soils previously unfit for cultivation from the presence of noxious salts ?

19. What has been the general effect of continued canal irrigation on the character of the cultivation ? Has the irrigated area of the poorer grains which supply the chief part of the food of the people been gradually diminished, and has the area of the better crops been increased ? If the area of poorer crops has been reduced, is this due to conditions of soil or position of lands and difficulties of access from the water-supply or to the relative profits in the one case being greater than in the other ? State the general facts as to the changes in the areas irrigated during the last 10 or 12 years, and make any comments that seem desirable. Is there reason to suppose that prolonged irrigation damages the land under any circumstances ? Is there any evidence of a reduced production ?

20. Under what conditions is an inundation canal, giving water only during the rainy season, found to be useful ? To what extent is it probable that such irrigation could be usefully attempted in the North-Western Provinces, or elsewhere where not now applied, and where a water-supply is available ? How far would such irrigation be useful for rabi or kharif cultivation ? How far may wells be depended on to supplement the deficiencies of supply in such a canal during the dry season ?

21. What is the system of canal administration ? Who is responsible for distributing the water and for collecting the dues ? May the functions of the Engineer in charge of the works and the technical business of the water-supply, and those of the officer responsible for seeing that the available water is distributed equitably to the land that most requires it, and securing water to the extension of irrigation and the realization of the canal revenues and their due assessment and increase, be best combined, or should they be kept separate ? State the reasons for your opinions.

22. What system actually prevails in your Province, and if you think it susceptible of improvement, say how. Do you think a special canal law necessary to admit of proper administration ? And have you such a law, and is it satisfactory ?

23. Why has the extension of the use of canal water been commonly so slow ? What has been the nature of the obstacles, and how can they best be avoided or removed ? Are any of the canals now in an unsatisfactory condition in these respects, and can any sufficient explanation be given of the want of progress ? This question would specially apply to the Orissa Canals, and to the works of the Madras Irrigation Company with reference to which last see Question No. 30. Have any of your canals practically reached the state in which any further extension is not likely or is likely to be small ? Say how far this is the case in each. Are difficulties met with in preparing land for irrigation for the first time, in the way of sub-dividing fields or levelling the surface or formation of water-courses which require more time and money than can be supplied by a limited population otherwise than slowly ? If such difficulties are met with, how may they best be removed ? Does the existing system provide sufficiently for making advances to cultivators to adapt their land to irrigation, and if not what changes are desirable ? Does shortness of supply during the hot season materially affect progress of canal irrigation ?

24. Where the financial prospects of projected irrigation works are not such as to appear to justify the outlay of public money on them in the expectation of the income being at an early date sufficient to cover all the expenses including the charge of interest on capital outlay, do you think that a special rate to make good the deficiency might properly be charged on the District for the benefit of which the works are designed, or on the land that would be protected, and if so, under what conditions ? If not, what are your objections ? How would you meet the case put in this question if not by some such special rate ? Is it more equitable to place a compulsory charge on other Districts which can probably derive no advantage from the works, or only on the Districts or lands that can benefit ? If the protection to be given by such works to particular Districts is deemed of great importance under conditions such as have been above stated, what course do you think should be taken having regard to the necessity for protecting the general finances of the country ?

25. Have any customary claims or prescriptive rights in use of water from tanks or canals or water-courses grown up in your District? What is their nature and history? Have they led to inconvenience in respect to the general utility of such works to the agricultural community that might benefit by them? Would it, in any case that you know, be desirable to buy out such rights as exist, and to prevent the accretion of others? Have such claims or rights to the use of the water in the upper parts of rivers obstructed the application of the water in the lower parts to purposes of irrigation? or *vice versa*? If this has happened in any case, could any remedy be applied which would be equitable? How should disputes on such points be settled? In cases in which the action of the ordinary courts would be impossible or inapplicable, what principles should govern decisions in such disputes?

26. If anywhere it be found that the tanks, &c., are so small and numerous that Government cannot practically carry out their supervision and maintenance, would it be expedient that steps should be taken for imposing on the cultivators or proprietors who benefit by the water, the duty of carrying out all necessary repairs or works for securing the irrigation in an efficient condition? Do you think this principle should apply to all tanks, great and small alike? Might the obligation equitably be held to attach without any corresponding relief being given, or should any privileges (such as lowered rent) be conceded to the ryots, if they are charged with the duty of repair? To what extent should the liability go, whether only to minor works not requiring engineering skill, or to all work? How could such a duty be best enforced, and any neglect of repairs checked at its inception? and what penalties should be legalised to punish such neglect when it does occur? Is there any local or other fund from which to pay for such work if it consisted of more than ordinary earth-work? could such a fund, in case of need, be established?

27. How far do obligations rest on zamindars or other superior landholders to maintain tanks or other irrigation works? Are such obligations properly recognized where they exist, or is any additional power called for to enforce them? Where they do not now exist, are there circumstances or localities in which it would be expedient to impose them on some such basis as that referred to in Question No. 26, and if so, on what general system should it be done?

28. What are the rules made under Madras Act No. VII of 1855? Give a statement of the works to which this Act has been applied, and what is the revenue realized by means of it? Give an illustration of the cases in which exemptions are granted under Section 4 of the Act. What is the nature of receipts entered in the Miscellaneous Land Revenue under the head "Cess for repair of tanks?"

29. How has the distribution of water been fixed where the supply is less than the demand? Do customary or other established rights interfere with the extension of irrigation from any Government canal, and if so, where and to what extent, and what remedy should be applied? Is it the duty of any one to see that the available water is made use of to the best possible advantage for the community as a whole, and on whom does the duty fall? Is there any difference in the system of supplying canal water to lands under ryotwari settlement and under zamindari settlement, where the two exist, and what is it?

30. Is there any special difficulty introduced into the spread of irrigation by the intervention of the agency of a company in the management of a canal, and how could such difficulties be best overcome?

31. In reckoning the return obtained from the outlay on canals or other irrigation works, is full credit given them under the existing system of accounts? Where separate water-rates are charged on the cultivators, is the indirect profit obtained by the increase of land revenue properly taken into account? Where there has been no distinction made in the payment to Government between the charge made as land revenue and that for the supply of water, is the canal revenue fairly estimated at present, and if not, how do you think it would be best reckoned?

No. 25 dated Simla, 22nd June 1878.

From—C. A. ELLIOTT, Esquire, C. S. I., Secretary to the Famine Commission:
To—the Officiating Secretary to Government, Punjab.

I HAVE the honor to forward, for submission to the Government of the Punjab, copies of a Circular containing enquiries suggested by the Famine Commission on matters relating to the general condition of the people, to famine relief and to famine prevention; the

answers to which will, it is hoped, materially assist the Commission in forming their views on the different points submitted to them by the Government of India.

2. It has occurred to the President and Members of the Commission, that the best method of obtaining answers to these questions speedily, would be to select the most competent and experienced of the officers under orders of His Honor the Lieutenant Governor, and to

* Questions 2, 3, 4, 5, 8, 10, 13, 14, 15,
16, 17, 18, 19, 20, 21 and 22.

direct them to reply to such of the questions as refer to matters within their particular sphere. For instance, the greater part of the 1st Chapter* might be made over to some one specially qualified officer who would compile for the whole Province, and, if possible for each District of it, such statistics as are required to throw light on its economic condition. The other questions which are less susceptible of purely statistical treatment might be made over both to officers of the Department specially concerned, and also to those District Officers, who have most experience in administrative matters, and whose opinions are most trusted, by the Government of the Punjab. The enquiries contained in Question 1 might be separately answered by the Meteorological Reporter: those in Questions 6 and 7 by the Director of Agriculture where such an official exists, or by some officer who has made a special study of agricultural subjects; those in Question 23 by the head of the Forest Department, as well as by District Officers who have taken an interest in forest management; those in Questions 24 and 25 by the Sanitary Commissioner or any Officer of the Medical Department who has given his attention to vital statistics and the general health of the population. The answers to Questions 11, 12 and 26 would only be of value if given by officers of wide administrative experience, and accustomed to a close and thoughtful observation of the country and people. The facts desiderated in Question 9 could, perhaps, be best ascertained if they were recorded in the first place by some capable native official in each District, and the results tested and compared by some specially selected superior officer in each Division or considerable number of Districts.

3. In the same way Chapters II and III, can only be answered by officers who have had practical experience in dealing with famines in their different stages; and it is requested that the questions may be sent to all such officials, whether District Officers or in subordinate grades, who have been in responsible charge of any definite part of the relief operations including Officers of the Department of Public Works, of the Medical Department, with the instruction that each should answer those queries regarding which he has direct personal knowledge.

4. The questions contained in Chapter IV, are of a more technical character, and can, it is conceived, be best answered in the form of a memorandum drawn up by the Chief Engineer and the head of the Irrigation Department, respectively, though the opinions of selected Executive Officers may also usefully be invited. There are certain points such as those involved in Questions 6, 11, 13, 14, 15, 17, 19, 21, 22, 24, 25, 26, 27 and 28 (wholly or in part), on which the views of the most experienced Civil Officers should also be obtained.

5. It has been arranged that the duty of superintending the compilation and the preliminary consideration of the replies received from the various parts of India, shall be undertaken by the members of the Commission named in the margin, and the President would suggest that you should, with the permission of His Honor the Lieutenant-Governor, communicate to the local member of the Commission, who is specially accredited to your Province, the names of the Officers to whom the different parts of this set of questions are to be sent:

Bengal	...	Mr. Batten.
Assam	...	
Punjab	...	Mr. Cunningham.
Burmah	...	
N.-W. P. and Oudh	...	Mr. Elliott.
Central Provinces	...	
Bombay	...	Mr. Pelle aided by Mr. Vasudeo.
Madras and Mysore	...	Mr. Ballard aided by Mr. Ranga Charlu.

and that their replies should be forwarded direct to him, in order to be compared, examined, and, if necessary, returned for correction or amplification before they are submitted to the Lieutenant Governor, and before the general opinion of the Local Government is recorded, so far as it may be the desire of His Honor to do so.

6. The above remarks refer to the detailed questions contained in the Circular; but the Commission trust, that they may also be favoured with the opinions of the Government of the Punjab on any subjects connected with famine on which the Lieutenant Governor may be inclined to record his views.

7. I am further to request that it may be enjoined on all Officers consulted that they should submit their replies with as little delay as possible, with a view to these being brought into a shape for consideration by the whole Commission, not later than the 1st October next; and that the Circular may be published in your *Gazette* for general information.

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Bengal	...	} Mr. Batten.
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Punjab	...	} Mr. Cunningham.
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Bombay	...	} Mr. Peile aided by Mr. Vasudeo.
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		} Mr. Ballard aided by Mr. Ranga Charlu.

and that their replies should be forwarded direct to him, in order to be compared, examined, and, if necessary, returned for correction or amplification before they are submitted to the Lieutenant Governor, and before the general opinion of the Local Government is recorded, so far as it may be the desire of His Honor to do so.

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7. I am further to request that it may be enjoined on all Officers consulted that they should submit their replies with as little delay as possible, with a view to these being brought into a shape for consideration by the whole Commission, not later than the 1st October next; and that the Circular may be published in your *Gazette* for general information.

No. 282 C.

FROM

J. G. CORDERY, ESQUIRE,
*Officiating Secretary to Government,
 Punjab and its Dependencies,*

TO

THE SECRETARY TO FINANCIAL COMMISSIONER,
 PUNJAB.

Dated Simla, 12th July 1878.

Revenue, Agriculture and Commerce.

SIR,

I AM desired to forward the enclosed papers, being a letter from the Secretary to the Famine Commission, No. 25, dated 22nd ultimo, together with a Circular containing enquiries on matters relating to the general condition of the people, to famine relief, and to famine prevention; and to convey the following observations and orders of His Honor the Lieutenant-Governor.

2. It will be seen that Mr. Cunningham is the local member of the Commission, who is specially accredited to this Province; and it is contemplated, as a convenient course, that the replies of the officers consulted should be forwarded, direct to him, in order to be compared, examined, and, if necessary, returned, before the general opinion of His Honor the Lieutenant-Governor is recorded. Mr. Egerton remarks that it is a matter of the first importance so to organize the enquiries which will be instituted as to facilitate the labours of the Commission, and to render available to them the best information which is at the command of the Local Government and its officers. In furtherance of this object, the special circumstances of the Punjab must be duly borne in mind. The Financial Commissioner has always been the superintendent of famine relief, and a very large proportion of the interrogatories but relate to agricultural conditions and phenomena, to the economic state of the rural communities, to the nature and effect of systems of land tenure, and of land revenue, which are all matters within his sphere of duty, and on which the opinions of the civil officers of the Province would be inadequately represented, if arrangements were not made for the Financial Commissioner to be heard upon such points as he might wish to express his views; moreover, on all these subjects he has already available in his office the consolidated experience of many years. It is a further proposal of the Commission that the duty of supplying the information, required by the majority of the questions in the first chapter of the Circular, relating to the condition of the country and the people, should be entrusted to some one specially qualified officer. This measure, His Honor considers, is altogether indispensable, as it would be quite impossible, in any other way, to elicit and arrange the necessary information within the short time allowed for furnishing the report. He accordingly wishes that Major Wace may now be placed on special duty in the Financial Commissioner's office for this purpose; and also in order to assist the Financial Commissioner generally, in the conduct of this very important correspondence. He desires, in order to meet to the fullest extent possible, the wishes of the Commission, that the Financial Commissioner and Major Wace should place themselves in communication throughout with Mr. Cunningham, that such records as may bear upon the subject of their labours and enquiries should be open, if required, to Mr. Cunningham's inspection, and that any requisitions which he may wish to make, and any information for which he may call, should be furnished by them on his application. The final form of the report will then be settled by Mr. Cunningham, in consultation with the Financial Commissioner and Major Wace, before it is submitted for the opinion of Mr. Egerton. It is thought desirable to inform the Financial Commissioner at once of these intentions: but I am to explain that the sanction of the Government of India is necessary to the appointment of Major Wace; this will be immediately solicited, but in the meantime the Financial Commissioner should, so far as may be practicable, take the necessary measure on the lines indicated in this letter.

3. Before passing on to explain in what manner His Honor thinks that Chapters II, III, IV, of the Circular may be best dealt with, I am to record a few observations on some special points in Chapter I. The Commission suggested that certain questions should be referred to the heads of particular departments, such as the Meteorological Reporter, and the Conservator of Forests. In view of the explanation above given, His Honor thinks it will be the better plan for such references to be made by the Financial Commissioner himself, so that the whole of the replies to the first chapter may be treated in a comprehensive and consistent manner by Major Wace. There is, however, one exception to be noted in adopting this course. Upon question 26, regarding local taxation for the prevention and relief of famine, the Lieutenant-Governor will not ask the Financial Commissioner or Major Wace to record any reply, as he thinks this enquiry may best be answered by the Local Government. Questions 11 and 12, in regard to which the Commission remarks that the replies would only be of value, if given by officers of wide administrative experience, are proper subjects for memoranda by the Financial Commissioner himself; but there is no reason why he should not consult a few selected civil officers, if he should be so disposed.

4. The first question of the series, regarding the effect of the rain-fall, could not, Mr. Egerton observes, be satisfactorily replied to by the Meteorological Reporter alone, although his aid would be requisite. In considering the sufficiency of rain-fall for the crops two sets of facts should be borne in mind: *first*, experience has, in some localities, shown that a comparatively moderate rain-fall may sometimes be far more beneficial than heavy rains; and His Honor believes that evidence on this subject can be found in the reports on the Pesháwar Settlement; *secondly*, the effect of a decreased rain-fall upon the extension of canal irrigation is an important point, which should not be lost sight of, and on which the annual revenue reports will bear.

5. In replying to the second question, so far as it relates to destructive calamities other than famines, it will be remembered of what serious consequence in this Province is scarcity of fodder for cattle, as distinguished from scarcity of food grains. In the third question, the estimates of the total consumption of food grains should include grain used for seed. As regards question 9, the Commission desire that the facts required should be first recorded by some competent natives of experience. The Lieutenant-Governor thinks that Hukm Chand, Extra Assistant Settlement Officer, Mooltan; Muhammad Hyat Khan, C.S.I., Assistant Commissioner; Alimulla, Honorary Extra Assistant Commissioner, Rohtak, and Raja Sir Sahib Dyal, may, with advantage, be consulted, as well as any other whom the Financial Commissioner may select. Upon the remaining question in this chapter, the general instructions already recorded will suffice. The Financial Commissioner will consult on the appropriate topics the Meteorological Reporter, the Sanitary Commissioner and the Conservator of Forests; and it will be in his discretion to record distinct notes upon such subjects as he may desire; and Major Wace, in compiling the consolidated reply, will act under his orders. It will be convenient, if practicable, to exhibit some of the statistics in a tabular form, and to fix upon one year for which the required information may be given, otherwise discrepancies will occur which will require explanation.

6. In reference to Chapters II, and III, which deal with the organization of famine relief, in the rise, height and decline of famine, the Commission only desire the replies of officers who have had practical famine experience. As regards these chapters—with the exception of the third part of Chapter III., which will be dealt with in the next paragraph—the Commissioners of the divisions marginally noted, which have been affected by the recent scarcity in the Punjab, have been asked to obtain the necessary information. They have been instructed to refer Chapters II, and III, Sections 1 and 2, to those officers in their divisions who may be best qualified, from practical experience, in the recent distress, or on former occasions, to furnish information which may be useful to the Commission. It has been impressed upon them that it is highly undesirable that any conjectural replies should be framed, and they have been requested to direct their subordinate officers to confine themselves strictly to those questions upon which their personal experience would directly bear. No question will be answered by any officer unless he is in a position to give substantial evidence in regard to it. The Commissioners will forward the replies, when received, to the Financial Commissioner, who will submit them to Mr. Cunningham.

Pesháwar
Rawalpindi,
Amritsar,
Jullundur,
Delhi,
Hissar.

7. The third section of Chapter III, should not be circulated in this manner, inasmuch as it throughout involves large general questions, which are much more intimately connected with famine of a severe type, than with the comparatively slight pressure which this province has lately experienced. To open to general discussion, unstrengthened by recent practical knowledge, many of the wide and debatable issues which this section raises, would not, in His Honor's opinion, lead to results satisfactory either to the Commission or to himself; he therefore invites the Financial Commissioner's most careful consideration to this portion of the *questionnaire*, and requests that Mr. Ouseley "will have the goodness himself to furnish, as far as may be practicable, a memorandum in reply to it." On such points as Mr. Ouseley may prefer, some selected District officers should be consulted, and their replies should be included in the papers which will be furnished to the member of the Commission accredited to the Punjab.

8. Questions 1 to 11 of the IVth Chapter, regarding the preparation of schemes of work for future use, have been referred to the Secretary to Government in the Public Works Department, with instructions to forward his reply to the Financial Commissioner, who will deal with it in the same manner as with the other correspondence collected. On questions 6 and 11, which the Commission think are proper matter for the opinion of the experienced civil officers, the Financial Commissioner will have the opportunity of recording his remarks, and the discretion of consulting officers, allowed throughout the case, is of course permissible in this instance.

9. The second portion of this chapter, relating to irrigation works, has in like manner been transmitted to the Joint-Secretary to Government, Public Works Department, Irrigation Branch, who will report upon it in relation to the canals under his department. There are, however, in this Province, many canals under the District Officers, and His Honor wishes the replies in so far as they relate to canals, under district management, to be furnished by the Financial Commissioner, who should consult officers who have had special opportunities of understanding the subject, amongst whom should be Mr. D. C. Macnabb, Major Grey, Mr. Tremlett, Mr. Fryer and Major Corbyn.

10. In framing his minutes relative to Section 3 of Chapter III., and to the latter portion of Chapter IV., the Financial Commissioner will be able to avail himself of the assistance of Major Wace, should he desire to do so.

I have, &c.,

Officiating Secretary to Government, Punjab.

QUESTION 1, CHAPTER I.

What is the normal system of rain-fall in your Province? From what quarter does the rain come, and in what months does it fall? Give any returns you possess showing the average amount gauged in each month; and state whence they are obtained, and how the registers of rain-fall are kept? CH. I.

It will be most convenient to answer briefly the last half of the above paragraph before the first. The rain-fall is registered at the head-quarters of each tahsil and District. At the tahsil offices the observations are made and the registers written up by one of the native revenue clerks under the supervision of the Tahsildár. At the head-quarters of each District the observations are similarly made either at the tahsil or Sadar Office.

At the great majority of these observing stations (aggregating about 150) the gauge used for registering the rain-fall is a cylindrical copper tube, into which the rain-fall is collected from a wide funnel. The depth of water in the tube is measured by a metal scale. The dimensions of the tube and the funnel are so adjusted that one inch of water in the tube represents a fall of one-tenth of an inch at the mouth of the funnel, that is to say, on the surface of the ground. At a few stations more elaborate gauges are in use.

In addition to these weekly reports by the land revenue establishments, a system of meteorological observations is carried out at the head-quarter Medical Dispensary of each District, and reported to a selected Medical Officer at Lahore, who fills the office of Meteorological Reporter to the Punjab Government. These observations are carried on with accurate instruments, and include, besides the rain-fall, humidity and temperature of the atmosphere, barometric pressures, and the wind directions; and are summarised in an annual report addressed to the Punjab Government.

It is noteworthy that the rain-fall reported by the land revenue establishments, though observed with rough instruments and by clerks on small pay, agrees well with the more detailed and scientific observations last described.

I append the following papers, which embody the results of the above observations for a series of years; viz.,

- I. A report by Surgeon-Major A. Neil, Meteorological Reporter to the Punjab, describing the rain-fall of the Punjab for each month.
- II. Statement of average monthly and annual rain-fall at the head-quarters of each District in the Punjab; compiled from the returns of 10 years supplied by the Meteorological Reporter.
- III. A more condensed statement of the average rain-fall at the head-quarters of each tahsil, compiled from the returns submitted by Deputy Commissioners.
- IV. A map of the Punjab, showing the annual rain-fall at the head-quarters of each District and tahsil.

With the aid of these papers it is possible to describe briefly the normal system of rain-fall, from what quarter it comes, and its distribution over the different seasons.

The rain-fall of the Punjab, like that of the North West Provinces, is brought to it by wind currents from the east and south-east. A portion of the fall may be due to the south-west currents from the Indian Ocean; but so much of these as contribute to the Punjab rain-fall seem to strike the eastern currents at a point east of Delhi, and are deflected by and added to the latter.

It is a proverb all over the Punjab that the east wind brings rain. This is said both of the autumn and winter rains. I gather from Dr. Neil's report that his observations do not corroborate this fact in respect of the winter rains. But the fact is notorious, even in winter, that rain comes with the east wind; and I have no doubt that in due time meteorological observations will confirm and explain it.*

* The following extract from the reply to the 1st question of Chapter I, submitted by the Meteorological Reporter of the North West Provinces, is pertinent to this subject.

"At Chakrata southerly or south-easterly winds prevail during the first three months, and the preponderance of these becomes still greater further west at Simla and Murree. This direction from the east to south is that of the so called "anti-monsoon," a moist upper current which in the coldest months descends occasionally to the earth's surface and brings the winter rains as well as the snow-fall of the Himalayas."

See also the reply of the Bengal Meteorologist to this question.

The seasons in the Punjab are so adjusted that the later rains of the autumn (August to October) both ripen the autumn crops and prepare the ground for the rabi sowings. If these rains fail, 2 crops are lost at one blow. Both in 1860 and 1868 it was this which caused the famine. The natives say that the loss of the kharif harvest by itself does not cause famine, but that famine always comes in with the kharif, and goes out with the kharif. That is to say, the kharif may fail owing to short rains at the sowing time ; but if the later rain fails absolutely, the rain which both ripens the autumn millets and on which the wheat is sown, the country loses at one blow a year's food supply. In the same way famine goes out with the kharif, because these late autumn rains bless the country with 2 crops at once.

Papers appended to reply to question 1, of chapter I.

The rain-fall of the Punjab, by Surgeon Major A. Neil, Meteorological Reporter to the Punjab Government.

Statement of average rain-fall at the head-quarters of each District, registered under the control of the Meteorological Reporter.

The same, registered at the head-quarters of each tahsil by the land revenue establishment.

Map showing rain-fall, irrigation, &c., in the Punjab.

ANSWER to QUESTION I, CHAPTER I.

The Rain-fall of the Punjab—By SURGEON MAJOR A. NEIL, Meteorological Reporter to the Government of the Punjab.

JANUARY.

This is the coldest month of the year throughout the Punjab, and usually more than November and December. The winds usually blow from north-westerly directions, but as in the cold season generally, vary greatly. CH. I.

The rain-falls during this month, as indeed during the cold weather generally, are due to local influences, local areas of low pressure, whither wind currents of different degrees of saturation and different temperatures blow and mingle. A good instance of this was shown in January 1874, on the 21st and 22nd of the month. On the north-west Frontier the wind had been blowing previously mostly from northerly and easterly directions; while on the north-eastern boundary from below and through the District of Ludhiana, the wind came from westerly sources. These currents, impinging and uniting, deflected towards the more eastern Districts, and there, the regions being colder, precipitated their moisture.

A cold wind from the hills meeting a warmer current from the plains will serve to produce a depression of temperature with consequent condensation of moisture, and a continuance of this will bring the moisture below the dew point or point of saturation, and a fall of rain will be the result. The range of rain-fall for January extends from a maximum of 4 inches to a few drops. The submontane Districts are usually the most liberally supplied, from causes described above.

FEBRUARY.

This month is warmer, by an average of 5° or 6° than January. The winds, though variable, blow mostly from northerly and westerly directions, and the rains are due mostly to the same causes as I have mentioned in my remarks for the previous month. The largest rain-falls occur in the submontane Districts. The largest fall during this month in Lahore (4.67 inches) occurred in 1877; so also in Rawalpindi and in Siālkot in the same year. In the more eastern Districts the fall does not usually reach one inch, and the same remark applies to the more southern Districts.

MARCH.

The mean temperature of this month exceeds that of February usually by about 7 degrees. The temperature in the sun's rays begins to increase greatly. The winds, still variable, begin to blow more frequently from easterly sources as the heat of Northern and Western India begins to increase, but northerly and westerly currents still prevail. The average rain-fall at Lahore rarely exceeds two inches; and seldom, indeed, reaches that amount. During this month of 1868 and 1869 the rain-fall in the submontane Districts and a few others was very considerable, and was due to a prevalence of wind currents blowing towards the great north-eastern boundary, and being there met by counter-currents. In March 1871, these same Districts had very little rain, and I account for this by the fact that the westerly currents were so powerful that they carried their moisture far into the mountains beyond the Districts noted. The average amount of rain in the more southern districts, such as Delhi, Gurgaon, Hissar, does not usually exceed an inch. In the submontane Districts the fall is more plentiful, from the reasons given above, and

in the western and north-western Districts the fall is also usually tolerably plentiful. This will depend of course greatly upon whether the area of low pressure may shift towards them, and thus cause a rush of wind currents in that direction.

APRIL.

The mean temperature of this month exceeds that of March by about 11°. The wind begins to assume more southerly directions, but is still variable. The rain-fall varies very much throughout the Province. In the more southern Districts and on the north-western Frontier it seldom exceeds one inch, and in many places does not even reach that amount. The north-eastern Districts usually fare better, though occasionally very badly.

MAY.

This month has a mean increase of about 10° over that of April. The amount of rain varies very much in different years during this month in the Punjab. In the year 1869, 1870, 1871, this month was almost rainless, and in 1874, 75, 76, 77 very little fell, at random periods. In the years 1867 and 1872, and notably in the present year, the falls for this month have been very considerable. On turning to my report for 1869, I find the following remark :—"The most remarkable difference in the amount of rain is observable in May as compared with that of the same month for the two previous years, during which it so happened that a certain amount of rain fell in almost every District in the Province. The Barometer showed greater fluctuations of pressure during the month in 1867 and 1868." It is to be observed that the month of *March of 1869* was unusually rainy, which, due, as the cold weather rains are, to local influences, principally accounts, partly at least, for the scanty fall in the May following.

Turning to the table of "Directions of Wind," for 1869, I find that the winds were with unusual frequency easterly, as for example at Siālkot, and this will account for the absence of rain in the submontane Districts. The wind currents were blowing towards the area of low pressure. Turning to the report for 1872, I find that westerly currents were more prevalent; the area of low pressure had therefore been more eastward.

JUNE.

This is the hottest month of the year. The amount of rain which falls during this month is subject to very great variation. In the report for June 1873, I made the following observations:—"It is most interesting to compare this month's (June, 1873) weather results with those of the same month for the past four years." In my report for June 1871, I wrote as follows :—"The rain-fall during this month was unusually large in the eastern and south-eastern Districts and in the hills. The cause of this was the almost entire prevalence of the south-east winds. These south-east rain-bearing winds, blowing as they did along the great mountain boundary of the Himalayas, had most of their moisture precipitated to the east of 74° Long. The south-west winds to the west of this, on the other hand, meeting seldom with any resistance from counter-currents, blow onwards towards the north-western boundary of the Province, over a large tract of arid country, and had little moisture left in them by the time they reached the great Sulimán range as south-eastern deflected currents. The Districts north of the 33rd parallel fell short of their usual supply of rain, and it is most likely that, with the same predominance of south-easterly winds, this state of matters will always maintain, as it will in the case of Districts lying to the west of 74° Longitude." As the Gangetic current waxes stronger or otherwise over the south-western, the greater or less will be the fall of rain in June."

Quoting still from the report of 1873, "The table of results (appended) shows at a glance in how far the above remarks are confirmed by subsequent observation. Take for example Ludhiána. In June 1871, when east and south-east prevailed, there was a fall of over 10 inches of rain; while in 1873 for the same month there was a fall of only a fraction of an inch. With the other years for the same month there will be found shades of

difference which correspond to the prevalence of the rain-bearing currents or otherwise. Ch. I. The same remark applies to Siālkot, Lahore, and Rawalpindi.

STATIONS.	Years	WIND.								Rain.	Mean Maximum Temperature in Shade.	Mean Minimum Temperature in Shade.	Mean Daily Range.	Mean Monthly Temperature.	Mean Relative Humidity.	GENERAL REMARKS.
		N.	N. E.	E.	S. E.	S.	S. W.	W.	N. W.							
Lahore	1869	14	...	5	...	28	...	16	1-7	115.2	82.1	33.1	85.6	37.		
	1870	7	8	10	2	10	11	9	0.6	109.9	78.6	31.1	84.3	30.		
	1871	8	15	20	2	7	3	2	1.2	101.5	79.1	22.4	80.3	41.		
	1872	14	3	17	...	...	...	26	2.00	119.38	78.80	40.50	85.65	32.64		
1873	5	29	3	...	...	4	71	3	0.64	110.11	82.40	27.71	86.28	24.00		
Ludhiana	1869	3	1	4	11	1	5	28	10	1.1	110.4	82.8	27.6	86.4	28.	
	1870	6	9	15	1	3	6	18	2.7	104.1	Instrument out-of order.	...	...	39.		
	1871	1	4	4	26	3	3	1	10	10.17	99.3	78.2	21.1	85.8	49.	
	1872	2	8	9	21	5	2	16	4.21	110.18	82.60	27.58	86.86	30.80
1873	3	3	...	5	4	4	6	57	0.18	111.66	78.26	33.40	83.96	18.00		
Siālkot	1869	13	3	27	4	2	11	15	7.3	106.1	80.0	26.1	85.1	26.		
	1870	1	3	16	12	5	6	8	3.4	105.5	81.4	24.1	82.4	27.		
	1871	1	3	13	17	4	7	6	6	5.6	95.1	79.6	15.5	87.3	...	
	1872	2	4	6	29	5	14	10	1.40	112.10	80.73	31.37	88.91	26.80
1873	2	13	6	3	...	...	5	14	11	...	113.68	79.37	34.36	88.65	19.00	
Rawalpindi	1869	9	1	22	2	2	...	28	1	1.6	109.7	78.9	30.8	87.3	29.	
	1870	4	2	22	...	1	...	24	...	5.1	110.4	74.9	35.5	82.6	35.	
	1871	...	...	15	32	2	...	6	2	4.1	105.8	78.5	27.3	83.1	38.	
	1872	6	8	7	6	1	...	4	15	10	0.81	114.25	77.75	36.50	86.90	37.20
1873	6	3	6	6	3	7	28	6	0.64	115.15	74.15	40.97	84.67	9.00		
Dera Ismail Khan	1869	4	9	5	12	5	6	1	9	2.0	116.8	79.1	37.7	84.7	39.	
	1870	3	7	11	24	9	7	...	...	4.3	108.3	80.5	27.8	86.4	28.	
	1871	1	3	6	20	3	11	...	...	0.88	109.1	81.4	27.6	85.3	44.	
	1872	1	23	4	7	...	...	10	3	...	114.77	No instrument.	...	...	25.28	
1873	...	37	13	10	...	...	...	...	...	114.05	75.73	38.32	84.89	24.00		
Mooltan	1869	...	7	3	6	...	22	2	42	0.6	110.5	81.9	28.6	85.6	22.	
	1870	...	6	3	5	...	38	2	1	0.2	110.4	...	...	...	30.	
	1871	...	6	4	2	...	6	...	...	...	112.6	77.6	34.9	81.	...	
	1872	...	6	1	6	...	25	1	...	...	120.34	87.37	32.93	105.20	22.81	
1873	...	2	...	18	...	20	...	1	0.01	112.28	76.43	35.85	84.40	37.00		

JULY.

Owing to the rains this month is slightly cooler than June, and the daily range of temperature is less. As a general rule, the monsoon rains do not set in in the Punjab before the end of the first week of this month. At all events this is usually the case with the Districts north of the 30th parallel. As regards the amount of rain which the Province will receive during this month and the following, we have tolerably definite and trustworthy data at command. Depending as the rain-fall is upon monsoon influences, and recognising the fact that two rain-bearing currents, south-western and south-eastern, affect the eastern and northern-parts of the Indian Peninsula, we have only to discover by observation whether the current is more or less powerful than the other. Of the two monsoon currents, the south-east or Gangetic current is the one upon which the Punjab depends most for rain. In my Report for July 1873, I wrote as follows:—"A considerable amount of rain fell in most of the eastern Districts, and the obvious cause was the prevalence of the rain-bearing currents from the east and south-east."

The fall was observed to be most copious in the more eastern Districts, in some of which the fall nearly doubled the mean of any of the previous years for the same month. If we compare the falls of July 1869 and 1873, we notice that north of latitude 30° the fall for the former period far exceeded that of the latter, while in the Districts south of that parallel, the rains were comparatively scanty. Thus, at Delhi the fall in July 1869 was only 6.5 inches; while that of July 1873 in the same station was nearly three times that amount. On examining the wind charts for these periods, we find that during the early part of the month of 1869, the winds blew most frequently from westerly directions; and it was not till the middle of the month that rain fairly set in with the change of wind to south-east. I append a table showing the wind directions, amount of rain, &c. &c. Again, as regards July 1874, I wrote:—"Had the south-west monsoon been more powerful, less rain would probably have fallen in the Districts north of the 30th parallel and to the east of the 73rd degree of Longitude, inasmuch as to the west of this lies a dry arid country, in which moisture (in the south-west wind) is absorbed."

* Drops only.

STATIONS.	Years	WIND.							Rain.	Mean Maximum Temperature in Shade.	Mean Minimum Temperature in Shade.	Mean Daily Range.	Mean Monthly Temperature.	Mean Relative Humidity.	GENERAL REMARKS.	
		N.	N.E.	E.	S.E.	S.	S.W.	W.								N.W.
Lahore	1869	1	26	1	18	...	14	...	3	590	105-16	77-14	28-02	91-15	49.	
	1870	1	2	6	23	4	18	2	12	120	119-29	81-90	28-30	98-05	28.	
	1871	3	6	21	15	2	9	5	3	500	97-70	78-10	19-51	87-84	53.	
	1872	...	18	...	86	...	12	...	5	420	97-87	75-22	22-65	86-54	59.	
	1873	...	18	...	97	...	9	...	4	12	9-16	82-12	17-17	90-71	58.	
Ludhiana	1869	3	4	88	9	1	5	9	3	48	97-55	80-28	17-87	88-95	58.	
	1870	3	9	20	7	3	1	4	15	16-10	96-86	79-37	17-43	88-11	50.	
	1871	...	6	6	37	1	...	4	6	377	101-16	67-61	26-55	84-38	50.	
	1872	2	9	10	30	1	...	10	...	3-54	97-51	71-39	20-12	87-45	58.	
	1873	4	7	8	35	4	1	7	8	13-94	94-51	75-84	17-67	85-67	53.	
Sialkot	1869	2	4	3	38	4	1	...	4	3	8-32	96-19	78-29	17-90	87-26	58.
	1870	...	6	3	28	2	4	2	9	3	15-60	97-26	79-48	17-80	88-26	57.
	1871	...	6	6	37	1	...	4	6	5	10-80	99-32	80-32	19-00	89-32	53.
	1872	...	4	...	21	21	13	1	...	2	9-53	91-10	78-42	12-68	84-76	71.
	1873	6	8	9	23	2	2	1	11	6	7-20	98-38	78-68	18-80	88-48	57.
Rawalpindi	1869	1	9	21	11	2	4	4	5	5-30	102-48	79-16	25-32	89-82	48.	
	1870	1	14	27	9	1	1	5	4	8-2	102-00	77-77	24-23	89-89	69.	
	1871	...	42	...	1	...	12	...	...	7-58	102-70	76-10	26-60	89-40	39.
	1872	...	6	2	20	9	8	...	13	2	4-84	102-20	77-00	28-29	91-10	43.
	1873	2	7	15	28	5	7	3	3	7-91	102-40	76-60	25-80	89-50	49.	
D. I. Khan	1869	1	7	22	15	5	5	4	2	8-38	104-00	76-70	27-30	89-35	52.	
	1870	...	1	20	12	5	4	3	1	9-52	105-00	76-40	25-63	89-23	48.	
	1871	...	6	12	6	1	4	12	7	12-1	98-14	74-63	23-21	88-38	69.	
	1872	...	21	10	19	3	9	...	9	1-23	105-35	89-77	24-58	89-08	44.	
	1873	...	13	11	29	10	3	...	...	0-81	102-29	83-60	25-49	86-54	61.
Mooltan	1869	...	1	5	1	9	42	3	1	1	105-36	80-80	24-56	89-08	45.	
	1870	...	23	4	35	6	4	...	2	2-44	102-87	...	...	86-23	52.
	1871	...	1	20	12	5	4	3	1	1	204	110-55	79-00	30-65	86-23	46.
	1872	...	16	5	29	3	6	1	3	8	4-4	102-19	77-38	24-61	89-88	64.
	1873	...	17	...	2	4	28	1	6	0-40	105-44	81-08	24-38	83-25	59.	

August.

The temperature of this month differs but little from that of July. The rain which falls depends of course upon monsoon influences. In this month of 1868, there was a great scarcity of rain in the more southern, and in many of the submontane Districts. Take as example, Delhi and Sialkot. In 1867 Delhi had 7.4 inches in this month, and Sialkot 26.2; whereas in 1868, for the same period, Delhi had only 0.3 inches, and Sialkot 9.7. These results were due entirely to the greater frequency and force of the easterly and south-easterly currents in the former period than in the latter.

STATIONS.	Years	WIND.							Rain.	Mean Maximum Temperature in Shade.	Mean Minimum Temperature in Shade.	Mean Daily Range of Temperature.	Mean Monthly Temperature.	Mean Relative Humidity.	GENERAL REMARKS.	
		N.	N.E.	E.	S.E.	S.	S.W.	W.								N.W.
Lahore	1869	1	16	1	6	...	22	...	16	0-30	107-31	77-92	29-29	92-61	47.	
	1870	1	8	9	19	2	8	...	15	6-30	102-55	77-00	25-55	89-72	53.	
	1871	3	4	10	5	1	17	19	3	0-20	104-50	78-80	26-10	91-85	42.	
	1872	...	5	1	8	...	12	...	5	102-06	74-19	27-36	88-08	60.		
	1873	...	4	00	...	...	22	...	2	4-27	97-23	79-02	18-21	88-13	57.
Ludhiana	1869	...	11	32	43	4	4	18	3	9-28	80-82	18-46	89-56	48.		
	1870	...	3	12	7	...	1	11	17	1-40	100-06	75-65	22-41	88-35	51.	
	1871	...	11	...	30	1	4	5	21	6-99	96-00	70-22	26-78	84-11	62.	
	1872	...	3	8	2	37	1	1	2	8	2-29	109-00	76-80	26-20	88-40	53.
	1873	...	4	8	2	38	8	1	2	19	11-79	95-00	75-83	18-17	85-31	52.
Sialkot	1869	...	11	4	5	24	...	1	14	4-66	94-19	74-97	19-52	84-43	61.	
	1870	...	5	8	6	21	7	3	2	8	1-1	102-28	76-25	26-00	89-26	51.
	1871	...	4	2	19	4	11	1	11	4	20-90	80-58	78-51	17-07	86-04	55.
	1872	...	6	5	81	7	3	1	8	1	10-60	92-74	77-09	13-63	83-32	62.
	1873	26	16	4	6	11	...	3	3-76	95-06	76-45	21-61	87-25	71.
Rawalpindi	1869	...	9	3	17	...	12	10	11	8-16	100-80	77-38	22-22	89-19	54.	
	1870	...	8	21	8	1	6	15	...	7	7-16	98-96	78-82	25-14	86-39	62.
	1871	...	7	10	8	...	8	6	8	3	7-4	98-53	72-70	25-35	85-61	63.
	1872	...	6	...	23	...	1	...	32	...	103-20	72-50	31-40	88-20	20.	
	1873	...	6	1	27	...	6	...	12	...	9-89	98-40	72-70	25-70	85-55	57.
D. I. Khan	1869	...	1	18	10	27	...	3	4	3-70	103-80	75-90	27-50	89-55	49.	
	1870	...	8	5	16	16	6	4	2	2-33	101-00	74-20	26-90	87-69	42.	
	1871	...	8	21	8	1	6	15	...	7	7-16	98-96	78-82	25-14	86-39	62.
	1872	...	7	...	10	8	...	8	6	8	7-4	98-53	72-70	25-35	85-61	63.
	1873	...	4	14	5	23	5	8	...	3	1-81	104-45	78-87	25-38	91-66	47.
Mooltan	1869	...	7	2	31	17	5	...	4	1-99	102-31	79-71	22-80	91-11	56.	
	1870	...	9	5	30	11	7	...	4	...	103-83	80-87	24-96	89-35	48.	
	1871	...	25	8	35	...	4	...	...	0-45	102-67	...	...	86-08	61.
	1872	...	24	6	13	1	6	...	3	2-92	103-23	75-19	28-13	89-25	54.	
	1873	...	1	12	5	32	2	7	...	3	8-0	100-61	74-61	25-60	87-61	56.

SEPTEMBER.

Ch. I.

The weather phenomena for this month are also under monsoon influences. The south-easterly currents begin by this time to lose their force, and the south-west monsoon prevails. In my Report for 1873 I wrote as follows:—"The south-west monsoon from the Arabian Sea meets with little obstacle, as it blows over the comparatively arid plains to the east of the Indus river; and as it blows onwards towards the great Himalayan boundary, the falling south-east current is unable to deflect it. These facts show why there are later rains in the north-eastern districts than in those further to the south. A reference to a map will show that the remaining moisture of the combined currents gets dammed up, as it were, against the great mountain boundaries, and falls as rain in the valley bounded on the west by the great Sulimán range, on the north by the hills north of Pesháwar, and to the east by the continuation of the Himalayan range.

STATIONS.	Years.	WIND.								Rain.	Mean Maximum Temperature in Shade.	Mean Minimum Temperature in Shade.	Mean Daily Range of Temperature.	Mean Monthly Temperature.	Mean Relative Humidity.	GENERAL REMARKS.	
		N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.								
Lahore	1869	3	23	6	10	2	11	...	5	8-90	88-72	74-38	34-34	86-55	63		
	1870	4	18	6	7	...	12	1	14	0-90	83-68	72-30	20-16	82-38	49		
	1871	6	10	10	10	2	7	7	8	...	102-70	...	74-98	27-74	88-88	38	
	1872	
	1873	2	4	107	4	...	...	...	...	5-55	97-67	75-62	21-39	86-61	50	3 Calms.
Ludhiana	1869	1	7	18	12	...	1	9	17	18-01	88-83	74-38	19-30	84-28	65		
	1870	1	8	...	7	...	...	...	15	2-28	85-83	62-10	30-18	78-96	69	
	1871	1	5	2	23	3	1	1	14	1-04	101-45	74-20	27-28	87-93	42		
	1872	1	2	...	9	3	3	...	62	4-28	86-76	70-43	20-33	83-09	61		
	1873	2	4	7	23	2	...	2	20	2-84	85-83	70-00	28-38	83-01	47	1 Calm.	
Sialkot	1869	8	1	17	4	11	...	21	8	4-39	88-86	76-63	17-33	85-30	70		
	1870	8	5	18	7	4	...	14	1	1-08	88-36	72-08	21-00	82-81	48		
	1871	2	4	33	6	2	...	10	8	3-00	97-30	74-56	22-74	85-28	57		
	1872	...	6	4	14	1	15	4	16	1-28	89-56	71-40	28-16	85-18	46		
	1873	...	7	19	8	...	...	7	9	2-20	88-33	72-14	28-07	85-19	50	
Rawalpindi	1869	5	...	18	8	8	...	28	...	4-07	88-87	71-70	24-67	84-08	48		
	1870	2	1	26	...	2	...	19	...	1-77	97-70	67-90	29-80	82-80	42		
	1871	8	8	12	16	4	8	12	2	8-06	102-40	69-40	33-00	85-00	41		
	1872	2	7	22	12	2	8	8	4	4-28	98-18	66-70	32-40	83-90	47		
	1873	3	13	8	9	6	4	10	8	2-78	100-42	67-60	32-92	83-96	49		
D. I. Khan	1869	2	2	15	28	14	4	...	...	1-70	88-10	76-44	22-44	87-78	58	
	1870	...	23	4	27	1	5	...	...	...	102-00	74-88	27-47	88-27	40	
	1871	1	28	2	21	5	8	...	...	...	104-78	74-76	29-97	83-74	40	
	1872	...	29	2	19	4	8	...	...	2-38	99-18	65-43	32-70	82-28	52	
	1873	1	31	18	18	...	8	...	...	0-15	103-70	69-80	38-90	82-28	52	
Mooltan	1869	...	...	...	...	...	...	...	...	0-37	87-65	76-05	20-90	87-10	42	
	1870	...	8	...	4	9	41	2	8	...	111-26	74-45	36-30	82-88	28		
	1871	1	2	1	15	6	34	...	1	...	100-28	76-01	24-28	82-16	33		
	1872	2	8	4	15	1	24	8	8	0-62	111-00	69-20	41-80	80-10	62		
	1873	2	6	1	...	14	28	7	8	0-70	106-63	78-60	32-18	89-58	49		

OCTOBER.

During the early part of this month the monsoon breaks up, and a little rain falls throughout the Province, sometimes in considerable quantity in the submontane Districts. This fall sometimes does not occur till about the middle of the month. Westerly winds are most frequent. The area of lowest pressure, about this period, seems to be along the Indus valley.

NOVEMBER.

This is the least rainy month of the year in the Punjab. A little falls occasionally in the north-western area of low pressure. The winds are variable, but most frequently westerly.

DECEMBER.

CH. I. The winds are very variable during this month, but westerly currents are most frequent. A little rain usually falls about the end of the month, called the Christmas rains.

This table is intended to show how much the mean temperature of each month differs in increase or decrease from that of its predecessor. A glance at such a summary will show that during the first six months, January to June inclusive, the greatest monthly increase of temperature occurs in April and May, and the greatest decrease during the latter half of the year, in November. January is the coldest month, and June the hottest.

STATIONS.	January.	February	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Lahore, ...	53.56	60.35	68.74	80.96	89.14	94.39	90.31	89.68	86.41	77.93	65.21	56.25
Rawalpindi ...	50.75	55.83	63.59	74.56	85.48	93.27	90.32	87.54	83.76	74.02	61.90	53.60
D. I. Khan ...	52.77	58.75	67.02	78.57	88.77	95.06	93.48	90.63	87.08	75.74	63.35	54.41
Sialkot ...	54.09	59.72	67.19	78.71	88.78	93.11	88.33	87.16	85.65	76.96	63.88	54.73
Mean of the four stations, ...	52.89	58.66	66.63	78.20	88.04	93.96	90.61	88.80	85.73	76.16	63.59	54.75
Mean difference between each month.	...	+ 5.77	+ 7.97	+ 11.67	+ 9.84	+ 5.92	- 3.86	- 1.81	- 3.07	- 9.57	- 12.67	- 8.84

CHAPTER I.

Question 1.

A. — AVERAGE RAIN-FALL REGISTERED AT THE HEAD-QUARTERS OF EACH DISTRICT UNDER
THE CONTROL OF THE METEOROLOGICAL REPORTER.

A.—Statement of average monthly and annual Rain-fall at the Head-Quarters of each District in the Punjab; reckoned from returns supplied by the Meteorological Reporter for the ten years ending 1876.

[The figures in large type are inches of rain-fall; the small figures under each of these give the number of rainy days in each month].

DIVISIONS.	DISTRICT.	AVERAGE FALL.												Total.			
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	1st October to 1st January.	1st January to 1st April.	1st April to 1st October.	Total annual.
DELHI.	Delhi ...	6.4	4.1	9.3	3.1	12.3	1.9	7.5	5.5	6.2	5.1	...	5.1	9.2	20.6	22.6	25.6
	Gurgaon ...	5.1	3.1	7.2	2.1	10.4	2.5	10.1	4.8	7.2	6.1	...	3.1	11.1	16.4	25.8	28.6
	Karnal ...	1.2	1.2	1.4	3.3	1.2	3.9	10.4	5.5	4.7	2.1	...	3.1	6.1	3.8	26.0	30.4
HISSAR.	Hissar ...	4.4	5.1	7.7	0.8	5.5	2.0	5.6	3.8	2.7	3.1	...	4.4	7.1	15.1	14.8	16.9
	Rohtak ...	3.1	6.1	7.7	3.1	5.1	1.9	6.6	2.9	4.7	5.1	...	5.1	10.1	14.1	16.8	19.2
	Sirsa ...	4.4	4.4	7.7	2.2	6.2	2.2	3.3	2.9	2.7	5.1	...	4.4	9.1	15.1	11.9	14.3
UMBALLA.	Umballa ...	6.1	1.3	1.1	8.1	1.0	4.5	12.8	7.9	4.7	3.1	...	3.1	6.1	3.0	31.6	35.3
	Ludhiana ...	9.1	9.1	1.7	6.1	1.1	1.8	7.9	5.3	4.5	4.1	...	3.1	7.1	3.4	21.2	25.3
	Simla ...	9.2	2.0	3.9	3.1	4.0	8.4	18.6	17.3	6.6	7.0	...	7.1	1.4	6.7	57.0	65.1
JULLANDUR.	Jullundur ...	9.1	1.4	1.2	5.1	1.3	2.3	8.7	7.6	5.6	2.1	...	3.1	5.1	3.4	25.9	29.8
	Hoshiarpur ...	9.1	1.4	1.7	7.1	1.0	3.4	9.0	9.2	5.4	3.1	...	6.1	9.1	4.0	28.8	33.7
	Kangra ...	3.4	5.3	3.1	1.6	2.2	12.1	4.5	3.7	13.4	10.4	...	1.1	2.1	11.8	111.7	125.6
AMRITSAR.	Amritsar ...	6.1	1.1	9.1	4.1	7.1	1.6	6.9	6.2	3.6	5.1	...	4.1	9.1	2.6	19.6	23.1
	Sialkot ...	1.0	1.6	2.3	1.3	1.1	2.7	14.3	9.9	4.2	3.0	...	4.1	7.1	4.9	33.5	39.0
	Gurdaspur ...	3.1	1.3	2.1	3.1	1.0	2.7	10.0	8.1	3.9	4.1	...	4.1	7.1	4.2	26.0	30.9
LAHORE.	Lahore ...	5.1	9.1	9.1	3.1	9.1	1.2	6.3	3.9	2.5	6.1	...	5.1	11.1	2.3	15.1	18.5
	Ferozepore ...	5.1	7.1	1.2	6.1	5.1	1.6	6.4	5.3	2.5	4.1	...	4.1	8.1	2.4	16.9	20.0
	Gujranwala ...	9.1	1.4	1.9	1.0	8.1	1.6	8.7	6.1	2.7	6.0	...	4.1	10.1	3.9	21.5	26.3
RAWALPINDI.	Rawalpindi ...	2.1	1.3	2.3	1.6	1.2	2.0	8.3	6.1	3.7	6.1	...	3.1	10.1	6.6	23.0	31.5
	Jhelum ...	3.1	1.1	1.5	1.6	1.6	4.9	4.7	2.0	3.1	1.1	...	4.1	1.8	3.3	14.5	18.6
	Gujrat ...	1.0	1.4	3.1	1.2	3.1	2.6	9.4	6.1	2.6	6.0	...	4.1	10.1	5.5	22.7	29.2
SHAHPUR.	Shahpur ...	4.4	7.1	8.1	5.1	8.1	1.6	2.8	3.1	1.5	3.1	...	2.4	8.1	1.9	10.3	13.0
	Mooltan ...	9.1	1.1	1.1	1.5	5.1	3.1	2.2	2.3	1.1	4.1	...	0.8	2.3	10.1	4.8	6.1
	Jhang ...	3.1	4.1	1.5	5.1	3.1	4.1	3.6	2.1	9.0	0.6	...	0.4	3.4	2.2	7.8	10.3
MONTGOMERY.	Montgomery ...	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	...	1.1	1.1	1.1	1.1	1.1
	Muzaffargarh ...	3.1	2.1	5.1	5.1	3.1	4.1	1.2	1.9	8.1	1.0	...	1.0	3.4	8.1	4.9	6.1
	Dera Ismail Khan ...	3.1	8.1	1.1	6.1	4.1	8.1	1.7	1.5	4.1	1.0	...	3.1	5.1	2.2	5.4	8.0
DERA GHAZI KHAN.	Dera Ghazi Khan ...	5.1	1.1	8.1	3.1	4.1	5.1	2.0	1.6	5.1	1.1	...	1.1	4.1	6.1	1.4	6.3
	Bannu ...	8.1	1.0	1.5	1.2	5.1	8.1	2.0	3.1	7.1	1.1	...	1.1	3.4	3.3	8.2	12.0
	Feshiwar ...	1.3	1.2	1.6	1.3	6.1	2.1	1.8	2.6	1.1	4.1	...	3.1	6.1	1.2	4.1	7.5
PESHAWAR.	Kohat ...	1.3	1.6	2.5	1.3	1.2	1.1	4.3	3.4	2.3	7.4	...	5.1	1.5	5.4	13.3	20.2
	Hazara ...	2.6	3.7	5.5	2.2	3.0	3.7	9.5	8.9	3.4	1.5	...	6.1	1.7	3.8	11.8	30.7

CHAPTER I.

Question 1.

**B.—AVERAGE RAIN-FALL REGISTERED AT THE HEAD-QUARTERS OF EACH TAHSIL
(STATIONS ALREADY GIVEN IN RETURN A-OMITTED) BY THE LAND REVENUE ESTABLISHMENT.**

CH. I. B.—Statement of average rain-fall at the head-quarters of each Tahsil (not already given in Statement A) in the Punjab.

NOTE.—The fall is given in inches and decimals thereof. The average number of days on which rain fell cannot be given. The averages have been compiled in the Financial Commissioner's Office from returns supplied weekly by the Land Revenue Establishments. These returns are fairly correct.

Division.	District.	Tahsil Station.	Average rain-fall for the 5 years ending 31st March 1878.					Average annual rain-fall reckoned over a longer period.		REMARKS.
			1st October to 1st January months.	1st Jan. to 1st April 3 months.	1st April to 1st Oct. 6 months.	Total annual fall.	Annual rain-fall.	No. of years on which calculated.		
DELHI	Delhi	Sonepat	1.4	0.7	15.4	17.5	30.6	8		
		Ballabgach	1.4	0.5	14.5	16.4	27.8			
	Gurgaon	Firozpur	0.8	0.6	25.4	26.8	31.1	10		
		Nuh	0.4	1.5	29.1	31.0	32.0			
		Palwal	0.6	1.7	31.6	33.9	33.6			
		Rewari	0.7	0.9	20.5	22.1	31.7			
Karnal	Painpat	0.5	2.3	28.2	31.0	27.5	83			
	Kaithal	0.2	2.1	21.2	23.6	18.0	14			
HISSAR	Hissar	Hansi	2.7	1.4	14.1	18.2	17.1	4		
		Bhiwani	4.1	1.1	15.7	20.9	17.0			
		Barwala	3.0	1.3	13.2	17.5	15.9			
		Fatahabad	1.6	1.6	14.0	17.2	14.7			
	Rohtak	Jhajjar	0.8	1.1	23.5	25.4	19.7	17		
		Sampal	0.9	1.4	26.6	28.9	18.8			
Sirsa	Gohana	0.6	2.0	21.6	24.2	20.2	19			
	Dabwali	1.2	1.4	10.0	12.6	13.3				
UMBALLA	Umballa	Fazilka	0.2	1.2	13.1	14.5	12.7	14		
		Jagadhri	0.9	2.2	39.7	42.8	39.4			
		Kharar	0.3	1.3	30.2	31.8	31.6			
		Narsingarh	0.7	2.1	44.1	46.9	43.6			
	Ludhiana	Pipli	0.3	0.9	31.1	32.3	25.5	12		
		Rupar	0.5	1.0	24.6	26.3	27.8			
JULLANDHUR	Ludhiana	Jagraon	0.3	2.5	23.9	26.8	24.0	12		
		Sarnala	0.5	3.4	21.6	26.3	26.0			
	Sirma	Barauti	5		
		Kot Khali	...	...	...	...	...
JULLANDHUR	Jullundur	Kotgarh	14		
		Kasauli	6.7	2.4	52.5	60.6	72.6			
		Nawashahr	0.2	1.6	23.8	25.6	29.5			
	Hoshiarpur	Phillour	1.0	2.3	21.0	24.3	25.6	10		
		Nakodar	0.1	1.2	23.3	24.6	25.5			
		Dasuya	0.9	5.5	36.4	42.8	35.8			
Kangra	Una	4.8	9.5	27.9	42.2	37.9	9			
	Garhshankar	1.5	5.3	33.2	40.0	34.8				
	Narpur	1.8	12.5	72.1	86.4	79.5				
	Hamirpur	1.4	10.7	49.1	61.2	58.3				
AMRITSAR	Amritsar	Dera	1.3	12.6	60.7	74.6	53.6	9		
		Kulu	0.4	17.2	21.6	39.2	40.1			
		Tarn Taran	0.3	2.5	17.3	20.1	24.9			
	Sialkot	Ajnala	0.0	2.8	17.1	19.9	24.4	11		
		Pasrur	5.8	4.3	27.1	37.2	35.5			
		Raya	4.2	3.4	24.9	32.5	24.2			
Gurdaspur	Zafarwali	3.4	3.0	25.2	31.6	30.4	12			
	Daska	4.1	3.0	23.7	30.8	30.4				
	Batala	1.0	2.9	23.1	27.0	27.0				
	Pathankot	1.8	10.7	41.6	54.1	54.1				
LAHORE	Laure	Shakargarh	0.9	7.9	32.9	41.7	41.7	14		
		Chunian	2.6	7.5	7.1	17.2	21.8			
		Kasur	2.9	6.3	6.9	16.1	21.5			
	Ajmerna	Shakarpur	2.4	5.1	6.5	17.0	19.0	17		
		Wazirabad	0.5	3.9	20.9	25.3	25.0			
		Hafizabad	0.7	2.9	14.7	18.3	20.3			

B—Statement of average rain-fall—concluded.

C_H

Division.	District.	Tahsil Station.	Average rain-fall for the 5 years ending 31st March 1878.				Average annual rain-fall reckoned over a longer period.		REMARKS.	
			1st October to 1st Jan. 3 months.	1st Jan. to 1st April 3 months.	1st April to 1st Oct. 6 months.	Total annual fall.	Annual rain-fall.	No. of years of which calculated.		
LAHORE—concl'd.	Ferozepore	Zira	9.8	0.0	17.3	27.1	19.4	14		
		Moga	4.8	0.0	20.9	25.7	26.6			
		Muktsar	4.1	0.2	10.6	14.9	13.3			
RAWALPINDI	Rawalpindi	Gujar Khan	...	...	...	...	...	5	12	
		Attock	...	...	...	...	...
		Rahuta	...	...	...	...	...
		Murree	4.5	2.8	49.7	51.0	62.0			
		Pindigheb	...	...	...	...	...
		Fatahjang	...	...	...	...	...
	Jhelum	Pind Dadan Khan	...	1.5	2.8	10.2	14.2	16.4	15	26
			Chakwal	...	0.6	2.6	6.2	9.4	12.4	
			Talagang	...	0.9	3.1	10.9	14.9	14.4	
	Gujrat	Kharián	...	2.7	7.6	22.2	32.5	30.8	23	10
			Phalia	...	2.2	5.8	16.4	24.4			26.1
	Shahpur	Khusháb	...	0.7	2.3	12.8	15.8	11.8	10	15.7
Rhera			...	0.8	3.0	15.0	18.8	15.7		
MOOLTAN	Mooltan	Shujabad	0.1	0.1	3.9	4.1	5.3	15	7.3	
		Lodhrán	0.1	0.5	5.5	6.1	5.4			
		Mailsi	0.1	...	1.8	1.9	5.1			
		Sarai Sidhu	0.2	0.4	3.5	4.1	7.3			
	Jhang	Chiniot	...	0.7	2.4	12.1	15.2	21	13.0	
			Shorkot	...	0.5	1.0	7.5			9.0
Montgomery	Gugera	...	0.1	1.6	5.9	7.6	8.3	11	8.1	
		Dipalpur	...	0.2	1.2	8.1	9.5			8.1
		Pakpattan	...	0.1	0.5	8.0	8.6			8.1
Muzaffargarh	Alipur	...	0.7	1.5	10.0	12.2	7.3	14	13.1	
		Sinanwán	...	0.2	0.9	4.8	5.9			13.1
DERAJAT	Dera Ismail Khan	Kulachi	0.1	1.4	6.3	7.8	7.9	5	8.4	
		Bhakkar	...	0.2	2.3	5.9	8.4			8.4
		Leish	...	0.3	1.4	6.5	8.2			8.2
		Tank	...	...	...	...	...			...
	Dera Ghazi Khan	Sanghar	...	0.3	1.4	3.9	5.6	5.2	5	10.2
			Jampur	...	2.9	0.6	6.7	10.2			9.6
Bannu	Kájanpur	...	0.1	...	1.0	1.1	1.2	14	9.7	
		Laki	...	0.1	0.5	13.1	13.7			9.5
PESHAWAR	Issa Khel	...	0.6	3.6	7.0	11.2	9.8	13	17.0	
		Mianwali	...	...	3.4	9.0	12.4			9.7
PESHAWAR	Peshawar	Haehtnagar	1.2	6.1	10.0	17.3	13.6	13	27.1	
		Yusafzi	...	3.7	3.9	16.2	23.8			17.0
		Khálsa Khatak	...	1.9	7.7	13.6	23.2			13.1
		Doaba Daudsai	...	0.9	4.8	8.8	14.5			14.5
		Utmán Bolak	...	2.8	11.5	22.4	36.7			27.1
	Hazára	...	4.2	9.2	24.8	37.7	35.9	10	41.6	
Kohát	...	3.5	11.4	29.1	44.0	41.6	10	41.6		
Kohát	Hangu	...	...	...	...	...	...	...	...

CHAPTER I, QUESTION 2.

What part of the country is most subject to famine and freest from it, and why? What is known as to past famines, their causes, their dates, their extent locally, and their severity as tested by prices, mortality, loss of revenue and expenditure on relief; give as far as possible precise figures.

If I first describe the Punjab famines of 1860-61 and 1868-69, it will be easy then to point out the parts of the province most subject to famine and those freest from it, with the reasons for the same.

Of famines previous to the annexation of the Punjab in 1849, no account has yet been drawn up. But the country suffered in the great famine of 1783 A.D., equally with the rest of Northern India; and no subsequent famine has nearly approached this one in severity. The first famine of which we have any record is that of 1860-61.

FAMINE OF 1860-61.
LOCALITY AND CAUSE.

From the reports of the years 1860-61 and 1861-62, I append extracts giving such brief details of this famine as were then placed on record. From these it appears that, though the autumn rains of 1860 and the spring rains of 1861 were scanty throughout the Province, complete failure and consequent famine occurred only in the country between the Sutlej and the Jumna; that is to say, in the Delhi, Hissar and Umballa Divisions. In these tracts the autumn rains of 1860 failed almost completely, thus causing the loss of that autumn's crop; and the failure of the usual rains extended on to the month of January, so that the spring (rabi) crop was lost likewise.

The previous harvests of 1859-60 had been short owing to scanty rain-fall, so that the stocks of grain were already low prior to the failure of the harvests of 1860-61. The failure of rain continued up to June 1861, when unusually favourable autumn rains set in followed by equally favourably winter and spring rains.

COST.

The following abstract of the expenditure on the Punjab famine of 1860-61 is taken from the report of the Honorary Secretary, the Revd. Mr. Sloggett:—

Received by public subscriptions—		Rs.	Rs.
From Madras	...	19,000	
„ Bombay	...	3,22,241	
„ Calcutta	...	5,75,000	
„ England	...	50,000	
Collected in the Punjab	...	84,034	
			10,50,275
Contributed by Government	...		80,429
			<u>11,30,704</u>

EXPENDED.	In relieving the poor with food.		In advance to cultivators for seed grain and cattle.		
	Rs.	Rs.	Rs.	Rs.	
In Delhi Division	4,61,901	50,000			
In Hissar	20,360	1,00,000			
In Umballa	(a) 58,048	72,000			
In Lahore, Amritsar and Jullundur Divisions	(b) 10,123				
In Rawalpindi Division	2,200	5,000			
Total	5,52,630	2,27,000			7,79,630
Office charges					1,650
Total expenditure					<u>7,81,280</u>
Balance of Famine Fund at close of operations					8,49,424

(a) Includes Rs. 700 for relief of orphans at the Ludhiana Mission.
(b) Includes Rs. 6,500 for relief of orphans at Amritsar.

This expenditure of Rs. 5,52,630 on the relief of the poor was materially supplemented by contributions aggregating Rs. 2,31,315 from District and Municipal Funds; and to obtain the total sum spent on relief in 1860-61, it is necessary to add these contributions to the expenditure from the Famine Fund.

Division.	District.	RELIEF EXPENDITURE.			
		From Famine Fund.	From District and Municipal rates.	Total of each District.	Total of each Division.
		Rs.	Rs.	Rs.	Rs.
Delhi	Delhi	1,86,991	1,06,927	2,92,918	6,01,498
	Karnal	62,818	4,784	67,602	
	Gurgaon	2,12,092	28,886	2,40,978	
Hissar	Hissar	8,808	19,791	28,099	77,018
	Bohtak	6,710	27,188	32,848	
	Sirsa	6,542	9,727	16,069	
Umballa	Umballa	27,987	20,141	48,128	89,988
	Kasauli	400	...	400	
	Thánesar... ..	27,259	8,029	35,288	
	Ludhiána	1,700	3,742	5,442	
	" orphans	700	...	700	
Jullundur	Jullundur	470	150	620	620
Amritsar	Amritsar for orphans	6,500	...	6,500	7,500
	Siálkot	1,000	...	1,000	
Lahore	Lahore	2,153	...	2,153	5,153
	Gujránwála ... ..	...	3,000	3,000	
Rawalpindi	Rawalpindi	2,200	...	2,200	2,200
	Total	5,52,630	2,31,315	7,83,945	7,83,945

In addition, a sum of Rs. 3,25,106 was disbursed out of the Government treasury for Famine Works, presumably in the Public Works Department; but no detail of this is forthcoming. Omitting therefore the advances to cultivators (concerning which see below), the net cost of the relief expenditure may be thus classified :-

Net cost of famine relief.		How contributed.	
	Rs.		Rs.
By Statement above	7,83,945	By public subscriptions [i. e., by Famine Fund, the Government contribution thereto being deducted.]	4,72,201
By Famine Works under Department of Public Works.	3,25,106	By the District and Municipal Funds of the Districts suffering from famine.	2,31,315
		<i>By the Imperial Revenue.</i>	
		(1) contributed to Famine Fund, being a sum equal to the private subscriptions in the Panjab. Rs. 80,429	
		(2) on Special Works in the Public Works Department Rs. 3,25,106	4,05,535
Total	11,09,051	Total	11,09,051

Of the number of persons relieved, there is no reliable record. Such references to the subject as occur in the appended extracts from the reports of the time, give, not the true number of persons relieved, but the sum of the numbers relieved daily during the whole period of relief operations.

At the close of the famine, advances for the purchase of cattle and seed-grains were made both from the Government's treasury and from the Famine Fund. Those from the Famine Fund were made on easier terms than was permissible in the case of advances from the treasury (though even as

regards these latter the ordinary rules were relaxed; and it was at first expected that the Famine Fund advances would not be recoverable. Eventually, however, both classes of advances were repaid with equal success. CH. I.

The subject is noted in the appended extracts from the Famine Fund report; and I have also added extracts from the correspondence concerning the advances made by Government. The aggregate sums thus advanced were :—

DIVISION.	Advances to cultivators for purchase of seed-grain and cattle.		
	From the Famine Fund.	From the Government's Treasury.	Total.
Delhi	50,000	2,05,824*	2,55,824
Hissar	1,00,000	1,27,632	2,27,632
Umballa	72,000	...	72,000
Shahpur District	5,000	...	5,000
Total	2,27,000	3,33,456	5,60,456

The loss of revenue caused by the famine of 1860-61 is stated, in the extracts from the Punjab Administration Report of 1860-61, to have been nearly 11 lakhs in that year; and about 3 lakhs more must be added for the rabi of 1861-62. A statement of the demands and balances of the 2 years, copied from the revenue reports, will be found among the appendices. The nominal balances shown in it are matters of account; those caused by the famine are shown as irrecoverable, or as doubtful and undetermined. The irrecoverable balances are those which had been so decided when the final report for the year was submitted; the doubtful and undetermined balances were so shown because final orders had not been received. Eventually these also were classed as irrecoverable and remitted. The fact that a village had lost its crops by drought was accepted as good ground for remitting the revenue. The system of suspension of demand and subsequent recovery from good harvests was not resorted to, the famine tracts having suffered too much in their resources for such an expedient to be thought of.

The extent to which the land revenue was paid up, even in the height of the famine, is remarkable. Of the Districts most affected, Hissar paid 76 per cent. of the usual demand for 1860-61, Sirsa 55, Rohtak 71, Gurgaon 77, Thanesar 63 (now part in Umballa and part in Karnal). From the records of the time it is clear that the revenue demand was not enforced where there was any difficulty in paying it. The explanation therefore apparently is: (1) that when the rabi demand fell due in June 1860, the famine had not established itself; and this harvest usually pays half the revenue; (2) that irrigated lands pay a portion of the revenue which is double the proportion they bear to the whole cultivated area; and (3) that a village with a portion of its area irrigated can (especially when famine prices rule) pay the demand due on its whole area in spite of the failure of the unirrigated crops, for that the demand is reckoned on prices far cheaper than those which prevail at famine seasons. Great as is the value of irrigation at famine seasons as a security for the production of food, its value at such times, as a security for the revenue, is far greater. The maund of wheat which the cultivator sells in ordinary times that he may pay Rs. 1½ of revenue, will sell in famine time for Rs. 4†; so that a village with a 4th of its area irrigated cannot improbably in a famine year lose two-thirds of its unirrigated crops and yet pay its ordinary revenue demand with ease.

The effect of the famine of 1860-61 on prices is shown in a table appended, compiled from the annual reports of the period. The table shows the variations in price at the beginning of each half year from 1859 to 1863. Monthly prices are not on record. I confine my remarks to the prices of wheat; Prices.

* In this column a small sum for advances for wells &c. is included, which I cannot separate off. The figures are taken from the Revenue Report of 1861-62, Statement 18.

† This represents a fall in the price of wheat from 24 sers per rupee to 10 sers

the return showing that other grains and pulses were nearly as dear, and that the fluctuations in their values closely followed that of wheat. In June 1859, wheat was selling for 25 sers the rupee at Delhi; and in the rest of the Province generally at 40 sers. By January 1860, prices had risen in most places; and in June 1860, after a poor rabi crop, they stood at about 18 sers in Delhi and Hissar, and 30 sers in the rest of the Province. Six months later in January 1861, the kharif crop of 1860 and the rabi sowings of the ensuing harvest having failed between the Sutlej and the Jumna, prices had reached their highest level. In the Delhi and Hissar Divisions, wheat sold for 8 or 9 sers the rupee; in the Umballa, Jullundur and Amritsar Divisions for 10 and 11; and so on in a graduating ratio towards the more western portions of the Province, where the ruling price seems to have been from 15 to 18 sers. Six months later in June 1861, the prices in the west of the Province were much the same; but in the country between the Sutlej and the Jumna, though the rabi harvest had failed, imports from the centre and west of the Punjab had improved the prices to 11 and 12 sers. In January 1862, when a good kharif harvest had been reaped, the prices of pulses and the autumn millets and barley had nearly returned to their normal level in the famine districts, and so did wheat with the reaping of the spring harvest. It is noteworthy that prices recovered their normal level more rapidly in the famine districts south of the Sutlej, than in those districts in the centre and west of the Province, the exports from which had supported the famine tracts.

Of the mortality caused by this famine there is no record; but in the annexed extracts ^{Mortality, rapidity with which the tracts affected recovered.} it is admitted to have been extensive, "though not in such numbers as seriously to diminish the bulk of the population." And it is stated that not a single village in the cultivated tracts was broken up; and that as soon as the autumn rains of 1861 commenced, absentees returned to their villages and energetically resumed agricultural operations. This is the more noteworthy, as we know the mortality among the plough cattle to have been extreme.

FAMINE OF 1869-70.

LOCALITY AND CAUSE.

The causes and circumstances of the famine of 1869-70 were very similar to those of the previous famine. Appended are extracts from the report of the Secretary to the Punjab Relief Committee, giving a very complete account of the course of the famine. As in 1860-61, the failure of the rains north and west of the Sutlej just stopped short of the point at which famine would have been caused; it was the tract to the south and east of the Sutlej which suffered most severely; and the grain stocks which saved this tract were drawn mainly from the more favoured portions of the Punjab.

The harvests of 1867 were below the average; and the stock of grain in the Province at the commencement of 1868 was unusually low. The spring rains of 1868 were abnormally heavy; the summer unusually hot; and there was a general failure of rain in August and September. The kharif crop, but poor everywhere, failed entirely in the country between Ferozepore and Delhi. A season of this character involved, besides the loss of the kharif, poor rabi sowings; and the year 1868 closed under circumstances of the most serious anxiety. The January, February and March rains, however, proved timely and sufficient, north of the Sutlej; south of that river the fall was scanty, enough to give grass for a time, but insufficient to secure the rabi crops. The opening of the rains in June was of a similar character, plentiful north of the Sutlej and scanty southwards; and the agriculturists throughout the Punjab, stimulated by these early rains, sowed unusual large areas with kharif crops. But there followed in July and August a period of terrible anxiety; for (partial and scanty showers excepted) the rains again failed. Happily on the 4th and 5th September rain fell abundantly throughout the Province, especially in the Districts south of the Sutlej which needed it most; and the crops, before more than half withered away, recovered wonderfully. A fair kharif harvest was reaped and the rabi sowings were secured. By the end of 1869 relief operations had ceased; and with the reaping of the wheat crop in the succeeding spring, prices receded to their normal level.

The accounts of the sums expended on this famine are still more incomplete than ^{Expenditure of relief.} those of the previous famine. A statement appended shows

the sums expended under the control of the Central Relief Committee; viz:— CH. I.

Source of contribution.		Amount.
		Rs.
Local subscriptions and donations	...	1,81,896
Government's equivalent contribution	...	1,49,385
Other grants from Government	...	20,226
Central Relief Committee, mainly from balances of old Famine Funds	...	73,736
Total		4,25,192

There remain the sums spent by the District and Municipal Committees, and by the Public Works Department (see para. 20 of appended extract from the report of the Secretary Central Relief Committee); of neither of which is any record forthcoming.

Of the number of persons relieved, it is equally impossible to give any clear account. The numbers given in the statement, last quoted, were obtained by adding up the total number of persons relieved each day. Certain useful observations can, however, be made on them, for example, the following tables:—

	Per-centage of persons.		
	Relieved gratuitously.	Employed on works.	Total.
Men	82	46	86
Women	88	35	38
Children	30	79	26
Total	100	100	100

The total number of persons relieved* is thus divided between the several Divisions:—

DIVISION.	Relieved.		
	Gratuitously.	On works.	Total.
Delhi	23,49,299	2,73,797	26,24,096
Hissar	28,28,666	16,88,741	45,17,407
Umballa	2,69,551	62,253	3,45,804
Jullundur	1,44,399	1,15,082	2,59,481
Amritsar	2,02,737	3,04,977	5,08,714
Lahore	3,41,294	1,38,275	4,79,569
Gujrat District	9,199	866	10,064
Total	61,60,045	25,84,890	87,45,035

As in the previous famine, Government assisted the people who had suffered most with advances to replace their cattle and buy seed-grain. Full and exact figures are not forthcoming; but the following statement of the total takavi advances for the 3 years ending 1869-70 will throw sufficient light on the subject:—

DIVISION.	Total advances for improvements, and purchase of cattle, &c.		
	1867-68.	1868-69.	1869-70.
Delhi	12,445	17,498	1,11,662
Hissar	15,350	1,65,327	2,87,429
Umballa	1,195	9,400	18,198
The rest of the Province	28,680	89,269	1,32,417
Total	57,670	2,81,484	5,49,706

* i. e. the sum of the numbers relieved daily during the whole period of relief operations.

The increased advances of 1868-9 were given mainly for new wells and tanks, the Hissar Division alone thus taking a lakh and a half of the advances of 1869-70. There were given for purchase of cattle in the Delhi Division (principally in the Karnál District) Rs. 50,166; in the Hissar Division Rs. 1,64,707; also for seed in the same Divisions about Rs. 1,00,000; no advances for seed were made in any other Divisions. For bullocks, Shahpur and Gujránwála took small advances, aggregating Rs. 7,755, and Ludhiána Rs. 50. If to the sums advanced (as shown above) for cattle and seeds in the Delhi and Hissar Divisions, be added money advanced for tanks and wells, it would appear that of the 5½ lakhs thus appropriated in the whole Province in 1869-70, at least 3½ lakhs were advanced to assist famine-stricken agriculturists of these 2 Divisions.

The loss of revenue arising from the famine was surprisingly small; although the Government at an early date instructed Local Officers to suspend the revenue demand where its realization would cause serious distress. The figures being small, it is not necessary to give them in any elaborate form. Briefly stated they are:—

DIVISION.	Year.	LAND REVENUE.	
		Demand.	Of which all was collected except the following balances.
Delhi	1868-69	26,29,932	24,329
	1869-70	26,40,486	23,713
Hissar	1868-69	14,92,471	2,63,212
	1869-70	14,81,770	1,22,617
Umballa	1868-69	15,16,655	54,282
	1869-70	15,13,679	4,651
The rest of the Province	1868-69	1,28,46,425	1,48,926
	1869-70	1,30,01,820	85,784
Total	1868-69	1,84,85,483	4,90,749
	1869-70	1,86,43,755	2,36,765

The balances of ordinary years about this period were in the regular course of revenue business usually from Rs. 1,00,000 to Rs. 1,50,000; so the famine may be said to have caused balances aggregating 3½ lakhs to 1868-69, and 1½ lakhs in 1869-70. Of the former the principal items were:—

		Rs.
The greater part of these items were afterwards collected.	In Rohtak	1,62,551
	" Hissar	34,569
	" Sirsa...	40,586
	" Umballa	49,445

		Rs.
Of the latter the principal items were:—		
In Rohtak	...	89,201
" Sirsa	...	13,320
" Montgomery	...	11,634
" Bannu	...	10,184

Though the famine of 1869 was not as severe as that of 1860, prices rose to the same extent. From October 1868 to August 1869, the average price of wheat in Delhi was 12 $\frac{11}{16}$ sers per rupee; for the same months in 1860-61 it was 13 $\frac{1}{16}$ sers. The revenue report of the year accounts for this by the fact, that the value of money had fallen greatly in the interval between the 2 famines. The price of food had been steadily rising from year to year since 1863-64; thus, taking Lahore as an average District, the average price of wheat had been rising from year to year thus:—

	Sers per rupee.
1863-64	32 $\frac{1}{2}$
1864-65	26 $\frac{1}{2}$
1865-66	19 $\frac{1}{2}$
1866-67	21 $\frac{1}{2}$
1867-68	19 $\frac{1}{2}$
1868-69	11 $\frac{1}{2}$

From inquiries instituted at the time, it further appeared that the country had never recovered from the great depletion of its granaries caused by the severe famine of 1860-61; and that the harvests subsequent thereto had been usually poor, varied only by an occasional good season. I append the remarks on the subject made in the revenue report of 1868-69. These remarks were not written till the close of 1869, when the autumn rains of September had saved the country.

More detailed information will be found in the appended tabular statement of half yearly prices from 1867 to 1872. This statement shows that in January 1869, after the failure of the autumn crop and rabi sowings, wheat was selling almost uniformly all over the Province at 9, 10, or 11 sers the rupee; barley, bájra, jowár and the common pulses stood at almost the same price. The reaping of a rather poor rabi in 1869 raised wheat to about 14 sers, and barley to 18 or 20; the autumn grains however remained equally dear. Six months later, in January 1870, the autumn grains were in most places selling at their normal prices. The recovery of wheat and barley was slower; in January 1870 wheat was still usually selling at 9 or 10 sers, and barley (except in the west of the Province) at from 12 to 15. By mid summer wheat rose usually to 15, and barley to 20 sers; and a similar improvement followed in the next 6 months. In the face of this slow recovery of the prices of wheat and barley, it is impossible to doubt the dangerous extent to which the stocks of the Province had been depleted.

During the worst days of the famine, wheat fell to 8 sers the rupee, and less in the Hissar Division, and in other adjacent tracts of similar character.

It is noteworthy that prices equalised themselves throughout the Province more rapidly and more completely during this famine than in that of 1860-61.

Mortality.

Of the mortality caused by the famine there are no data.

SCARCITY OF 1877-78.

I am not sure whether any very useful object will be served by more than a very brief notice of the late scarcity. Up to June 1877, the crops had been plentiful for several years, and a considerable export of grain to Europe and to the famine in Southern India was proceeding without materially deranging normal prices in the Punjab. But the autumn rains of 1877 proved unusually scanty,* and the kharif harvest was a general failure except on irrigated lands. As the failure of rain continued through September, extreme anxiety was felt concerning the rabi sowings. But happily between the 5th and 12th October rain fell generally throughout the Province; and in spite of unseasonable rain at harvest time in April and May 1878 a fair rabi crop was secured. The present kharif harvest is also generally good.

The failure of the autumn rains of 1877 created a panic in prices, due no doubt to the knowledge of the famine in Southern India, and to the depletion of stocks, caused by the large exports which had lately been made from the Punjab. If the statement appended to my reply to question 16 be referred to, it will be seen that the price of wheat at the end of June 1877 varied from 24 sers at Delhi to 32 sers in the west of the Province, and by the end of July it was only 3 sers cheaper. But by the end of August wheat had risen to 17 sers at Delhi, and by the end of September to 12 sers; at the end of November, when the rabi sowing had been secured, prices had fallen slightly, being 15 sers at Delhi, and somewhat cheaper west of Lahore. When the wheat crop ripened there was an improvement, but not of a very decided character. In August and September with good kharif prospects prices have again fallen; and at the end of September the market rates at Amritsar were:—

Wheat	20 sers.	} per rupee.
Barley	...	...	...	...	32 "
Bájra	...	...	...	...	18 "
Jowár	...	...	...	...	28 "

* In a statement appended, I have compared the fall in 10 Districts with the average fall. The comparison shows the deficiency of the fall of 1877 in a very marked way.

Ch. I. The correspondence on the distress caused by the failure of the kharif of 1877 was published in the *Punjab Gazette*, dated 3rd October 1878, and the two principal reports are appended. Excepting an unusual aggravation connected with Kashmir and Hazára, the scene of the principal distress has been the same as before, viz., the Hissar Division and the dry tracts of the Delhi Division. In the Rohtak District, about $\frac{1}{3}$ of the rabi land revenue demand has been suspended; and similar suspensions have been granted in the dry tracts of the Karnál District, and where necessary in Hazára. The mortality of cattle, consequent on the failure of the kharif of 1877, has been very great throughout the Province; and I will notice this subject more particularly a few paragraphs further on.

Hazára (Abbott-abad) is a District which suffered less than any other in the famines of 1860-61 and 1868-69. About $\frac{2}{3}$ of the District consist of mountain tracts which have very poor rabi crops, and depend mainly for their prosperity on the kharif harvest. This was an almost entire failure in 1877, and with it the grass crops, necessary to the support of their cattle, failed also. Consequently by January 1878 very severe distress developed itself in the District, and lasted till a fair rabi crop ripened in May. In March, 4,182 people were being fed daily gratuitously, and 1,500 were employed on relief works. On 19th April, 4,774 were on gratuitous relief, and 3,766 were on relief works. By the end of May all relief works had been closed. Appended is an extract from a report by the Deputy Commissioner of Hazára, dated 5th March 1878, describing how the distress arose, and the prices current before and during it.

The distress in the Kashmir hill country which adjoins our border from the Siálkot is no part of my duty to describe it, and I only refer to it on account of the number of starving people which in consequence migrated from the Kashmir hills into the Rawalpindi, Gujrat, and Siálkot Districts. In the same way, distress in the southern portion of the Punjab is always aggravated by large numbers of starving immigrants from the Native States to the south-west of the Delhi and Hissar Divisions, the territory of which forms part of the most rainless portion of India.

The period of this scarcity is the first during which any persistent attempt has been made to ascertain the human mortality caused by such calamities. Lists of the reported deaths by starvation between 1st December 1877 and 28th July 1878, aggregating 1,119, are included in the Government's reports appended. It is quite certain that such lists give only a most partial view of the excess mortality due to such seasons. Among a people, great numbers of whom are habitually insufficiently clothed and poorly fed, the rate of mortality must be much accelerated in seasons, when it is impossible for them to maintain at its usual pitch their already poor standard of subsistence; and how great this acceleration is, it is impossible to know under the present imperfect system of registration of vital statistics.

Having thus described briefly the famines which have occurred since our rule commenced in the Punjab, it remains to answer the main point of the question under reply. "What part of the country is most subject to famine and freest from it, and why?" The answer is, those parts of the country which, having an average rain-fall of 20 inches and less, are the least protected by irrigation.

The Mooltan Division has a rain-fall varying from 10 to 6 inches, but two-thirds of its cultivation is protected by canal or well irrigation; and nearly all the rest is of the class known as *sailáb*, that is to say, situate in moist alluvial lands on the bed or banks of the great Punjab rivers, which are renewed by annual inundations and constant percolation. The Derajat Division has an equally scanty rain-fall; but in Dera Gházi Khan more than half of the cultivation is irrigated; and in Dera Ismail Khan a third; there is also the same abundance of *sailáb* land as in the Mooltan Division. The Shahpur District again has a rain-fall of only 13 inches, and the reports of the famine years contain grievous complaints of loss of crops on unirrigated lands, and the sufferings of cattle from drought; but 64 per cent. of the cultivation is irrigated, and there is a considerable area of *sailáb*; and, as a matter of fact, the District thus always pulls through its troubles with little or no help.

There are 4 Districts, however, in the south of the Province, which invariably suffer CH. I. severely in famine years; viz:—

DISTRICT.							Average annual rain-fall.	Per-centage of cultivation irrigated.
							<i>Inches.</i>	
Hissar Division.	Sirsa	...	...	...	...	...	14	3
	Hissar	...	...	...	...	...	17	5
	Rohatak	...	...	...	...	...	19	13
	Gurgaon	...	...	...	...	...	23	13

The western portion of Karnál (tahsil Kaithal), the Pipli tahsil in Umballa, the southern portions of Ludhiána, and the south-east portions of Ferozepore, all similarly circumstanced, suffer in the same way.* Their all is staked on a rain-fall usually less than 20 inches; and, if that fails, the heavens are brass and the earth iron, in a sense which those only know who have lived in those tracts at such seasons; the rivers, which at such times are the refuge of the Punjab graziers, are miles away; the cattle die of thirst as much as of hunger, and the people themselves have a hard fight for their lives, living on wild berries, grasses and roots.

The portions of the country freest of famine are unquestionably the submontane tracts with rain-fall of from 30 to 40 inches.

Has the province suffered from any other destructive calamity, such as floods, frost, hails, locusts, blight, &c., to such an extent as to produce distress amounting to famine, or to create any general and wide-spread failure of the crops.

The answer to this is briefly, no. All the causes noted are known in the Punjab; but as yet they have never been more than very local in their action. Perhaps, however, the most considerable calamity, from which the Province occasionally suffers, is extensive mortality among the cattle, caused usually by failure of the kharif rains and crops. Vast numbers of kine are maintained in the waste lands (Bárs), which form the centre of the lower portions of the Punjab Doabs; and in fair rainy seasons these Bárns produce abundant grass for their support. When no autumn rain falls, this pasturage fails completely. Similarly, in the other comparatively rainless portions of the Punjab, where there is little irrigation, as in the western half of the Jhelum and Rawalpindi Districts, the western half of Karnál, and the Hissar Division, the failure of the autumn rains, though not involving a famine if the rabi sowings are secured, produces terrible mortality among the cattle. Where it is so difficult to estimate human mortality, we of course know still less of what happens with the cattle, but estimates are forthcoming in a few instances. The Jhelum District is believed, at the lowest estimate, to have lost a fourth of its kine consequent on the failure of the kharif of 1877. At the Government cattle farm in Hissar, of 10,521 head of cattle present on 31st May 1877, there had died, consequent on the autumn drought, by 31st March following, 3,351, or 32 per cent. During the same season in the dry tracts of the Karnál District, of 38,584 head of cattle possessed by 441 villages, 18,831, or a fraction less than half, died. And reports lately received from the District Officers of the Hissar and Dehli Divisions show that the loss of cattle has been nearly equally extensive in all the unirrigated tracts. No doubt the plough bullocks, being the sturdiest of the cattle, do not die in the same ratio as the old cattle and the calves, but the reports submitted indicate that even among the plough bullocks the loss has not been less than a third; and it has been necessary for Government to sanction advances for

* Karnál Ra. 40,000 purchase of new plough cattle in these Divisions aggregating
Gurgaon " 50,000 Rs. 1,90,000.* The records of 1860 and 1868-69 show the
Hissar Division " 100,000 same extensive mortality among the cattle.

* I have omitted to point out that in these tracts the spring rains are very small, generally only 2 or 3 inches; and that the cultivation consists mainly of autumn crops. In the Hissar Division, the autumn crops are four-fifths of the entire cultivation; in the Gurgaon District of the Delhi Division, they are two-thirds of the whole; consequently the loss of the autumn crops falls with greater and more prolonged severity on these tracts than on the northern portions of the Punjab; where the spring rains are more plentiful, and the spring crops are of equal and sometimes greater area than those of the autumn.

To what extent do famines in any past period appear to have affected the general condition of the country, and how long has the effect lasted? Has the condition of the country improved in spite of such calamities? What is the normal increase in the population of the country, and how far has it been affected and kept down by famine? What are the facts on which your opinion on these last points is based?

The famines of 1860-61 and of 1868-69 certainly affected the country unfavourably for only a very short time. The agricultural population appears to recover its position with a bound, as soon as favourable rains set in. This is, no doubt, mainly due to the very small amount of capital necessary to the cultivator. His only material outlay is the purchase of a pair of bullocks price Rs. 50.

This has not always been so. No one who has been brought much into contact with the agricultural population can have failed to observe the enduring mark left on the country and its tenures by the famine of A. D. 1783. In Hissar, for instance,* that famine literally depopulated the country, and the whole agricultural stock perished; at its close hardly any of the original inhabitants remained or could return. Few villages now existing even pretend to a history which goes back uninterruptedly to a period before this famine, and there is not one which does not date its present form of tenure from the time when cultivation was resumed. Every social relation of the people has its origin subsequent to this fatal era.

This is but an exaggerated instance of the story which many Districts could tell. In the north of the Punjab, the oldest tenants will scarcely pretend that their tenure is older than the date of the great famine.

Returning to more recent times, the famines of 1860-61 and of 1868-69 have unquestionably done little to retard the steady improvement which has been taking place in the Punjab since its annexation. It is difficult to give facts on this point. One such fact is, that difficulty in paying the land revenue created by famine does not last beyond the famine year; with the close of the famine prices return to their normal level, and yet the revenue is paid as easily as before. Not only so, arrears due on account of revenue suspended during famine seasons are not unfrequently easily paid up. No one who has lived in the Province for the last 20 years will assert that the famines of this period have materially retarded its progress; while they have certainly quickened the free interchange of grain from end to end of the Province, and have strengthened our motives for the extension of canal irrigation.

The normal rate of increase in the population is at present purely a matter of opinion. I append the 2 best opinions available; 1st, the conclusion arrived at in the census report of 1868, by a comparison of the returns of that census with those of 1855; and 2ndly, the opinion of the Sanitary Commissioner. The former indicates an increase of 20 per mille per annum, the latter of 4; in each case the facts supporting the conclusion are stated. The Sanitary Commissioner has, however, been forced to base his deductions on figures obtained in one of our most densely populated Districts, and which has only 6 per cent. of the culturable area uncultivated. Whereas the principal increase in population takes place in tracts previously sparsely populated where cultivation is rapidly spreading.

On the question how far this increase has been affected, or kept down by famine, there are no data whatever.

* These facts are extracted from papers supplied for the Gazetteer of the Province.

Replies and extracts from records.	Tabular Statements.
<p style="text-align: center;"><i>Famine of 1860-61.</i></p> <ol style="list-style-type: none"> 1. Extract from Punjab Administration Report 1860-61. 2. Extract from Revenue Report 1860-61. 3. Extract from Report on Punjab Famine Fund operations. 4. Extract from correspondence on advances to cultivators in 1861. <p style="text-align: center;"><i>Famine of 1868-69.</i></p> <ol style="list-style-type: none"> 5. Extracts from the Report of the Secretary Central Relief Committee. 6. Extract from Punjab Administration Report, describing the tracts affected by the famine of 1868-69. 7. Extract from Revenue Report of 1868-69 reviewing the prices of the years 1868 and 1869. <p style="text-align: center;"><i>Scarcity 1877-78.</i></p> <ol style="list-style-type: none"> 8. Secretary Punjab Government's No 545 A, dated 30th April 1878, to Government of India; also Secretary Punjab Government's No. 509½ C, dated 13th August 1878, to Government of India. 9. Extract from Deputy Commissioner's No. 62 dated 5th March 1878, describing rise and course of distress in the Hazára District, 1877-78. 10. Extract from Census Report of 1868, showing rate of increase of the population. 11. Reply of Sanitary Commissioner on the same subject. 	<ol style="list-style-type: none"> I.—Prices of cereals, &c., 1859-60 to 1862-63. II.—Land Revenue Demands, Collections and Balances, 1860-61 and 1861-62. III.—Amounts received and expended on Famine Relief, 1868-69 and 1869-70. IV.—Prices of cereals, &c., 1867-68 to 1871-72. V.—Rain-fall Statement, April to October 1877.

CHAPTER I, QUESTION 2,—FAMINE OF 1860-61.

EXTRACTS FROM PUNJAB ADMINISTRATION REPORT OF 1860-61.

50. Excluding the nominal balances, a real deficit of nearly 11 lakhs is shewn, which has accrued owing to the failure of the periodical rains, and the consequent entire miscarriage in unirrigated tracts of the autumnal harvest. The drought has been most felt in the Delhi territory and the Cis-Sutlej States bordering thereon. The following statement exhibits how the revenue of the several Districts has been affected :—

DISTRICT.	Amount of Balances.	Per-centage on total revenue.		
		Rs.	A.	P.
Delhi	68,066	16	4	0
Gurgaon	2,76,092	23	2	8
Karnal	37,067	4	9	11
Hissar	1,06,103	23	7	5
Rohtak	2,75,544	28	9	8
Sirsa	85,182	45	4	6
Umballa	88,092	19	7	1
Thanesar	1,44,545	36	14	5
Total	10,73,601	22	5	4

In the remaining Divisions north and west of the Sutlej, the revenue due for 1860-61 was fully realized,

DIVISION.	Per-centage of revenue realized.		
	Rs.	A.	P.
Trans-Sutlej States	99	7	6
Amritsar	99	12	0
Lahore	98	13	2
Rawalpindi	99	5	4
Mooltan	97	4	15
Derajat	96	15	0
Peshawar	98	6	5

51. The high price of grain caused by the great demand for food has enabled the agriculturists to realize large profits, wherever their crops could be matured.

52. In 1859-60 the Delhi territory suffered from want of rain. The great Najafgarh Jhil or lake became entirely dry, "a thing never before known within the memory of any one." The villages dependent for irrigation on the Najafgarh Jhil, or its feeder the Sahibee Nuddi, suffered much distress, and the unirrigated tracts of the southern Parganah of Delhi and of Parganahs Rewari and Bhora in Gurgaon yielded scanty harvests. The drought was not less felt in the Jhajjar and Rohtak Districts of the Hissar Division. The Delhi territory, except where irrigated by the Western Jumna Canal or moistened by its vicinity to the Jumna, is naturally sterile. The average fall of rain is small; the soil sandy; water brackish and deep below the surface of the soil, which is in parts diversified by rocks and ravines. A portion of the population are Gujars and Mewatis, and indifferent husbandmen. The kharif crops partially failed in Umballa, and entirely in Thanesar and Ludhiana. Grass dried up, and the herds were taken away from the villages to graze in the valleys inside the Sewalik range, or on the banks of the rivers.

53. The rains of 1860 almost completely failed in the country between the Jumna and Sutlej; and, except where irrigation was available, no autumn or spring crop could be sown. The effects of the previous drought, and of the confusion which had reigned during the period of the mutinies, soon became visible. Women and children were to be seen in crowds picking wild berries for food. Old unwholesome grain was sold in the bazars. Numerous deaths from starvation were reported. Herds of cattle perished, and general emigrations from the famine-stricken tract took place. The Lieutenant Governor immediately directed the District Officers to provide work on which unskilled labourers could be employed. The construction of earthen roads and dams, and the excavation of tanks, were those found to be best adapted to the necessities of the people. Simultaneously subscriptions for the relief of the starving poor were raised in all parts of the Province. To these an equal sum was added by Government. Large contributions were subsequently received from Bombay, Calcutta and England; and at the end of May, charitable funds to the amount of £40,000 had been received. Relief and work were

provided by Local Committees. In the town of Delhi as many as 30,000 persons daily received food from the charitable fund, at the same time that 16,000 were maintained in the villages of the district. For the same purpose a sum, ultimately increased to Rs. 35,000 a month, was allotted in the Gurgaon District where the famine has been most severely felt; smaller sums were allotted to the Districts of the Hissar Division, and Karnal, Thanesar and Umballa. No correct record of the mortality caused by the famine has been kept, but it must have been considerable.

54. The Gurgaon District, during the month of June 1861, has suffered from the ravages of cholera, to which many of the population may have been predisposed by privation.

55. It is consolatory to be able to report, after recording a visitation which human power can at best but inadequately alleviate, that the periodical rains of 1861 have set in most favorably. It is, however, doubtful if the agriculturists, impoverished as many of them have become, could have effectually entered upon the tillage of the soil at the right time, had not arrangements been made by Government to supply them at once with advances for the purchase of seed and plough cattle. Charitable grants for similar purposes have also been made by the Relief Committees.

57. Notwithstanding the inauspiciousness of the seasons, coercive processes used in the collection of the land revenue were rarely resorted to. The number of dastaks or notices issued was 36,670, less by one-fourth than in the previous year. There were 23 cases of personal confinement; 43 of distraint of personal property; 3 of sequestration; and 2 of alienation of proprietary right.

238. The average fall of rain throughout the Province is reported to have been 33.8 inches in 1860-61, to 57.2 in 1859-60. The registration of the gauges is not yet made so carefully as to entitle the results to implicit belief. The failure of rain seems to have been complete in September and October and in December and January.

239. The dearness of food caused by the famine will be seen from the following price current of best wheat, taken on the 1st of January of the years specified:—

	1859-60.		1860-61.	
	Sers	Chitaks	Sers	Chitaks.
Delhi	24	0	8	0
Lahore	39	8	14	0
Pesháwar	35	12	29	5

240. Although the harvests on unirrigated lands were scanty throughout the Punjab, the yield from watered tracts was generally superior, both in quality and quantity. The great demand for corn in the Delhi territory, and the extraordinarily high prices, led to its extensive exportation from the hills of Kangra and the wheat fields of the Jullundur and Bári Doábs. This trade has been especially beneficial to the owners of irrigated and inundated land, who have been much depressed by the cheapness of agricultural produce prevailing for so many years. The keenness with which exportation was carried on, when prices became decidedly remunerative, proves that the people are fully awake to their own interests, and that, to the extent of their means, they are as ready as other nations to avail themselves of any facilities for traffic which may be provided for them. The manner in which the Delhi territory, drained as it had been of food by war and famine, was supplied from Hindustán and the Punjab, is a beautiful illustration of the law of political economy which prohibits any interference of the State in the corn trade. The following remarks of Adam Smith might have been written from observation of the events of the past year: "In an extensive corn country, between all the different parts of which there is a free commerce communication, the scarcity occasioned by the most unfavorable seasons will never be so great as to produce a famine; and the scantiest crop, if managed with frugality and economy will maintain, through the year, the same number of people that are commonly fed in a more affluent manner by one of moderate plenty. The seasons most unfavorable to the crop are those of excessive drought, or excessive rain. But as corn grows equally upon high or low lands; upon grounds that are disposed to be too wet, and upon those that are disposed to be too dry, either the drought or the rain which is hurtful to one part of the country is favorable to another; and, though both in the wet and in the dry season the crop is a good deal less than in one more properly tempered, yet, in both, what is lost in one part of the country is, in some measure, compensated by what is gained in the other."

Whilst it must be acknowledged that the perfect application of these observations must await the completion of our railway and canal systems, that they deserve quotation is shown by the disposition which has been evinced by the Independent Chiefs, and even by some of the civil authorities, to act on other principles.

241. Mr. Melvill, Commissioner of the Trans-Sutlej States, states that, whilst the British Zamindárs of the Pesháwar valley realized immense profits, the Independent Chiefs of this Division prevented the export of grain from their territories; but they are mostly induced to admit that they were in error. The Kapurthala Rájá has now thrown open the trade. I believe that there never was a greater difference in price than one ser per rupee between Kapurthala and Jullundur, notwithstanding the embargo laid on the export of grain, and the efforts to prevent grain leaving Mandi, Suket, and Chamba have proved very unavailing.

CHAPTER I, QUESTION 2.—FAMINE OF 1860-61.

EXTRACT FROM PUNJAB REVENUE REPORT FOR 1860-61 (WRITTEN AT THE COMMENCEMENT OF THE AUTUMN RAINS OF 1861).

626. The general fall of the season, it is needless to say, has been very deficient, more especially south of the Sutlej. But even more serious than the deficiency in quantity is the fact that the rains broke up so early, that the kharif crops, where sown, were not matured, and the preparation of the land for the rabi and sowing of that crop became impossible. This drought, too, in many parts succeeded previous unfavourable seasons, so that the evil has been greatly aggravated.

627. As a consequence of this, it is no matter for surprise that 10 lakhs of doubtful and irrecoverable balances have accrued in the 3 Divisions south of the Sutlej, while it is probable that at least an equal amount will have to be suspended or remitted, from the rabi demand of the current official year; as the distress has now, owing to the want of spring rains, extended to tracts which have been heretofore more or less able to pay their revenue, such as the Bár or grazing tracts of Sháhpur, and the Sindh Ságar Doáb, where villages and wells have been largely deserted for a time; and the losses amongst cattle have been enormous. One-half of the cattle at least are said to have died in some parts, and the distress and destitution resulting from this cause are second only in importance and severity to those resulting from failures of the crops and want of food.

628. But for the noble efforts made by Government and the public to feed and employ the starving populations, extensive disorganization must have taken place in the Delhi and Hissar and part of the Cis-Sutlej Divisions. But as it is, I rejoice to believe that this has not been the case to any considerable extent. Desertions have no doubt taken place, but they are, for the most part, only temporary; and deaths from starvation have been reported from month to month in all the more distressed districts; but these, however deplorable, have not I believe been in such numbers as seriously to diminish the bulk of population. I am not aware that a single village in the cultivated tracts has been broken up, and now that we have been favoured with seasonable falls of rain, absentees are rapidly returning in all quarters; and agricultural operations are being resumed with a vigour which indicates that the spirit of the people generally is still buoyant. The distress has happily extended, but slightly, to the Punjab north of the Sutlej. The Deputy Commissioner of Sháhpur states that his District has now experienced five successive seasons of failure, more or less complete, and the effects of an unusually dry year have, without doubt to some extent been felt everywhere; but it has been remarked very generally that, though the stems of the cereals have been stunted, the grain produced, some under very unfavourable circumstances, has been heavier and finer than in other years, while the immense export of grain, which has gone on continuously towards the famine Districts, and the high prices which have ruled in consequence, have tended to enrich all connected with the production of, or trade in grain.

QUESTION 2, CHAPTER I.

FAMINE OF 1860-61.

Comparative Statement of Land Revenue demands, collections, and balances in the Punjab Provinces for the years 1860-61 and 1861-62.

1	2	3	4	5	6	7 8 9 10				11 12	
						PARTICULARS OF BALANCES.				PER-CENTAGE ON DEMAND.	
DIVISION.	DISTRICT.	Years.	Demands.	Collections.	Balances.	In train of liquidation.	Doubtful or undetermined.	Irrecoverable.	Nominal.	Of collections.	Of balances.
DELHI.	Delhi ...	1860-61	3,89,853	3,26,787	63,066	6,679	53,776	...	8,611	84	16
		1861-62	4,03,734	3,68,904	34,830	2,966	23	31,706	135	91	9
	Gurgaon ...	1860-61	11,48,490	8,82,812	2,65,678	18,102	2,18,964	...	38,612	77	23
		1861-62	11,34,265	10,83,638	50,627	23,447	27,180	...	...	96	4
	Karnal ...	1860-61	8,02,543	7,65,476	37,067	...	25,489	...	11,578	95	5
		1861-62	7,00,158	7,72,495	17,663	9,385	...	...	8,278	98	2
Total ...	1860-61	23,40,886	19,75,076	3,65,811	19,781	2,98,229	...	47,801	84	16	
	1861-62	23,28,167	22,25,037	1,03,120	35,798	27,203	31,706	8,413	96	4	
HISSAR.	Hissar ...	1860-61	4,18,081	3,42,978	1,05,103	...	...	1,05,101	2	77	33
		1861-62	4,79,602	4,53,829	25,773	...	...	24,132	1,641	96	4
	Rohtak ...	1860-61	9,69,672	6,85,128	2,74,544	354	2,441	2,70,432	1,317	71	29
		1861-62	8,94,326	6,87,734	2,06,592	2,775	...	2,00,804	3,013	77	23
	Sirsa ...	1860-61	1,88,623	1,03,184	85,439	...	4,779	62,035	18,625	53	45
		1861-62	1,68,732	1,48,048	10,684	...	...	5,905	4,779	93	7
Total ...	1860-61	15,96,376	11,51,280	4,65,086	354	7,220	4,37,568	19,944	71	29	
	1861-62	15,32,660	12,89,611	2,43,049	2,775	...	2,30,841	9,433	84	16	
CHISWAJEE OR UMBALLA.	Umballa ...	1860-61	5,15,163	4,15,468	99,695	966	86,478	...	12,251	80	20
		1861-62	5,04,093	4,32,982	71,131	70,599	49	...	483	85	15
	Thanesar ...	1860-61	4,14,187	2,82,671	1,51,616	9,478	1,35,716	6,285	142	63	37
		1861-62	4,16,195	3,19,965	96,230	8,935	11,488	70,944	4,913	77	23
	Ludhiana ...	1860-61	7,44,848	7,23,128	21,522	...	20,084	1,438	...	97	3
		1861-62	7,56,738	7,56,914	824	...	...	509	315	100	...
Simla ...	1860-61	44,449	43,987	462	...	...	...	462	97	3	
	1861-62	44,449	43,987	462	...	...	...	462	97	3	
Total ...	1860-61	17,18,447	14,45,152	2,73,295	10,439	2,42,278	7,729	12,855	85	15	
	1861-62	17,21,475	15,52,828	1,68,647	79,634	11,487	71,463	6,173	90	10	
OTHER DIVISIONS.	Total of above 3 Divisions.	1860-61	56,55,709	45,51,517	11,04,192	80,574	6,47,727	4,45,291	80,600	80	20
		1861-62	56,82,292	50,67,476	5,14,816	1,18,107	38,690	3,34,000	24,019	91	9
	Jullundur or Trans-Sutlej.	1860-61	38,01,818	32,81,750	19,568	7,306	2,928	2,914	6,490	99	1
		1861-62	33,03,094	32,86,319	16,775	6,016	183	1,291	9,285	99	1
	Amritsar ...	1860-61	27,88,287	27,80,086	8,201	638	227	5,481	1,855	99	1
		1861-62	28,06,287	26,68,239	1,38,048	4,849	695	2,061	1,30,459	95	5
Lahore ...	1860-61	13,58,785	13,43,291	15,494	1,018	1,081	2,139	11,256	99	1	
	1861-62	13,86,373	13,71,339	15,039	102	1,389	...	13,642	99	1	
Rawalpindi ...	1860-61	22,12,369	21,91,015	21,353	4,138	100	474	16,441	99	1	
	1861-62	21,63,077	21,46,491	16,586	9,272	363	4,858	2,113	99	1	
Mooltan ...	1860-61	16,19,855	15,77,877	41,978	786	3,046	73	38,123	97	3	
	1861-62	17,16,428	16,81,616	34,913	11,230	7,005	8,506	8,172	98	2	
Derajat ...	1860-61	11,79,495	11,45,519	33,976	6,810	17	5,387	23,962	97	3	
	1861-62	11,77,121	11,04,953	72,168	5,464	419	3,751	62,634	94	6	
Peshawar ...	1860-61	8,87,870	8,73,069	14,801	5,808	...	4,910	4,083	98	2	
	1861-62	8,83,461	8,58,384	27,077	12,845	...	559	13,673	97	3	
Grand Total	1860-61	1,90,03,687	1,77,44,124	12,59,563	56,528	5,55,126	4,66,769	1,81,140	93	7	
	1861-62	1,90,18,132	1,81,82,716	8,35,416	1,67,879	48,744	3,51,996	2,63,797	96	4	

QUESTION 2, CHAPTER I.

Price of Cereals &c. in the Punjab in 1859-60, 1860-61, 1861-62 and 1862-63 (extracted from Punjab Revenue Reports for those years.

Year.	No. of sers per rupee on	DELHI.		HISSAR.			UMBA-LLA.	JULLUNDUR.	AMRITSAR.	LA-HOBBE.	RAWAL-PINDI.	MOOLTAN.	DERA-JAT.	PESHAWAR.				
		Delhi.	Gurgaon.	Karnal.	Hissar.	Rohatak.	Sirsa.	Ladhiana.	Jullundur.	Hoshiarpur.	Amritsar.	Gujranwala.	Rawalpindi.	Shahpur.	Mooltan.	Jhang.	Dera Ismail Khan.	Peshawar.
ATTAHOR WHEAT FLOUR.																		
1859-60	1st June 1859	25	25	28	27	27	27	43	41	42	33	39	42	40	20	35	35	29
	1st January 1860	21	22	26	23	...	24	34	33	39	29	39	41	34	23	31	29	28
1860-61	1st June 1860	18	19	18	21	...	16	28	31	32	29	36	44	33	21	24	26	26
	1st January 1861	7	8	9	...	...	10	11	10	9	11	14	23	10	16	13	18	26
1861-62	1st June 1861	12	11	12	11	12	11	15	17	19	20	19	14	15	14	14	18	18
	1st January 1862	13	15	13	13	14	12	13	12	12	13	13	10	12	15	14	15	12
1862-63	1st June 1862	24	25	23	19	22	17	24	24	26	24	24	21	28	18	14	19	22
	1st January 1863	25	26	27	24	26	18	25	26	27	25	28	26	28	18	21	21	24
BARLEY.																		
1859-60	1st June 1859	49	45	60	53	50	70	62	39	68	52	95	62	60	39	55	73	74
	1st January 1860	52	35	38	36	33	46	50	55	68	49	85	65	55	38	47	48	75
1860-61	1st June 1860	27	28	31	34	31	40	48	48	52	50	75	64	48	36	40	52	85
	1st January 1861	10	9	14	14	10	13	13	8	14	15	24	33	24	21	22	82	84
1861-62	1st June 1861	15	16	17	14	15	16	24	23	32	24	27	18	16	20	21	21	26
	1st January 1862	31	37	23	24	34	24	20	19	16	17	20	11	15	21	23	19	32
1862-63	1st June 1862	44	70	40	29	37	29	37	37	36	37	45	81	40	38	40	33	61
	1st January 1863	45	46	62	47	53	32	42	41	52	43	70	42	50	36	50	40	55
BAJARA.																		
1859-60	1st June 1859	28	32	34	38	35	45	55	50	38	30	40	56	57	70	44	45	40
	1st January 1860	27	30	22	32	29	35	44	38	32	35	50	66	48	36	40	42	88
1860-61	1st June 1860	21	24	21	30	28	35	32	32	32	18	48	67	46	34	32	37	41
	1st January 1861	9	9	12	10	9	11	12	13	12	10	19	31	22	19	20	88	32
1861-62	1st June 1861	14	13	12	12	13	11	10	11	8	10	12	17	19	15	...	26	20
	1st January 1862	30	34	25	35	33	32	28	29	20	26	20	20	18	19	...	18	18
1862-63	1st June 1862	29	32	27	36	32	26	27	22	22	18	18	26	17	23	14	16	27
	1st January 1863	32	38	...	7	6	9	42	39	40	39	40	36	30	30	50	29	30
JOWAR.																		
1859-60	1st June 1859	20	33	33	42	40	55	90	75	65	58	60	48	...	37	...	73	47
	1st January 1860	28	30	36	38	33	42	85	50	65	45	60	50	...	32	46	48	54
1860-61	1st June 1860	23	24	21	26	25	30	40	48	44	40	43	50	...	24	...	42	66
	1st January 1861	10	9	13	11	10	13	13	13	12	14	24	40	...	19	...	30	47
1861-62	1st June 1861	13	12	10	11	12	10	14	27	...	8	17	11	...	15	20	26	...
	1st January 1862	31	35	27	35	33	35	26	23	...	26	20	20	...	21	20	22	...
1862-63	1st June 1862	27	28	27	35	30	...	29	32	...	21	16	25	35	21	30	25	23
	1st January 1863	36	40	50	55	50	45	46	42	...	40	42	27	30	34	35	37	55
GRAM.																		
1859-60	1st June 1859	51	52	58	56	60	80	85	48	72	74	73	49	54	35	56	52	38
	1st January 1860	30	32	38	42	37	49	56	48	54	45	49	51	44	34	39	40	34
1860-61	1st June 1860	25	23	22	34	28	47	42	46	44	40	50	45	40	30	34	53	32
	1st January 1861	10	9	11	12	10	12	12	13	11	14	19	23	20	18	20	32	23
1861-62	1st June 1861	13	13	12	13	12	14	17	18	19	20	17	15	21	14	18	12	13
	1st January 1862	17	17	18	24	21	20	18	18	16	16	16	13	20	17	19	15	10
1862-63	1st June 1862	30	33	27	33	33	28	38	30	30	34	35	29	32	21	19	28	30
	1st January 1863	35	35	34	41	40	36	26	34	33	25	51	35	30	27	34	3	29
RICE.																		
1859-60	1st June 1859	8	10	...	10	13	10	10	12	14	12	18	9	14	12	16	13	6
	1st January 1860	8	9	...	10	10	10	10	12	14	12	20	9	14	12	14	14	6
1860-61	1st June 1860	8	8	...	10	9	10	12	10	12	13	16	12	13	11	8	12	6
	1st January 1861	6	9	...	6	7	8	8	8	8	8	12	10	10	9	8	9	6
1861-62	1st June 1861	7	8	6	8	7	8	7	8	8	8	10	7	8	8	6	9	8
	1st January 1862	7	8	7	10	9	10	10	9	9	8	14	7	10	8	6	9	8
1862-63	1st June 1862	6	8	9	8	9	10	10	8	10	9	12	7	8	10	6	7	7
	1st January 1863	7	9	9	8	10	11	10	12	10	9	20	7	9	9	6	8	9
DAL URD.																		
1859-60	1st June 1859	29	27	28	30	30	30	37	40	45	44	34	22	26	24	28	25	17
	1st January 1860	16	17	17	23	18	21	25	24	26	26	24	20	25	25	25	25	24
1860-61	1st June 1860	12	12	11	14	13	12	12	16	18	22	19	22	24	21	22	12	22
	1st January 1861	8	8	9	9	9	9	10	10	9	12	12	16	14	14	14	15	20
1861-62	1st June 1861	11	10	11	10	11	9	9	11	15	11	9	10	11	10	9	9	10
	1st January 1862	27	27	22	22	28	20	22	17	16	17	14	14	13	12	11	9	13
1862-63	1st June 1862	28	24	24	26	25	20	23	16	16	10	10	15	18	16	15	13	12
	1st January 1863	33	31	25	35	32	22	26	22	22	8	12	22	19	16	29	13	20
DAL MUNG.																		
1859-60	1st June 1859	31	28	44	35	...	38	58	41	42	41	...	28	30	22	31	22	18
	1st January 1860	20	19	32	26	...	25	67	34	26	25	38	29	28	22	28	25	27
1860-61	1st June 1860	13	12	...	29	...	18	18	17	16	28	28	34	26	26	25	34	23
	1st January 1861	9	...	...	9	...	11	9	10	10	13	16	22	16	13	16	21	28
1861-62	1st June 1861	10	10	11	8	10	9	9	9	9	10	10	13	21	13	10	12	14
	1st January 1862	29	35	26	28	33	25	23	20	14	20	19	17	18	11	13	14	14
1862-63	1st June 1862	20	29	27	23	30	25	27	22	20	24	...	18	17	21	24	10	16
	1st January 1863	25	36	36	10	10	36	30	29	20	22	...	26	22	21	26	14	18

CHAPTER I QUESTION 2.—FAMINE OF 1860-61.

EXTRACTS FROM FINAL REPORT ON THE PUNJAB FAMINE FUND OPERATIONS, BY THE HONORARY
SECRETARY, THE REV. C. SLOGGETT; DATED 4TH FEBRUARY 1862.

You will see from these accounts that the whole sum of money given for feeding the starving population by remittances from our central fund, amounts to Rs. 5,52,630-2-5; and the sum raised from local sources, with Government equivalent, to Rs. 2,31,315-4-5; making a total sum of Rs. 7,83,945-6-10. In addition, there has been given for advances to the needy cultivators for the purchase of seed-grain, bullocks, &c., Rs. 2,27,000-0-0, making a total expenditure of Rs. 10,10,945-6-10 in famine relief, from what may be called the general contributions of the public.

Of this sum, about two lacs of rupees have been contributed by Government, as the equivalent for local subscriptions: this having been promised at the commencement of the relief operations to encourage private liberality.

I am favoured with a memo. from the Financial Commissioner, to which he authorizes me to refer in this place, from which I learn that the additional relief sanctioned by Government has been as follows:—

For takávi advances to cultivators	... ..	Rs. 2,75,000
For Famine works	... ..	„ 3,25,106
and in remissions of revenue chargeable on the land	... ..	„ 6,74,526
Total	... ..	„ 12,74,632

Which, added to the sum given for Government equivalent above mentioned, will give a total amount of about

... ..	„ 14,74,632	0 0	
given by Government; and about	„ 8,10,945	6 10
supplied by the public for famine relief in the Punjab, being a total of	„ 22,85,577	6 10	

6. I mentioned on the 30th May last, at the close of the reports concluded up to that time, and circulated in a small pamphlet for general information, that “from the returns then received it would appear that about 90,000 persons (men, women and children) were daily fed by the Famine Fund; nearly all of whom must otherwise have perished of starvation.” Returns subsequently published by me in the local journal shew that in May the actual number fed had really amounted to 100,000; in June to 105,000; and in July to 116,000 persons daily. The number of persons relieved continued nearly undiminished throughout the month of August, but in September it ceased rapidly; and by the end of October the famine operations were no longer needed in any but a few partial cases.

8. It must be remembered that the stores of grain in the famine Districts had been almost entirely consumed when the cry of famine was first raised, and the bulk of the population could find no employment the wages of which would have enabled them to buy food, so that the supplies of money so liberally furnished to the distressed districts had this good effect, among others, of inducing the country dealers in grain to forward it to those places where it was most wanted in much greater quantities than would otherwise have been sent; and hence was experienced the remarkable result that the price of grain in the famine districts generally was very little higher than in the comparatively prosperous districts in the Punjab from which it was exported.

13. I have now to allude to the 2nd general head of relief touched on in the 5th para: “by advances to needy cultivators for the purchase of bullocks and seed-grain.” Our Committee recognized the importance and necessity of this mode of relief even from the very commencement of their operations, and on the 9th May last, circular letters were addressed by me at their request to officers in all the famine districts, asking them to furnish the Committee with an estimate of the amount which they considered might be usefully employed for this purpose in their several districts. At the time of making this inquiry there seemed great reason to fear that all the money at their disposal would be required for feeding the poor, but the Committee wished to obtain an early and deliberate judgment on this important question. For, although they had suggested this mode of relief, they were not insensible to the many objections which might be urged against it. In the first place, it was concluded that the Government, in the great existing distress, would probably make advances to the cultivators on the security of their lands, to be repaid in future years; and in the second place it was felt that such relief could only be given with the utmost caution: that it might easily lead to the grossest imposition, and be productive of many evil consequences. Strong objections, which need not now be repeated, were made on these grounds to any such mode of relief, and the Committee would not have ventured to neglect them, but for the conviction they entertained that, in the terrible crisis which had occurred, ordinary rules might be for a time suspended; and that it was their duty not only to feed the starving poor, but also to supply the most impoverished of the agricultural classes, who had been almost crushed by the famine into utter pauperism, with means to enable them to resume once more their agricultural labours. The Government advances were necessarily made under the operation of general rules, to those persons only who were able to give a promise of repayment; and, but for some aid thus given by the Committee, the poorer persons alluded to would never be able to recover the ruin the famine had brought on them.

14. The Commissioners of all the distressed districts most thoroughly approved of the Committee's decision, and set themselves with careful earnestness to apportion the advances, as above indicated, in the best and most fitting manner. It has been said, subsequently, after the plan had received the approval of most of the highest authorities, and been also carried out in the districts of the North-West Provinces, that our Committee have not advanced sufficient money for this mode of relief. I am anxious therefore to inform you that they complied to the fullest extent with the requisitions made to them by the several Commissioners, and they have no reason to think that these eminent officers were desirous to obtain more money on this account than they actually received. They must be considered to have been the best judges of the wants of their own districts.

15. Now that the plan has been tried, there seems to be but one opinion as to its suitability and propriety. I beg therefore to submit the following extract from one of the reports with which these gentlemen have favored the Committee, which will be the best argument for what was done in the matter. The Commissioner of Hissar informs them: "I have officially reported to the Financial Commissioner the result of the distribution of Government *tsakavi* advances, which have been made nearly simultaneously with those granted by the Committee and by the same agency. No question as to the permanent benefit conferred can be raised. It has been the *very saving* of the agricultural interest, and what greater charity can be conferred. It is one thing to support starving thousands under such a dire calamity as we have passed through, which has been so essentially accomplished, but it is a greater to have averted ruin from vast agricultural interests, which, when once destroyed or seriously crippled, can hardly be reestablished."

The Commissioners of Cis-Sutlej and Delhi have also spoken to a similar effect.

16. These advances have been made either as free gifts, or to be recoverable at the discretion of the Commissioners. The Committee have now reason to believe that considerable portions will be ultimately recovered, owing to the improved circumstances of the country; although they have repeatedly urged their opinion that they should be recovered slowly, and only as the borrowers may be able conveniently to pay.

17. It was decided by the Committee at the meeting of the 7th May above alluded to, that these advances should, "when recovered, be kept as a reserve fund, to be placed at the disposal of the Commissioner of the Division in which they were made, as the commencement of a charitable fund for future relief in the districts, when required in future years of famine, or from other causes."

They did not at that time anticipate the possibility of so speedy an improvement in the position of the cultivators under the late extraordinary harvest and the present abundant prospects; neither did they contemplate the appointment of trustees for the general management of such funds as will be hereafter proposed.

They would therefore now rescind the resolution of 7th May last, above alluded to, so far as to decide that any money hereafter recovered from the advances in question, is to be remitted to the general fund, and brought under the operation of the rules which may be ultimately resolved upon respecting it.

CHAPTER I, QUESTION 2.

EXTRACT FROM A REPORT BY THE COMMISSIONER OF DELHI, DATED 20th NOVEMBER 1861, APPENDED TO THE FOREGOING REPORT.

8. The first efforts were of necessity turned to distribute food to the famished applicants, which flocked in thousands to the city of Delhi from all quarters ; the numbers soon swelled to a multitude, and it became requisite to appoint several localities under different members of the Committee for the distribution of food. This duty was no sinecure, and not a little trying ; the crowding and crushing on the part of the eager applicants made it almost a service of danger to those who superintended, and few who were witnesses of these scenes will readily forget them ; arrangements were subsequently made to secure greater order, and after a time, with complete effect.

9. Attention was then turned to the many women of respectable families, mostly without protectors of any kind, from their having been killed or banished, or being afraid to return from their share in the criminal deeds of the mutiny ; these women, as may be supposed, were a very numerous class and their condition truly pitiable, for work they could not, and to beg they were ashamed ; to search them out, and ensure their receiving relief, was a work that could only be undertaken by some of the native gentry ; it was accordingly given to them, and on the whole was, I believe, performed in a satisfactory manner

10. Having thus provided for the city, it became necessary to extend relief to the villages in the interior, and for this purpose, the agency of the Tahsildárs, Lambardárs, and Patwáris was largely employed. It was, however, soon apparent, that the two latter could not be trusted, and that even the former required aid and supervision, and to this intent, visitors on salaries were appointed from amongst the clerks and others who were willing to undertake the duty ; and over all an Assistant Commissioner was put in charge, and sent out to each tahsil.

12. I have hitherto alluded to the distribution of food only, and would now mention the other equally important measure for alleviating the prevailing calamity. With the sanction of Government, extensive works of public utility were immediately commenced at convenient localities, and money was besides largely given for the digging of wells in many villages. The report of these measures was of course to give employment to the people, and thereby not only enable them to support themselves, but to prevent their being driven to crime from sheer starvation.

13. I should have explained that food without labour was given to those only who were incapable of work ; all others were required to earn their bread, for I need hardly point out the evils of creating a feeling of shameless mendicancy.

14. The results of these combined measures had the best effect ; relief was afforded to nearly all in some shape, and the labour of a vast multitude, which would have been lost, possibly for ever, was turned to good account ; and many of the works then made are likely to prove permanently useful.

15. I must refer you and others to the accompanying statement for closer details ; it may be enough here to state that the large sum of Rs. 2,73,633-4-4 was expended by the Delhi Committee in providing food and raiment, and in payment of labour, to the relief of 40,176,190, men, women and children.

16. In the District of Gurgaon the famine was equally dire ; the European community is limited to 3, and sometimes 4 European officers, and they could get no extraneous aid.

19. The measures undertaken at Gurgaon were much the same as at Delhi ; but in working them out there was not the same completeness from the impossibility of giving sufficient European supervision.

20. Mr. Crown, was enabled late in the season to make a hasty tour of a portion of the District, of which he submitted a report to you. The sum expended by the Gurgaon Committee in food, raiment and payment of labour, amounted to Rs. 2,60,978-2-8 to the relief of 5,515,000 souls.

21. In the Karnál District the famine was confined to the villages at a distance from the canal ; amongst them it was very grievous, as may be judged from the extract I have already given from Mr. Wood's report, after he had visited the interior on my requisition.

22. The number of European officers, for there are no other residents at Karnál, is also very small, though in excess of Gurgaon. Here also an earnest desire was shewn by all to alleviate the prevailing calamity, the extent of which was not at first known owing to the culpable negligence of a Tahsildár, since dead.

24. The amount expended in this District for food, clothing and labour, amounted to the comparatively small sum of Rs. 67,602-11-9 to the benefit of 1,428,400 persons.

CH. I. 25. It will be seen from the above, that the sum received from you and the public for the Delhi Division amounted to the large sum of Rs. 5,91,100-1-5 or £59,110. To this has to be added Rs. 20,500 for local works from the Local Funds and Imperial Revenue; likewise Rs. 1,75,000 granted from the general revenues as advances to the cultivators for sinking wells and buying bullocks and seed-grain, making a total of Rs. 7,86,600-1-5 or £78,660, expended amongst the people for their relief in the hour of their need.

27. How little crime increased during the great want was a subject of general remark, and is best proved by the small number of cases which came under the exceptional rule sanctioned at my suggestion by Government, that offences committed by the famine-struck should not be punished in the ordinary manner, but with nominal sentences and the offenders employed out of jail.

28. It was also impossible for any observant person not to notice the perfect impunity with which the sweetmeat sellers and small Baniáhs exposed their wares on the road-side, with a stream of famished people passing, of whom, not one put his hand out to take by violence to satisfy hunger; this could not be from a mere fear of consequences, for surely it was rather a temptation to a starved man to gratify his present craving with the knowledge that a short imprisonment, during which he would be well fed and lightly worked, were the worst that could befall him.

CHAPTER I QUESTION 2.—FAMINE OF 1860-61.

EXTRACTS FROM CORRESPONDENCE ON ADVANCES MADE TO CULTIVATORS IN 1861 FOR PURCHASE OF CATTLE &c. IN FAMINE DISTRICTS.

[The original correspondence at length will be found in the Supplement to the Punjab Gazette dated 19th April 1862.]

No. 961, dated Murree, 14th June 1861.

From the Secretary to Government, Punjab, to the Financial Commissioner for the Punjab.

CH. I.

The Lieutenant Governor has duly considered your letters Nos. 381 and 406, recommending the grant of Rs. 1,75,000, for takávi in the distressed districts of the Delhi Division, to enable the cultivators to sow kharif crop. Experience has proved that, without the greatest precaution, takávi advances do not do the good which they are intended to diffuse, and are in the end irrecoverable. Therefore in sanctioning your proposals His Honor requests your earnest attention to the following instructions.

2. The advances should be made without delay, and under the prescribed formalities detailed in your letter No. 406. But repayment shall not be demanded until 2 years from the date of the advance have expired, after which the whole advance must be repaid by instalments in the two years following, or the third and fourth, from the date of the advance.

3. The duty of making the advances will be entrusted to the Tahsildárs of Parganahs, under the supervision of the District Officer. The Tahsildárs should be relieved of all current work, as they were during the assessment of the income tax. They should complete the work in six weeks or two months. They should make tours, staying at central places, and assembling the Zamindárs of the neighbourhood. In consultation with the Lambardárs, they must determine the cultivators to whom takávi is to be given, and give them the money in the presence of the Lambardárs and Patwáris.

4. As money is also being given by the Famine Fund Committee, His Honor thinks that you might suggest to that Committee that they confine their grants to the very poorest of the cultivating community, to households in distress and families bereaved of their natural supporters. The Lieutenant Governor, further considers that it would be well for the Committee to accept the Tahsildárs as their almoners for the distribution of their bounty. They may supervise his acts as they think best, but there is an obvious advantage in making use of their experienced agency instead of having a double machinery at work.

5. The Judicial Commissioner should be consulted regarding the nomination of the substitutes of the Tahsildárs.

No. 199, dated 23 October 1861.

From the Commissioner and Superintendent, Hissar Division; to the Financial Commissioner of the Punjab.

I have now the honor, in reference to your No. 2754, dated 2nd July 1861, and annexures, to report on the completion of the takávi advances made to Zamindárs of this Division for the purchase of cattle.

2. The work was completed six weeks ago, but non-receipt of the Sirsa report has delayed this communication.

3. Annexed is a statement exhibiting the operation of the measures for each district of the division.

4. Except in Sirsa, where a small balance of Rs. 1,060-15-0 was stated not to be required, the entire sum sanctioned by Government has been advanced; the terms on which these advances were granted, as directed in the Government annexure to your letter under acknowledgement, were fully explained to District Officers, and clearly understood.

5. According to the instructions, Tahsildárs were relieved of their current duties, that they might devote to the work of distribution their undivided attention.

They were directed to move carefully over their jurisdictions, and themselves to arrange for the distribution of the advances as they progressed. One month I fixed the term within which I expected the arrangements should be completed; this term however was exceeded in all the districts; the work was first finished in Rohtak and last in Sirsa.

6. The two main objects to be attained, and which was impressed on the district authorities were immediate action and judicious and careful distribution.

7. Unless the advances were made promptly, they would be of comparatively little benefit. The kharif is the principal harvest, and it was of vital importance that the agriculturist should be placed in a position to profit by an unusually favourable rainy season, which, without assistance, they could never have accomplished.

8. The presence of the Tahsildárs, it was hoped, would ensure careful, judicious and fair distribution of the assistance granted; but to ensure this still more certainly, I directed that in each district an Extra Assistant Commissioner should after a time go over each tahsil jurisdiction, test the work of the Tahsildár, and satisfy himself that all had been systematically, promptly and honestly assigned. Independent of the manifest advantage of this double testing, it served to confirm the people in the conviction that our measures were undertaken in earnest, and that Government was determined to be satisfied that they had been really beneficial. I believe the care taken in this respect was valuable as a check, and fully appreciated by the people.

9. Each Deputy Commissioner testifies to the great benefit which has resulted from these timely arrangements. The Deputy Commissioner Hissar says, "That the area brought under cultivation is larger than the average of former years, a strong proof of the benefits derived from the advances made," and "I need hardly say that they" (Government takávi advances) "have been most useful, and the Zamíndárs are very content with the favourable terms."

The Deputy Commissioner Rohtak observes, "The very large quantity of ground brought in to cultivation for the kharif, and yet larger extent of country broken up for the rabi harvest, proves that the object for which the money was given has been obtained;" and "The distribution was completed in time to allow of the usual extent of land being broken up and cultivated for the kharif crop, and the result is most gratifying, the whole country being one sheet of cultivation as far as the eye can reach."

The Deputy Commissioner of Sirsa remarks that "There can be no doubt as to the timeliness and value of the aid afforded to this District by the advances on the part of Government."

10. The same agency was used in the distribution of the Punjab Famine Committee's grant, and both were superintended much about the same time.

11. It is thus confidently hoped that the fullest benefit has been conferred on the people by these timely and liberal advances. It is the permanent injury to popular resources which constitutes the most serious and disastrous effects of such a calamity as we have just passed through, and it was just this evil which was vigorously met at the proper time, and it is believed satisfactorily averted. Without these measures, the favourable rains vouchsafed would have been of little avail, the agricultural community must have succumbed, and the ruin which has so disastrously marked former visitations of the kind, would have been the inevitable consequence.

Memo. shewing how Government takávi advances for purchase of cattle have been distributed to the villagers in the Districts of the Hissar Division.

DISTRICT.	Sum allotted by Commissioner to each District.	Sum distributed by Deputy Commissioner to Zamíndárs.	Balance.	Number of persons to whom advances have been made.	Number of villages in which advances have been made.	REMARKS.
Hissar	38,000 0 0	38,000 0 0	...	2,752	307	The total number of villages in Hissar Division is 679.
Rohtak	38,000 0 0	38,000 0 0	...	3,317	338	Ditto in Rohtak District 494.
Sirsa	24,000 0 0	22,939 1 0	1,060 15 0	2,153	283	Ditto in Sirsa District 697.
Total	1,00,000 0 0	98,939 1 0	1,060 15 0	8,222	928	Many of these are in Mouzáh Abádi.

From the Officiating Commissioner Delhi, to the Financial Commissioner, Punjab, No. 62, dated Delhi the 14th March 1862.

I have the honor to submit the report required by your No. 321, dated 31st January, regarding the sum of Rs 1,75,000 allotted to this Division for distribution as takávi advances to agriculturists for the purchase of cattle.

2. Of this sum, my predecessor assigned Rs. 50,000 to the Delhi District, Rs. 1,00,000 to Gurgaon, and the Rs. 25,000 to Karnál.

3. The reason of this unequal allotment is to be found in the far greater territorial extent of Gurgaon, and in the fact that the famine pressed with more severity in this District and Delhi than in Karnál, which is traversed by the Western Jumna canal, a branch of which also passes through the northern Parganáh of the Delhi District.

4. The sums spent in each District are as follows:--

DISTRICT.	Amount allotted.	Amount spent.
Delhi	50,000 0 0	31,461 0 0
Gurgaon	1,00,000 0 0	81,309 8 0
Karnál	25,000 0 0	23,190 0 0

The balances :—

	Rs.	A.	P.
Delhi	18,539	0	0
Gurgaon	18,690	8	0
Karnál	1,810	0	0

5. The instructions conveyed in your letters, as per margin, were communicated to Deputy Commissioners. In the Delhi District, as the civil work was light, the Tahsildárs were not relieved of their current duties. Each Tahsildár was provided with a skeleton map shewing the villages which were to be relieved. Each village had a number which corresponded with the number given to it in a memo. descriptive of the circumstances of the distressed villages, which had been prepared in anticipation of the reliefs eventually afforded; central spots were then selected for the payment of the advances, and shortly after the Tahsildárs proceeded to personally examine and satisfy themselves that the money had been expended by the recipients for the purpose intended. The reports of Tahsildárs were subsequently checked by Extra Assistant Bansi Láál, who made "full inquiries at the villages and ascertained that the distribution was honestly and correctly made."

Ch. I.

6. As to repayment, the terms prescribed in para 2 of Government letter No. 961 dated 14th June to your address, were authoritatively circulated for guidance, viz., that no demand was to be made till expiry of 2 years from date of advance, after which the amount was to be repaid by instalments in the two years following.

7. In Gurgaon the advances were, as a general rule, made in the presence of an European officer, the prescribed terms of repayment being observed. No other precaution besides the above appears to have been taken, but Mr. Ford states that there is no reason to suppose that any misappropriation by recipients of advances took place. In Gurgaon, as in Delhi, the Tahsildárs were not relieved of their current duties.

8. In Karnál the Tahsildárs visited the villages, and ascertained what persons stood most in need of plough bullocks; they were then desired to go in search of the cattle they required, which on being produced, together with the owner, the price was settled, and payment made by the Tahsildár; the animals were then branded with a stamp, and made over to the purchasers. No security was taken from Biswahdárs, their lands being considered sufficient security; in other cases security to the extent of the value of the animals given has been taken.

9. Major Elliot remarks that during his recent tour he has seen many scores of these cattle distinguishable by the tahsil brand, and is satisfied of the general truthfulness of the Tahsildárs' reports.

10. Immediately on receipt of Government sanction to the measure, instructions were issued to the District Officers; and the information previously acquired of the distress, by the measures which had been taken for alleviating it, greatly facilitated the carrying out of the Government intentions.

11. The agriculturists, depressed by an almost unprecedented calamity, must have perceived in the Government liberality an incentive to exertion; that the relief was much needed there can be no question, and the results have been most beneficial. I have satisfied myself by personal inquiry that in the Delhi and Gurgaon Districts the distribution was fairly made to those who needed help.

Memo. shewing how Government takávi advances for purchase of cattle have been distributed to the villages in the Delhi Division.

DISTRICT.	Sum allotted by Commissioner.	Sum distributed by Deputy Commissioners to zamindárs.	Balance.	Number of persons to whom advances have been made.	Number of villages in which advances have been made.	REMARKS.
Delhi	50,000 0 0	81,461 0 0	18,539 0 0	1,933	234	The amount was distributed by the Tahsildárs to the recipients in person; it was paid to them in rabi 1861, and will be realized after the expiration of 2 years from date of receipt in four half-yearly instalments, i. e., from rabi 1863 to kharif 1864.
Gurgaon	1,00,000 0 0	81,309 8 0	18,690 8 0	4,380	569	
Karnál	25,000 0 0	23,190 0 0	1,810 0 0	2,045	127	
Total	1,75,000 0 0	1,85,960 8 0	39,039 8 0	8,358	930	

CHAPTER I QUESTION 2.—FAMINE 1868-9.

Extract from the Report of Mr. LEPHEL GRIFFIN, C. S., Honorary Secretary Central Relief Committee, on the Punjab Famine of 1869-70; dated 28th July 1870.

The scarcity in the Punjab during the year 1869, so severe as to be justly called a famine, was due, in a great measure, to the failure of the harvest of 1868. The harvest of 1867 had been scarcely an average one, and the stock of grain in the Province at the commencement of 1868 was unusually low. During the early months of 1868 so much rain fell that it was anticipated that the rainy season would be injuriously affected, and this proved to be the case.

The summer was exceedingly hot, and during July and August only a few showers fell, too light to be of any material benefit to the crops. The grass was burnt up and the cattle began to die in great numbers. Their usual fodder, 'chari,' owing to the drought, became hard and indigestible, and produced a severe inflammation of the bowels, occasioning in some districts a great mortality. In the districts south of the Sutlej and in the Independent Rájputána States the wells and tanks dried up, water was impossible to procure in sufficient quantities, villages were deserted, and the people flocked northward, driving their cattle to the banks of the Punjab rivers, where they hoped to obtain sufficient grass to preserve their lives.

The drought in the Punjab still continued, and the reports from the direction of Sirsa and Hissar became extremely grave. By the commencement of October the kharif crop had entirely failed and the grass had withered away: the tanks had dried up, the wells had become brackish and unserviceable, so that the inhabitants had no choice but to abandon their villages and seek food and pasture elsewhere, while the number of immigrants from Rájputána, where the aspect of affairs was still more gloomy, added greatly to the distress. In the Hissar Division the Government were, as early as October, compelled to give direct assistance, and ordered any necessary outlay for relief works to be incurred without formal sanction. Such works were accordingly commenced on an extensive scale, and gave employment to a very large number of persons at the time when such assistance was most needed. The advantage of relief works is most evident at the commencement of periods of severe distress. The time arrives when the people, emaciated, weak and heart-broken, are unwilling if not unable to work, and have so lost energy and courage that they prefer to die in their villages to asking for the work which the Government is ready to give them.

On the 21st of October the Government sanctioned the suspension of the Revenue demand, wherever Commissioners might be satisfied that the realization of it would cause serious distress: this suspension not being lightly made, but on good and sufficient grounds, and on the understanding that the Zamíndárs should exercise the same clemency towards their tenants that the Government showed towards them.

At the close of 1868, it appeared certain that the rabi harvest, which furnishes all the food grain, would be very deficient, and in many parts of the Province would altogether fail as the kharif harvest had done.

During the last quarter of 1868, the price of all food grains in the Punjab was exceedingly high. The average of wheat was about 10 sers the rupee, though in Sirsa it was as low as 8 sers, 8 chittaks; in Hissar 9 sers: in Hoshiárpur the same. Nor were the inferior grains, generally used largely by the people in times of scarcity, cheap enough to be able to afford much relief. Gram was only one ser cheaper than wheat: barley averaged 13 sers the rupee; *bájra* (spiked millet) was as expensive as gram; *jowár* (great millet) and *moth*, a pulse (*Phaseolus aconitifolius*), averaged 11 sers; while the price of rice was altogether prohibitive. With the prices of grain everything had risen rapidly: *ghí*, from the destruction of the cattle, became a luxury which few could afford, and *grass* and *bhúsa* were enormously expensive.

During the last few days of January and the first ten days of February 1869, rain fell in considerable quantities in the Punjab. In the Jullundur Doáb and the northern districts of the Bári and Rachna Doábs it was heavy; while south of the Sutlej, though less in amount, it was still of great benefit for the time, and the grass, which had almost disappeared, began again to spring up. The accounts from most districts were brighter and the improvement continued throughout February and March, so that, on the 22nd of the latter month, the Central Committee considered that it was unnecessary to continue the collection of private subscriptions towards the General Fund.

During March a considerable quantity of rain fell; in some districts so heavily as to injure the crops: but the general condition of the Punjab north of the Sutlej had much improved and there was little fear for the future. But the state of Hissar, Rohtak, Sirsa and Karnál grew daily worse, and the number of immigrants from foreign territory constantly increased.

In June rain fell in the districts north of the Sutlej, but to the south, where it was most urgently wanted, there was little or none. Food rapidly rose to prices which prevented any of the poorest classes from obtaining sufficient to support healthy life, the grass again withered away, and fodder of any kind became very scarce. Locusts made their appearance in great numbers, and an unusual amount of sickness, caused in a great measure by insufficient and bad food, added to the distress. During the month of June, the people in the Hissar Division had found a most welcome and important addition to their scanty food in the unusually large crop of jungle berries. The Government waste lands in the neighbourhood of the town of Hissar were the residence of hundreds of families of Bikaner immigrants, including women and children of all ages, who lived on the fruit of the *ber*, crowding under the bushes during the heat of the day, and sleeping there, often, at night. Many of these poor wretches were emaciated in the extreme, and during the later weeks of June, there was a large addition to their numbers, fresh arrivals having come from Delhi and elsewhere, whither they had vainly gone in search of employment, waiting for the first fall of rain to return to their villages. All the large cities of the Punjab were now crowded with immigrants from foreign territory, for whom it was necessary to organize special relief arrangements. The richer classes of natives were liberal in the extreme, feeding daily thousands of their poorer countrymen, and the figures which show the amount of subscriptions to the Fund are no guide to the amount expended by private charity, which was very great and honorable to the humanity of the natives of the Punjab.

During July rain fell, in many districts, reviving the standing crops, and rendering the soil fit for the autumn sowings. But the weather was excessively hot, and the fierce winds like the blasts from a furnace dried up the moisture too soon. The condition of the Punjab became critical in the extreme. As in the previous year, the heavy spring rains seemed to have prevented the usual rain-fall at the proper season: through the whole Province, week after week, not a cloud was visible in the sky, and the crops withered and fell away. About the middle of August, it became certain that unless rain fell speedily a famine more terrible than any known in the Punjab since the evil year of 1783 must result. The stock of grain in the Punjab was now almost exhausted. Encouraged by the heavy rains, early in the year, the people had sown a greater breadth of land than in any year since annexation. This diminished greatly the stock of food, and what remained was rising day by day to a price, which meant starvation to many and want to all save the rich. The people had too begun to lose heart, and fancied that a curse had come upon the land. Year after year they had reaped scanty harvests, and now, at last, when the promise was so good, and they had mortgaged houses and fields to buy seed to sow every available acre of land, the heavens were shut up and they saw the crops turn a sickly yellow, while the cattle died, and there was nothing but death or ruin before them. Even had there been sufficient grain in the country, the people, especially the artisan class, had no money to buy it. The high prices, so long continued, had exhausted their savings; their houses and ornaments were pledged, their scanty furniture sold, and the money-lenders would advance nothing more. The people were, moreover, unable to bear famine so well as during the last year; for they were exhausted with anxiety and want, and a terrible sickness was doubling the lists of mortality. The prices in some of the richest districts of the Province were far higher than they had been in the poorest districts during the famine of 1860-61, and the grain-dealers, though in many cases unjustly accused, were creating an immense amount of ill-feeling, by storing up the grain, by mixing inferior grain with the wheat, and by raising the prices quickly and continuously. The great crime of these men may simply have been that they were prospering while others were being ruined; but it is no use to expect people who are starving to be logical, and the cry against the bannias, a cry which has an unhappy significance in time of famine, rose louder and louder. Every night the people came out of the towns and villages, and resorting with drums and processions to every shrine prayed for rain, while the hearts of those who had to think for the people grew sick with longing for the rain which never came. Those who saw most of the people during these unhappy days will know that no tribute of praise to their conduct can be exaggerated. Crime, it is true, largely increased in some districts; but the increase was only in theft; and whatever any code of morality may say, it is more reasonable to steal than to die. But the mass of the people bore their sufferings with a patience, a reticence, and a courage, truly noble. They understood that the Government was doing all it could for them, and they accepted its relief gratefully; but they did not apply for relief till it was needed to save their lives: they complained little, and remained at the worst and the darkest time patient, obedient and loyal. The people have deserved well of the Government, and no race in the world could have borne themselves, under such trying circumstances, more bravely or well.

Towards the end of August the wished-for rain came, but it was very partial and too scanty to be of much advantage, and on the 1st of September, the Central Committee again appealed to the public for assistance. They showed how the expectations of a rich harvest, which had been natural and general after the heavy rains of July, had been disappointed, and that unless rain immediately fell, the harvest would be utterly lost and the cattle would perish as they perished by tens of thousands early in the year. But on the 4th and 5th of September, when almost all hope was gone, a heavy fall of rain literally saved the Punjab. It was general over the whole Province, from the Jumna to the Indus, and was plentiful in those Cis-Sutlej districts which needed it most. Here it had come too late to make a harvest, half withered away, good: but the crops, even where they were worst, recovered in a wonderful manner, and north of the Sutlej and on the frontier

there was hope of at least an average harvest, while some districts eventually reaped a harvest exceptionally good. How imminent had been the danger, how intense the anxiety, and how great the relief, the people of the Punjab and the officers of Government will not soon forget.

The operations of the Central Relief Committee were not at once affected by the rain-fall. The fear for the future was at an end, but the present distress was very great. The operations of the Central Committee were much affected by the rain. Prices continued to rise owing to the smallness of the stock, and it was only in March 1870 that they began sensibly to decline. The cattle had died in such numbers that Government assistance was necessary to purchase new oxen to plough the land, and the distress in the districts of the Hissar Division did not show, till November, much tendency to decrease, though the Rájputána immigrants left for their own villages.

From these accounts it will be seen that the sum of Rs. 4,21,674-2-11 has been expended in the direct relief of paupers unable to work. In the hands of the Central Committee, and in Local Treasuries a balance remains of Rs. 21,882-8-7, although it is probable that some of this may have been expended since District Officers forwarded their latest accounts to me. The number of destitute persons relieved was over six millions, that is to say, there were 6,160,045* cases, of relief, comprising 1,954,224 men, 2,393,895 women, and 1,811,926 children; and the number of persons who were employed on local works under the control of the district authorities was 2½ millions—2,583,990—being 1,177,206 men, 900,718 women, and 506,066 children.

To these should be added the very large number employed under the Public Works Department on special or ordinary works. In some districts the Department Public Works was able to provide sufficient work for the able-bodied, as in Kangra, where a great number of persons were employed on the new roads under the Executive Engineer, and at Madhopur, Gurdáspur District, in the construction of a new dam. The excavation on the Sirhind Canal, between Rúpar and Douráha-ki-Serai, gave employment to all who asked for it: while on the Western Jumna and Bári Doáb Canals, and on the Inundation Canals of the Multan and Dera Gházi Khan districts, abundance of work was procurable.

In addition to the work given to able-bodied paupers, and the direct relief given to those unable to work, the Government throughout the distress made large advances (Takávi) to Zamíndárs and others for digging and repairing tanks and wells, and, later in the year, for the purchase of cattle. These advances amounted during the year 1869-70 to Rs. 5,49,706 for the whole Province, of which no less than Rs. 3,99,091 was advanced in the Delhi and Hissar Divisions, alone. Remission of revenue demand during 1869-70 was granted in the Rohtak district to the amount of Rs. 89,201, and in Sirsa Rs. 13,320. Considerable sums were suspended during the famine, but were for the most part collected before the end of the year 1869-70.

The expenditure of the Central Committee on Establishment was trifling. An auditor on Rs. 50 a month looked over the monthly accounts; and with a clerk on Rs. 25 formed the whole establishment. Printing Statements and Circulars cost Rs. 116-2-8, and the only miscellaneous expenditure during the year amounted to Rs. 1-6-0.

* This is the number relieved for one day, counting the sum of the numbers relieved daily during the whole period.

Amounts received and expended on account famine relief in the districts of the Punjab, during the famine of 1868-69, 1869-70.

1	INCOME.										EXPENDITURE.				BALANCE AT THE END OF THE YEAR OF THE LIEF OPERATIONS.				NUMBER OF DISTRICT PERSONS EMPLOYED.					
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
DISTRICTS	Subscriptions received.		Government equities and donations.		Government grants and other values.		Amounts received from Central Relief Com.		Amounts received from private persons.		Cost of feeding destitute persons.		Amounts remitted to Amritsar, Jalandhar, &c.		Total.		Men.		Women.		Children.		Total.	
	Rs.	P.	Rs.	P.	Rs.	P.	Rs.	P.	Rs.	P.	Rs.	P.	Rs.	P.	Rs.	P.	Rs.	P.	Rs.	P.	Rs.	P.		
1. - Districts in which relief operations were in progress.	16,642	...	24,628	...	3,289	...	83,372	...	83,376	...	69,752	...	14,000	...	68	...	8,576	...	...	...	...	...	...	1,87,401
2. - Districts which only collected subscriptions and donations for the "General Relief Fund."	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2,00,987
TOTAL	16,642	...	24,628	...	3,289	...	83,372	...	83,376	...	69,752	...	14,000	...	68	...	8,576	...	...	...	...	...	...	1,89,488

LEWEL GRIFFIN,
Secretary Central Relief Committee.

CHAPTER I, QUESTION 2.

FAMINE OF 1868-69.

I. The following extract from a memorandum by the Secretary to the Central Relief Committee, appended to the Punjab Administration Report for 1868-69, and written about June 1869, describes succinctly the extent to which the famine had, up to that date, affected each part of the Punjab :—

9. The effects of the scarcity were very partial in the Punjab. In the country to the north of the Ravi it was felt very slightly; in the Bári and Jullundur Doábs the pressure was for a short time only severe; while the Districts south of the Sutlej were visited with real famine and are still in most distressed circumstances.

10. (a).—*The country to the north and west of the Ravi.*

Here, no distinct distress can be said to have existed, nor were relief works of any magnitude instituted.

In Siálkot, Gujránwála and Gujrat, the rain-fall was average in quantity, the land is rich, and to a great extent irrigated by wells, and the crops were scarcely below the average. In Shahpur and Jhang the rain-fall is ordinarily so small that few crops are grown upon unirrigated land, and the crops this year were quite up to the average. The grass in the Bár, however, was burnt up, and a considerable number of cattle died. In Rawalpindi and in the Districts Trans-Indus the crops were probably above the average.

11. (b).—*The Bári and Jullundur Doábs.*

The northern portion of these Doábs, comprising the Kángra, Hoshiárpur and Gurdáspur Districts, were very slightly affected by the drought, in only one of them, Hoshiárpur, was it necessary to institute relief works, and these were rather for the benefit of immigrants from the south than for the inhabitants of the District.

Jullundur.—There was some distress here, but not of serious character. The people were not in the habit of storing grain, and the supply soon became nearly exhausted. The relief works, instituted chiefly on the District roads, were well attended; on irrigated lands the crops were fair; on unirrigated about half an average crop was obtained.

Amritsar.—The Bári Doáb Canal flows through this District and was of inestimable value, though the water of the Ravi from which the canal is drawn this year was lower than had ever before been known. There was considerable distress and loss of cattle in the Tarn Táran Perganah of the District, and relief works were started on the Hariki, Batála, and other roads. But the Amritsar peasantry were comparatively wealthy, and being able to support themselves during a bad season, had sufficient independence to decline Government assistance; nor did they ask for remissions of revenue. The special works at the city of Amritsar itself, filling in the city ditches &c., were resorted to by large numbers, chiefly the lower classes of the city, whom the exceptionally high prices reduced to a state bordering on starvation, and the Rájputána immigrants who flocked to Amritsar in great numbers.

Lahore.—The state of Lahore was very similar to that of Amritsar. A very large number of immigrants had to be supplied with work, which was provided for them in the neighbourhood of the station. The kharif crop of 1868 was almost lost, except on irrigated land; but the rabi, owing to the heavy rain which fell in March, was of average character.

Montgomery.—The rain-fall in Montgomery is always small. This year the distress was at one time very considerable, and almost all the grass was burnt up, occasioning great loss of cattle. Relief works were undertaken in various places; only a third of the usual area was brought into cultivation for the rabi crop in the Parganahs of Montgomery and Gugera, and not more than one-fifth in the Hujra and Pákpattan Parganahs, except upon the canal lands, where the yield was as good as usual.

Mooltan.—A great many immigrants from Baháwalpur and Bikáner came to this District, occasioning relief works to be undertaken, but there was no extreme distress among the residents.

11. (c).—*The countries to the south of the Sutlej.*

Hissar.—This Division, consisting of three Districts, Hissar, Sirsa, and Rohtak, has suffered more than any other portion of the Punjab, with the exception of Karnál.

Early in the autumn of 1868 the aspect of affairs in the Division was very gloomy, and, Mr. Naesmyth, the Commissioner, on the 28th of September, submitted a list of works of the estimated cost of Rs. 75,475, which were proposed to be undertaken for the relief of distress in the Sirsa district, and asked sanction to undertake them without delay. In Hissar two special works, the Hánsi and the Bhiwáni roads, were also taken in hand early in October. At this time the state of things in the three Districts was much the same. The grass was all burnt up; the tanks were dry; the wells had become brackish, and the cattle, without fodder, were dying in all directions; while the people had no choice but to abandon their villages and seek food and pasture elsewhere. At the end of January, a heavy fall of rain brought some relief, and the young grass began to spring up; all over the Division, relief

works were in full operation, well and tank digging and road making being found to be both most useful and most suited to the capacity of the labourers. Every effort was made to start works near the villages in which the greatest distress prevailed, and relief houses were opened in convenient places, at which infirm paupers received food, and in some cases money. The distress was very severe till the middle of the month of March, when rain fell, and what cattle still survived were able to obtain fodder. Since that time the distress has still been very great, the number of paupers receiving direct relief, and of those employed on special works, fluctuating from week to week, but maintaining a pretty constant average. The number of cattle that have died in the Hissar Division is enormous, and in Rohtak alone the loss is estimated at 88,300, about a fourth of the whole number in the District. The numbers who received direct relief in this Division, from the end of January till the end of May, were 1,383,636, and this does not represent at all accurately the extent of the distress, for relief operations commenced very early. In Sirsa from October to the close of January, 98,024 paupers were relieved, and in Rohtak 204,436 during December and January.

Karnal suffered perhaps more than any other individual District in the Province, and during the months of February, March, April and May, nearly 800,000 have received in it direct relief, in addition to the large and numerous special works started in all directions. The mortality among the cattle has been great: in one Parganah alone, that of Kythal, it being estimated that 45,000 had died. This was the most afflicted portion of the District, with the Parganahs of Asandh and Kathana, a high tract, almost entirely dependent upon the rain-fall, as the wells are of too great a depth for profitable irrigation.

12. No special mention is required of the other Cis-Sutlej Districts—of Ferozepore, Umballa, Ludhiana, Gurgson and Delhi. In all of them the scarcity was more or less severely felt, but in none, save Ferozepore, was it necessary to institute special works of any magnitude, and in Ferozepore it was chiefly necessary on account of the large number of immigrants from the south.

QUESTION 2, CHAPTER I.

FAMINE OF 1868-69.

Extracts from Revenue Report of 1868-69, dated 24th December 1869.

11. Balances.—The balances of the year are classed as follows:—

Year.	In train of liquidation.	Doubtful or undetermined.	Irrecoverable.	Nominal.	Total.
1867-68 ...	32,460	30,202	7,784	39,368	1,09,814
1868-69 ...	1,97,504	44,549	2,03,645	45,051	4,90,749
Difference,	+ 1,65,044	+ 14,347	+ 1,95,861	+ 5,683	+ 3,80,935

The largest irrecoverable balance is in the Rohtak District, Rs. 1,62,551, on account of the remissions and suspensions above alluded to. Among the rest are—

Sirsa	...	...	...	...	Rs. 12,383
Kohát	...	...	...	...	" 6,415
Hissar	...	...	...	...	" 7,698

These are all more or less owing to the unfavorable season.

The doubtful balances are chiefly in the Montgomery, Karnál and Pesháwar Districts, and some of them will probably have to be remitted.

The balances in train of liquidation show a very large increase over the previous year. They are chiefly in the following Districts:—

Hissar	...	...	...	...	Rs. 34,569
Sirsa	...	...	...	...	" 40,586
Umballa	...	...	...	...	" 49,445

Each of these Districts showed no such balances last year. The falling off in the collections during the year under report was doubtless due to the impoverished state of the people owing to bad harvests. This led the collectors to refrain from bringing any pressure to bear upon them for the payment of their revenue. Apart, however, from these special causes, there has been a tendency of late to be remiss in the collection of the Government demand, which if not checked must have had a bad effect on the minds of the people, and on the interests of Government. Where valid cause can be shown, applications for suspension, and even for remission of the demand, always receive due consideration. But mere delay in the collection of revenue admitted to be due, and which cannot be recommended for suspension or remission, is productive of much evil, and the serious attention of revenue officers has recently been called to the subject, with a view to the punctual collection of the revenue instalments on the dates on which they fall due.

Considering the character of the agricultural season during the latter part of the year, it is gratifying to find that the difficulty in the realization of the revenue in the great majority of Districts was so small as it really was.

In the following Districts the entire balances were actually less than in the previous year:—

Delhi.	Gujrat.
Gurgaon.	Mooltan.
Kángra.	Jhang.
Gurdáspur.	Muzaffargarh.
Rawalpindi.	Pesháwar.

93. The memo. attached to the detailed return of rain-fall shows that the fall during the regular rainy season, that is, from 1st April to 1st October, was much less than in the previous years, being only 16.1 inches; but on the other hand, the fall in the cold weather from 1st January to 1st April was slightly higher, being 8.2 inches.

The total average fall was 25 inches, against 30 in the previous year. The annual average has varied during the last few years as follows:—

1864-65	...	...	...	28.9
1865-66	...	...	...	26.8
1866-67	...	...	...	22.9
1867-68	...	...	...	30.0
1868-69	...	...	...	25.0

There was a general failure of rain in August and September, just at the time when it is most wanted for the maturing of the autumn crop, and the preparation of land for the spring crop; so that though the rain-fall of the year was not in the aggregate much below that of former years, it was so unseasonable and capricious as to cause considerable distress.

104. Disease and want of proper food caused a great loss of cattle during the year. The loss was about 450,000, of which nearly 300,000 died in the Districts of Hissar and Sirsa alone.

The Deputy Commissioner of Sirsa notices that the loss of cattle varied among different castes of people. The Sikh Jâts managed to preserve their cattle, as they spared no expense or trouble to procure fodder. The Muhammadan Bhattis slaughtered their cattle for food. The Bâgrî Jâts let them loose on the country, and made some profit by selling fodder to people who had kept their cattle. The Deputy Commissioner also notices that in some places the scarcity of bullocks was such that women were to be seen dragging the ploughs. Takâvi advances, or loans to agriculturists, on a large scale, were sanctioned about the close of the year to enable the people to replace their losses and prepare their land for the ensuing autumn crop.

107. This return shows that food was cheaper in June 1868 than during the preceding year. But in January 1869 prices had risen to famine rates, in consequence of the drought that prevailed during the intervening months. In January 1869 wheat was selling in Delhi at $11\frac{1}{4}$ sers (or $22\frac{1}{4}$ pounds) per rupee, and in the other Districts specified in the return, as follows:—

Umballa	...	...	...	$9\frac{1}{4}$	sers.
Lahore	...	...	...	$9\frac{1}{4}$	"
Sialkot	...	...	...	$10\frac{1}{2}$	"
Mooltan	...	...	...	$11\frac{1}{4}$	"
Peshâwar	...	...	...	$14\frac{1}{4}$	"

In some of the frontier Districts prices were at all times considerably lower than elsewhere; prices were highest in the arid parts of the Delhi and Hissar Divisions, which are not given in the return. But the figures are ascertainable from the returns published in the Gazette at the time. The prices of wheat were in January as follows:—

Karnâl	...	...	...	$9\frac{1}{2}$	sers.
Hissar	...	...	...	9	"
Rohtak	...	...	...	$9\frac{1}{4}$	"
Sirsa	...	...	...	$8\frac{1}{2}$	"

In the Mooltan Division prices did not rise to the same extent, owing partly to the extensive importations from Sindh, which also had the effect of keeping down the price in all Districts within reach of the Railway and the great rivers.

During January and February prices decreased to some extent, owing to a pretty general fall of rain. But as this rain did not continue, prices again rose in the southern and eastern tracts. In Hissar and Sirsa wheat again rose to from 9 to 10 sers per rupee, and remained at that price at the close of the year.

The rates at that date were—

DEAREST.					
Hissar	...	...	...	9	to 10 sers.
Sirsa	...	...	...	$9\frac{1}{4}$	"
Gujrat	...	...	...	9	to 10 "
Shahpur	...	...	...	9	to 11 "
CHEAPEST.					
Lahore	...	...	...	$12\frac{1}{4}$	to 13 sers.
Ferozepore	...	...	...	$13\frac{1}{4}$	"
Mooltan	...	...	...	14	to 16 "
Muzaffargarh	...	...	...	15	to 16 "
Derajât	...	...	...	14	to 16 "

Since the close of the year the tendency has been towards an equalization of prices. But in the frontier Districts wheat is still cheaper than in the interior.

Ch. I.

110. Prices have been high for about two years past. That unfavorable seasons should have led to this result is reasonable enough, but it was found that even when the prospects of the crops were entirely changed for the better by timely and copious rains, prices continued nearly as high as before. The Government directed an inquiry into the causes of this, and local officers were called upon to report on the subject. Various reasons were assigned, but there was a general impression that the stock of food in the Province and in the country generally was low, and that the deficiency was the result not of one or two unfavorable seasons only, but of a series of bad seasons for many years, varied by an occasional good season, and also of the great depletion of the granaries of the country in the severe famine of 1860-61, the effects of which were never fairly got over.

It was expected that when the prospects of the Kharif crop of 1869 were thoroughly secure, prices would fall. The crop was saved by a timely fall of rain in September last, and the harvest, which has since been gathered, was in most places an unusually good one, as regards the yield of lands brought under cultivation. The fall in prices however has been very slight, not only in the Punjab but all over Upper India. The stock of food grain in the Punjab was at one time so low that supplies had to be obtained from Sindh, a Province which in ordinary years takes a large supply from the Punjab.

During the height of the scarcity wheat and the inferior grains were all selling at about the same price. The price of the grains in the autumn has fallen. Wheat being a spring crop still continues nearly as high as ever. Gram also continues very dear, owing to the repeated failure of this crop in the northern Districts.

Had it not been for the fall of rain in September, which saved the autumn crops all over the Upper Provinces, the stock of grain in the Punjab, according to the opinions of the local officers, would not have supported the population for more than 2 or 3 months. An inquiry was made as to whether in the event of an absolute failure of stock the grain-dealers would be able to supply themselves from elsewhere without other assistance. The reply in most cases was, that they would have been able, but their confidence on this point generally rested on the assumption that the crops in neighbouring Districts were better than in their own immediate vicinity. This was in many instances the case. Had there been a simultaneous failure of crops in all Districts, such as there was in parts of the Hissar and Delhi Divisions, the result would have been most disastrous, and it is difficult to see in what way the requirements of the population would have been supplied.

118. A statement has been prepared to show the fluctuations of price of the principal food grains in the past year as compared with the prices of the famine year 1860, and as compared with the ordinary averages of other years. Three representative Districts have been selected, Delhi on the south-east, Lahore in the centre, and Pesháwar on the frontier of the Province. The statistics also of two Districts in the North-West Province and two in the Central Provinces, have been added.

During the recent famine it was found that grain was as a rule cheaper on the frontier than in the interior. But an examination of the figures of a series of years shows that this state of things was quite exceptional. The result is still in favor of the frontier, but the difference is very trifling. The average price of wheat for six years from 1862-63 to 1867-68 was as follows:—

	Srs.	Chka.	
Delhi	23	12	per rupee.
Lahore	24	8	"
Pesháwar	24	14	"

In particular years the price of wheat at Pesháwar was above that in Lahore and Delhi. This occurred in 1862-63 and 1867-68. But from October 1868 to the end of the year and up to August 1869, the price was much lower in Pesháwar than in Lahore and Delhi. The average for those months was as follows:—

	Srs.	Chka.	
Delhi	12	11	per rupee.
Lahore	11	6	"
Pesháwar	16	8	"

In the famine year 1860-61 the average price in Delhi during the same months was 13 sers 1 chittak. So that the recent famine raised the price of food even higher than the memorable one of nine years ago.

But the value of money has fallen so greatly in the interval that these high prices do not by themselves indicate the comparative degree of pressure of the two periods. The price of food has been steadily rising from year to year since 1863-64, which was the last year of comparatively cheap prices.

Thus, in Lahore, which is a fair instance of an average District, the rise was as follows:—

	Srs.	Chka.	
1863-64	32	8	per rupee.
1864-65	26	12	"
1865-66	19	12	"
1866-67	21	8	"
1867-68	19	8	"
1868-69	11	6	"

QUESTION 2, CHAPTER I.

Price of Cereals &c. in the Punjab for 5 years from 1867-68 to 1871-72 (extracted from Punjab Revenue Reports for those years).

YEAR.	Number of sars per rupee on	DELHI:		HISSAR.			UMBRA-LLA.	JULLUNDHUR.	AMRITSAR.	LAHORE.	RAWALPINDI.	MOOLTAN.	DERAJAT.	FRISHAWAR.			
		Delhi.	Gurgaon.	Karnal.	Hisar.	Rohia.	Sirsa.	Lothiana.	Jullundur.	Hoshiarpur.	Amritsar.	Gujranwala.	Rawalpindi.	Mooltan.	Derajat.	Frishawar.	
WHEAT 1ST SORT.																	
1867-68	1st June 1867	20	22	21	17	19	17	22	24	26	22	23	20	10	16	25	21
	1st January 1868	25	27	21	19	26	17	23	22	23	18	20	17	18	14	19	15
1868-69	1st June 1868	26	22	23	21	23	23	24	19	20	12	21	16	19	17	16	22
	1st January 1869	11	12	10	9	10	9	10	10	9	10	10	11	10	11	11	18
1869-70	1st June 1869	15	14	17	12	14	11	14	14	15	14	12	15	16	18	18	14
	1st January 1870	9	8	10	8	9	6	8	9	10	9	10	11	11	10	11	18
1870-71	1st June 1870	14	14	13	13	13	13	18	17	16	16	14	17	14	12	13	11
	1st January 1871	20	18	15	15	18	17	21	22	21	19	16	16	18	15	14	11
1871-72	1st June 1871	23	20	23	22	22	21	28	30	31	27	23	18	16	17	19	14
	1st January 1872	20	16	18	16	17	18	18	22	22	19	16	18	16	18	17	21
BARLEY OR JAO.																	
1867-68	1st June 1867	27	35	29	24	26	31	26	34	34	30	40	30	27	22	21	33
	1st January 1868	34	37	29	35	33	30	26	30	34	26	31	17	26	18	20	28
1868-69	1st June 1868	38	29	35	38	32	32	33	28	27	59	24	29	29	28	24	28
	1st January 1869	15	16	11	11	13	12	11	12	14	13	12	17	12	16	16	23
1869-70	1st June 1869	21	21	23	16	17	14	19	19	20	19	22	25	20	17	18	38
	1st January 1870	15	16	15	8	16	12	12	12	12	13	16	29	18	18	18	21
1870-71	1st June 1870	22	21	19	19	21	12	24	22	22	20	20	23	18	16	17	34
	1st January 1871	29	30	31	28	26	30	33	27	28	23	19	22	18	21	23	25
1871-72	1st June 1871	30	31	36	31	30	33	49	48	47	39	36	26	24	27	26	30
	1st January 1872	26	26	35	20	22	24	27	28	30	26	25	21	25	27	26	35
BAJRA.																	
1867-68	1st June 1867	25	26	19	22	21	25	24	20	20	26	20	30	24	21	18	33
	1st January 1868	28	30	18	30	31	32	22	26	20	21	19	25	23	18	16	20
1868-69	1st June 1868	26	17	24	33	28	34	24	22	18	22	16	20	20	27	20	34
	1st January 1869	12	11	11	9	11	10	11	10	11	11	12	13	12	19	16	18
1869-70	1st June 1869	10	11	11	11	9	11	12	10	10	9	9	13	8	11	14	17
	1st January 1870	18	21	17	18	20	20	18	18	17	15	14	22	15	18	14	17
1870-71	1st June 1870	19	20	16	15	20	18	18	16	16	15	12	22	16	12	12	21
	1st January 1871	26	28	28	25	23	28	25	27	28	24	19	26	16	20	19	15
1871-72	1st June 1871	25	23	25	24	24	27	29	24	24	21	25	18	23	15	24	18
	1st January 1872	21	21	20	18	19	20	21	24	20	20	26	19	24	22	32	20
JOWAR.																	
1867-68	1st June 1867	24	27	22	22	22	30	28	20	20	26	27	24	25	22	25	18
	1st January 1868	32	29	18	40	40	36	34	28	30	26	24	24	20	18	16	26
1868-69	1st June 1868	28	26	26	40	31	40	34	20	16	19	18	19	18	20	34	16
	1st January 1869	18	12	11	10	12	12	12	10	11	11	13	11	14	15	16	21
1869-70	1st June 1869	11	12	10	9	13	10	14	10	10	10	10	8	13	13	13	18
	1st January 1870	21	25	20	9	26	20	22	22	20	18	15	19	14	14	22	36
1870-71	1st June 1870	22	20	19	19	21	20	22	21	19	16	12	28	15	13	17	37
	1st January 1871	27	30	34	28	25	30	33	28	34	25	21	32	20	22	22	16
1871-72	1st June 1871	24	25	32	28	25	30	39	32	32	28	24	34	18	28	20	25
	1st January 1872	20	18	18	22	22	21	21	24	24	20	20	36	24	27	25	30
GRAM.																	
1867-68	1st June 1867	20	34	22	26	29	32	26	25	26	25	37	21	21	18	22	30
	1st January 1868	26	29	29	34	31	32	28	26	23	25	31	14	21	17	19	22
1868-69	1st June 1868	28	26	28	36	30	40	30	26	28	27	23	16	19	22	20	19
	1st January 1869	18	12	12	13	11	12	13	14	11	26	12	10	11	12	13	10
1869-70	1st June 1869	13	13	13	13	13	13	16	15	15	14	19	9	11	12	12	11
	1st January 1870	9	9	9	9	9	10	10	11	10	14	10	5	10	10	12	9
1870-71	1st June 1870	14	15	15	17	15	20	18	10	16	16	16	12	14	14	13	9
	1st January 1871	19	20	21	20	21	22	24	22	22	20	17	13	14	17	18	9
1871-72	1st June 1871	22	19	26	25	23	30	30	31	32	30	23	18	19	20	19	21
	1st January 1872	21	18	20	20	19	22	25	25	24	25	17	17	19	17	19	25
RICE.																	
1867-68	1st June 1867	6	7	8	8	6	8	9	9	8	8	7	7	9	7	5	9
	1st January 1868	6	7	8	8	6	8	8	12	8	8	10	7	8	8	5	9
1868-69	1st June 1868	6	7	10	7	6	11	9	10	16	7	8	7	8	8	5	9
	1st January 1869	6	7	7	6	6	7	6	8	10	6	7	6	6	6	5	7
1869-70	1st June 1869	6	6	8	9	6	6	6	8	7	6	6	6	6	6	5	7
	1st January 1870	4	6	7	8	6	8	6	8	7	4	7	6	6	6	5	6
1870-71	1st June 1870	5	6	6	10	6	8	7	9	7	7	7	5	6	6	5	5
	1st January 1871	6	6	8	14	6	7	7	10	10	8	13	6	6	7	7	5
1871-72	1st June 1871	6	7	8	10	10	10	8	8	10	7	8	6	8	7	5	8
	1st January 1872	6	7	8	8	11	10	8	8	10	7	8	6	8	6	5	8
DAL URD.																	
1867-68	1st June 1867	19	18	16	13	16	13	12	14	13	14	16	16	16	15	20	13
	1st January 1868	22	22	16	15	21	12	11	14	13	14	16	13	16	12	12	14
1868-69	1st June 1868	21	16	17	16	17	10	12	12	10	11	10	9	11	10	10	11
	1st January 1869	22	10	9	8	9	9	7	9	8	9	8	7	9	9	9	10
1869-70	1st June 1869	16	16	8	12	14	...	14	16	9	10	9	15	12	15	...	8
	1st January 1870	18	20	18	10	21	...	20	19	18	18	14	23	16	10	...	30
1870-71	1st June 1870	20	17	19	18	28	...	25	21	19	18	16	23	16	20	16	18
	1st January 1871	30	29	34	22	25	...	33	31	32	19	21	26	16	24	17	19
1871-72	1st June 1871	19	18	13	16	16	...	19	17	17	19	15	13	16	16	15	11
	1st January 1872	18	16	18	15	16	...	17	15	15	16	13	15	16	15	16	11

QUESTION 2, CHAPTER I.

Ch. I. Reports of the Punjab Government on the scarcity of 1877-78 :—

No. 546A dated Lahore, 30th April 1878.
 From—C. L. TUPPER, ESQUIRE, Under-Secretary to Government, Punjab.
 To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

Information will have already reached the Government of India regarding the distress prevailing in Kashmir territory, and a special report has been submitted on the scarcity which unfortunately exists in the Hazara District. I am now desired by the Hon'ble the Lieutenant-Governor to explain briefly the extent of the pressure recently felt in some other Punjab Districts, and to note generally the present circumstances of the Province in respect of food-supply and agricultural prospects. Reports were furnished, as marginally detailed, on the spring and autumn harvests of last year; but the main facts, as bearing on the districts in which some suffering has occurred, may here be usefully recapitulated. It will be most convenient to remark in order on each of the several divisions.

2. No special report of distress has been received from the Delhi District. The area sown for the autumn crop was short of the average; but rain fell between the 6th and 10th October with good effect. Prices then declined, but rose again, owing to the demand for export. The stock of food in store was believed to be large and sufficient. The spring crop, now being reaped, was expected to be extensive and good, owing to the timely October rain. It has, however, now been reported that the gram crop is a comparative failure. The wheat and barley harvest is average, but not a full average.

In the Gurgaon District during the autumn months prices were high and exports large. The general prospects were then considered bad, and the cattle were suffering. In December, deaths from starvation were said to have taken place in Hodal and Palwal, and subsequently some considerable distress has undoubtedly occurred. The total number of deaths, according to the District and Police returns, attributed to want, from October last to the 6th current, is 196, though the Sanitary Commissioner reports a higher figure. The local officers remark, that the bodies of the persons described as having met their death in this way are generally found by the road-side, and brought to the nearest police post, no relative appearing to claim or identify the deceased; no medical investigation is ordinarily possible as to the cause of death, which is in all such cases assumed to be hunger. The great majority of the sufferers are stated to have been immigrants from Alwar and Bhartpur; but there have also been deaths among sweepers and other village servants, and even of Zamindars owning land. The fact of work being procurable on the new Delhi Branch of the Western Jumna Canal was widely published, but with little result, the people being unwilling to leave their homes in order to labour. On the other hand, they have readily gone abroad to beg; and some deaths amongst wandering mendicants, exhausted by fatigue and unknown, it would probably have been impossible under any circumstances to prevent, and certainly not without an impracticable and demoralizing expenditure. Due efforts have, however, been made to afford permissible relief. Private subscriptions have been collected; and at Rewari, Nuh, Palwal, Hodal, Punahana, Pinangwa, Sakras, Nagina, and Firozpur, that is at the principal towns in the District, relieving houses have been established. Municipal Committees, where they exist, have made grants of money, and where both these sources have been exhausted, the Deputy Commissioner has obtained grants from the District Fund. In November he distributed sums of money to every police post, with instructions to give to all hungry applicants sufficient food to carry them to the nearest relieving house, or help them on their way; and Zaidars and Lambardars have been similarly directed to assist starving people who may come within their knowledge. These operations are still in progress, though it is hoped they will not be much longer required; and the Deputy Commissioner does not consider that he will be compelled to ask the Government for a special grant of money, unless the pressure should continue beyond the end of the current month. The Lieutenant-Governor regards the measures taken in this District as sufficient to meet the necessities of the case. In the Firozpur and Palwal tahsils the present harvest is not below the average; in the Nuh, Rewari and Gurgaon tahsils it is reported to be very light; and the out-turn for the whole District is slightly below the average.

As early as October last the question whether any special relief works would be required in the Karnal District was referred by the Officiating Commissioner of the Delhi Division, Major Waterfield; but, since very large works of the Irrigation Department were under construction within a reasonable distance of Karnal, and the Canal Officers had been instructed to give work to all persons applying for it, no further steps then seemed necessary. On the 3rd November the Financial Commissioner reported that about half the autumn crop on irrigated land, and the whole crop on unirrigated land, had been lost; cattle had died, fodder was scarce; in Kaithal and the west distress existed, but Panipat and the east were safe. During the month the Police reports showed no improvement, and orders were issued by the Lieutenant-Governor that able-bodied distressed persons should be sent to the canal works in charge of a responsible tahsil or district official, who should give the people subsistence allowance during their journey. In December, a heavy fall of rain throughout the distressed tract greatly changed its prospects for the better. Some works, though not of an extensive or unusual character, were then in progress on district roads; and the Commissioner, Colonel Davies, in dealing with some further proposals, directed that no roads or tanks which were not likely to be permanently useful should be undertaken merely to provide work for the people near their homes. Gratuitous relief, he thought, would probably be no longer necessary. The last report on the scarcity in Karnal,

which the Lieutenant-Governor has received, is dated 23rd December, or three days later than the instructions of the Commissioner, which have just been summarized. It defined with greater precision the area of distress comprising the western part of the Karnál tahsil, and almost the whole of the Kaithal tahsil; but within these limits the degree of suffering was very unequal in different localities,—in one tract three harvests in succession having failed, in another two, and in a third one only. The most serious matter was the great mortality among cattle from want of fodder. No deaths from starvation amongst the people have been reported either by the District Officers or by the Police; and as the subject of scarcity has ceased to be specially brought to notice since the favourable December rains, it may be safely assumed that Karnál is recovering itself. One death reported by the Sanitary Commissioner for the week ending 6th April is, however, under inquiry. The latest crop report estimates the out-turn at 75 per cent. in the Pánipat tahsil; and at 65 per cent. and 25 per cent. in those of Karnál and Kaithal, respectively.

3. No distress has been specially reported from any District in this Division; but early in October the Commissioner solicited instructions as to the course to be pursued in the event of the people of the Sirsa District being driven by hunger to seek relief from Government. He was desired to forward distressed applicants to the canal works, and the necessary orders were issued to the Irrigation Department. Gratuitous relief, it was thought, was not needed. As regards the Hissar and Sirsa Districts, the means of support afforded by labour on the canals appear to have been adequate, the numbers from these Districts standing high in the return of distressed labourers on the Irrigation Department canals, which is annexed to this letter. On the 23rd April the numbers were respectively—

HISSAR DIVISION.		
<i>Population.</i>		
Hissar District	... 484,681	
Rohtak "	... 636,969	
Sirsa "	... 210,795	
TOTAL	... 1,332,435	

From Hissar	... 1,527
From Sirsa	... 963
From Rohtak	... 12

A death from starvation was reported to have occurred in the last-named District during the week ending 30th March; and the Police reports have indicated the prevalence of some scarcity. This matter is now under inquiry, but it is believed that there is no serious or wide-spread difficulty in the Division. With the single exception in Rohtak, the circumstances of which are not yet known, there have been no deaths attributable to want. In Rohtak and Sirsa the out-turn of the spring harvest of 1877 was above the average, and in Hissar it was equal to the average. The autumn harvest was almost a total failure on unirrigated lands; but crops had been obtained on the area irrigated from the Sutlej and by canals, lands of the latter class forming about one-seventh of the whole area in the Rohtak District. Large exports were made, but were checked by spontaneous causes towards autumn; and the stock of food was then estimated to be enough for six months, unless exportation on a large scale should again set in. The October rain did great good in Rohtak, facilitating the sowings for the present spring harvest. The prospects, however, though not calculated to cause any immediate anxiety, are scarcely as good as elsewhere. Although there is an average wheat and barley crop in Hissar, the grain is but an eighth of the usual yield. In Rohtak one-third of an average crop is expected; and in Sirsa only one-sixth.

4. It will be within the recollection of the Government of India that in the early part of September riots of a more or less serious character took place at Delhi, Umballa, and Badli in the Rohtak District, in consequence of the high and increasing price of grain. The Lieutenant-Governor then caused a circular to be issued impressing on the Officers of Government the necessity for avoiding interference with private trade, and a copy of this proceeding was forwarded to the Home Department with this office letter No. 4201, dated 3rd November 1877. The circular* is annexed for facility of reference; and it is satisfactory to note that similar disturbances have not again occurred.

5. The Districts of Ludhiána and Sirsa call for no remark. Five deaths from starvation in the Umballa District appear in the Sanitary Commissioner's reports, published in the *Punjab Gazette*; and one such death was reported by the Police during the week ending 31st March. The latter occurrence is stated by the Deputy Commissioner to have been in reality a case of fever; and his last letter, dated 20th instant, states that there is no distress in the District. The area cultivated for the last autumn harvest was about one-third of the average, and the out-turn was poor, being estimated at one-third only of what it should have been even on this restricted area. The Financial Commissioner, however, thought this estimate too low. These circumstances are mentioned, because it was at one time believed that some distress existed in the north-east portion of the District. As regards the spring crops, the out-turn per acre of wheat and barley in the Umballa and Ludhiána Districts is small; but as the breadth of land sown is extensive, the total out-turn is above average. It is, however, stated that about half the grain and straw was damaged slightly by rain on the 14th current after reaping.

6. The out-turn of the autumn harvest in the Jullundur District was one-third less than in the previous year, and before the 15th October there had been considerable exports of food grains. On the 28th February, owing to the high prices of food and the influx of mendicants, it became necessary to start, as a relief work, a portion of the Jullundur City drainage scheme, the estimate of the total cost

JULLUNDUR DIVISION.	
<i>Jullundur District.</i>	
Population	... 794,764
Some distress.	

being under Rs. 700, to be met from District Funds. On an inquiry made as to two deaths from starvation recently reported by the Sanitary Commissioner, it was stated by District Officer that in both instances the deceased was infirm and suffering from organic disorders, and that the Medical Officer was of opinion that death was due to such diseases, probably accelerated by cold and want. The Deputy Commissioner was aware that up to the ripening of the barley there has been considerable hunger abroad; but not to such extent as to cause alarm lest a large number of persons should die. The drainage work has been completed, and has afforded the relief required by giving employment to 7,372 persons, of whom 2,496 were women and children. The people relieved were from the Dasuya tahsil of the Hoshiarpur District, from Kartarpur, in the Jullundur District, and from other surrounding villages.

Distress was reported in the Dasuya tahsil, particularly within the local jurisdictions of the Mukerian and Hajipur Police Stations, on the 4th October last; and by the Hoshiarpur District. Population ... 938,890 22nd October, District roads had been undertaken as relief works. During Distress has abated. the months of December, January, February and March, a total of 16 deaths, as reported by the District Officer, occurred from starvation, or starvation and exposure combined. Other relief works had been opened, but the principal work was discontinued on the 11th instant. Prices having fallen and the harvest having commenced, the Deputy Commissioner remarks that the risk of death from starvation has been greatly reduced, and preventive or relief measures appear no longer necessary. Everywhere in the Hoshiarpur and Jullundur Districts the wheat and barley crops are said to be very satisfactory, and are this year expected to yield a large amount of grain and fodder than for several years past. The harvest on hard soil is specially mentioned as successful, though excessive rain seems to have done some harm to crops on sandy soil. On the whole the prospect is excellent. The gram and masar crops, however, are said to have entirely failed.

Considerable anxiety has lately been felt in regard to the state of the Kangra District. The Sanitary Commissioner reported 71 deaths as due to starvation during the fortnight ending with 9th March, and the Police reports of the 1st to the Kangra District. Population ... 743,882 23rd March showed 24 deaths from this cause. The autumn reports did not indicate any probability of suffering, and such distress as there has been is of comparatively recent date, and is now believed to be rapidly abating. The Deputy Commissioner on the 20th instant had just returned from a tour in the south of the District, and had been struck with the general health and robustness of the population, and reports a fall in the price of grain. The principal pressure has been experienced in the Nurpur and Hamirpur tahsils: there was less distress in the Dera and Kangra tahsils; whilst towards Palampur where the tea plantations provided labour, there was no distress at all. One relief work had been opened on 1st January, and others on 1st March. Returns which have just been received show 712 persons on the relief works, and 930 persons in receipt of gratuitous relief. These people belong, almost without exception, to the District. No demands have been made on Provincial Funds, the emergency having been met by private charity and local resources. The present wheat and barley harvest in this District are reported by the Commissioner to be fairly satisfactory, the sowings having been late owing to failure of rain in the early part of the season. The Deputy Commissioner, after his tour above referred to, expected a more than average spring crop.

With reference to the considerable number of deaths reported in this Division, the Lieutenant-Governor is not satisfied that they are all attributable to want exclusively, and further inquiries have been instituted. On the other hand, he regards the efforts made by the local officers to alleviate the distress as sufficient.

7. For two or three years the crops in the Amritsar and Sialkot Districts have been good, except the autumn harvests of 1875 and 1877, the latter having failed on unirrigated lands from want of rain. In the Amritsar and Gurdaspur Districts, however, a large area is protected by canals. The Commissioner, whose description was thought by the Financial Commissioner to be somewhat exaggerated, stated that the last five harvests had been bad in Gurdaspur. From all three Districts there were large exports of grain, compensated in Sialkot by imports from Ferozepore and elsewhere, and flowing both from Sialkot and Gurdaspur into Kashmir territory.

By the 9th March so many able-bodied men and women were begging in the city and District of Amritsar that it was found necessary to begin some earth-works, the cost being met from Municipal and District Funds. On 28th March 6,281 persons were employed, some 2,000 belonging to the city and District, including 300 Kashmiris, 1,200 coming from Sialkot, 600 from Hoshiarpur, and the rest from various localities, inclusive of 117 from Jummoo. In the Amritsar District no deaths from want have occurred.

In the Gurdaspur District a few deaths are said both by the Sanitary Commissioner and by the Police to have been due to want; though in some cases reported by the latter, investigation brought misdescriptions to light. Relief works had been opened in all four tahsils before the 20th ultimo, and, on a very small scale, some gratuitous relief had been organized. The distress prevailed more or less throughout the District, being, however, worst in the neighbourhood of the large towns along the Jummoo border, and in the portions of the District adjoining Sialkot and Nurpur in Kangra.

The greatest distress in the Amritsar Division has occurred in the Siálkot District. From a report, dated 12th March, it appeared that the scarcity was to a certain extent general throughout the district, though most severe in those villages of the Siálkot and Zafarwál tahsils which border on Kashmir territory. The Deputy Commissioner stated that there was no actual wide-spread famine, though many persons were without food and without the means of obtaining it. These he estimated at 20,000 belonging to the district, and about 10,000 immigrants from Jummoo; this estimate, however, was not based on any accurate returns, and may probably be above the mark. The three harvests previous to last autumn had all been poor, and the autumn harvest had been a total failure. Relief works had been opened from Local Funds, and gratuitous relief was being afforded at Siálkot and Zafarwál. The scarcity was not expected by the Deputy Commissioner to continue beyond the reaping of the present spring crop; but the Commissioner, writing on the 17th instant, thought that measures might be needed throughout the hot season for the relief of the Jummoo immigrants. The returns of the Sanitary Commissioner, which, however, are by no means a safe guide, show a considerable number of deaths. The Commissioner has been informed that, if necessary, the Lieutenant-Governor is prepared to supplement local resources from Provincial Funds.

Throughout the Amritsar Division the spring harvest will probably be above the average owing to the large area sown of land left uncultivated last autumn. Some damage has occurred from hail and high winds, but present information is to the effect that the average will be exceeded, unless injury should still result from bad weather, which now seems improbable.

8. The only district in the Lahore Division which need be noticed is that of Gujránwála. The autumn harvest was here about three-fifths of the usual out-turn, and the food grains of the preceding spring crop had been injured by rain. Instances occurred in October of the villagers preventing export of grain, although there was no riot such as had taken place in Umballa and Delhi; and some distress was anticipated. This was, however, averted by the November rains, and a re-assuring report was submitted in December. Within the last month, in view of the state of things in the adjoining districts of Gujrá and Siálkot, the Commissioner was again addressed on the subject. On the 13th instant he stated that the measures taken in the districts last named for the support and employment of those whom scarcity of food had lately induced to cross the Kashmir frontier into British territory, appeared to have been sufficient to arrest the further flow of distress into Gujránwála, where no relief measures had been found needful, nor was there any apprehension that they would be needed. The present spring crop in this district is above the average. In one or two localities some damage has been done by hail; but, generally speaking, the harvest has been satisfactory.

Throughout the Division the gram crop is a failure; but there is ample compensation for this in the wide area sown with wheat and barley. The yield in the Lahore District is a good average, and in the Ferozepore District above the average.

9. From the Jhelum and Shahpur districts no reports of distress have been received. On the 30th January it was stated that there was suffering in the Gujrá District, chiefly in the eastward tracts, which received immigrants from the greatly distressed territory in Jummoo. Again on 13th February the Commissioner thought that it was the influx of starving people from the Jummoo territory that caused the difficulty felt. Up to the middle of March 3,000 or 4,000 people were believed to have arrived from Kashmir State, some of whom had passed through to other districts. Relief works had been opened, giving employment to 1,500 people, of whom a considerable proportion were Kashmiris. About 300 persons were in receipt of gratuitous relief. The Deputy Commissioner did not believe that any casualties had happened except among the earlier arrivals of sick and emaciated travellers from Jummoo. Two deaths have been noticed in the Police reports; and two have appeared in the statistics prepared by the Sanitary Commissioner.

That officer also reports a total of 22 deaths in the Rawalpindi District up to the 17th March. In a communication dated the 16th instant, the Commissioner expresses his surprise that the deaths from starvation have not been even more numerous, considering the numbers of people who come over in the last stage of emaciation from the territories of the Mahárája of Kashmir. It previously appeared that some migration had set in from the Murree and Kabúta hills to the plains. On the 27th March it was reported that relief works had been started some time before from District Funds, and that gratuitous relief in cooked food was given in the town of Rawalpindi to those unable to labour. Arrangements had also been made in the hills to afford support to famished way-farers seeking to reach the plains and obtain work. In both the Gujrá and the Rawalpindi Districts the Commissioner has endeavoured to meet the distress systematically with Local Funds, keeping gratuitous relief as much within bounds as possible. In the Rawalpindi District the present harvest is fully up to the average.

As regards the causes of the distress in the Gujrá District, the Deputy Commissioner attributes its impoverishment to the failure of an integral portion of the autumn crop following on an indifferent spring harvest, these misfortunes being aggravated by the influx of pauperized refugees from Jummoo territory. This explanation is no doubt correct, and to some extent applies also to Rawalpindi; but the demand for export in 1877 must also have lessened stocks of food.

The last reports from Murree show that large numbers of the starving immigrants from Kashmir prefer begging to work, which they altogether refuse; and they even crowd the sanitarium and the

roads thither, in order, by parading their wretched appearance, to move the charity of visitors and travellers. The Commissioner is dealing vigorously with this abuse, which is mentioned in illustration of the special difficulties with which the officers of Government have to contend.

The gram crop in the Division is an entire failure, all plants having died directly after sprouting. The present harvest is a good average in Jhelum and Gujrat, and above the average in Shahpur. Barley is fair in all districts, but light in the grain in Rawalpindi : it is very good in Gujrat.

10. No distress has been reported in the Mooltan Division, where there is throughout a full average spring harvest. Wheat is being everywhere cut, and if rain does not fall in the next fortnight, will be gathered in well.

11. On the 8th March the Commissioner of the Derajat Division intimated the existence of considerable distress in the submontane part of the Dera Ghazi Khan District, especially in the Rajanpur tahsil. It was directed that District Funds should be employed for immediate relief, and any necessary advances under the Land Improvement Act were promised; and loans for seed, &c., recoverable with interest, and aggregating Rs. 5,400, have been made. A subsequent report states that the measures thus taken have been sufficient; and neither relief works nor gratuitous relief have been needed. The spring harvest in the Bannu and Dera Ismail Khan Districts promises an average yield; and in the particular district whence distress was reported, the out-turn will be above the average. As regards the Division generally, the Commissioner states that recent rain did some damage, but that a fair average harvest may be expected if rain keeps off.

12. The severe scarcity in the Hazara district having been separately reported, there would be no remarks to make in this place on the Peshawar Division, were it not that in a general letter, such as the present, some reference to the recent general instructions issued by His Honor the Lieutenant-Governor, seems appropriate and necessary. Subsequent to the despatch of my letter No. 475, dated 18th instant, forwarded to you with this office communication No. 477 of the same date, the Commissioner of Peshawar strongly represented the desirability of a re-consideration of the orders passed on the subject of loans in grain. To some extent a modification was permitted; but at the same time the Lieutenant-Governor placed on record certain considerations in regard to famine relief, which were forwarded to all Commissioners for information and guidance. A copy of these papers* of which the purport will appear below, is herewith enclosed; and a circular, No. 13, dated 23rd April 1878, bringing to the notice of the Commissioners of the Province the most recent experience of the Government of India in connection with the relief of distress, is also submitted for information.

In the Peshawar district the present harvest is fairly good, though somewhat damaged by hail and floods, and on the irrigated lands by rain. In Kohat there is an average spring crop; whilst in the Hazara District it is satisfactory to note that the crop is above the average, and more extended than usual.

13. It will thus have been seen that there has been more or less suffering from high prices of food grains and want of the means of subsistence in 7 out of the 10 divisions and in 14 districts out of the 32; the list of affected localities standing as follows:—

<i>Divisions.</i>	...	...	<i>Districts.</i>
Peshawar	...	...	Hazara
Rawalpindi	...	...	{ Rawalpindi. Gujrat
Amritsar	...	...	{ Sialkot. Amritsar. Gurdaspur
Jullunder	...	...	{ Jullunder. Hoshiarpur. Kangra.
Delhi	...	...	{ Karnal. Gurgaon.
Hissar	...	...	{ Hissar. Sirsa.
Derajat	...	...	Dera Ghazi Khan,

The interior Divisions of Umballa, Lahore and Mooltan have escaped; and the zone of distress, beginning from the neighbourhood of Garhi Habibulla, in the Hazara District, stretches along the Kashmir border, omitting Jhelum, which has a very small frontage on Jummoo territory; then vanishes at Palampur, in Kangra, to reappear in the Gurgaon district, and to extend, with greatly diminished intensity to Hissar and Sirsa; the three last-mentioned districts all abutting on Rajputana States. In the northern portion of the Province there has, no doubt, been a considerable immigration of impoverished Kashmiris, the numbers in two districts only, those of Gujrat and Sialkot, being estimated, though possibly over-estimated, as between 13,000 and 14,000; and in Gurgaon, where deaths have been somewhat

numerous, there have also been many arrivals from Alwar and Bhartpur. One principal cause therefore of the mortality, which is the gravest feature in the present report, is the influx from foreign territory of destitute wanderers, driven from their homes by want. But there has also been distress in many places amongst the permanent inhabitants of the Punjab, the pressure, it is believed, first affecting labourers sweepers, village servants and artisans;—the classes who have no land and gain no benefit from high prices, and who, living from hand to mouth, find it hard to tide over the interval between a bad autumn harvest and the reaping of a good spring crop. Lastly, land-owners have themselves suffered, especially in loss of cattle. The causes His Honor would assign for the distress amongst residents of the Province as opposed to immigrants, are—first, the failure of the last summer rains, the consequent ruin of the autumn crop and failure of fodder, especially where this followed on one or more bad harvests; and secondly, the diminution of stocks by the large exportations to Southern and Western India in 1877, and more recently in the direction of Kashmir. On this subject some details are given in the Appendices.

Appendices I. and II.—Imports and exports

at one time the anxiety was greatest, have been provided with work on the Sirhind and Western Jumna Canals. The loans in the Dera Ghazi Khan District have been mentioned above. Some statistics of the numbers employed on the Canal works, at different intervals, will be found amongst the Appendices of this letter. The rains for the spring sowings

Appendix III.—Relief returns.

* Appendix IV.—Rain reports from 1st July to April,

diffuse still wider the already spreading relief. In twelve districts the crop is reported to be above the average; in fifteen, it is of the usual kind; in two, it is slightly below the average; and it is only in two that it is poor. † It is well to notice prominently the brightness of the immediate prospect, because a collation, like the present, of scattered facts occurring in different districts, is apt to produce too deep an impression of the gravity of the case.

14. On the other hand, the appended return of deaths reported by the Sanitary Commissioner must not be accepted as an infallible guide, as, of course, a correct diagnosis in every case is an impossibility. Granted, however, that even this number of deaths may have been in part due to simple starvation, and in part accelerated, especially amongst wandering and homeless immigrants, by want of shelter, or clothing, or food,—in a word, by destitution,—the special circumstances of the Province must still be borne in mind. There has been no wide-spread famine, and there has existed every probability that after a few months the pressure would entirely cease. The Lieutenant-Governor therefore thinks these deaths, many of which it is probable no human efforts could have long delayed, are themselves a lesser evil than the demoralization of society by the too eager proffer of State help, or than the public embarrassment of creating, for a merely temporary purpose, the vast organization which could alone have effectively prevented all risk to life. The danger was nowhere so diffused, so intense, or so likely to last as to justify large measures of village inspection; and the employment of numerous establishments to be continually on the search for the few famine-stricken way-farers, who may have died before reaching centres of relief, would have involved efforts altogether disproportioned to the result to be attained.

15. Of the policy of the Lieutenant-Governor on the subject of famine relief the Government of India is already to some extent informed. Although there has been no famine in the Punjab, the scarcity in more districts than one has forced into some prominence the problems which elsewhere and at other times have accompanied such disasters. In dealing with these the Lieutenant-Governor has acted on the principles repeatedly affirmed by the highest authority, which wide and sad experiences have established beyond cavil. Famine, even in the modified guise of scarcity, assails the vital forces of the social organism, which normally and even without extraneous aid rouses itself to wrestle with the disease; rise of price, emigration in search of temporary work, private charity in accordance with hereditary custom,—each in turn co-operating towards unadventitious relief. State aid, in His Honor's opinion, legitimately fulfils its function where it facilitates the spontaneous efforts of society to help itself, and mistakes its aim where it impairs in any degree the self-supporting capacity of the community. The Lieutenant-Governor has therefore insisted, in the cases requiring his orders, that there should be no interference with private trade; that relief works should be opened in such localities and under such conditions as to make the readiness to seek work a guarantee for the real need of it; and lastly, that none but those unable to labour should be gratuitously relieved. He has at the same time admitted that fixed rules cannot exhaust all the possibilities of misfortune, and that there may be special and local circumstances under which special action is needed. Viewing the particular emergency as a temporary one, and therefore the more surely to be met without unusual and disturbing processes, His Honor's most recent orders have disclaimed all intention on the part of the State to enter upon a system of permanent poor relief, which would here be as impracticable as it would be foreign to the actual needs and immemorial practices of the country; and, in the assurance which the forthcoming harvest gives of the speedy replenishment of village stocks; he has not hesitated to invoke the customary charity which honourably distinguishes the village

† There is no report from the Simla District.

communities of the Punjab, and which is not the less real and efficient because it coincides with their best interests. When the harvest is gathered the Punjab labourers on relief works will be sent back to their villages where, as there will be abundance of food, it is certain they will not starve. For the immigrants from foreign territory some prolongation of relief measures may prove necessary; but this will be more certainly known in a few weeks.

16. In conclusion, the Lieutenant-Governor has only to express to the Government of India his sense of the intelligence and energy with which the Commissioners and District Officers of the affected localities have met the exigencies of a somewhat anxious and difficult time.

No. 5064C, dated Simla, 13th August 1878.

From—C. L. TUPPER, ESQUIRE, Under-Secretary to Government Punjab.

To—The Additional Secretary to the Government of India, Department Public Works, Famine.

THE concluding paragraph of your letter No. 1290, dated 31st May last, expressed the desire of His Excellency the Governor-General in Council to receive a report on the prospects at the end of that month of the Districts in this Province affected by the recent distress, and called for such details, as could be conveniently afforded, as to the numbers of persons in the Punjab who had been or then were relieved either gratuitously or by works opened for the purpose. The replies of the Divisional Officers concerned to the Circular which issued on receipt of your letter being now complete, I am desired to supply the information required by the Government of India, and at the same time to bring the review of the agricultural prospects of the Province up to date, so far as practicable.

2. The condition of the several affected Districts up to the 30th April was summarized in the 13th paragraph of my letter to which your communication under acknowledgment was a reply; and in the present letter the order then observed will be followed. The circumstances of the Hazára District

PESHAWAR DIVISION.

Hazára.

having formed the subject of a separate correspondence, will here be very briefly referred to. The discontinuance of all relief operations by the 29th May was reported in this office letter No. 117C, dated 15th June. Advances for the purchase of seed grain and plough cattle up to a limit of Rs. 40,000 have been sanctioned, Rs. 10,000 being allowed under the authority of a telegram from this Office of the 6th May, and Rs. 30,000 in accordance with your letter No. 1274, dated 15th idem. In an Appendix* will be found statistics exhibiting, on selected dates, the course of relief operations in this and other Districts, and in the Province generally. The pressure in Hazára, as the Government of India are aware, was most severe during March and April and rapidly abated in May. By a few days after the close of that month a good spring crop had,—with the exception of a few isolated cases of destruction by hail,—been gathered throughout the District. On the 23rd June a large area was awaiting rain, and would, it was stated, be sown by the end of July, should rain fall. The reports from the Pesháwar Division during the last three weeks show plentiful rain and describe the harvest prospects as excellent.

* Appendix A.

3. The Districts in the Ráwalpindi Division where scarcity was felt were Ráwalpindi and Gujrat.

RAWALPINDI DIVISION.

Gujrat.

As regards the latter District, the Deputy Commissioner, writing on 26th June, reports that prices have continued high owing to a considerable portion of the rabi crop having been damaged by heavy rain at harvest time. Distress was nevertheless alleviated to a degree admitting of the closure of relief works. The autumn prospects were favourable, and in the event of timely rain a good crop was expected. The numbers of distressed people whom it was necessary to provide with labour or food in Gujrat were at no time large, being greatest towards the end of February and the beginning of March. The highest total of relieved persons in the appended return is 1,228, including both classes; and throughout the period when relief operations were in progress, a considerable proportion of the labourers and recipients of State charity came from Kashmir territory.

In the Ráwalpindi District the various small relief works were closed at different dates between

Ráwalpindi District.

Relief operations discontinued in April and May.

the 1st April and the 5th May. In the plains, gratuitous relief had ceased by the end of April, but it was requisite to keep open relief stations at Barakao, by the foot of the Murree hills, and at Murree and Changlagali, till later dates, distribution ending at the two latter places on the 16th June. From the beginning of May, however, the numbers were quite inconsiderable. Measures were first undertaken towards the middle of March, and the largest number employed on any one work at any one time was 1,974 on the 30th of that month. In the table accompanying this report, which gives the actual numbers for the several Districts generally on specific dates, the highest figure is 1,180 for the 23rd March, and this fell to 639 by the 13th April, and to 249 by the 27th idem. The localities, it should be noted, where distress in fact prevailed, were rather Puch and Kashmir than any portion of the Rawalpindi District itself; for the inhabitants of British territory alone, there would probably have been no need for special works or relief posts. The numbers on the relief works varied very much, and the people, it is said, did not work steadily. In some cases the appearance of starvation was undeniable. Gratuitous relief given by the Municipality of Ráwalpindi and by the public in the city seems to have somewhat

encouraged mendicity, and notwithstanding prohibitions and special measures, it is certain that others besides the starving were fed. In the hills, relief houses were started. The Judicial Assistant, Mr. Wilkinson, and a Naib Tahsildar visited the tracts where distress was said to prevail, and found that most of the applicants for relief were immigrants from across the border. Notwithstanding direction given to the Police and other officials to send down distressed people to Rawalpindi, very few came, begging, it is reported, being preferred to work. The Lieutenant Governor acknowledges the exertions made to mitigate the suffering which existed, and the special difficulties with which the District Officers had to contend; but at the same time, in view of the principle that, in every case, even when the numbers relieved are small, it is necessary to insist upon work being done by the able-bodied, he has caused to be conveyed to the Commissioner his opinion that the distribution of gratuitous relief in Rawalpindi was hardly so well managed as it should have been.

In the Rawalpindi Division generally, the prospects of the autumn harvest are favourable. By the third week in June the sowings had been wide throughout three of the four Districts, but in the Rawalpindi District itself they had been confined to cotton and *bajra*. There was plentiful rain between the 7th and the 16th July, just at the time when it was most urgently required. Up to the 24th July the total rain-fall at Rawalpindi for the month had been 7.21 inches which compares well with the average July rain-fall of the place of 8.28 inches. Moderate rain has also fallen during the last three weeks, and there seems to be no further cause for anxiety in this Division.

4. There is little to add to information previously submitted in regard to the Amritsar Division.

AMRITSAR DIVISION. All relief measures were finally discontinued in the Amritsar District on the 4th May, and in Gurdaspur on 13th April. In Sialkot the special works were closed on the 1st May, and gratuitous relief was not dispensed after the 18th of the same month; the anticipations of the Commissioner as to the possibility of continued provision for Jummoo immigrants were therefore unrealized, and no grant from Provincial Funds was required. It will be seen, however, that the total numbers for the several Districts were large on the 23rd March, being for Amritsar 7,459, for Gurdaspur 5,190, and for Sialkot 7,753, or for the Division in general 20,404. The chief work in the Amritsar District was carried on at the city under the supervision of the Municipality and its officers; and a full report received by the Lieutenant-Governor shows that the rates paid for excavation were exceedingly high, the inference being that the method of exacting piece-work, which His Honor considers a most useful test, was not adopted. Towards the end of May harvesting was in progress, and there was no distress. The yield, however, of the spring crop was not nearly so good as had been expected, the high wind is said to have loosened the roots of corn and shrivelled the grain, and thus no more than an average crop was obtained from a wide area of sowings. Some damage also occurred from rain and hail in April. By the 7th July timely rain for the next harvest had fallen throughout the Division, and had been specially abundant in Amritsar. Ploughing had been facilitated, and good hopes were entertained of a full autumn yield. A report from Amritsar, dated 23rd July, stated that more rain was still desired, and as since that date the rain-fall has aggregated some 5 inches, the agricultural prospects are good.

5. In the last report it was said that further inquiries had been instituted as to the considerable

JULLUNDUR DIVISION. number of deaths attributed to want in the Jullundur Division. It appears from the replies received that 6 of the deaths previously ascribed to starvation in the Kangra District were due to want and illness combined; whilst in the Hoshiarpur District, of 13 deaths specially investigated, it was shown that 3 only were due to hunger exclusively, 9 were caused by a combination of hunger with cold or disease, and 1 by disease alone.

The failure of the autumn crop of 1877 did not occasion severe distress in the Jullundur District although the poorer classes certainly felt the high prices of grain. Distress was chiefly noticed amongst the vagrant immigrants from the Dasuya tahsil of the Hoshiarpur District. A small relief work, completed by the 5th April, afforded all the aid that was needed; and by that date the people went away to their homes to reap the spring harvest. This did not prove quite so good as was expected, the gram, *sarson* and *masar* having failed, and the out-turn of wheat being only of an average description. Prices, however, are now steady. There was plenty of rain in July; sugar-cane, cotton and indigo then promised well; and the reports for the weeks ending 30th July and 6th August described prospects as very favourable.

Relief works were stopped in the Hoshiarpur District on 11th April. The return now enclosed shows 248 people in receipt of gratuitous relief on 1st June. It is explained that the persons entered by the Deputy Commissioner in his statement were relieved by daily doles provided partly from Municipal Funds and partly from private charity, only some Rs. 210 having been supplied from public sources. Distribution ceased at Dasuya in March, and the subsequent figures refer to a charitable dole kept up by Sardar Bur Singh and other liberal inhabitants at Mukerian. The return does not include the persons provided for by an extra monthly grant of Rs. 50 to the Hoshiarpur Poor-house. There is now no appearance of severe scarcity, which had ceased to threaten several weeks before the end of May. Confidence had been restored many weeks ago by anticipations of the spring crop; but the Deputy Commissioner alleges that stocks had at one time run so low that, had the *rabi* failed, there would not have been enough grain in the District to feed the population for two months. A very fair spring crop has now been gathered, and, although prices still range abnormally high, and thus poverty is necessarily sharper than in ordinary times, apprehensions may be dismissed for this District.

Kangra relief operations are reported to have finally ceased from 13th May, though they practically came to an end a month earlier, being discontinued between the 13th and the 27th April, and only again restored to in behalf of exceedingly few people at Hamirpur in the beginning of May. Towards the end of June the Indian corn and rice crops were being rapidly sown, and in many localities had sprouted with good promise. Early in the same month rumours reached the Lieutenant-Governor of distress in the outlying tract of Láhau, of deaths of cattle, want of seed grain, and anxiety for the future. The Assistant Commissioner in charge of the Kulu Sub-Division, Mr. Leslie Smith, was desired to visit Láhau, and an expenditure not exceeding Rs. 2,000 for importation of grain or for the replacement of cattle was authorized in case it should be required. Mr. Leslie Smith's report is entirely reassuring. He states that last year the crop was not so good as usual, trade was bad, and a heavy fall of snow closed the Rotang Pass at an unusually early date, thus impeding the import of food from the Kulu Valley. The exceptional severity of the winter, and the length of time which the snow lay, led to the fodder being exhausted before the spring grass was to be had; a large number of cattle consequently died, but the proportion of plough bullocks lost is not such as to affect the cultivation. Notwithstanding these misfortunes no signs were to be seen of the pinched face and emaciated form which tell of privation and famine. The people were in excellent condition; fodder had become plentiful; all the fields had been sown; the crops were, so far, very flourishing; and the Pass and its approaches were said to be swarming with grain-laden flocks of sheep, here used as beasts of burden, destined either for Láhau itself or for Ladák beyond it.

Writing on the 26th June, the Commissioner says that the result of the spring harvest throughout the Jullundur Doab has, in spite of some loss caused by unseasonable wet, and much grievous anxiety, been on the whole, rather above than below the average, with the exception of the gram, which has almost entirely failed. Prices are still high, and there is doubtless a great deal of poverty abroad, though nothing resembling scarcity. He adds, on the same date, that the sugar-cane and cotton crops are well reported of, and that, if rain were to fall within the next 10 or 15 days, there would be employment for all and prospects could be regarded as favourable. The subsequent weekly rain reports show on the 2d, 9th, 16th, and 23rd July falls of 5-10ths, 57-10ths, 7-10ths, and 35-100ths respectively at Jullundur. During the past three weeks there has been more rain, amounting to over 6 inches, and anticipations of a good harvest may be regarded as assured.

6. When the last report was drawn up no information had been received of distress in Chamba territory. It has since appeared that the scarcity of the past winter told upon the people of Pangi even more than on the inhabitants of Láhau. The Superintendent, Mr. Burney, visited the place in July, and found that there had been considerable distress and loss of cattle. The causes assigned are the partial failure of the autumn crop, the late melting of the snows, and the retardation of the spring harvest, which seems too to have suffered in some degree from a blight. The people, mountaineers, with little energy for trade or agriculture, are at the best of times very poor, and are accustomed to eke out their subsistence by edible roots and herbs, which are abundant. Wearing a more pinched aspect than usual, they still are not seriously enfeebled by want, and—as a probable consequence of their habits of life—they have not suffered from the diseases ordinarily generated by the deprivation of food grains. Mr. Burney has satisfied himself that no epidemic has broken out, and that there has been no properly authenticated death from starvation. He has, however, distributed grain, and directed a remission of land revenue of three annas on the rupee, the tract being, in his opinion, over-assessed, even in its normal condition. Further, he has ordered a small allowance in grain to be made to the coolies employed on road repairs, whose services—in accordance with the custom which dispenses with a road cess—are yearly retained without payment. He promises to assure himself, before the passes are closed, that there is enough grain in the country to keep the people alive during the winter months. If there is not, it can be imported without great difficulty from the richest grain country in Chamba lying under the Sach Pass.

7. The recovery, which is apparent in the Northern Punjab, does not extend in quite the same degree to the Delhi and Gurgaon Districts. It is not, however, the inhabitants of the Delhi District who have suffered or are suffering, and the circumstances of this part of the country cannot be accurately delineated without entering on some little detail. Up to the end of June it has not been found necessary to open special famine relief works, but labour had been available on the Delhi Branch of the Western Jumna Canal; and although private charity had been active, no distribution of gratuitous relief had been made from Public Funds. Thus, at the date to which this letter specially refers, that is, at the close of May, there was no material change in the Delhi District. There has now been an alteration only in so far that the numbers of immigrants, chiefly from Native States, have increased. The Sanitary Commissioner has not reported more than four deaths from starvation in this District since 1st December 1877, and none since the week ending April 27th; but the Police reports for June alone show 33 deaths attributed to want or to disease, which want is believed to have aggravated. In Appendix E, to which further reference will be made below, only such deaths have been entered as may in reality be due to starvation. The Commissioner was accordingly addressed, and a report furnished by the Deputy Commissioner on 18th July states that funds had been placed at the disposal of the Tahsildár of Ballabgarh—a locality much frequented by the impoverished wanderers—and of the Deputy Inspectors of the Police Stations in the neighbourhood, to assist the destitute people to the canal works; it is also reported that District relief works have been opened near Delhi, though the

number employed, when the only return received was sent in on 20th July, was only 46. Regarding the deaths brought to notice by the Police, the Deputy Commissioner remarks on the high proportion of the sufferers who came from Native States and other Districts, and he points out that for such people it is most difficult to provide. As in the Ráwalpindi District, they prefer begging to labour; in and near the large towns, they find adequate support, but as they wander into the remote parts of the District, resources fail them and they sink and die. Before the recent rain-fall 400 or 500 such mendicants had appeared in the city of Delhi and were subsisting on private charity. The S. P. G. and Cambridge Mission distributed food to the value of Rs. 2,527 between 13th March and 17th May, of which Rs. 2,000 had been supplied by the Calcutta Famine Relief Fund; a further grant from this source had been obtained by the Revd. James Smith of the Baptist Mission, which he proposed expending in consultation with the District Officer. But there being very little destitution in the District itself, gratuitous relief operations on any large scale had not been attempted, as they would probably have attracted so many immigrants from Native States as to overwhelm local resources. The canal works, for reasons which will appear below, have not proved successful in alleviating destitution, being almost immediately deserted by the labourers sent to them, and being little resorted to except under immediate official direction.

In the Gurgaon District the Lieutenant-Governor has heard with regret that there was no improvement, at least up to the end of June. The spring harvest in most places lamentably disappointed expectation, the grain having been injured by the dry winds. Lands were still being sold and mortgaged. Suspensions of the revenue have been found necessary to the amount of Rs. 1,22,400. The mortality amongst cattle has been exceedingly great, the loss reaching 1,46,679 out of a total of 3,05,607 head, including 31,694 bullocks out of 98,661. This subject has been separately reported, and advances up to a limit of Rs. 50,000 for the purchase of cattle and seed have been sanctioned by the Government of India, Financial Department Orders No. 1762, dated 22nd July. Prices had not amended by the 21st June; gram was then very little cheaper than at the worst times of scarcity; *bájra*, *jowár*, and *moth* had risen; barley, the staple food of the people, was selling at 18 or 19 sers the rupee; and in the latest report of 15th August, this commodity still stands at the same figure. It was hoped that the breaking of the monsoon would at once relax prices and give the people employment in sowings; that this hope has been to a considerable extent realized, at least as regards employment, may be inferred from the following statistics of the numbers of persons relieved both by provision of labour and the gift of food on dates subsequent to the 1st June:—

Numbers relieved on 15th June	...	1,424
Ditto 22nd June	...	1,675
Ditto 29th June	...	1,318
Ditto 6th July	...	990
Ditto 13th July	...	678
Ditto 20th July	...	476
Ditto 27th July	...	548
Ditto 3rd August	...	791

The number shown on 1st June being 1,804, the decrease since that date of 1,013 may be regarded as good evidence of a distinct improvement, consequent, no doubt, on the rains of the early part of July.

Two circumstances in connection with this District have attracted the special attention of the Lieutenant-Governor. The high proportion of the numbers in receipt of gratuitous relief, as compared with those on District relief works, and the absence of Gurgaon famine labourers from the professional works of the Western Jumna Canal in the Delhi District, were both points calling for explanation. The replies of the local officers are to the effect that the persons aided by the distribution of food are, in fact, physically incapable of doing enough work to support themselves; that it is useless to send them to the canal, because they will not stay there; and that to curtail the gratuitous operations would be to run risk of loss of life. The best method of utilizing the Imperial Canal works for the relief of distress is a question not without difficulty. It is impossible to pay the famine labourers at higher than ordinary rates, because this leads to coolies deserting the contractors in order to reappear in the guise of applicants for relief; on the other hand, if distressed workmen are only paid in proportion to the labour they perform, they do not earn enough to keep themselves alive; and it is probably because they are aware that they cannot support themselves at the canal that they immediately leave it. The Lieutenant-Governor is prepared to make arrangements for such people being supported till they are capable of a sufficient amount of work, and he has the matter under consideration in the Irrigation Department with this object in view. The Commissioner has been warned to prepare, in communication with the Canal Officers, schemes for the employment of a large number of people in case any failure in the next harvest should occasion wide-spread demand for relief.

In the Karnál District, distress prevailed for many months in the western half of the Karnál tahsil and in the greater part of the Kaithal tahsil. The *kharij* crop had been an entire failure, and the people suffered greatly from loss of cattle. To give them temporary relief some minor works were started from District Funds, and resort was also had to gratuitous relief on a small scale. The highest total given in the Appendix is 2,281 on 23rd March. On 14th July there were still 164 people on relief works and 306 gratuitously relieved. The reports dated 21st July show 308 of the latter class; but all relief works had been stopped owing to rain having fallen and the labourers having left to obtain work in the fields. On 27th July there were 44 persons receiving gratuitous relief; and on 3rd August, the latest date for

which particulars are available, the same number as on 21st July. Relief works have not been re-opened. Suspensions of land revenue have been granted to a considerable amount, and the Government of India have approved advances for the purchase of cattle and seed grain to the extent of Rs. 40,000. On the whole, notwithstanding the fact that a few people are still supported by charity, there is a decided improvement in this District.

8. The Commissioner of Hissar reported some time back that the need for relief works or gratuitous relief had not arisen in any of the Districts of his Division, and that if timely rain fell, it was not expected that there would be any necessity for relief operations. There has nevertheless been a great mortality amongst cattle, and, under orders received in June, loans to enable the people to replace their stocks have been allowed to the amount of one *lakh* of Rupees. The number of labourers from the Hissar and Sirsa Districts in the Sirhind Canal has been considerable; but the part of it to which they have resorted, though easily accessible from their Districts, is in the Ferozepore District of the Lahore Division. The difficulty felt on the Western Jumna Canal in Delhi does not seem to have repeated itself here, probably because Hissar and Sirsa labourers were not reduced by want. In the Rohtak District the last spring crop was a comparative failure, and suspensions of the demand, aggregating Rs. 1,69,396, have proved unavoidable. As regards the future, the Commissioner has been addressed, as in the case of the neighbouring Division, with the view of schemes of labour being matured in good time should they be found hereafter to be necessary. He is accordingly in communication with the officers of the Irrigation Department. He states in a letter of 15th July, that timely rain has fallen in all the Districts of his Division, and that he sees no present reason to fear a failure of the autumn crops. More rain, however, in this part of the Province would do good.

To the remarks made in the last report on Derajat there is nothing, on the present occasion, to add.

THE DERAJAT DIVISION. The measures taken in the Dera Ghazi Khan District sufficed, and there has not, for some time, been any distress in this Division.

9. The point in the above resumé, at once most noticeable and most satisfactory is the rapid contraction of the area of distress as the spring crop fell to the sickle. This was, of course, expected; but anxiety, no longer directed towards the Upper Punjab, has been somewhat concentrated on the Districts adjoining the North-Western Provinces, especially Gurgaon. The reports on the spring harvest generally have been to some extent conflicting, and there is some doubt how far the grain and straw were injured after reaping by wet; the Financial Commissioner has been asked to estimate the yield of grain, now that it has been garnered, and to ascertain in what condition it was saved. That the harvest was sufficient to ward off all pressing danger is attested by the fact that no relief measures are now needed in any District except in the Delhi Division, and that even there the totals for all three Districts on 21st July aggregated no more than 836. If to these are added 914 people from Hissar and Sirsa employed on the Sirhind Canal on 20th July, there is a total for the Province, up to a recent date, of 1,750 persons relieved by labour or otherwise, all from the Delhi and Hissar Divisions. This number—or the parallel figure of 1,533 up to the latest date, 27th July, for which particulars are available—standing by itself, would indicate a practical cessation of distress; but it is believed that the explanations afforded in this letter will convey a more correct impression than could be derived from any unelucidated statistics. For—not to dwell upon the strain which many Districts have undergone in their successful contest with a time of scarcity—there is the circumstance so prominent in the Hissar Division, and also in Karnal, that without loss of human life one of the characteristics of famine can appear in the wholesale mortality of cattle, weakening in a vital point the agricultural strength of the people, because it deeply injures agricultural capital. The general rain-fall of the early part of July has promoted the preparations for the ensuing harvest; has raised confidence and provided work. On the whole, though the spring has probably not quite realized its promise of exceptional abundance, the present prospects of the Punjab, especially as the rains have now continued with fair abundance, are distinctly good.

10. Since my communication of the 30th April, the Lieutenant-Governor has not issued any General instructions of the instructions in regard to distress applicable to the Province at large, except Lieutenant-Governor. such as have been received from the Government of India, and the accompanying general rules for the management of relief works, circulated to all Commissioners with this Office endorsement No. 716, dated 10th June. The main principles are—that payments must have a direct reference to the amount of work done; that the relation between work and wages must be so adjusted as to keep the remuneration of the famine labourer below that earned by an ordinary day labourer unaffected by distress; and lastly, that the quality of the work must be up to the usual standard, though the time given to it may be prolonged. These rules are enclosed for information.

11. In conclusion, a few remarks seem needed to explain the Appendices. The returns * from the canals are added to complete the view of distressed labour throughout the Punjab, as the persons shown are not included in the District statistics of Appendix A. The statement of deaths, † compiled from the reports of the Sanitary Commissioner, adds only 89 casualties to those which previously occurred; but information from the Police Department is to the effect that between the 30th April and the 25th July 114 deaths have happened, in which destitution had at least a share. As it appeared both in the case of the Delhi District and elsewhere that other deaths than those really due to starvation were included, the Inspector-General has been asked to confine his special reports to cases really known to be due to

this cause. But, since the returns of the Sanitary Commissioner might nevertheless be somewhat misleading if taken by themselves, a further abstract is added from the Police reports—Appendix E.—which shows deaths between 30th April and 28th July, those reported to have been merely accelerated by want or due to disease being excluded. It has also been thought convenient to append the rain reports from 30th April, and the special reports which you have received of the prospects of the *khariif* harvest. This letter, I am to add, has been somewhat delayed by the necessity for clearing up some discrepancies in the reports of the local officers.

APPENDIX I.

Statement showing the Inter-Provincial Trade in all kinds of Food Grains from 1st July 1877 to 31st December 1877.

IMPORTED FROM	Wheat.	Gram and Pulse.	Spring Crops.	Rice.	Rain Crops.	Provisions.	Summary.	
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.		Mds.
North-Western Provinces	228	16,244	1,052	50,732	1,053	2,699	Wheat ...	328,129
	297,199	47,548	6,823	37,772	13,888	45,803	Gram and pulse ...	133,948
Sindh	1,350	255	...	2,320	1,980	...	Spring crops ...	10,325
	506	48	...	2,380	3,462	2,445	Rice ...	41,576
Baháwalpur	26,302	53,378	36	175	164	...	Rain crops ...	22,576
Bikáner	986	6,756	2,308	919	1,050	5,793	Provisions ...	53,541
Rájpútána States	3,237	26,223	1,158	380	4,012	...		
TOTAL ...	328,129	133,948	10,335	41,576	22,576	53,541	GRAND TOTAL ...	590,095

EXPORTED TO	Wheat.	Gram and Pulse.	Spring Crops.	Rice.	Rain Crops.	Provisions.	Summary.	
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.		Mds.
North-Western Provinces	27,722	2,20,094	3,216	386	2,702	273	Wheat ...	15,00,694
	641,210	3,158,270	165,009	14,463	252,050	5,558	Gram and pulse ...	34,05,093
Sindh	1,85,280	34,317	...	...	33,295	...	Spring crops ...	215,701
	793,241	115,847	3,264	513	137,743	1,052	Rice ...	23,324
Baháwalpur	2,821	3,232	...	152	353	366	Rain crops ...	401,405
Bikáner	41,506	95,490	45,619	1,840	2,542	459	Provisions ...	7,685
Rájpútána States	21,916	82,254	2,819	6,856	1,717	150		
TOTAL ...	1,500,694	3,405,093	215,701	23,324	401,405	7,685	GRAND TOTAL ...	55,54,403

[The figures in antique type against North-Western Provinces and Sindh show the results to 31st March 1878 by the { East Indian Railway } but are not totalled.]

APPENDIX II.

Statement showing the Imports and Exports of Food Grains to and from Kashmir Territory from 1st July 1877 to 31st March 1878.

IMPORTS FROM KASHMIR,				Wheat.	Gram and Pulse.	Spring Crops.	Rice.	Rain Crops.	Provisions.	Detail.	Summary.
				Mds.	Mds.	Mds.	Mds.	Mds.	Mds.		Mds.
1st July 1877	...	...	...	2,375	437	2,154	981	210	4	Wheat	12,167
1st August 1877	...	...	...	2,747	465	490	596	891	1	Gram and pulse	2,182
1st September 1877	...	...	...	1,389	217	47	499	420	...	Spring crops	4,264
1st October 1877	...	...	...	1,231	324	118	525	762	25	Rice	7,072
1st November 1877	...	...	...	1,529	629	106	532	1,252	49	Rain crops	6,135
1st December 1877	...	...	...	1,582	75	168	555	1,615	60	Provisions	992
1st January 1878	...	...	...	524	74	23	1,540	715	59		
1st February 1878	...	...	...	157	29	111	1,178	560	547		
1st March* 1878	...	...	...	188	32	37	661	210	247		
TOTAL				12,167	2,182	4,264	7,072	6,135	992	GRAND TOTAL	* 32,802

EXPORTS TO KASHMIR,				Wheat.	Gram and Pulse.	Spring Crops.	Rice.	Rain Crops.	Provisions.	Detail.	Summary.
				Mds.	Mds.	Mds.	Mds.	Mds.	Mds.		Mds.
1st July 1877	...	...	...	8,706	5,964	795	359	65	421	Wheat	187,094
1st August 1877	...	...	...	7,985	2,522	989	218	49	200	Gram and Pulse	80,423
1st September 1877	...	...	...	14,799	6,467	1,078	291	83	191	Spring crops	8,536
1st October 1877	...	...	...	19,233	4,454	838	374	...	569	Rice	4,266
1st November 1877	...	...	...	11,694	5,121	850	545	10	705	Rain crops	2,678
1st December 1877	...	...	...	19,276	8,468	797	1,556	244	559	Provisions	4,741
1st January 1878	...	...	...	25,982	16,352	394	209	1,316	736		
1st February 1878	...	...	...	35,265	15,139	1,743	304	643	372		
1st March* 1878	...	...	...	43,134	15,916	1,062	421	268	988		
TOTAL				187,094	80,423	8,536	4,266	2,678	4,741	GRAND TOTAL	287,738

*Does not include Imports or exports, viz., Gujrat District, returns for which have not yet been received.

APPENDIX III

Statement showing the number of distressed persons employed on the Sirhind and Western Jumna Canals at different intervals.

DISTRICT.	SIRHIND CANAL.								WESTERN JUMNA CANAL.							
	10th December 1877.	22nd December 1877.	7th January 1878.	18th January 1878.	11th February 1878.	24th March 1878.	12th April 1878.	23rd April 1878.	10th December 1877.	22nd December 1877.	7th January 1878.	18th January 1878.	11th February 1878.	24th March 1878.	12th April 1878.	23rd April 1878.
Delhi	3	3	..	..	..	22	..	..
Gurgaon	27	..	10	..	..	..	5	11	11	32	3	..	..
Karnal	12	..	..	..	..	534	562	138	106	2	..	..	..
Hissar	...	289	31	460	723	1,121	1,910	1,714	1,504	115	111	294	348	149	38	22
Rohtak
Sirsa	...	300	20	1,000	1,366	1,623	1,034	1,124	963	8	..	..	..	..	4	12
Umballa	16	..	..	..	..	..
Ludhiana	1	..	..	..	..	..	..
Ferozepore
Dera Immail Khan	6	..	..	..	..	..	..	..
TOTAL	...	473	51	1,460	2,128	2,149	3,004	2,838	2,467	667	681	460	460	183	67	34
GRAND TOTAL including Native States, &c.	...	743	98	2,822	3,234	3,103	4,827	4,373	4,412	741	791	570	630	457	114	74

APPENDIX V.

Statement showing the number of Deaths from starvation reported by the Sanitary Commissioner between 1st December 1877 and 13th April 1878.

DISTRICT.	Between 1st December 1877 and 26th January 1878.	Week ending 2nd February.	Week ending 9th February.	Week ending 16th February.	Week ending 23rd February.	Week ending 2nd March.	Week ending 9th March.	Week ending 16th March.	Week ending 23rd March.	Week ending 30th March.	Week ending 6th April.	Week ending 13th April.	Total.
Delhi	...	...	...	...	...	...	2	...	...	...	...	...	2
Gurgaon	102	28	10	13	28	14	19	25	24	10	12	1	281
Karnal	...	...	...	...	...	...	...	...	...	...	1	...	1
Umballa	...	...	...	...	2	...	2	1	...	...	...	...	5
Jullundur	...	...	...	...	1	2	...	1	...	...	...	...	4
Hoshiarpur	...	...	1	...	1	...	...	...	...	...	...	...	2
Kangra	2	18	15	24	16	86	85	7	14	12	...	...	179
Gurdaspur	...	...	...	8	8	8	4	2	8	1	...	...	24
Sialkot	...	8	8	6	21	37	25	17	18	11	...	2	148
Bawalpindi	...	...	...	2	...	8	2	8	7	...	...	...	22
Gujrat	...	...	...	...	...	...	...	...	...	2	...	...	2
Hazara	6	22	26	19	8	27	21	6	11	9	80	98	288
TOTAL	110	78	60	72	75	122	110	67	72	45	48	101	958

(49)

APPENDIX A.

Statement showing the number of persons on relief works and the number receiving gratuitous relief, respectively, on various dates between the 2nd February and the 1st June 1878, in certain Districts of the Punjab.

DISTRICT.	2nd Feby.		23rd Feby.		9th March.		23rd March.		13th April.		27th April.		11th May.		1st June.		REMARKS.
	No. on relief works.	No. receiving gratuitous relief.	No. on relief works.	No. receiving gratuitous relief.	No. on relief works.	No. receiving gratuitous relief.	No. on relief works.	No. receiving gratuitous relief.	No. on relief works.	No. receiving gratuitous relief.	No. on relief works.	No. receiving gratuitous relief.	No. on relief works.	No. receiving gratuitous relief.	No. on relief works.	No. receiving gratuitous relief.	
Gurgaon	233	911	166	894	122	748	60	740	...	1,896	89	1,455	251	1,904	212	1,592	
Karnal ... ..	...	182	628	205	1,895	212	2,062	219	424	46	1,020	45	885	51	239	34	
Jullundur ... ..	...	...	...	...	187	...	...	...	...	...	...	...	...	...	...	...
Hoshiarpur	75	200	649	396	2,104	862	1,608	398	...	242	...	229	...	246	...	248	
Kangra ... ..	...	...	...	...	562	837	582	832	100	139	...	...	7	3	...	...
Amritsar ... ..	...	...	...	...	2,550	1,221	6,505	954	4,886	864	97	...	...	...	...	...
Gurdaspur ... ..	...	...	...	...	2,622	...	5,446	1,744	1,142	2,308	...	...	...	...	...	...
Sialkot ... ..	...	525	876	1,632	1,244	2,991	2,701	5,052	1,058	5,012	93	100	...	...	...	...
Rawalpindi ... ..	...	...	...	...	15	32	785	395	150	489	49	200	...	50	...	27	
Gujrat	111	...	618	610	641	409	427	484	344	863	...	...	...	...	...	...
Hasdra	100	445	571	1,483	817	2,305	1,220	4,188	30	6,638	2,347	3,883	418	191	...	...
TOTAL	519	2,263	8,508	5,320	12,759	9,117	19,396	15,006	3,131	17,492	3,635	5,912	1,061	2,448	451	1,901	

APPENDIX B.

Statement showing the number of distressed persons employed on the Sirhind and Western Jumna Canals at different intervals.

DISTRICT.	SIRHIND CANAL.								WESTERN JUMNA CANAL.					
	* 23rd April.	30th April.	7th May.	14th May.	21st May.	30th May.	22nd June.	†29th June.	23rd April.	30th April.	7th May.	14th May.	21st May.	30th May.
Delhi ...	...	...	...	...	...	...	...	...	...	5	...	...	12	9
Gurgaon ...	...	...	...	...	...	45	...	...	...	...	...	...	...	...
Hissar ...	1,504	1,270	1,292	1,270	1,077	948	406	536	23	19	31	26	36	35
Rohtak ...	...	...	...	...	...	...	...	...	12	...	2	15	22	30
Sirsa ...	963	1,023	1,060	1,053	922	746	368	617	...	...	...	...	...	...
TOTAL ...	2,467	2,293	2,352	2,323	1,999	1,739	834	1,153	35	24	33	51	70	74
GRAND TOTAL including Native States, &c.	4,412	3,309	3,942	3,574	3,526	3,445	1,512	2,550	79	62	97	121	162	155

* The figures shown in this column were also given in Appendix No. III. to this office letter No. 545A., dated 30th April 1878.

† Returns received subsequent to the preparation of this Appendix show that there were 642 persons from Hissar and 624 from Sirsa on the 6th July 1878.

Ditto	ditto	486	ditto	481	ditto	18th	ditto.
Ditto	ditto	518	ditto	401	ditto	20th	ditto.
Ditto	ditto	497	ditto	385	ditto	27th	ditto.

APPENDIX C.

Statement showing the number of famine labourers from the Districts of Hissar, Sirsa and Rohtak, employed on the Sirhind Canal, on various dates between the 2nd February and the 1st of June 1878.

DISTRICTS.	2nd February.	23rd February.	9th March.	23rd March.	13th April.	27th April.	11th May.	1st June.
Hissar ...	916	1,217	1,255	1,895	1,688	1,297	1,258	915
Sirsa ...	1,275	1,114	1,008	1,052	1,105	909	1,082	713
Rohtak ...	...	...	...	...	...	...	...	...
TOTAL ...	2,191	2,331	2,263	2,947	2,793	2,206	2,340	1,628

On the Western Jumna Canal.

Hissar ...	86	86	97	34	22	19	36	35
Sirsa ...	...	...	...	...	...	...	...	...
Rohtak ...	6	7	6	4	12	13	6	...
TOTAL ...	92	93	103	38	34	31	42	35
GRAND TOTAL ...	2,283	2,424	2,366	2,985	2,827	2,237	2,382	1,663

APPENDIX D.

Statement showing the number of deaths from starvation reported by the Sanitary Commissioner between the 1st December 1877 and the 13th April 1878; and between the 20th April and 4th May 1878.

DISTRICTS.	Between the 1st December 1877 and the 13th April 1878.	Week ending 20th April.	Week ending 27th April.	Week ending 4th May.	Total.	REMARKS.
Delhi	2	1	1	...	4	The figures given in column 2 were also shown in the last column of Appendix No. V. to this office letter No. 545A., dated 30th April 1878. The Sanitary Commissioner in a communication dated the 15th July, stated that no deaths from starvation were reported to have occurred between the 5th May and the end of the first week in July.
Gurgaon	281	2	2	4	290	
Karnál	1	...	...	...	1
Umballa	5	...	...	...	5
Jullundur	4	..	...	...	4
Hoshiárpur	2	...	...	...	2
Kángra	179	...	...	...	179
Gurdáspur	24	...	...	1	25
Siálkot	148	2	1	...	151	
Rawalpindi	22	...	2	...	24	
Gujrát	2	...	...	...	2
Hazára	283	29	39	4	355	
TOTAL	952	35	45	9	1,042	

APPENDIX E.

Statement showing the number of deaths from starvation reported by the Police Department between the 4th May and the 28th July.

DISTRICTS.	Week ending 4th May.	Week ending 7th May.	Week ending 10th May.	Week ending 11th May.	Week ending 18th May.	Week ending 1st June.	Week ending 8th June.	Week ending 15th June.	Week ending 21st June.	Week ending 22nd June.	Week ending 29th June.	Week ending 6th July.	Week ending 13th July.	TOTAL.
Delhi	2	7	..	3	..	1	2	15
Gurgaon	..	2	..	1	1	4	2	..	..	1	2	5	5	23
Hissar	2	..	..	..	..	2
Rohtak	1	2	..	..	..	..	..	..	3
Jullundur	1	..	..	..	..	..	..	..	..	..	1
Rawalpindi	5	3	..	..	..	..	..	1	..	..	9
Hazara	7	2	..	4	1	..	..	1	..	..	..	15
TOTAL	..	2	7	2	7	4	9	7	7	2	5	3	6	63

N. B.—Subsequent reports received from the Inspector-General of Police show that five deaths from starvation occurred in the Gurgaon District during the week ending 21st July; two in the Rohtak District during the fortnight ending 28th July; and two in the Hazara District during the weeks ending 10th and 17th July.

QUESTION 2, CHAPTER I

CH. I.

Statement of rain-fall in ten Districts of the Punjab, from 1st April to 21st October 1877.

- Explanation 1.*—The fall given in large type is the average fall at the several observing stations in these ten Districts for the above period.
2.—That given in small type is the average fall of the same months for ten years ending 1876, registered by the Meteorological Reporter.
3.—A comparison of the 2 sets of figures will show the great deficiency which occurred in the autumn of 1877.

Division.	District.	RAIN-FALL IN INCHES, APRIL TO OCTOBER 1877.								
		April.	May.	June.	July.	August.	September.	October.	Total.	
Delhi	Gurgaon	0.7	0.6	3.9	2.7	0.4	0.9	2.3	11.5	
		0.2	1.0	2.5	10.1	4.8	7.2	0.8	26.6	
Hisar	Hisar	0.6	2.5	2.3	2.2	0.2	1.2	0.1	9.1	
		0.8	0.8	2.0	5.6	3.8	2.7	0.3	14.98	
Umballa	Umballa	0.7	1.4	3.1	2.9	1.7	1.4	2.0	13.2	
		0.8	1.0	4.5	12.8	7.9	4.7	0.8	32.0	
Jullundur	Jullundur	1.6	1.0	1.2	2.4	0.9	0.7	1.0	17.8	
		0.5	1.3	2.3	8.7	7.6	5.5	0.2	26.1	
Amritsar	Amritsar	1.1	0.8	1.0	3.8	0.3	2.8	0.9	10.7	
		0.4	0.7	1.8	6.9	6.2	3.6	0.5	20.1	
Lahore	Gujranwala	2.3	0.8	0.3	0.9	0.6	1.0	0.6	6.5	
		1.0	0.8	1.6	8.7	6.7	2.7	0.8	22.1	
Rawalpindi	Rawalpindi	2.1	3.6	1.0	2.1	0.8	1.2	3.6	15.0	
		1.6	1.2	2.0	8.8	6.1	3.7	0.6	28.5	
Mooltan	Mooltan	0.8	1.7	0.4	0.8	...	10.1	...	13.8	
		0.5	0.3	0.2	2.8	1.1	0.4	...	4.8	
Derajat	Dera Ismail Khan	1.5	0.8	0.1	0.3	...	0.1	...	2.9	
		0.6	0.4	0.8	1.7	1.5	0.4	0.1	5.5	
Peshawar	Hazara	7.7	3.2	3.5	3.2	2.5	1.3	4.7	26.1	
		2.2	3.0	3.7	9.5	8.9	3.4	1.5	32.2	

QUESTION 2, CHAPTER I.

I. Extract from (R. Udny, Esquire,) Deputy Commissioner of Házara's No. 62 dated 5th March 1878, to Commissioner of Pesháwar, describing the rise and course of distress in the Házara District in 1877-78.

In this office No. 420-1412, dated 13th October last, I reported to you that the out-turn of the autumn harvest of 1877 in this District would probably not exceed one-fifth or one-sixth of the average; but in my No. 428-1443, dated 18th idem, which contained an application for a Government advance of Rs. 4,000, to be distributed in small sums to needy cultivators to enable them to buy seed for the spring sowings, I expressed an opinion that, while such assistance was rendered most desirable by the high prices of grain, it was unlikely that any further measures of relief would be called for, though something might have to be done later in certain localities, and notably in Agror.

2. The failure of the autumn crops does not seem to have produced any serious signs of scarcity or distress till early in January of the present year, when reports began to flow in, not only of extensive emigration towards Yusufzai, Lower Házara, and the adjacent portion of the Rawalpindi District, but of occasional deaths, which were said to have resulted from want of food.

3. About the 20th of the month, the distress became so apparent that the native community at Abbott-abad took measures of their own accord for the supply of charitable relief to the people, who were flocking into the Sadr in search of employment, or on their way southwards to more favoured regions; and on the 26th January, Mr. Robinson, Officiating Deputy Commissioner, telegraphed to you requesting permission to apply the Rs. 6,000 lying in the secret political deposit to the organization of relief works, explaining that in consequence of the advance of Rs. 4,000 which had been made from this District Funds to cultivators for the purchase of seed-grain, no local funds remained available for the purpose; but this expenditure, if sanctioned from the political deposit, could be repaid from District Funds in April next, on the commencement of the new financial year.

4. On the 27th January, I happened to be passing through Pesháwar on my way here; and with reference to this telegram you then accorded your verbal sanction for the appropriation of Rs. 6,000 in question, on the proviso, that this money should only be used if I considered it necessary to relieve serious want, and if it could be made good from District Funds in April, as suggested.

5. I joined at Abbott-abad on the 29th January, and at once began an inquiry into the causes and extent of the scarcity and the particular localities in which it prevailed. I have now the honor to report the result of this inquiry, and the measures I have thought it necessary to adopt for the relief of urgent distress.

6. The price of grain throughout the District during the first six months of the year 1877, ranged from 32 to 35 sers for wheat, and from 34 to 54 sers for jowár [maize or the greater millet] the other staple of consumption.

7. In August, however, owing to the failure of the usual rains, wheat rose to 20 sers for the rupee; maize being the same; and the prices of both grains increased steadily till the end of the year, when the rates were 14 and 16 sers respectively.

8. In January 1878 the growing pressure was indicated about the end of the month in an average rate for the District, 9½ sers for wheat, and 13 sers for maize; and during the first fortnight of February, though wheat remained the same, maize experienced a further rise to 11 sers.

9. The accompanying table (Appendix C) shows the prices of grain for the first three fortnights of the year in Házara and the neighbouring Districts of Pesháwar, Rawalpindi and Kohát, with the rates during the corresponding periods of 1877; from which it will be seen that prices here during the present season, besides being half as dear again as at Rawalpindi, and nearly twice those of Kohát, are about four times as high as at this time last year; whereas the prices in the other Districts have only increased two, or at the most three-fold compared with the same periods of 1877. This is the more remarkable, because on every other occasion since the introduction of our rule, when famine or scarcity has prevailed in the plains of the Punjab, Házara has escaped (vide pages 171-172 of Wace's Settlement Report). From all I can gather, food has not been so dear in Házara for the last 30 or 40 years at least, and it would probably be necessary to go as far back as S. 1840 (A. D. 1783) to find a parallel, though in the latter year there was a famine which, according to common report, depopulated the country; while in the present year, I am happy to say, it can hardly be called more than a very severe scarcity.

10. In the plain tracts of the Haripur tahsil, which includes all the lower or southern portion of the District, prices no doubt have been more favourable generally than the average. I have given above for the whole District, partly on account of the Zamindárs being better off, and possessing stocks of grain which

saved them from the necessity of going into the market, but chiefly owing to the proximity of the corn producing countries of Chhach (Rawalpindi) and Yusafzai (Peshawar) from which any deficiency of grain was soon made up by importation.

11. On the other hand, in hilly region comprising the ilákás of Bof, Bakot, Nára and Dannah in the east of the Abbott-abad tahsil, where the autumn harvest, which is the only one in the year, had failed almost entirely from drought, prices ruled much higher, and maize became as dear as wheat; flour of either kind of grain selling commonly for 7½ and 8 sers the rupee; while in some outlying villages it could only be procured at 6 or 7 sers, and even then but in very limited quantities. Similar remarks, though in a less degree, apply to the more level country surrounding Abbott-abad, with the exception of the Wrash basin in which the station itself is situated.

12. In the Mansahra tahsil the case was much the same, though certain localities were more fortunate than others. In the Bhogarmong glen, for instance, the crops, though unirrigated, were partially saved by showers, and by the comparative coolness of the climate; and in the Kághán valley above Bálakot the harvest on lands watered from the Kunhár river was sufficient for local consumption. Below Bálakot, however and in the Agror, Pakhli and Kaunsh valleys, as well as on the plateau immediately south of Mánshahra, and among the low-lying hills of the Garhián iláka in the south-west of the tahsil, the jowár crops were burnt up and lost. The rice too, on unirrigated lands in Agror and Pakhli, besides damage from hail and insects while standing, was much injured by rain when lying on the ground after being cut. The consequence was, as in the Abbott-abad tahsil, that the prices of wheat and maize flour rose at Mánshahra to 8 sers for the rupee in the early part of February, and for a short time to 6 and 7 sers in the more distant villages.

13. The distress was further aggravated by heavy falls of snow and by the cold, due to the high elevation of the larger portion of both the Abbott-abad and Mánshahra tahsils, which varies from 3,000 and 4,000 feet to 6,000 and 7,000 feet* above the sea level.

14. The same drought that destroyed the harvest also gave rise to a great deficiency of grass; and "bhussa" being equally scarce on account of the failure of the jowár crops, very extensive mortality has prevailed among the cattle, which besides depriving the zamindárs of a considerable source of income at a time when it was most required, has tended indirectly to increase the dearth of grain by checking the importation which might otherwise have taken place.

15. North of Abbott-abad, or indeed anywhere out of the lower Hazára plain, camels are rarely seen, and the only mode of transport is bullocks. The effect of the cattle famine may therefore be easily imagined; and, as an illustration of it, I may mention the fact that at Mánshahra, I learnt from Khatri traders that the rate of carriage for a maund of grain from Haripur, which used to be reckoned at 3 annas, had risen to 9 annas and 10 annas, on account of the unwillingness of owners to bring their bullocks north-ward into a country where grass, owing to the greater number of stock, was even scarcer than in the neighbourhood of Haripur, and only procurable at a ruinous price.

16. This general distress, coupled with the feeling of shame which deters most natives from begging their bread except among strangers, has led to a very large amount of emigration, principally directed towards the plains of the Haripur tahsil, where grain is cheaper, the climate milder, and labour also to some extent obtainable. In a few instances the emigrants actually left Hazára altogether, as in the case of the Dannáh iláka on the borders of the Rawalpindi District, from which many of the people are said to have resorted to the Railway works in progress between Rawalpindi and Jhelum. Most of the Agror emigrants too have gone across the Indus to Yusafzai, where some have taken employment on the Swát canal. I now pass to the measures of relief I have considered it necessary to adopt.

* I am here speaking only of the inhabited region.

QUESTION 2, CHAPTER I.

I.

Extract from Report on the Punjab Census of 10th January.1868

RATES OF INCREASE OF POPULATION.

78. It will be useful here to consider how far the population has increased since the last Census in the more favoured and the less favoured Districts respectively, or what the respective rates of increase are in Districts where there is ample room for expansion on all sides and in those in which there is not.

79. It will be convenient to select those Districts in which there has been carefully allowed for in the District Reports.

	Remaining	Population	Population	Per-centage
	culturable	1853.	1868.	
	area.			of Increase.
		Per cent.	Per square	
			mile.	
Jullundur	...	6.57	513	16
Ludhiána	...	10.84	383	12
Amritsar	...	14.03	437	21
Ferozepore	...	26.43	187	12
Hoshiárpur	...	4.69	384	18
Gurdáspur	...	6.87	470	13
Gujrát	...	28.59	270	20
Jhang	...	63.49	44	36
Mooltan	...	18.98	73	9½
Lahore	...	31.66	...	12.8

80. With regard to Mooltan it may be noted that, though the boundaries of the District are said to be the same, the area is greater than in the former census, owing to better measurement of wastes. Had the same area been taken, the present population would have been more than 80 per square mile. The Deputy Commissioner represents the increase as being 14.62 per cent. But he arrives at this by adding up the increase of five tahsils and dividing by five, instead of taking the increase per square mile on the whole District.

81. In Lahore the boundaries have changed considerably, and a comparison of the increase per square mile would not be quite correct. But the Deputy Commissioner, by calculation of the figures of selected places, and allowing for changes of area, shows that the increase has been 12.8 per cent., which is very much the same result as that arrived at after careful inquiry by the Deputy Commissioner of Gurdáspur.

82. The highly cultivated and populated Districts of Jullundur, Hoshiárpur and Amritsar have increased 16, 18 and 21 per cent. respectively; Lahore, Gurdáspur and Ludhiána have increased at a uniform rate of 12 to 13 per cent. Jhang shows an increase of 36 per cent.; but though the area of the District is nearly the same as in 1855, this is merely because the former area was under-estimated. The District has been enlarged by the addition of 145 villages from Shahpur, Muzaffargarh, &c, the population of which, thrown over the same total area, gives an increase per square mile which is apparent and not real. Mooltan is a fair specimen of thinly peopled District with a margin of spare cultivable land. Population here has increased much less than in more favoured Districts.

83. It must be remembered that no statistics are available to show the rates of increase from year to year. During recent years a great impulse has been given to some Districts by the introduction of canals. The Deputy Commissioner of Lahore notices that cultivation in that District has increased by 26½ per cent., chiefly on this account. The Deputy Commissioner of Montgomery notices that the increase of population has been greatest in tracts under the influence of canals.

84. But whatever the reasons—for the increase has taken place steadily from year to year, or at an increased rate during the later years—the total results show that the population per square mile has increased about 11½ per cent.; while the per-centage of cultivation to total area has increased from 24.40 to 32.11, or about 31.60 per cent.

85. Owing to the numerous changes in the area of Districts, it is impossible to give a detailed statement of the rates of increase in each District. The information can only be obtained in a general way from an examination of selected instances, such as those above noted.

QUESTION 2, CHAPTER 1.

*Reply to the last part of the above Question, by Surgeon-Major H. W. BELLEW, c. s. i., Ch. I.
Sanitary Commissioner, Punjab.*

1. There are no statistics in this office which enable me to answer any of the inquiries embodied in questions 24 and 25, there having occurred no famine in this Province since the first establishment of death and birth registration in 1869.

2. With reference to the inquiry in question 2, "What is the normal increase in the population of the country, and how far has it been affected and kept down by famine?" I quote from my Sanitary Report (Section V. Vital Statistics) of the Punjab for 1877, now in the press, what I have been able to record concerning the population of the Punjab:—

"The population of the Punjab under registration according to the census of 1868 was 17,487,125, and of this total, the town population was 1,922,680 and the rural 15,564,445. With reference to the former, my predecessor, Dr. DeRenzy, when submitting to Government the results of the census of Municipal towns of the Punjab taken in 1875-76, said—'It is to be regretted that, owing to the boundaries of towns as censused in 1868 not coinciding with those which were recognized in the present census, it is not possible in many cases to draw any safe conclusion as to whether there has been an increase or decrease of population.' It does not appear, however, that the Province as a whole has suffered much from emigration, nor do I think that its numbers have been augmented to any appreciable extent by immigration, so that whatever increase, if any, has occurred, may be reckoned as a consequence of the births on the whole exceeding the deaths.

"In London the death-rate is calculated on the population enumerated in April 1871, and every year raised at the rate of increase which prevailed (*viz.*, 10 per cent.) between 1861 and 1871. But no such accurate basis of calculation can be hoped for here till a new census of the Province is taken.

"In the review by the Hon'ble the Lieutenant Governor of the Report of the Sanitary Commissioner, Punjab, for 1872, it is stated that 'Judging from the increase of population between the census of 1856 and 1868, the general population must have increased by about 9 per cent. since 1868. Now if we, after taking into consideration the generally insanitary condition of the Province and the consequent high rate of mortality that usually prevails in it, adopt the same rate of increase, *viz.*, 9 per cent., not for the years up to 1872 as was assumed by His Honor, but for the 10 years up to 1877, then the increased population in 1877 will be 19,060,966, instead of that enumerated in the census of 1868, *viz.*, 17,487,125."

3. There are no statistics whereby the normal increase of population in this Province can be calculated accurately, as the records available are unreliable as a whole. The records of the rural circles of Jullundur are as reliable as any others, and their figures may be taken as a criterion for the remaining circles of the Province. The birth and death rates of the Jullundur rural circles are as below for a series of 7 years.

Year.	Birth-rate per 1000.	Death-rate per 1000.
1871	... 36	27
1872	... 35	31
1873	... 34	24
1874	... 41	22
1875	... 41	32
1876	... 33	53
1877	... 29	26
Mean	... 36	Mean ... 30

The mean birth-rate in towns of the Punjab is 50 per 1000, and the mean death-rate is also 50 per mille. Hence it would appear that the town population remains stationary, whilst the rural population for the Province as a whole increases at the rate of 4 per mille per annum.

How far the population has been affected and kept down by famine I have no data to enable me to say. There are no records in this office of any famine in the Punjab since 1869, when separate records of the effects produced by it were not kept in this office.

CHAPTER I, QUESTION 2.

Since writing the answer to the above question, the annexed complete statement showing the effect of the scarcity of 1877-78 on the land revenue of the Punjab, and the amount of special advances sanctioned to relieve needy cultivators, has been furnished by the office of the Financial Commissioner.

Memo. showing the remissions and suspensions sanctioned in the Districts of the Punjab, during 1877-78 and 1878-79; also the special advances sanctioned for the purchase of seed and cattle by needy cultivators.

DISTRICTS.	1877-78.		1878-79.		Land revenue demand for 1877-78.	Special advances for purchase of seed and cattle.
	Remissions.	Suspensions.	Remissions.	Suspensions.		
Delhi	...	1,954	1,110	...	8,84,637	...
Gurgaon	755	...	...	1,22,438	11,99,230	50,000
Karnal	313	...	...	29,734	6,78,594	40,000
Hissar	...	...	...	...	4,24,110	17,000
Rohtak	...	...	...	1,60,396	8,83,219	23,000
Sirsa	3,799	...	...	6,328	1,79,191	10,000
Umballa	...	...	...	...	7,74,281	...
Ludhiána	...	...	...	...	7,85,159	...
Simla	...	...	...	...	13,592	...
Jullundur	...	...	...	...	12,09,982	...
Hoshiárpur	...	...	...	...	12,86,625	...
Kángra	...	...	...	...	6,13,230	2,000
Amritsar	...	...	4,850	...	7,86,956	2,000
Gurdáspur	2,448	...	10,746	...	10,55,391	...
Siálkot	...	...	1,528	...	11,04,629	...
Lahore	...	...	242	...	5,25,741	...
Gujránwála	...	...	395	...	4,60,303	...
Ferozepore	...	...	...	...	5,05,729	...
Rawalpindi	...	...	690	...	6,88,812	...
Jhelum	446	...	332	...	5,87,789	...
Gujrát	196	...	...	...	5,69,669	...
Shahpur	...	...	...	...	3,83,888	...
Mooltan	...	...	638	...	5,33,563	...
Jhang	97	...	2,666	...	2,91,014	...
Montgomery	...	...	...	...	3,02,996	...
Muzafargarh	...	...	137	...	5,11,967	...
Dera Ismail Khan	793	...	1,118	...	3,21,668	...
Dera Gházi Khan	3,001	...	...	1,026	3,49,010	10,000
Bannu	22,037	...	...	691	4,28,361	...
Pesháwar	...	...	1,283	...	6,71,141	...
Hazára	25,512	...	351	780	2,21,545	30,000
Kohát	3,647	...	5,337	...	95,059	...
Totals	63,044	1,954	31,423	3,21,393	1,93,27,081	1,84,000

QUESTION 3, CHAPTER I.

How are the statistics of cultivation and produce collected? What amount of reliance can be placed on them?

The statistics of cultivated areas published in the reports of each year are based on a very complete system of survey and registration. All the Districts of the Punjab (a portion of the Kohat District alone excepted) have come under Regular Settlement, and the great majority of them have also been surveyed by the Revenue Survey.* In the latter case the total area of the District is ascertained by scientific Surveyors working with the most accurate methods known to science; and the cultivated area, as it exists at the time of survey, is also ascertained by the same agency, though by less exact methods. At the Regular Settlement of a District a less expensive method of survey is employed, with results which experience has shown to be, under proper supervision, scarcely less accurate (indeed as regards the exact area of cultivation, for reasons which I need not here explain, they are usually more accurate) than the returns of the scientific survey.

The object of a Regular Settlement is 1st to assess the Land Revenue, and 2ndly to provide a correct record of the land of which it is assessed and of the persons who have rights of ownership or occupancy therein. Many ends of the first importance are served by such a record; but the primary reason for its formation was the great difficulty of assessing and collecting the Revenue without it.

The record is made up by villages, or rather by mauzas, of which perhaps the best translation is the word township. Each mauza, or (if they are small) each cluster of mauzas, has an accountant, locally known as the Patwari; whose office is kept as far as possible hereditary; and whose business it is to report as they occur, all successions and mutations which take place among the owners and tenants of his charge with a view to the record of holdings being kept up to date; and annually in October to inspect every field, noting the crops grown on it, and such mutations of ownership and occupancy as he may not already have reported. Immediately after this inspection he furnishes a statement showing the total cultivation of his charge for the kharif just reaped and the rabi just sown.

It will be seen that this system is built up upon a reliable foundation. The total cultivated area of each mauza is ascertained at or before Settlement, both by the Revenue Survey and by the Settlement Officers. The record of rights prepared for each village shows also the area of each field, cultivated or waste. Thus far we may be sure that errors are eliminated. The Patwari's reports each year cannot of course be so closely checked. But there is no reason to suppose that in the majority of instances they contain any very gross errors of area and classifications.

During the past 15 years great improvement has taken place in the returns of the 21 Districts that have been under Settlement. It is acknowledged that there is still room for improvement. But these remarks are written in order to shew that there are good grounds for accepting as fairly accurate, the crop areas published in the annual reports. They are not guesses. They are originally based on surveys admittedly accurate, and differ from those surveys only to the extent of the annual expansion or contraction of cultivation and variation of crops; the facts of which are ascertained annually in October by the village accountants.

Thus far as regards statistics of area and of crops cultivated. In regard to statistics of yield, our position is much weaker. It may be said with truth that the very great majority of our statistics of yield are guesses. The difficulties surrounding this question even in an advanced European country are very great, and in India they are exaggerated many fold. The agriculturists keep no record of what their crops produce, and the replies

*Foot note.—This is the last part of Question 3. But it will be convenient to answer this, before the statistics asked for in the beginning of the question are supplied.

of even the most intelligent and straightforward among them need to be very carefully weighed. The Financial Commissioner has found that the returns of yield of each crop reported from year to year by each District Officer are not usually, in strict language, estimates of the yield for the year under report; they are approximations arrived at by the reporting Officer by the use of the data of old experiments. These experiments are either those made when the District was under Settlement, or others made independently by orders of the Financial Commissioner during the years 1872-1875. As regards the Settlement experiments Mr. Ouseley observes that their value for the purpose to which they are applied is open to question. The officers who made them commonly mistrust the results; in practice they never assess up to the standard indicated by their produce estimates, and not uncommonly arbitrarily modify or frankly reject them. Also the small areas, usually small fractions of an acre, subjected to actual experiment, together with the limited periods over which the observations extend, greatly reduce their value as bases for generalisation. Concerning the value of the other set of experiments, those made by the order of the Financial Commissioner during the years 1872-1875, Mr. Ouseley directs me to quote the remarks on the subject made by his predecessor, in forwarding them to Government for submission to the International Statistical Congress.

"As the experiments, the results of which have now been embodied, extend over a considerable period and number several thousands, the results may be considered to be fairly general in their nature. With regard to their accuracy, it is necessary to remark that the facilities for supervision of such returns are limited, and that only of late have attempts been made to procure such statistics upon an extensive scale, and the subject is one which requires considerable experience on the part of those who make the observations, and a careful exclusion of all unreliable data, to an extent which the returns now furnished can hardly claim."

The last sentence expresses one of the greatest difficulties involved in the subject. And Mr. Ouseley considers that the improvement of our annual estimates of yield depends largely on our recognising this, and on the patient training of those on whom we depend for our observations.

At the same time taking such estimates of yield as we possess, for what they worth, a set of papers on the subject are appended, *viz.*,

A table showing the average produce of the principal staples of agriculture per acre, as reported by District Officers for the 5 years ending 1876-77; and as ascertained by the Financial Commissioner's experiments during the years 1872 to 1875.

A set of tables showing the average rates of produce assumed by Settlement Officers in recent Settlements.*

What suggestions can you make for the improvement of the existing statistics?

The Financial Commissioner considers that improvements of two kinds are possible. *First*, in observing actual out-turn; secondly, in the form and system of the general statistics. On the first point he considers that District Officers should be urged to make independent and systematic observations. If we could succeed in observing in each District for 10 or 15 successive years the average out-turn of say 500 acres of land, selected as representing fairly the average fertility of the District; noting at the same time all the contingencies connected with its cultivation, such as expenses, losses &c., a basis of much value would be obtained, from which to calculate the average rate of production, and the limits within which it varies. With the large revenue establishments at the disposal of Government, such observations would be practicable; 2ndly, as to the form and system of the general statistics now annually reported, the Financial Commissioner considers them capable of material improvement, in the following ways. At present the crop area of each year is ascertained by an inspection which takes place just after the kharif has been harvested, and while the rabi is being sown; and the rabi yield is assumed, as if all the field sown with the rabi came to maturity. This is a fertile source of error; many fields of wheat and barley are cut for fodder, or the seed fails to germinate; the gram crop constantly fails to a material extent; and for these and other reasons the area harvested never agrees with the area sown. Mr. Ouseley would oblige the

* *Foot note*—Since writing the above I have been able to add some statistics of average produce from Mr. Baden Powell's valuable work on Punjab Products. I have also compiled from the annual Irrigation Reports of the past 5 years the average rates of yield of irrigated lands therein given.—E. WACE.

Patwāris to inspect and record the area of each harvest at the reaping season ; i. e., in October for the kharif and in April for the rabi. In the next place, the returns required from each District should be more carefully adapted to the circumstances of its agriculture. At present one uniform set of statements is required from each District ; which give : 1st, a bare statement of the total acreage of each crop ; 2ndly, a statement of the average yield of each crop per acre, and 3rdly, the maximum and minimum rate of rent paid by each crop. It is only in respect of the 3rd subject that any distinction is drawn between irrigated and unirrigated land. The returns do not provide for the separate exhibition of the irrigated and unirrigated areas, and of their respective rates of yield. Only the main crops are shown ; and the agriculture is very imperfectly classified. The extent to which manure is used, and its effect on the yield, is also entirely omitted.

The omission of these details from the returns gives them an appearance of simplicity, which is fallacious. The simplicity has been obtained by the excision of the most important details ;—details without which they can neither be accurately compiled, nor command the confidence of those who use them. It is of little use to state that wheat yields 800 lbs. per acre in one District and 600 lbs. in another, unless the proportion of crop which is irrigated in each can be stated. Situated as we are, the most important point of all is to know for each year, how much of each food crop is irrigated, and how much is dependent on rain only. It is with no little difficulty and incompleteness, that an answer on this subject (see reply to question 4) could be framed, even after calling for special returns from District Officers.

The Financial Commissioner does not think that the demanding of such details from District Officers would necessitate the employment of more costly agency than we already possess in the village Accountants and Revenue establishments of the Province ; though it would involve an increase in special agency and the cost of supervision. Elaborate statistics are neither desirable, nor practicable ; but if the returns required from each District are properly adjusted to the main features of its agriculture, it will be as easy, perhaps easier, to furnish them than the cruder returns now submitted. In brief, the annual returns required from District Officers should be revised, so as to show :—

- (1) The total areas under each crop more correctly than is now done ;
- (2) The area of each crop which is irrigated, aided by river floods, or solely dependent on rain ; and so far as practicable, the area manured ;
- (3) The average yield of each crop under these several circumstances.

And a reasonable amount of variation should be allowed in the returns of each District ; so that no one should be required to fill up tables unsuited to the agriculture which they are intended to describe, or which neglect important local specialities.

In conclusion, Mr. Ouseley would urge on the Government the creation of an appointment in the Punjab, similar to that held by Mr. Buck as Director of Agriculture in the North West Provinces. If the attention which Government desires its District Officers to give to agriculture and its statistics is to be intelligently directed, and to achieve any results ; this can only be by providing at least one Officer in each Province, who can give his sole attention to the supervision of the subject.

Having thus explained the nature of the statistics available, their shortcomings and the direction in which they are capable of improvement ; I proceed to give the results of such statistics as have been collected in past years.

What is the average area in each District under cultivation ?

A statement appended shows this with details of the area under each crop. The annual crop returns above described being available in the annual Revenue Reports ; the only difficulties were to ascertain a fair average for each District, and to eliminate and correct any cases in which the returns were admittedly unreliable. To this end each District Officer has been asked to state the general character of each harvest for the 5 years ending 1876-77 ; and the replies received show that the average of those 5 years is probably on the whole a fair one. These officers have also been asked to state whether the crop returns submitted during these 5 years are

I. approximately true; the answers except in 7 cases being that they are. The 7 excepted cases are those of Districts under Settlement; in which either the returns submitted have been estimates necessitated by the employment of the Patwáris in Settlement work, or the Settlement measurements have supplied more accurate data than those before available. In all seven instances the crop returns of the recent Settlement measurements have been given instead of the average of the annual crop statements.

The following is a summary of the average thus obtained for the whole Province; reduced to round numbers for perspicuity's sake :—

DESCRIPTION OF CROP.	*Lakhs of acres.			Percentage of total cultivation.		
	Rabi.	Kharif.	Total.	Rabi.	Kharif.	Total.
<i>A.—Food grains.</i>						
<i>Cereals.—Wheat</i> ...	64	...	...	30	...	...
Barley ...	17	...	...	8	...	...
Rice ...	...	7	...	...	3	...
Jowár ...	...	22	...	...	10	...
Bájra ...	...	29	...	...	14	...
Maize ...	...	9	...	...	4½	...
China and Kangni ...	...	2	...	...	1	...
Total ...	81	69	150	38	32½	71
<i>Pulses.—Gram</i> ...						
Peas ...	16½	...	...	8	...	...
Masur ...	1	...	...	½	...	...
Moth ...	1½	...	...	¾	...	...
Másh and Mung ...	...	11	...	...	5½	...
... ..	...	5	...	...	2½	...
Total ...	19	16	35	9½	7½	17
<i>B.—Other products.</i>						
Drugs and spices ...	½	1½	...	½	¾	...
Oil seeds { Mustard ...	4	...	...	2	...	...
{ Til ...	...	2	...	...	1	...
{ Tárámírá ...	2	...	...	1	...	...
Cotton and hemp ...	...	8	...	...	4	...
Indigo ...	...	1	...	...	½	...
Sugar-cane ...	...	3½	...	...	1½	...
Vegetables ...	1½	1	...	¾	½	...
&c. ...	1	...	...	½	...	...
Total (B.) other products ...	9	17	26	4½	8	12
Total (A.) food grains ...	100	85	185	47½	40	88
Grand Total ...	109	102	211	52	48	100

* Lakh = 100,000.

What is the average amount of the chief food grains produced per acre; the total consumption of such grains; the surplus that remains for export; or the deficiency supplied by import in ordinary years?

District Officers have not been asked to state the average amount of the chief food grains produced per acre; as it was considered that their annual reports for 5 years past supplied answers on the subject, which however defective would be less so than any hurried answers that could now be given. They have been asked to state the surplus of food grains exported from or deficiency exported into their Districts. They have not been asked to furnish a complete estimate of gross production and consumption; it was considered that such estimates if furnished would have been unreliable; they would have been contributed by officers of varying degrees of experience, acting on conflicting rules and conclusions. But as an approximation to such an estimate, District Officers were asked in replying to question 5, to state not only the staple food of the people, but also the average consumption per family. (Their answers in full on this subject will be found in the replies to that question).

Accordingly in the papers appended will be found the following returns, on which my reply to this question will be framed :—

- (a). A statement of average produce of principal staples of agriculture in each District, (1) as reported by District Officers for the 5 years ending 1876-77; and (2) as ascertained by experiments conducted under the orders of the Financial Commissioner during the years 1872-75.
- (b). A set of statements, showing the average rates of produce estimated in recent assessments of Land Revenue in Districts now or lately under Settlement.
- (c). A tabular abstract of District Officers' replies to question 5, showing the staple food of the people, and the rate of consumption per head.
- (d). A statement of imports and exports of agricultural produce (external trade only) compiled from the Punjab Trade Returns of the 5 years, 1873-74 to 1877-78.
- (e). A statement showing the quantities of food grains exported from or imported into each District; as stated by District Officers in their replies to this question.

Some remarks are called for, in connection with these returns.

(a and b.) If statements "a" and "b" are compared; it will be seen that the rates of produce estimated by Settlement Officers for the purpose of assessing the Land Revenue are much below those estimated annually by District Officers. No complete explanation can be offered of the differences; but certain causes tending to create it can be stated. The Districts for which Settlement estimates of produce are furnished do not include the richer submontane tracts, such as the Umballa, Jullundur, Amritsar and Lahore Divisions; where the average rate of produce is higher than in the rest of the Punjab. Again, a Settlement Officer's estimates of produce are framed under very severe responsibility; for the Land Revenue Assessment depends on them; and this responsibility causes Assessing Officers to reduce their estimates of yield on grounds, which are often related more strongly to the Land Revenue Assessment depending thereon, than to independent and unbiassed inquiries into the yield of the crops. On the other hand the estimates of yield submitted by District Officers with their annual returns involve no similar responsibility, and are arrived at with far less care than those of Settlement Officers.

(c.) *Tabular abstract of District Officers' replies, showing staple food and rate of consumption.*—District Officers were asked to give the consumption of a family of 5 persons; viz., one old person, a man and his wife, and 2 children. In not a few instances

the replies (summarised in the foot note below*) largely over-estimate this consumption. The most obvious cases of such over-estimating are Sirsa, a dry District, where the crops are precarious, and the poorer members of the population are often insufficiently fed; Dera Ghazi Khan, where the rate given is an impossible one; and Hazara, to which the same remark applies, and where the poorer classes among the hill people certainly eat less grain than those of the plains, supplementing their meals with milk and herbs. The races of the Punjab are no doubt of larger stature than those of Southern and Eastern India; and the colder climate of this Province would also cause a larger consumption of food than occurs in the rest of India. But any estimate based on an average consumption of food grains, amounting to 1 ser (2 lbs.) per head per diem, is certainly excessive. It would be a large estimate to assume that a man and his wife in the prime of life together eat 2 sers per diem; and the 2 children with the old person will certainly on the average not eat 2 sers; thus giving less than 4 sers for 5 persons. The estimates submitted from each District multiplied by the population give an average for the whole Province of 11½ chitacks, or 0·71 of a ser per head per diem. Allowing for the instances of over estimate, the correct estimate is probably a consumption of 10 chitacks or 0·625 of a ser per head of population per diem.

(d). *Table of imports and exports for 5 years ending 1877-78.*—The figures are taken from the Punjab Trade Returns. They relate solely to the trade which crosses the frontiers of the Province; and the results are to be relied on.

(e). *Statement of exports and imports from and to each District.*—The contents of this return are not based on statistics, but are approximate estimates supplied by District Officers for the purposes of this report. In the nature of the case they cannot be very reliable.

These with the return of average areas under each crop before described, are the materials from which the estimate of production, consumption and surplus of food grains desired by the Famine Commission must be formed. In the existing state of our statistics of average yield, it is not practicable to submit with this report any such estimate for each District or for each Division; it is necessary to confine the attempt to an estimate for the whole Province; an unavoidable simplification which is perhaps the less to be regretted in the case of the Punjab; as the replies to questions 2 and 16 to 21 show, that trade in past years has succeeded and will certainly in future years increasingly succeed in distributing the produce of the Province according to the demand in each part of it. There is no

* Table showing average daily consumption per head of population per diem, in sers and decimals thereof; abstracted from District Officers' reports.

Division.	District.	AVERAGE DAILY CONSUMPTION PER HEAD OF POPULATION.		Division.	District.	AVERAGE DAILY CONSUMPTION PER HEAD OF POPULATION.	
		By agriculturalists.	By non-agriculturalists.			By agriculturalists.	By non-agriculturalists.
DELHI	Delhi	0·80	0·59	LAHORE	Lahore	0·79	0·57
	Gurgaon	0·88	0·58		Ferozepore	1·00	0·80
	Karnal	0·79	0·59		Gujranwala	0·88	0·79
HISAR	Hissar	0·84	0·52	RAWALPINDI	Rawalpindi	1·06	0·91
	Rohtak	0·85	0·61		Jhelum	0·58	0·58
	Sirsa	1·00	0·80		Gujrat	1·04	0·67
UMBALLA	Umballa	1·00	0·80	MOOLTAN	Sheikpur	0·75	0·63
	Ludhiana	1·00	0·74		Mooltan	0·75	0·70
	Simla	0·79	0·59		Jhang	0·66	0·72
JULLUNDUR	Jullundur	1·05	0·80	DERAJAT	Montgomery	0·77	0·62
	Hoshiarpur	0·88	0·77		Muzaffargarh	0·82	0·80
	Kangra	0·78	0·66		Dera Ismail Khan	1·00	0·70
AMRITSAR	Amritsar	0·71	0·57	PESHAWAR	Dera Ghazi Khan	1·60	1·40
	Sialkot	0·75	0·50		Banna	0·75	0·64
	Gurdaspur	0·82	0·66		Peshawar	1·00	0·90
					Kohat	0·60	0·60
					Hazara	1·31	1·03

real isolation of the several parts of the Province. The estimate framed accordingly is as CH. I. follows :—

Estimate of food grains and pulses, produced, consumed, and remaining over for storage and export, in an average year in the Punjab.

Food grains.	PRODUCTION.			CONSUMPTION.					Surplus remaining for storage or export in maunds.	Actual exports for the 4 years ending 1877-78 in maunds.	Difference between columns 10 and 11; i. e., amount by which surplus the estimated exceeds average actual exports from the Province.	Per cent. of total estimated produce.
	Average area cultivated in acres.	Rate per acre, seers.	Estimated produce, mds.	Population, souls.	Consumption at 15 lb. or 10 chitacks per head of population per diem.	Add required for seed grains.		Total consumption in maunds.				
						Rate per acre in seers.	Amount required in maunds.					
Wheat	6,354,266	400	63,542,660	17,600,000	47,188,236	43	6,671,979	83,860,205	9,682,855	1,017,805	8,665,049	14
Inferior grains												
Bazley	1,865,035	400	18,650,350			85	1,474,897					
Rice	728,759	400	7,287,590			32	282,607					
Jowar and bajra	5,129,248	250	5,357,250			5	641,156					
Maize	321,568	200	6,914,750			14	223,589					
Chana and kangul	165,280	200	816,400			10	40,820					
Total	8,627,780	296	68,921,600		47,148,236	...	2,061,682	40,202,928	22,711,875			
Pulses												
Gram	1,850,737	200	12,380,452			20	325,862					
Others	1,867,073	200	9,455,654			8	377,415					
Total	3,687,800	247	21,815,817		16,064,111	...	1,202,778	17,266,889	4,548,938	3,499,184	24,761,619	29
GRAND TOTAL	18,619,846	322	149,280,277		100,400,693	...	10,396,426	111,837,119	37,942,188	4,516,499	33,426,688	22

* It is worth while noting, that the net exports of these grains, down the Indus between the years 1861-62 and 1867-68, as registered at Mithankot, just below the junction of the Indus and Chenab, averaged only 480,242 maunds. Compare the later entries in the statement of exports appended. Exports by Railway were impossible ten years ago.

The rates of yield assumed in this estimate are the average of the rates reported by District Officers for 5 years past; and whereas in the case of the inferior grains this could not be stated from those reports separately for each kind of grain, the average of the Financial Commissioner's experiments has been adopted. This was the only course open, as no other estimates are of a sufficiently general character. The rate of seed per acre is for the same reason taken from the Financial Commissioner's experiments. The rate of consumption assumed is 10 chitacks per head per diem, and the consumption is divided between wheat, inferior grains and pulses, in the same proportion, as is given in the appended Tabulated Statement of District Officers' replies; viz., wheat 47 per cent., inferior grains 37, and pulses 16. Given the produce and consumption at these rates (columns 1—9), the surplus remaining is compared in columns 10 and 11 with the net average on rural exports. Columns 12 and 13 show the difference between this surplus and the average exports. The value of the estimate may consequently be held with fairness to depend on the possibility of giving a reasonable explanation of the discrepancy exhibited in columns 12 and 13. The details at our command limit the argument at the outside to the 2 heads of (1) wheat and (2) other food grains. If District Officers have over-estimated the consumption of wheat relatively with other grains by even so small a proportion as 8 per cent., of the total food, the excess of wheat shewn in column 12 of the estimate would disappear, and be transferred to the head other grains. Therefore it is necessary to avoid details of kind, and to limit the argument to the total discrepancy; which is 33,426,668 maunds.

Now the estimate includes no allowance for the grain consumed by sheep, kine, camels, and horses. From data obtained from the Commissariat Department, I have ascertained that the Military Establishments in the Punjab (elephants, horses, mules, ponies and bullocks) consume about 700,000 maunds of grain per annum; if we add to this the consumption of the horsed Dak Lines, Government Bullock Trains, and the private establishments of our Civil and Military Cantonments, we may take the total consumption on this head at 1,000,000 maunds per annum; though Mr. Ouseley thinks 900,000 maunds a safer conclusion.

There remains the grain consumed by cattle owned by the people of the country. The agriculturists do not usually feed their cattle with grain; but the townspeople do to a certain extent, especially their cows. The drivers of bullock carts always feed their cattle with 2 or 3 sers of grain when working. Bullocks, ponies and mules, are similarly fed when carrying pack loads. And there is a certain very limited consumption in feeding up

cattle and sheep for slaughter. It is difficult to put the consumption under these various heads at less than 6,000,000 maunds per annum; of which two-thirds is consumed by draught and pack cattle.*

And lastly, a certain reasonable amount should be allowed for dryage and loss in storage; say 5 per cent. of the total produce:—

The surplus shown in the estimate was	maunds 33,426,668
Deduct on the grounds above stated.	
(1). Consumption of the Military Establishments, Dák Lines, and Cantonments	1,000,000
(2). Consumed by cattle, &c.	6,000,000
(5). 5 per cent. of total production for dryage and loss in storing	7,464,014
Total deducted	<u>14,464,014</u>
So there remains over and above the estimated expenditure, a balance of the estimated production amounting to maunds	18,962,654

This balance is 13 per cent., of the total estimated production; and the average estimated produce per acre of all food grains being 322 sers or 644 lbs., this result indicates an excess estimate on the rate of production of 46 sers or 92 lbs. per acre. The estimate therefore indicates that on the whole Province the average rate of production of food grains (pulses included) per acre is not more than 322 sers and not less than 276 sers. The rate of consumption on which the lower estimate is based is certainly a moderate one. The consumption of grain by the cattle of the country is probably under-estimated; but as it is a point on which we have little information, a low estimate of it has been taken.

* The total stock in the Punjab is.	
Cows, Bullocks and Buffaloes	6,570,212
Horses	84,634
Ponies and Mules	51,395
Donkeys	288,118
Sheep and Goats	3,849,842
Camels	165,567
Carts	97,909

List of papers appended.

1. Statement in acres showing average area cultivated with each crop.
2. Average produce of principal staples of agriculture, as reported by District Officers, and as ascertained by the Financial Commissioner's experiments.
3. Tabular statements showing recent settlement estimates of average produce.
4. Statistics of agricultural produce, extracted from Mr. Baden Powell's *Punjab Products*.
5. Abstract of District Officers' replies showing staple food, and its estimated consumption.
6. Statement of imports and exports of food grains to and from the Punjab.
7. District Officers' estimate of surplus food grains exported from, and deficiency imported into each District.
8. Punjab papers of Agriculture Statistics compiled for the International Statistical Congress by the Financial Commissioner of the Punjab.
9. Tables of average produce per acre on lands irrigated from the Canals of the Punjab, as reported in the annual Irrigation Reports of the past 5 years.

QUESTION 3,

Statement in acres showing the average area cultivated with each crop during the 5 years
Revenue Reports

NOTE—The Districts marked * reported that these returns were not reliable; and in such Districts returns

1	2	3	4	5	6	7	8	9	10	11	
Divisions.	District.	Harvest.	CEREALS AND PULSES								
			CEREALS.								
			Wheat.	Jan (Barley).	Rice.	Jowar (great millet).	Bajra (spiked millet).	Kanoni (Italian millet).	Makkar (Indian corn).	China.	
Delhi.	Delhi *	Rabi	1,26,899	66,292	...	...	...	...	...	...
	Gurgaon *	Kharif	...	...	11,819	1,03,115	90,320	...	76	3,040	268
		Rabi	75,827	1,43,837	...	...	...	...	...	...	...
Hissar.	Karnal	Kharif	...	...	809	1,58,723	2,89,962	...	169	627	...
		Rabi	1,13,222	33,255	...	...	...	...	...	...	315
		Kharif	...	...	53,386	1,03,549	31,325	...	185	9,591	...
Hissar.	Rohtak	Rabi	41,514	36,921	...	...	...	...	...	...	...
		Kharif	...	...	10,756	2,18,853	6,92,571	...	...	1,325	...
		Rabi	1,16,467	70,436	...	...	...	...	...	...	45
Hissar.	Sirsa	Kharif	...	...	4,080	1,88,324	1,65,491	...	147	559	...
		Rabi	43,768	81,676	...	...	...	...	...	...	36
		Kharif	...	...	6,982	97,732	4,50,720	...	11	268	20
Umballa.	Umballa	Rabi	2,79,150	44,777	...	...	...	...	...	...	...
		Kharif	...	...	1,25,071	1,13,886	20,512	1,049	1,13,463	13,872	...
		Rabi	1,88,123	65,240	...	...	...	...	...	10	...
Umballa.	Ludhiana	Kharif	...	...	3,316	1,10,756	6,308	...	32	56,238	159
		Rabi	3,066	1,260	...	...	...	...	...	...	...
		Kharif	...	...	1,109	174	749	...	40	1,287	923
Umballa.	Simla	Rabi	...	...	...	...	...	...	...	...	...
		Kharif	...	...	...	...	...	...	...	...	...
		Rabi	...	...	...	...	...	...	...	...	...
Jullundur.	Jullundur	Rabi	2,93,170	21,050	...	...	...	...	...	...	...
		Kharif	...	...	11,117	1,00,838	428	3,191	1,08,489	13,124	...
		Rabi	3,30,709	37,475	...	...	...	...	...	...	...
Jullundur.	Hoshiarpur	Kharif	...	...	55,996	45,797	11,969	...	3,186	1,01,949	7,593
		Rabi	1,24,745	42,595	...	...	...	...	...	...	...
		Kharif	...	...	1,26,792	300	304	3,092	62,142	1,948	...
Amritsar.	Kangra	Rabi	...	...	...	...	...	...	...	...	...
		Kharif	...	...	...	...	...	...	...	...	...
		Rabi	...	...	...	...	...	...	...	...	...
Amritsar.	Amritsar	Rabi	2,60,688	37,313	...	...	...	...	...	...	...
		Kharif	...	...	23,515	70,389	12	4,045	46,876	6,312	...
		Rabi	3,43,718	82,412	...	...	...	...	...	...	...
Amritsar.	Sialkot	Kharif	...	...	81,049	55,497	4,043	...	6,664	42,271	1,050
		Rabi	2,05,847	1,29,682	...	...	...	...	...	...	...
		Kharif	...	...	79,214	38,821	10,574	6,577	38,067	1,465	...
Amritsar.	Gurdaspur	Rabi	...	...	...	...	...	...	...	...	...
		Kharif	...	...	...	...	...	...	...	...	...
		Rabi	...	...	...	...	...	...	...	...	...
Lahore.	Lahore	Rabi	2,54,070	39,997	...	...	...	...	...	...	...
		Kharif	...	...	19,175	70,231	1,806	4,348	29,737	3,550	21
		Rabi	2,07,192	1,45,050	...	...	...	...	...	...	45
Lahore.	Ferozepore	Kharif	...	...	3,947	1,95,092	65,973	1,918	84,237	4,601	...
		Rabi	1,80,443	61,349	...	...	...	...	...	...	...
		Kharif	...	...	13,327	43,430	5,656	1,301	13,766	5,884	...
Lahore.	Gujranwala	Rabi	...	...	...	...	...	...	...	...	...
		Kharif	...	...	...	...	...	...	...	...	...
		Rabi	...	...	...	...	...	...	...	...	...
Rawalpindi.	Rawalpindi	Rabi	3,65,797	50,321	...	...	...	...	...	...	...
		Kharif	...	...	1,129	44,569	1,68,262	2,733	44,061	...	...
		Rabi	4,13,619	36,492	...	...	...	...	...	...	33
Rawalpindi.	Jhelum	Kharif	...	...	1,760	39,987	2,01,202	...	192	2,920	2,342
		Rabi	...	...	...	...	...	...	...	...	...
		Kharif	2,40,813	67,876	...	...	...	...	...	...	9
Rawalpindi.	Gujrat	Rabi	...	...	28,482	55,172	1,20,802	1,130	16,476	2,127	...
		Kharif	...	...	...	...	...	...	...	...	...
		Rabi	1,57,085	11,124	...	...	...	...	...	...	2,308
Rawalpindi.	Shahpur	Kharif	...	...	890	18,785	74,660	...	426	911	1,595
		Rabi	...	...	...	...	...	...	...	...	...
		Kharif	...	...	...	...	...	...	...	...	...
Mooltan.	Mooltan *	Rabi	2,47,917	4,576	...	...	...	...	...	...	115
		Kharif	...	...	8,827	64,658	11,469	...	...	163	2,958
		Rabi	1,75,493	6,188	...	...	...	...	...	...	...
Mooltan.	Jhang *	Kharif	...	...	...	...	...	...	...	...	...
		Rabi	...	...	150	39,004	1,829	852	2,259	4,374	...
		Kharif	2,00,043	31,158	...	...	...	...	...	...	285
Mooltan.	Montgomery	Rabi	...	...	10,611	29,222	246	7,994	1,889	2,967	...
		Kharif	...	...	...	...	...	...	...	...	...
		Rabi	2,03,215	10,099	...	...	...	...	...	...	...
Mooltan.	Musaffargarh *	Kharif	...	...	10,353	21,545	16,241	...	...	...	1,265
		Rabi	...	...	...	...	...	...	...	...	...
		Kharif	...	...	...	...	...	...	...	...	...

CHAPTER I.

1872-73 to 1876-77, compiled from Statements No. XXIX appended to the Annual for those years.

supplied from recent Settlement measurements have been substituted.

12	13	14	15	16	17	18	19	20	21
USED AS FOOD.									
PULSES.							TOTAL.		
Gram.	Mattar (peas)	Masur.	Arhar.	Moth.	Másh.	Mung.	Cereals.	Pulses.	Total food grains.
72,266	1,429	100	...	290	7,215	1,213	1,98,191	73,795	2,66,986
1,14,798	280	100	...	...	...	...	2,18,636	24,781	2,38,417
78,376	2	2,667	...	191	1,28,253	218	2,19,664	1,16,178	3,34,842
...	...	...	...	...	9,494	10,438	4,50,287	1,48,204	5,98,491
...	...	...	...	...	...	...	1,46,792	81,045	2,27,837
...	...	...	...	...	...	...	1,98,336	81,087	2,29,423
61,275	...	...	...	13,300	1,95,388	19,356	78,435	61,275	1,39,710
1,25,256	...	400	...	...	...	76,295	2,23,505	3,04,339	12,27,844
31,277	279	790	...	23,768	10,412	19,824	1,56,848	1,25,656	3,12,504
...	46	...	...	1,59,505	629	4,596	3,58,595	54,004	4,13,599
1,51,753	1,471	13,303	...	...	...	...	1,25,480	32,346	1,57,826
1,47,728	...	3,065	...	17,136	19,000	1,114	5,55,738	1,64,776	7,20,509
...	...	...	...	...	...	...	3,23,927	1,66,527	4,90,454
...	...	...	...	...	...	...	8,84,853	97,250	4,22,103
...	...	...	...	...	...	...	2,53,373	1,50,793	4,04,166
...	...	...	...	...	...	...	1,76,809	77,264	2,54,073
...	...	...	...	...	...	...	4,326	31	4,357
...	...	...	...	...	...	...	3,682	173	3,855
55,611	...	2,637	...	...	...	...	8,14,220	65,248	3,79,468
...	...	...	...	...	...	...	2,37,197	59,356	2,96,553
53,086	1,358	21,863	...	86,542	20,905	1,909	3,68,184	76,307	4,44,491
94,753	2,859	4,448	...	28,687	23,683	5,281	2,26,490	68,969	2,84,869
...	...	...	...	...	...	...	1,67,340	1,02,060	2,69,400
...	...	...	...	...	...	...	1,94,578	16,141	2,10,719
89,967	...	4,396	...	...	...	...	2,98,001	94,263	3,92,264
13,356	1,711	20,139	...	18,491	12,418	889	1,53,149	51,798	1,84,947
22,533	2,806	12,671	...	12,269	10,550	1,524	4,35,190	35,206	4,61,396
...	...	...	...	...	...	...	1,32,374	24,353	2,16,327
...	...	...	...	...	...	...	3,35,529	38,010	3,73,539
...	...	...	...	...	...	...	1,74,738	35,912	2,10,650
1,15,085	6	7,376	...	...	...	...	2,24,104	1,22,467	4,16,571
1,48,630	571	16,400	...	50,103	11,350	9,996	1,28,847	71,451	2,00,298
24,538	800	...	...	86,279	24,680	26,524	3,52,287	1,64,601	5,16,888
...	668	1,272	...	46,360	1,036	19,076	3,05,763	1,37,783	4,43,546
...	46	...	...	...	...	...	2,41,792	26,376	2,68,168
...	...	...	...	...	...	...	83,364	66,503	1,49,867
87,729	201	2,023	...	...	...	...	4,16,118	39,953	4,56,071
...	...	...	...	...	...	...	2,60,754	72,781	3,33,535
27,693	114	992	...	48,187	4,558	20,036	4,50,144	28,799	4,78,943
...	5	...	...	36,056	1,763	12,208	2,48,403	50,032	2,98,435
28,374	311	7,873	...	...	...	...	3,09,328	37,058	3,46,386
...	...	...	...	...	...	...	2,24,189	34,954	2,59,143
11,884	158	613	...	...	...	...	1,70,517	12,555	1,83,072
...	3	...	...	...	...	...	97,267	9,393	1,06,660
14,883	27,010	1,145	...	...	...	...	2,52,610	49,038	2,95,648
...	...	...	...	...	...	...	89,059	2,044	91,103
13,968	8,487	2,435	...	271	1,557	216	1,81,681	24,891	2,06,572
...	...	...	...	...	...	...	47,468	10,127	57,595
30,080	9,358	5,370	...	408	9,178	551	2,31,489	45,231	2,76,720
...	...	...	...	...	...	...	62,939	10,153	73,092
12,786	24,926	4,477	...	274	2,457	4,849	2,13,314	42,189	2,55,503
...	...	...	...	...	...	...	61,690	4,512	66,202

Statement in acres showing the average

NOTE.—The Districts marked * reported that these returns were not reliable; and in such

Division.	District.	Harvest.	22	23	24	25	26	27	28	
			OTHER							Other kinds.
			DRUGS AND SPICES.							
			Poppy.	Tobacco.	Turmeric.	Coriander seed.	Ginger.	Chillies.		
Delhi.	Delhi*	Rabi	...	1,286	...	492	...	...	...
		Kharif	...	...	...	...	...	1,578	...
	Gurgaon*	Rabi	...	1,210	...	11	...	...	1,289
Karnal		Kharif	...	...	...	...	...	89	...
		Rabi	63	1,584	...	24	...	19	2,686	
		Kharif	136	...	...	...	...	465	1,954
Hissar.		Rabi	...	3,062	17	5,127	...	...	1,237
		Kharif	...	...	...	...	...	2,305	14
	Rohtak	Rabi	...	3,453	...	64	...	70	962	
		Kharif	...	...	...	...	...	8	3,387
	Siresa	Rabi	7	385	...	...	...	13	554
	Kharif	...	...	...	...	...	33	27	
Umballa.		Rabi	2,306	3,480	...	91	...	2	834	
		Kharif	...	...	...	...	86	917	1,662
	Ludhiana	Rabi	304	1,921	...	84	...	17	167	
		Kharif	...	...	...	...	...	62	303
	Simla	Rabi	299	19	...	1	...	...	...
	Kharif	...	1	43	4	374	...	160		
Jullundur.		Rabi	641	3,423	...	46	...	...	1,275
		Kharif	...	...	15	...	...	739	3,329
	Hosharpur	Rabi	233	4,888	4	246	17	...	42	
		Kharif	...	...	12	...	...	189	61
	Kangra	Rabi	944	1,015	...	114	...	64	393	
	Kharif	...	...	1,585	...	110	120	488	
Amritsar.		Rabi	1,116	2,982	...	6	...	...	4,489
		Kharif	...	...	...	45	...	666	372
	Sialkot	Rabi	465	4,898	...	139	...	...	3,143
		Kharif	...	117	222	...	...	1,545	2,861
	Gurdaspur	Rabi	248	5,000	27	561	...	...	3,352
	Kharif	...	542	684	...	...	3,076	89	
Lahore.		Rabi	935	2,745	...	166	...	...	10,601
		Kharif	...	...	...	8	...	1,178	2,130
	Ferozepore	Rabi	305	4,639	...	729	...	...	7,161
		Kharif	...	...	...	...	...	1,949	5,827
	Gujranwala	Rabi	184	4,552	...	75	...	61	2,160	
	Kharif	...	...	...	...	...	172	346	
Rawalpindi.		Rabi	33	705	1	29	...	...	48
		Kharif	...	833	1	...	...	111	27
	Jhelum	Rabi	62	826	...	19	...	1	1,433	
		Kharif	...	...	...	...	...	269	1,781
	Gujrat	Rabi	260	2,862	...	429	...	...	6,378
		Kharif	...	...	...	...	...	284	2,033
Mooltan.		Rabi	1,659	911	...	12	...	...	24
		Kharif	...	...	...	...	...	...	...
	Mooltan*	Rabi	...	1,302	...	...	...	...	...
		Kharif	...	...	...	...	...	...	...
	Jhang*	Rabi	13	987	...	...	...	...	...
	Kharif	...	...	...	...	...	...	...
Montgomery	Rabi	111	1,343	...	238	...	...	1	
	Kharif	...	...	...	...	...	111	2,321	
Muzaffargarh*	Rabi	61	1,122	...	12	...	...	209	
	Kharif	...	...	...	...	...	149	1,873	

Statement in acres showing the average

NOTE—The Districts marked * reported that these returns were not reliable ; and in such

1	2	3	4	5	6	7	8	9	10	11
DIVISION.	DISTRICT.	Harvest.	CEREALS AND PULSES							
			CEREALS.							
			Wheat.	Jan (Carley).	Rice.	Jowar (great millet).	Bajra (upland millet).	Kangri (Italian millet).	Makki (Indian corn).	Chia.
Derajat.	Dera Ismail Khan *	Rabi Kharif ...	8,19,502	14,907	1,970	25,917	2,62,903	1,816	139	92
	Dera Ghazi Khan...	Rabi Kharif ...	1,26,340	11,228	11,073	93,616	91,767	16	99	61
	Bannu ...	Rabi Kharif ...	2,34,572	28,599	534	11,641	89,228	...	24,046	...
Peshawar.	Peshawar ...	Rabi Kharif ...	2,90,552	2,12,280	10,329	62,853	2,327	8	59,827	84
	Kohat *	Rabi Kharif ...	97,533	10,014	2,361	2,213	47,342	2,106	12,920	...
	Hazara ...	Rabi Kharif ...	93,167	49,544	8,530	1,148	26,010	20,515	90,055	2
	GRAND TOTAL ...	Rabi Kharif ...	63,54,266	16,85,025	7,28,259	22,24,337	29,04,411	78,770	53	9,21,968	5,853

TOTAL OF EACH

Delhi ...	Rabi Kharif ...	3,15,948	2,43,384	66,014	3,65,387	4,11,607	427	18,558	815	266
Hissar ...	Rabi Kharif ...	2,01,749	1,89,033	21,818	5,04,909	13,08,782	152	2,152	81	20
Umballa ...	Rabi Kharif ...	4,70,339	1,11,277	1,29,496	2,24,816	26,969	10	1,67,988	14,954	...
Jullundur ...	Rabi Kharif ...	7,48,624	1,01,120	1,93,905	1,46,935	12,701	9,469	2,72,590	22,665	...
Amritsar ...	Rabi Kharif ...	8,10,253	2,49,407	1,83,778	1,64,707	14,629	19,286	1,27,214	10,847	...
Lahore ...	Rabi Kharif ...	6,41,705	2,46,396	36,449	3,08,753	73,435	16	77,740	14,035	66
Rawalpindi ...	Rabi Kharif ...	11,77,514	1,65,813	32,261	1,58,513	5,64,926	4,481	64,368	2,980	6,064
Mooltan ...	Rabi Kharif ...	82,668	52,023	29,941	1,53,429	31,785	3	4,311	400	11,665
Derajat ...	Rabi Kharif ...	6,80,414	54,734	13,377	1,31,174	3,83,898	16	24,245	11	152
Peshawar ...	Rabi Kharif ...	4,81,252	2,71,838	21,220	66,214	75,679	6	1,62,802	36	...
TOTAL ...	Rabi Kharif ...	63,54,266	16,85,025	7,28,259	22,24,337	29,04,411	78,770	53	9,21,968	5,853

area cultivated with each crop—continued.

C

Districts returns supplied from recent Settlement measurements have been substituted.

12	13	14	15	16	17	18	19	20	21
USED AS FOOD.									
PULSES.							TOTAL.		
Gram.	Mattar (peas).	Masur.	Arhar.	Moth.	Mish.	Mung.	Cereals.	Pulses.	Total food grains.
18,084	17,162	1,620	...	...	724	...	3,34,409	86,866	3,71,275
...	...	...	...	...	...	...	2,92,837	3,360	2,96,187
2,452	6,256	5,231	1	...	230	155	1,37,596	14,095	1,51,690
...	...	...	...	...	...	372	1,36,876	746	1,37,422
48,895	6,918	5,172	...	...	...	...	2,63,171	60,985	3,24,156
...	...	...	...	4,764	8,063	3,742	1,25,248	11,669	1,36,917
189	138	1,648	88	...	...	...	5,02,840	2,063	5,04,903
...	...	...	433	16,555	3,257	3,429	1,36,981	23,674	1,60,655
1,984	...	...	...	...	...	...	1,07,547	1,984	1,09,531
...	...	...	...	6,327	4	11,473	66,942	17,804	84,746
929	234	1,078	...	...	...	...	1,42,711	2,241	1,44,952
...	1,434	...	...	10,812	2,436	5,144	1,46,260	19,826	1,66,086
16,50,727	1,14,613	1,57,225	420	92	155	...	80,43,197	19,23,232	99,66,429
...	1,843	...	15,666	10,62,868	2,41,183	2,93,018	69,38,649	16,14,568	85,53,417

DIVISION.

2,65,440	1,711	2,867	...	...	...	...	5,59,647	2,70,018	8,29,665
...	...	...	481	1,44,962	11,869	46,760	8,62,259	2,04,072	10,66,331
2,17,808	279	1,190	...	...	...	...	8,90,863	2,19,277	6,10,140
...	46	...	13,300	8,78,661	30,397	1,00,715	18,37,833	5,23,119	23,60,952
2,99,489	1,473	16,389	...	...	...	...	5,81,626	8,17,351	8,98,977
...	8	...	...	73,629	28,296	12,755	5,65,344	1,14,687	6,80,031
2,08,450	4,217	85,948	...	...	...	...	8,49,744	2,43,515	10,93,259
...	...	...	1,142	66,448	68,785	7,496	6,68,265	1,33,866	7,92,131
1,25,856	4,517	87,106	...	...	...	...	10,59,660	1,67,479	12,27,139
...	...	...	10	48,750	39,588	3,715	5,20,461	92,063	6,12,524
2,88,253	1,143	24,048	...	...	...	...	8,88,183	3,13,444	12,01,627
...	347	...	46	1,82,742	37,066	55,596	5,17,974	2,75,797	7,93,771
1,06,180	784	11,501	...	...	...	...	13,46,107	1,18,465	14,64,572
...	8	...	...	1,21,149	10,077	85,926	8,30,613	1,67,160	9,97,773
71,718	69,781	13,427	881	92	...	...	8,79,094	1,85,349	10,64,443
...	...	...	274	7,090	15,924	3,547	2,41,156	26,835	2,67,991
69,431	30,336	12,023	1	...	...	...	7,35,175	1,11,940	8,47,121
...	...	...	...	5,718	8,485	6,452	5,54,761	15,665	5,70,426
3,102	372	2,726	88	...	...	...	7,53,098	6,288	7,59,386
...	1,434	...	483	83,694	5,697	20,046	8,50,183	61,304	4,11,487
16,50,727	1,14,613	1,57,225	420	92	155	...	80,43,197	19,23,232	99,66,429
...	1,843	...	15,666	10,62,868	2,41,183	2,93,018	69,38,649	16,14,568	85,53,417

Statement in acres showing the average

NOTE.—The Districts marked * reported that these returns were not reliable ; and in such

DIVISION.	DISTRICT.	Harvest.	22	23	24	25	26	27	28
			OTHER						
			DRUGS AND SPICES,						
			Poppy.	Tobacco.	Turmeric.	Coriander seed.	Ginger.	Chillies.	Other kinds.
Deraajat.	Dera Ismail Khan *	Rabi ... ..	...	666	...	5	...	...	...
		Kharif ... ..	...	...	...	...	...	...	50
	Dera Ghazi Khan ...	Rabi	531	1,849	...	14	...	...	140
		Kharif ... ..	...	...	...	...	...	74	32
	Bannu	Rabi	14	694	86	9	...	...	223
		Kharif ... ..	...	...	85	...	...	192	479
Peshawar.	Peshawar	Rabi	46	1,281	23	21	...	19	5
		Kharif ... ..	...	244	...	...	...	9	690
	Kohat *	Rabi ... ..	...	8,307	...	...	...	...	...
		Kharif ... ..	...	...	...	...	...	...	...
	Hazara	Rabi	67	1,570	...	5	...	...	469
		Kharif ... ..	...	...	708	...	...	10	5
	GRAND TOTAL ...	Rabi	10,907	69,961	158	6,759	17	256	53,250
		Kharif	135	1,737	3,350	57	572	16,082	35,376

TOTAL OF EACH

Delhi	Rabi	63	4,080	...	527	...	19	8,975
	Kharif	135	...	...	...	...	2,132	1,954
Hisar	Rabi	7	6,900	17	3,781	...	83	2,743
	Kharif ... ..	...	...	...	...	...	2,346	3,428
Umballa	Rabi	2,909	5,420	...	176	...	19	1,001
	Kharif ... ..	...	1	43	4	460	771	2,125
Jullundur	Rabi	1,818	9,328	4	406	17	64	1,710
	Kharif ... ..	...	...	1,612	...	110	1,048	3,378
Amritsar	Rabi	1,829	12,880	27	706	...	...	10,984
	Kharif ... ..	...	659	906	45	2	5,237	3,322
Lahore	Rabi	1,424	11,936	...	970	...	51	19,922
	Kharif ... ..	...	...	...	8	...	3,299	3,363
Rawalpindi	Rabi	2,014	5,304	1	489	...	1	7,883
	Kharif ... ..	...	833	1	...	...	654	3,841
Mooltan	Rabi	185	4,754	...	250	...	...	4,195
	Kharif ... ..	...	...	...	...	...	260	209
Deraajat	Rabi	545	3,203	86	23	...	...	363
	Kharif ... ..	...	...	85	...	...	266	561
Peshawar	Rabi	113	6,158	23	26	...	19	474
	Kharif ... ..	...	244	703	...	...	19	695
TOTAL	Rabi	10,907	69,961	158	6,759	17	256	53,250
	Kharif	135	1,737	3,350	57	572	16,082	35,376

area cultivated with each crop—continued.

CH. I.

Districts returns supplied from recent Settlements measurements have been substituted.

29	30	31	32	33	34	35	36	37	38	39	40	41
PRODUCTS.												
	OIL SEEDS.			FIBRES.		DYES.						
	Linseed.	Sawo (mustard).	Til (sesamum).	Tilamra (spinapis arvensis).	Cotton.	Hemp.	Kammbha (shaf. flower).	Indigo.	Vegetables.	Tea.	Sugar-cane.	Total of the products.
19	57,459	...	24,286	...	...	...	65	...	1,218	...	...	63,718
...	...	2,037	...	32,392	...	...	...	...	2,043	...	76	87,598
8	8,240	...	10,656	...	23,095	...	82	...	576	...	...	22,035
...	...	494	...	...	...	...	...	19,603	563	...	23	43,884
1	177	...	8,498	...	9,384	...	...	...	1,238	...	...	5,935
...	...	621	...	...	...	...	...	...	1,265	...	4,224	16,190
...	22,551	...	757	...	...	...	...	...	2,338	...	...	27,041
...	...	5,189	...	17,456	...	22	7	23	2,109	860	8,801	84,410
...	62	...	494	...	...	...	...	...	519	...	...	4,382
...	...	4,792	...	6,306	...	...	...	...	80	...	20	11,288
...	8,062	...	214	...	...	...	...	...	197	...	...	10,584
...	21	2,436	...	10,912	...	8	...	...	150	...	404	14,644
21,934	8,99,828	1,800	1,95,502	...	7,76,205	703	25,094	186	1,63,559	7,264	4	9,57,182
1	20,100	1,79,620	1,999	...	42,461	90	1,01,464	1,01,440	601	3,56,138	...	16,35,428
												1,09,23,611
												1,01,88,845

DIVISION.

103	12,562	...	4,344	...	...	400	...	6,825	...	...	...	82,898
...	...	2,164	220	1,29,364	1,388	...	779	2,370	...	44,926	...	1,85,432
...	86,988	...	1,420	...	...	1,191	...	8,278	...	4	...	65,812
...	...	73,761	...	68,690	8,284	...	2,863	3,495	...	27,551	...	1,90,368
2,460	32,919	...	5,516	...	855	7,659	89	9,537	...	29	...	68,059
...	...	3,862	...	49,143	3,680	...	8,874	16,249	...	36,052	...	1,14,664
6,048	28,073	1,800	6,105	...	841	12,029	127	7,570	...	7,235	...	82,673
...	...	9,698	1,241	66,033	14,078	...	2,784	7,386	...	...	84,422	1,89,290
10,540	87,947	...	4,481	...	...	955	...	15,355	...	...	...	95,714
...	2,980	17,028	22	78,886	6,351	...	...	12,833	...	1,03,208	...	2,31,028
281	74,661	...	11,135	...	...	28	...	20,672	...	...	...	1,41,075
...	10,871	17,139	833	74,688	3,217	...	6	89,680	...	29,144	...	1,76,698
2,478	55,577	...	1,07,802	...	...	2,659	...	83,039	...	...	...	2,17,283
1	6,226	14,059	...	1,05,003	5,487	...	110	12,735	...	241	9,384	1,58,526
...	24,550	...	14,794	...	...	91	...	61,202	...	...	...	1,10,023
...	26,840	...	189	1,12,363	151	83	71,422	11,492	...	...	3,403	2,31,408
23	65,876	...	88,440	...	...	97	...	3,027	...	...	...	1,11,688
...	...	8,152	...	66,821	...	...	18,603	3,861	...	4,323	...	97,672
...	30,675	...	1,465	...	...	...	...	8,054	...	...	...	42,007
...	21	12,417	...	34,764	...	25	...	2,339	...	860	5,725	60,342
21,934	8,99,828	1,800	1,95,502	...	7,76,205	703	25,094	186	1,63,559	7,264	4	9,57,182
1	20,100	1,79,620	1,999	...	42,461	90	1,01,464	1,01,440	601	3,56,138	...	16,35,428
												1,09,23,611
												1,01,88,845

Abstract in acres.

DIVISION.	Harvest.*	Cereals.	Pulses.	Total.	Other products.	GRAND TOTAL.	
						Harvesta.	Total.
DELHI	Rabi	5,59,647	2,70,018	8,29,665	32,898	8,62,563	21,14,326
	Kharif	8,62,259	2,04,072	10,66,331	1,85,432	12,61,763	
HISSAR	Rabi	8,90,863	2,19,277	6,10,140	55,812	6,65,952	82,17,272
	Kharif	18,37,833	5,23,119	23,60,952	1,90,368	25,61,320	
UMBALLA	Rabi	5,81,626	3,17,351	8,98,977	68,069	9,67,046	17,61,731
	Kharif	5,65,344	1,14,637	6,80,031	1,14,664	7,94,695	
JULLUNDUR	Rabi	8,49,744	2,43,616	10,93,369	82,873	11,76,032	21,57,453
	Kharif	6,58,256	1,33,866	7,92,151	1,89,230	9,81,421	
AMRITSAR	Rabi	10,59,660	1,67,479	12,27,139	95,714	13,22,853	21,66,406
	Kharif	5,20,461	92,063	6,12,524	2,31,029	8,43,553	
LAHORE	Rabi	8,88,183	3,13,444	12,01,627	1,41,075	13,42,702	23,19,171
	Kharif	5,17,974	2,75,797	7,93,771	1,76,698	9,70,469	
RAWALPINDI	Rabi	13,46,107	1,18,465	14,64,572	2,17,233	16,81,805	28,88,103
	Kharif	8,30,613	1,67,160	9,97,773	1,58,525	11,56,298	
MOOLTAN	Rabi	8,79,094	1,55,349	10,34,443	1,10,023	11,44,466	16,43,865
	Kharif	2,41,165	26,835	2,67,991	2,31,408	4,99,399	
DERAJAT	Rabi	7,35,175	1,11,946	8,47,121	1,11,688	9,58,809	16,26,907
	Kharif	5,54,761	15,665	5,70,426	97,672	6,68,098	
PESHAWAR	Rabi	7,53,098	6,288	7,59,386	42,007	8,01,393	12,73,222
	Kharif	8,60,183	61,304	4,11,487	60,342	4,71,829	
GRAND TOTAL	Rabi	80,43,197	19,23,232	99,66,429	9,57,182	1,09,23,611	2,11,12,456
	Kharif	69,38,849	16,14,568	85,53,417	16,35,428	1,01,88,845	

Abstract in Percentage.

DIVISION.	Harvest.	Cereals.	Pulses.	Total.	Other products.	Total.	REMARKS.
DELHI	Rabi	26	13	39	1	40	100
	Kharif	41	10	51	9	60	
HISSAR	Rabi	12	7	19	2	21	100
	Kharif	57	16	73	6	79	
UMBALLA	Rabi	33	18	51	4	55	100
	Kharif	32	7	39	6	45	
JULLUNDUR	Rabi	40	11	51	4	55	100
	Kharif	30	6	36	9	45	
AMRITSAR	Rabi	49	8	57	4	61	100
	Kharif	24	4	28	11	39	
LAHORE	Rabi	39	13	52	6	58	100
	Kharif	22	12	34	8	42	
RAWALPINDI	Rabi	47	4	51	8	59	100
	Kharif	29	5	34	7	41	
MOOLTAN	Rabi	53	9	62	7	69	100
	Kharif	16	2	17	14	31	
DERAJAT	Rabi	45	7	52	7	59	100
	Kharif	34	1	35	6	41	
PESHAWAR	Rabi	59	1	60	3	63	100
	Kharif	27	5	32	5	37	
TOTAL	Rabi	38	9	47	4	51	100
	Kharif	33	8	41	8	49	

CHAPTER I,
Average produce of principle staples of agriculture in each District of the Punjab.—(1) as reported by District
Financial Commissioner

DIVISION.	DISTRICT.	AVERAGE PRODUCE														
		Wheat.					Rice.					Inferior				
		1872-73.	1873-74.	1874-75.	1875-76.	1876-77. Financial Commissioner's estimate.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77. Financial Commissioner's estimate.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.
DELHI ..	Delhi	1,560	720	800	798	913	1,000	1,120	1,090	1,070	920	860	480	500	467	522
	Gurgaon	820	858	798	778	866	..	860	820	1,471	720	628	57	444	876	447
	Karnal	1,600	1,600	1,600	1,600	1,819	1,260	1,214	1,214	1,214	1,122	860	560	560	560	521
HISSAR ..	Hissar	667	636	818	614	648	856	890	716	708	745	418	278	236	284	393
	Rohtak	905	770	847	1,071	783	682	1,000	800	780	670	400	387	549	687	412
	Sirsa	418	466	345	199	255	656	670	656	1,392	869	60	80	90	100	118
UMBALLA ..	Umballa.. ..	800	1,280	889	960	1,000	450	1,120	1,100	1,000	680	220	680	836	720	680
	Ludhiana	1,259	992	1,119	1,013	1,013	943	1,148	1,096	1,096	1,096	1,227	1,214	1,351	1,355	1,350
	Simla	560	550	550	650	860	620	620	620	620	420	520	520	520	520	520
JULLUNDUR.	Jullundur	1,200	1,420	1,606	1,233	1,339	1,260	1,320	1,154	1,024	1,085	2,660	1,046	960	960	366
	Hoshiarpur	1,760	1,912	1,012	898	692	2,080	1,804	1,904	700	752	1,040	1,040	1,017	1,618	686
	Kangra	412	383	445	447	460	489	577	579	460	416	343	470	424	352	262
AMRITSAR ..	Amritsar	1,920	1,772	1,476	1,066	1,038	1,652	1,780	1,640	1,280	974	1,360	1,138	574	600	590
	Siālkot	981	865	928	691	910	948	1,011	964	878	1,029	687	492	651	565	743
	Gurdaspur	906	808	840	800	856	1,060	1,200	1,000	800	766	680	660	640	650	648
LAHORE ..	Lahore	405	678	618	466	557	758	1,043	912	910	861	856	506	410	386	374
	Ferozepore	673	555	487	673	738	880	696	448	621	756	469	501	407	434	608
	Gujranwala	967	880	780	791	793	821	990	806	768	759	663	498	459	469	449
RAWALPINDI.	Rawalpindi	477	438	648	700	776	603	529	538	602	970	868	460	700	640	654
	Jhalum	890	960	981	962	933	960	942	943	943	943	765	720	720	720	722
	Gujrat	736	726	736	736	736	410	887	686	686	686	679	623	623	623	623
MOOLTAN.	Bahpur	780	790	790	790	780	780	790	790	790	790	1,040	1,100	1,100	1,100	1,100
	Mooltan.. ..	800	784	820	663	653	608	690	808	760	760	679	390	482	468	468
	Jhang	668	663	674	671	674	226	226	267	268	261	301	210	220	221	216
DERAJAT ..	Montgomery	960	1,346	1,290	1,261	1,262	689	968	1,403	1,418	1,145	464	492	449	674	686
	Musafargach	862	793	914	914	1,248	714	760	714	714	822	760	650	634	634	693
	Dera Ismail Khan	910	947	667	803	777	823	1,000	261	430	196	701	678	686	670	485
PESHAWAR.	Dera Ghāzi Khan	655	494	645	765	765	256	260	480	613	613	423	504	547	648	640
	Bannu	662	621	468	501	523	530	544	960	880	880	1,006	1,008	445	565	526
	Peshawar	37	420	607	624	600	46	788	634	760	694	38	1,148	593	690	650
Total average of the Province	Kohat	700	700	700	708	816	1,200	1,200	1,200	1,474	1,507	863	868	868	932	770
	Hasdra	448	776	776	776	993	1,066	892	892	892	1,112	..	640	640	640	960
		Average 826.					Average 869.					Average 666.				

CHAPTER I, QUESTION 3.

Appended are returns of the average rates of yield, assumed by Settlement Officers in Districts now or recently under Settlement. The general results of each return are summarized in the first table.

DISTRICT.	CEREALS.								PULSES.						OTHER PRODUCTS.			REMARKS.	
	Wheat.	Barley.	Rice.	Jowar.	Bajra.	Maise.	Chhna.	Kaangai.	Gram.	Peas.	Masur.	Moth.	Mash.	Mung.	Mustard.	Til (Sesamum).	Taramira.		Cotton.
Delhi	190 to 640	200 to 720	160 to 320	80 to 280	80 to 260	240 to 560	160 to 240	240 to 360	200 to 480	120 to 300	60 to 120	80 to 240	80 to 260	40 to 200	40 to 140	80 to 200	40 to 120	15 to 107	Cleaned.
Karnal	192 to 598	189 to 482	178 to 574	107 to 186	109 to 163	127 to 555	...	...	225 to 606	...	63 to 104	54 to 98	...	...	...	...	...	29 to 117	Cleaned.
Gurgaon	160 to 600	200 to 680	720	200 to 320	160 to 240	...	...	...	200 to 400	280	160	130 to 240	160 to 200	110 to 200	80 to 200	200 to 320	200 to 280	140 to 260	Uncleaned.
Rohtak	580	...	640	300 to 400	220	...	...	...	500 to 560	...	...	310	280	240	...	...	...	50 to 75	Cleaned.
Jhelum	120 to 480	80 to 480	320 to 480	80 to 240	120 to 480	160 to 400	...	80	120 to 400	80 to 120	160	80	80 to 120	80 to 120	140 to 240	80 to 120	80 to 160	80 to 240	Uncleaned.
Mooltan	160 to 480	...	320 to 480	...	200 to 400	...	320 to 400	240 to 280	160 to 240	160 to 280	200 to 240	200	120 to 160	120 to 160	...	120 to 160	160 to 240	160 to 220	Do.
Musaffargah	240 to 400	240 to 400	320 to 400	160 to 240	160 to 280	...	160 to 200	200	120 to 200	120 to 200	160	80 to 160	80 to 200	80 to 200	...	160	80 to 160	40 to 50	Do.
Jhang	220 to 400	800 to 460	...	200 to 280	229	...	320	...	280 to 340	200 to 240	160 to 254	...	175 to 220	175 to 220	...	...	...	30 to 50	
Dera Ismail Khan	160 to 491	260 to 400	320 to 400	120 to 440	100 to 320	...	...	...	160 to 320	280 to 320	240 to 280	120 to 280	160 to 320	240 to 320	62 to 280	100 to 240	60 to 260	50 to 280	Uncleaned.
Bannu	106 to 308	100 to 364	194 to 311	125 to 300	93 to 280	170 to 401	71 to 360	...	...	...	...	...	...	...	...	...	...	14 to 38	Cleaned.
Kohat	70 to 400	87 to 600	360 to 720	...	40 to 320	120 to 720	...	160 to 320	240 to 320	...	...	70 to 200	100 to 240	40 to 200	80 to 120	20 to 160	80 to 120	60 to 320	Uncleaned.
Hazara	210 to 388	277 to 464	278	...	254 to 439	296 to 512	...	128 to 161	183	168 to 237	208 to 259	208 to 259	202 to 275	105 to 120	...	145 to 261	

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CHAPTER I, QUESTION 3.

Statement showing the rate of produce per acre estimated in recent assessments of tahsils Delhi.—District Delhi. (Sers of 80 tolas each).

	KHADAR BANGAR.				BANGAR.				DABAR.				ZERKOH.				KOHJ.				KHANDRAT.				REMARKS.
	Irrigat- ed.		Unirri- gated.		Irrigat- ed.		Unirri- gated.		Irrigat- ed.		Unirri- gated.		Irrigat- ed.		Unirri- gated.		Irrigat- ed.		Unirri- gated.		Irrigat- ed.		Unirri- gated.		
	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	
CEREALS.	Wheat	510	440	340	200	600	470	360	220	580	440	360	240	560	400	320	220	440	360	280	190	640	480	360	240
	Barley	600	480	320	240	680	520	380	290	640	520	400	320	600	480	360	300	520	400	280	200	680	560	400	260
	Rice	200	160	...	...	320	260	...	...	320	240	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Jowár	200	180	160	120	240	220	200	160	200	180	140	120	200	180	120	80	180	140	100	80	220	180	120	100
	Bájra	200	160	120	80	220	200	160	140	200	160	120	80	160	140	100	70	170	140	100	80	180	150	100	80
	Maize	480	440	400	360	480	440	400	280	500	440	400	280	440	400	320	280	400	360	280	240	520	460	400	320
	China	...	...	...	...	240	220	200	160	240	200	180	160	...	...	...	...	...	...	...	...	...	...	...	...
Kangni	...	...	...	...	360	320	280	240	360	320	280	240	...	...	...	...	...	...	...	...	...	...	...	...
PULSES.	Gram	320	280	240	200	360	340	280	240	400	360	320	280	380	320	260	220	360	320	240	200	440	400	340	280
	Peas	280	240	160	120	280	240	160	120	300	240	220	160	...	...	...	...	...	...	...	...	300	250	200	160
	Masúr	120	100	80	60	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Moth	200	160	120	80	240	200	160	120	240	200	160	120	...	...	...	...	...	...	...	...	...	...	...	...
	Másh	200	160	120	80	240	200	160	120	260	200	180	120	240	200	140	80	...	...	...	...	...	...	...	...
Múng	160	140	120	80	200	180	120	80	200	160	120	80	160	120	80	60	140	110	75	40	200	160	140	80	
OTHER PRODUCTS.	Mustard	...	...	...	...	120	100	80	60	120	80	70	50	...	...	...	...	100	80	60	40	...	...	...	...
	Til	...	...	...	...	200	160	120	80	200	170	120	80	200	160	120	80	...	...	...	...	...	...	...	...
	Táramíra	120	100	80	40	120	100	80	40	120	100	80	50	120	100	60	40	100	80	60	40	120	100	60	40
	Cotton (cleaned)	80	60	40	20	100	70	50	30	80	60	40	20	80	50	40	20	60	45	35	15	80	50	40	30

CHAPTER I, QUESTION 3.

Statement showing the rate of produce per acre estimated in recent assessments of tahsil Ballabgarh.—District Delhi. (Sers of 80 tolas each).

	KHADAR BANGAR.				BANGAR.				DABAR OR DABRI.				ZERKOH.				KOHJ.				KHANDRAT.				REMARKS.
	Irrigated land.		Unirrigated.		Irrigated.		Unirrigated.		Irrigated.		Unirrigated.		Irrigated.		Unirrigated.		Irrigated.		Unirrigated.		Irrigated.		Unirrigated.		
	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	Manured.	Unmanured.	
CEREALS.	Wheat	520	440	320	200	640	480	360	240	560	440	360	280	560	440	280	200	480	400	320	200	640	520	400	280
	Barley	640	480	360	260	720	560	400	303	680	560	400	340	640	520	360	280	560	440	320	240	720	560	400	280
	Rice	...	...	...	...	200	160	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Jowár	220	180	160	120	280	240	200	160	280	240	200	160	200	160	120	80	220	180	160	120	280	240	200	160
	Báira	200	160	120	80	240	200	160	120	240	200	160	120	200	160	140	100	260	220	180	140	240	200	160	120
	Maize	520	440	400	360	520	440	400	360	520	440	400	360	520	440	400	360	520	440	400	360	560	480	400	320
	China	...	...	...	...	220	160	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kangni	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
PULSES.	Gram	380	320	280	240	440	380	320	280	440	380	320	280	400	360	320	280	400	360	300	260	480	400	340	280
	Peas	240	220	180	120	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Masúr	120	100	80	60	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Moth	200	160	120	80	200	160	120	80	200	160	120	80	200	160	120	80	200	160	120	80	200	160	120	80
	Músh	...	...	...	...	240	200	160	120	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Múng	200	160	120	80	200	160	120	80	180	140	120	100	180	140	120	100	...	...	...	...	...	...	...	...
OTHER PRODUCTS	Mustard	...	...	...	...	140	100	80	60	140	100	80	60	...	...	...	...	...	...	...	...	140	100	80	60
	Til	...	...	...	...	200	160	140	100	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Táramira	120	80	60	40	120	80	60	40	120	80	60	40	120	80	60	40	120	80	60	40	120	80	60	40
	Cotton (cleaned).	95	80	48	40	107	95	55	45	95	80	48	40	86	70	48	40	66	54	27	20	86	70	48	40

CHAPTER I, QUESTION 3.

DISTRICT KARNAL.

Average yield per acre, estimated in the late assessments—stated in sers of 80 tolas each.

CROP.	IRRIGATED.					UNIRRIGATED.					River sailab.	TOTAL.					
	High land.	Riverain.		Canal.		High land.	Riverain.		Canal.			High land.	Riverain.		Canal.		
		Karnál.	Pámpat.	Karnál.	Pámpat.		Karnál.	Pámpat.	Karnál.	Pámpat.			Karnál.	Pámpat.			
CEREALS	Wheat	414	363	489	496	598	218	259	289	290	322	192	366	332	454	490	593
	Barley	...	351	...	475	482	...	245	...	320	351	189	...	283	...	454	479
	Fine rice (ziri)	342	436	461	571	574	178	303	347	306	390	...	231	432	429	565	571
	Coarse rice (sauthi)	320	346	...	324	...	242	259	...	238	...	276	147	323	...	322	...
	Jowár	159	157	177	163	186	113	112	107	145	144	107	116	138	152	155	166
	Bájra	160	123	135	162	163	113	114	112	129	130	109	118	117	118	140	141
	Maize	392	510	612	492	...	155	208	208	181	...	127	299	467	555	478	...
PULSES	Gram	433	390	440	546	606	225	316	374	374	447	336	240	360	413	476	563
	Masúr	...	104	...	...	...	...	91	...	...	...	63	...	75	...	...	...
	Moth	...	78	81	98	96	...	56	56	80	73	54	...	67	70	84	84
OTHER PRODUCTS	Cleaned cotton	62	80	117	77	93	29	45	72	42	53	48	41	76	113	75	90

D. IBBETSON,
Settlement Officer, Karnál.

I.

Statement showing the rate of Produce per acre, in sers of

Name of Assessment Circle.		TAHSIL GURGAON.																										
		Najafgarh Jhil.			Adjoining Dahar.			Gurgaon.			Sihl.			Kasan.			Hill.			Sohna.			*Silani.					
		Chahi.	Dahri.	Barani.	Chahi.	Dahri.	Barani.	Chahi.	Dahri.	Barani.	Chahi.	Dahri.	Barani.	Chahi.	Dahri.	Barani.	Chahi.	Dahri.	Barani.	Chahi.	Dahri.	Barani.	Chahi.	Dahri.	Barani.			
CEREALS.	Wheat	500	440	240	500	400	240	600	340	160	440	...	...	400	...	...	460	340	160	480	340	160	500	400	240
	Barley	640	540	320	580	440	320	600	420	220	570	...	200	580	...	200	520	400	200	580	440	220	560	480	320			
	Rice	...	720	...	...	...	...	720	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Jowar	...	320	...	...	240	...	220	...	...	200	...	...	220	...	...	260	...	...	220	...	...	240	...	...	
	Bajra	...	240	...	...	240	...	240	...	...	180	...	...	210	...	...	180	...	...	200	...	...	200	...	...	
	Maise	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	China	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Kangni	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Gram	...	320	...	...	280	...	240	...	...	200	...	...	...	...	...	220	...	...	240	...	...	280	...	...	
	Peas	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
PULSES.	Masur	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Moth	...	150	...	...	160	...	180	...	...	140	...	...	170	...	...	130	...	...	140	...	...	140	...	...	
	Makh	...	160	...	...	...	...	160	...	...	160	...	...	...	...	...	...	...	...	160	...	...	160	...	...	
	Mung	...	130	...	...	...	...	160	...	...	120	...	...	150	...	...	110	...	...	120	...	...	120	...	...	
	Mustard	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Til	...	...	...	...	...	...	200	...	...	...	...	...	...	...	...	200	...	...	200	...	...	200	...	...	
	Taramira	...	240	...	...	240	...	240	...	...	...	...	...	...	...	...	240	...	...	240	...	...	240	...	...	
OTHER PRODUCTS.	Cotton (uncleaned)	...	200	...	...	200	...	180	...	...	140	...	...	160	...	...	160	...	...	160	...	...	160	...	...	

80 Tola each, estimated in recent assessments in—GURGAON DISTRICT.

Ch.

TARSIK REWARI.																													
Farukhnagar.			Sahibi.			Bahora.			Hill.			Magda Salt.			Kansoti.			Shahjahanpur.			Palhawas.			Rewari.			Mundi.		
Chahi.	Dabri.	Barani.	Chahi.	Dabri.	Barani.	Chahi.	Dabri.	Barani.	Chahi.	Dabri.	Barani.	Chahi.	Dabri.	Barani.	Chahi.	Dabri.	Barani.	Chahi.	Dabri.	Barani.	Chahi.	Dabri.	Barani.	Chahi.	Dabri.	Barani.	Chahi.	Dabri.	Barani.
440	340	160	440	320	200	500	360	240	400	...	300	400	...	300	560	...	280	560	...	200	360	...	200	480	...	200	480	...	200
540	440	220	540	400	240	620	440	320	540	...	280	600	...	280	680	...	320	680	...	280	520	...	280	620	...	280	600	...	280
...
220	320	...	...	280	...	...	200	...	...	280	...	...	320	...	...	380	...	...	240	...	...	240	...	...	240	...	...
180	200	...	...	240	...	...	160	...	...	240	...	...	200	...	...	240	...	...	200	...	...	200	...	...	200	...	...
...
...
280	360	...	...	500	...	...	200	...	...	280	...	...	320	...	...	300	...	...	340	...	...	240	...	...	240	...	...
...
...
180	150	...	...	160	...	...	140	...	...	200	...	...	140	...	...	140	...	...	180	...	...	180	...	...	160	...	...
160	160	...	...	...	...	...	...	...	...	160	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
110	130	...	...	140	...	...	120	...	...	180	...	...	120	...	...	120	...	...	160	...	...	160	...	...	160	...	...
...	200	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	60	...	...	...	...	...
...
...	240	...	...	240	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
160	180	...	...	200	...	...	160	...	...	160	...	...	160	...	...	160	...	...	...	...	...	160	...	...	160	...	...

I.

Statement showing the rate of

Name of Assessment Circle.	TAHSIL PALWAL.																									
	Sahibi.			Bánger.			Bánger Khadir.						Khadir.			Bhuder.			Dahri.			Taoru.				
							Bánger.			Khadir.																
	Chahi.	Dabri.	Barani.	Chahi.	Dabri.	Barani.	Chahi.	Dabri.	Barani.	Chahi.	Dabri.	Barani.	Chahi.	Dabri.	Barani.	Chahi.	Dabri.	Barani.	Chahi.	Dabri.	Barani.	Chahi.	Dabri.	Barani.		
CEREALS.	Wheat	560	360	280	520	...	280	520	...	280	400	...	320	400	...	320	400	...	200	480	860	240	480	240	160	
	Barley	680	440	320	600	...	320	600	...	320	480	...	860	480	...	860	480	...	240	520	400	280	600	320	200	
	Rice	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Jowár	...	300	...	320	...	320	...	320	...	320	...	320	...	320	...	200	...	800	...	800	...	200	...	200	
	Bájra	...	240	...	240	...	240	...	240	...	200	...	200	...	200	...	240	...	240	...	240	...	200	...	200	
	Maise
	China	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Kangni
	Gram	...	320	...	320	...	360	...	240	...	240	...	240	...	240	...	240	...	240	...	280	...	240	...	240	
	Peas	280	...	280	...	280	...	280	...	280
PULSES.	Masúr	...	...	...	...	...	160	...	160	...	160	...	160	...	160	...	...	...	...	...	...	...	...	...	...
	Meth	...	180	...	240	...	240	...	240	...	...	...	...	...	240	...	240	...	240	...	240	...	180	...	180
	Másh	...	160	...	200	...	200	...	200	...	200	...	200	...	200	...	160	...	160	...	160	...	...	...	...
	Mung	...	160	...	200	200	...	200	...	200	160	...	160
	Mustard
	Til	320
	Táramirá	200	...	200	...	200	...	200	...	200	...	200	...	200	...	200	...	200	...	200	...	200	200
OTHER PRODUCTS.	Cotton (uncleaned)	...	160	...	200	...	200	...	160	...	160	...	160	...	160	...	160	...	160	...	180	...	180	...	160	160

Produce per acre, in—GURGAON DISTRICT.—concluded.

TAHSIL NUH.			TAHSIL FIROZPUR.															REMARKS.			
Bangar			Dahar			Chiknot			Mandikhera			Landoth			Bhadier				Punabana		
Chahl.	Dahad.	Barani.	Chahl.	Dahri.	Barani.	Chahl.	Dahri.	Barani.	Chahl.	Dahri.	Barani.	Chahl.	Dahri.	Barani.	Chahl.	Dahri.	Barani.		Chahl.	Dahri.	Barani.
520	400	280	560	400	280	600	400	280	600	400	320	600	480	320	520	440	360	520	400	260	
600	400	300	660	400	280	600	440	320	680	440	360	680	520	360	600	480	280	600	440	320	
	720		720			720			...			...			720			720		
	320		320			320			320			320			240			320			
	240		240			160			240			240			240			240			
			
			
			
	320		400			320			400			400			320			320			
			
	...		...			...			...			160			...			...
	180		180			240			240			240			240			240			
	160		160			...			200			200			...			200			
	160		160			...			200			200			200			200			
			
	200		200			200			...			200			200			200			
	240		280			...			240			240			240			240			
	200		260			160			200			200			140			160			

NOTE.—As no information regarding cleaned cotton is available, the figures have been given for uncleaned cotton.

CHAPTER I, QUESTION 3.

I. Rate of produce per acre estimated in recent assessments of Rohtak District. (Sers of 80 tolas each)

CROP.	NAME OF TRACTS.				REMARKS.	
	IRRIGATED LAND.		UNIRRIGATED LAND.			
	Manured.	Unmanured.	Manured.	Unmanured.		
CEREALS.	Wheat	...	580	...	The figures entered are the combined results of Mr. Purser's and my Assessment Reports, and agree very closely with Mr. Ibbetson's in Karnal.	
	Barley	...	...	...
	Rice	640	...	...
	Jowár	...	400	...		300
	Bájra	...	...	...		220
	Maize	...	...	...		...
	China	...	...	...		...
	Kangni	...	...	...		...
PULSES.	Gram	...	560	...	The staples are wheat, jowár bájra and gram; after these cotton, sugar-cane, and rice occupy moderate areas. All other crops are very limited in extent.	
	Peas	...	...	...		...
	Masúr	...	...	...		...
	Moth	...	...	...		310
	Mash	...	...	...		230
	Mung	...	...	...		240
OTHER PRODUCE.	Mustard	...	...	...	...
	Til	...	...	...	...
	Táramira	...	...	...	...
	Cotton, cleaned	...	75	...	50	

H. C. FANSHAWE,
Offg. Settlement Officer.

CHAPTER I, QUESTION 3.

MOOLTAN DISTRICT.—Statement showing the rate of yield per acre adopted in the assessment estimates of the Revised Settlement of the District.

NAME OF CROP.	IRRIGATED.								UNIRRIGATED.				REMARKS.			
	Well and canal.		Well and Sailab.		Well alone.		Canal alone.		Sailab alone.		Báráni.					
	Maxm.	Minm.	Maxm.	Minm.	Maxm.	Minm.	Maxm.	Minm.	Maxm.	Minm.	Maxm.	Minm.				
CEREALS.	Wheat	...	480	360	400	360	360	320	240	160	240	160	I have given the maximum and minimum for the different classes of land. The reason of this is, that in each Tahsil of this District, we find the same kind of assessment circles, first a strip of land inundated by the river, then a belt of good well land, generally well irrigated by canals, and lastly the poor well lands of the Ráwá, where canal irrigation is generally precarious. One Tahsil is almost a repetition of another, and there is but little variation in the rate of yield I have adopted in each circle.	
	Barley	...	...	...	...	...	...	...	480	320	...	...	...	...
	Rice	...	...	...	...	...	...	...	...	...	...	...	...	...
	Jowár	...	400	320	...	...	280	200	280	200	...	...	...	...
	Bájra	...	...	...	...	...	...	...	...	...	...	...	...	...
	Maize	...	Insigni- ficant.	...	...	...	...	...	...	...	...	...	...	...
China	...	400	320	} For all kinds.	}	200	200	}	}	240	160	}	}	}		
Kangni	...	280	240													
PULSES.	Gram	240	160	} For all lands.	}	}	I have made no distinction between manured and unmanured land because they are practically the same in this District.	
	Peas	...	...	...	...	...	...	...	...	280	160			
	Masur	...	...	...	...	...	...	...	...	240	200			
	Moth	200	200	} For all lands.	}	}	}					}
	Mash	...	...	...	...	160	120							
Múng	...	...	...	...	160	120								
OTHER PRODUCE.	Mustard	...	Insigni- ficant.	} For all lands.	}	}	I have given the uncleaned yield of cotton, as it is on this that all my estimates have been worked out.	
	Til	160	120									
	Táramira	240	160									
	Cotton (uncleaned)	...	220	220	220	220	200	200	160	160	160					160

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C. ROE,
Settlement Officer.

CHAPTER I, QUESTION 3.

Average rates of produce per acre, estimated during the settlement now in progress—MUZAFFARGARH DISTRICT.

Name of crops.	IRRIGATED.						REMARKS.	
	Chenab Bet circle.	Indus Bet circle.	Cháhí sailábá circle.	Cháhí circle.	Thal cháhí nahri circle.	Cháhí nahri circle.		
Cereals	Wheat ...	320	280	320	240	360	400	I am unable to give the details of irrigated and unirrigated manured and unmanured. The rain-fall here is so small that there is no unirrigated cultivation in this District unless the land irrigated by the rising of the rivers be considered unirrigated. No separate data were collected for manured and unmanured land. The use of manure is general and as I have explained in the answers to former questions the canal and flood water is so rich in fertilising silt that it supplies both manure and irrigation.
	Barley ...	320	280	320	240	360	400	
	Rice (or sháfi) ...	400	400	400	300	320	400	
	Jowár ...	200	200	200	160	240	240	
	Bájra ...	240	240	360	160	230	280	
	Maize ...	...	...	...	...	...	...
	Chiná ...	200	200	200	160	200	200	
Kangni ...	200	...	200	...	200	200		
Pulses	Gram ...	200	200	200	120	200	200	
	Peas ...	200	200	200	120	200	200	
	Masúr ...	160	160	160	...	160	160	
	Moth ...	80	80	80	...	160	80	
	Másh ...	200	...	200	...	...	80
Other products ...	Múng ...	200	200	200	...	80	80	
	Mustard ...	...	...	...	...	...	...
	Til ...	160	...	160	160	160	160	
	Tárámíra (usún) ...	120	120	120	80	160	160	
	Cotton (cleaned) ...	50	50	40	40	50	50	

CHAPTER I, QUESTION 3.

Statement showing the rate of produce per acre estimated in recent assessment of the Jhang District.

Name of crop.	Name of Tahsil.	IRRIGATED.			Rain lands.	Average out-turn for Tahsil.	REMARKS.
		By well and River floods	By well alone	By river floods alone.			
Cereals	Wheat	Chiniot	400	400	280	222	360
		Shorkot	400	350	310	240	337
		Jhang	380	350	280	220	339
	Barley	Chiniot	..	..	..	..	399
		Shorkot	440	400	320	320	382
		Jhang	460	400	300	..	391
	Jowár	Chiniot	..	..	..	..	150
		Shorkot	280	240	200	200	234
	Bajra	Jhang	260	240	200	200	243
		Chiniot	..	..	..	..	229
Maize	Chiniot	..	..	..	..	..
	Chiniot	..	..	..	..	..
Chinà	Chiniot	..	..	..	..	168	
	Shorkot	320	320	..	..	320	
	Jhang	320	320	..	..	320	
Pulses	Gram	Chiniot	..	..	..	..	236
		Shorkot	..	..	230	230	230
		Jhang	..	..	240	240	240
	Peas	Chiniot	..	..	..	..	..
		Shorkot	..	..	240	..	240
		Jhang	..	..	200	..	200
	Massūr	Chiniot	..	..	..	..	254
		Shorkot	..	..	160	..	160
		Jhang	..	..	160	..	160
	Mash Mung	Chiniot	..	..	..	..	175
Shorkot		..	..	220	220	220	
Jhang		..	..	200	200	200	
Other products .. Cotton	Chiniot	..	..	..	..	29	
	Shorkot	..	50	40	30	30	40
	Jhang	..	45	40	30	30	45

E. B. STEEDMAN,
Settlement Officer.

CHAPTER I, QUESTION 3.

Average rate of produce per acre in sérs of 80 tolas—DERA ISMAIL KHAN DISTRICT.

CROP.	DAMAN TRACT (TRANS-INDUS).										RIVER LANDS.						CIS-INDUS TRAIL.		REMARKS.	
	Torrent irrigated (Rodkahi).			Rain irrigated (Daggar).			Irrigated from perennial streams, (Kálá-páni).		Paniáá sandy tract (Bárán).	Khasor Hills (bárán).	Cháhí.			Sailába.			Cháhí.	Báráni.		
	Classes.			Classes.			Classes.				Classes.			Classes.						
	1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2nd.			1st.	2nd.	3rd.	1st.	2nd.	3rd.				
Cereals	Wheat	480	400	280	280	240	220	400	300	280	160	440	400	360	360	300	280	491	...	The wells in this District are almost all in the Indus low-lands or kachí. The river lands are nearly all included in the 2nd and 3rd classes, 1st class rates are only for the Pahárpúr circle and are exceptionally high.
	Barley	...	...	...	...	...	...	360	...	...	...	400	360	320	320	260	260	400	...
	Rice	...	...	...	...	...	...	400	320	...	...	...	...	...	...	...	...	...	...
	Jowár	320	240	160	210	160	120	300	280	...	160	440	320	260	320	260	260	260	...	
Pulses.	Báira	280	200	160	210	160	100	300	210	240	160	320	280	260	280	260	260	260	...	
	Gram.	...	...	...	...	...	...	...	...	160	...	...	...	320	320	280	...	160	...
	Peas.	...	...	...	...	...	...	...	...	...	...	...	...	...	320	280	...	...	...
	Masur	...	...	...	...	...	...	...	...	...	...	...	...	...	280	280	240	...	...
	Moth.	...	...	...	...	...	...	...	...	...	120	...	...	...	280	280	280	...	...
	Mash	...	...	...	...	...	...	...	...	...	...	...	...	...	320	320	280	...	160
Other produce.	Múng.	...	...	...	...	...	...	...	...	...	...	...	...	240	320	240	240	...	...
	Mustard	260	180	100	175	80	60	260	195	...	...	...	280	240	240	240	200	240	120
	Táramíra	260	180	100	175	80	60	...	...	...	...	...	240	240	240	240	200	240	120
	Til	100	240	...	160	160	...	
	Cotton (uncleaned)	160	120	70	120	80	50	160	120	280	160	160	120	200	...	

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CHAPTER I, QUESTION 3.

DERA GAZI KHAN.—Settlement estimated produce per acre in sers of 80 tolas each.

Name of crop.	Produce.	CHAHI NAHRI CIRCLE.			DANDA CIRCLE.			SAILAB CIRCLE.			PACHAD CIRCLE.			REMARKS.
		Higher.	Average.	Lower.	Higher.	Average.	Lower.	Higher.	Average.	Lower.	Higher.	Average.	Lower.	
Rabi ...	Wheat	600	400	200	600	450	300	510	350	200	500	350	200	<p>In para. 375 of his Report the Settlement Officer made the following remarks:— "To elicit produce rates it was necessary first to determine the average produce per acre for each crop and for each of the main sub-divisions of soil. To enable me to do this I made a series of experiments, cutting crops and weighing the grain upon the spot, in order to ascertain the actual gross produce. With the results of these experiments in my hand, I called a meeting of all the Zamindars of the District, and got them to agree to this table of produce per acre." The <i>astik</i> circle consist of the alluvial lands on the bank of the river Indus aided by its floods. The <i>ahdi-nahri</i> are tracts rather more removed from the river, where the land is irrigated both by wells and canals. The <i>Danda</i> are dorsal tracts still further removed from the river, which canals do not reach, and where cultivation depends mainly on laborious irrigation from wells. The <i>pachad</i> are dry tracts under the hills, depended for cultivation on drainage from the hills. According to the Settlement Officer's actual experiments the highest yield per acre of <i>jowar</i> was 37 maunds 34 sers (in the Rajanpur Tahsil). The crop, on which the above experiments were made, was manured and well irrigated from a canal. The medium yield per acre was 16 maunds 20 sers as observed in the Saughar and Rajanpur Tahsils. No manure was used to these crops which were irrigated from hill streams. The lowest yield per acre was 4 maunds 26 sers in the Saughar Tahsil without manure. The highest yield of wheat per acre was 25 maunds per acre of canal and well irrigated manured land. The average yield was 17 maunds 35 sers of canal and well-irrigated manured land. The lowest yield observed was 4 maunds 20 sers. The average yield without manure was 10 maunds. The highest yield of <i>bajra</i> observed was 17 maunds 30 sers. The average yield was 7 maunds 10 sers, and the lowest was 3 maunds 22 sers. The yield of rice in the <i>Kalapani</i> (irrigated by a perennial stream) circle of Jampur was found to be 20 maunds per acre. An acre of barley on light soil irrigated and manured, produced 11 maunds 30 sers.</p>
	Gram .. ..	..	..	..	..	..	..	500	250	150	..	..	..
	Barley .. ..	..	..	..	600	400	200	600	450	300	500	350	200
	Taramira .. ..	..	..	..	..	..	..	..	..	..	500	250	150
	Peas (estimated in cash)	..	..	..	..	..	..	Rs 12	Rs 8	Rs 4	..	..	..
	Adaa .. ..	..	..	..	..	..	..	600	250	110	..	..	..
Kharif.	Sarshaf .. ..	..	..	..	..	..	..	..	..	..	400	250	100
	Cotton	200	125	25	300	200	100	..	..	..	300	200	100
	Bajra	500	300	100	..	..	..	500	300	100	500	350	200
	Rice	600	400	200	..	..	..	..	..	..	..	..	..
	Til (sesamum) ..	200	100	45	..	..	..	..	..	..	..	..	..
	Sawak	200	125	50	..	..	..	..	..	..	..	..	..
	Mung	450	300	150	..	..	..	..	..	..	..	..	..
	Jowar	513	300	150	300	200	100	..	..	..	600	400	200
	Moth	300	200	100	..	..	..	..	..	..	..	..	..
	Indian corn ..	300	200	100	..	..	..	..	..	..	..	..	..
Chinā and kangai	200	125	50	..	..	..	..	..	..	..	..	..

QUESTION 3, CHAPTER I.

Rate of produce per acre estimated in recent assessment—BANNU DISTRICT.

CH. I.

Tahsil.	Assessment circle.	Wheat.	Barley.	Rice.	Jowár.	Bájra.	Maize.	Gram.	Cotton (cleaned.)
BANNU.	Western Waziri circle (unirrigated)	180	175	...	300	143	...	200	14
	Sohrá (irrigated) ...	247	211	...	204	221	333	...	35
	Sandidák (irrigated) ...	117	150	...	200	190	340	...	34
	Bannú (irrigated) ...	244	271	311	206	148	401	...	35
	Nár (irrigated) ...	287	207	252	138	160	348	...	25
	Trika (irrigated) ...	143	249	194	...	267	306	360	32
	Eastern Waziri Thal (unirrigated)	144	219	...	277	216	...	200	21
MARWAT.	Pakha (unirrigated) ...	173	198	...	160	199	...	149	30
	Gadwad (unirrigated) ...	129	129	...	160	136	...	151	30
	Tandobáh (irrigated) ...	163	229	...	160	143	170	93	30
	Nár (irrigated) ...	230	274	...	160	110	240	71	30
	Shiga (unirrigated) ...	106	100	...	160	93	...	119	...
	Shiga khatina (unirrigated) ...	142	154	...	160	114	...	164	...
ISA KHEL.	Bhangikhel (unirrigated) ...	144	119	...	136	101	...	...	14
	Mohár (unirrigated) ...	278	300	...	240	258	...	...	30
	Danda (unirrigated) ...	282	338	...	185	251	...	232	29
	Kacha (ditto) ...	298	298	...	200	280	...	171	23
	Kacha Pakka (unirrigated) ...	291	311	...	...	256	...	...	24
	Nehri (irrigated) ...	246	251	...	136	212	...	123	27½
MIANWALI.	Kacha Thal (unirrigated) ...	303	364	...	180	230	...	345	38
	Kacha Pakka (unirrigated) ...	295	342	...	164	246	...	319	36
	Kacha (unirrigated) ...	302	351	...	214	230	...	360	31½
	Pakkar (unirrigated) ...	167	232	...	125	177	...	127	26
	Mohár (unirrigated) ...	286	313	...	178	253	...	290	34
	Thal (unirrigated) ...	241	280	...	154	223	...	232	30

S. S. THORBURN,
Settlement Officer.

CHAPTER I, QUESTION 3.

Statement showing the produce or money value per acre which has been assumed in the KOHAT DISTRICT.—in sérs of 80 tolas each.

Number.	Tahsil.	Name of assessment circle.	CEREALS.												PULSES.						OTHER PRODUCTS.										
			Wheat.		Barley.		Rice.		Jowár.		Bajra.		Maize.		Kangni.		Gram Bārání.	Moth.		Másh.		Múng.		Mustard.	Til.		Tarámirá.		Un-cleaned cotton.		
			Abi.	Bārání.	Abi.	Bārání.	Abi.	Bārání.	Abi.	Bārání.	Abi.	Bārání.	Abi.	Bārání.	Abi.	Bārání.		Abi.	Bārání.	Abi.	Bārání.	Abi.	Bārání.		Abi.	Bārání.	Abi.	Bārání.	Abi.	Bārání.	
1	Hangá.	Chiná Bálá ...	400	100	600	125	720	3 0 0	160	80	720	180	320	160	..	200	..	240	..	200	100	160	80	320	160
2		Koh-i-Dáman	360	120	540	150	640	2 8 0	160	80	640	210	320	160	200	100	160	80	280	160
3		Chiná Payán	400	100	600	125	720	360	3 0 0	320	80	640	160	320	160	100	200	100	80	120	240	120
4	Kohát.	Toi I	360	100	540	110	520	..	16	4 0 0	160	80	560	140	80	160	100	160	80	..	80	200	100
5		Toi II ..	280	70	420	87	400	..	16	4 0 0	120	60	480	120	..	..	240	..	80	..	..	120	60	120	160	80	120	80	160	80
6	Kohát.	Kinára Daryá	..	120	600	150	..	..	12	3 0 0	120	60	680	..	..	320	..	100	..	..	..	100	..	120	..	80	..	80	200	100
7		Shakardaráh	..	100	..	125	2 0 0	..	60	80	60	..	80	..	30	100	
8		Kohi ..	280	70	420	87	1 0 0	..	40	320	320	..	70	40	20	..	80	120	60	

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E. G. HASTINGS,
Settlement Officer.

HAZARA DISTRICT—(ABBOTT-ABAD.)

Average rates of produce assumed as a basis of assessment at the late Settlement. CH. I.
Stated in sers of 80 tolas each.

Produce.	Average yield per acre.		REMARKS.
	On irrigated land.	On unirrigated land.	
Wheat	388	210	
Barley	464	277	
Rice	272	...	
Jowár ... ..	...	...
Bájra	439	254	
Maize	512	296	
Chiná ... ..	...	...
Kangní	161	128	
Gram ... ..	...	...
Peas ... ..	...	...
Masúr ... ..	...	183	
Moth	227	168	
Másh	259	308	
Mung			
Mustard	275	202	
Til	120	105	
Táramíra ... ..	...	...
Cotton	261	145	

QUESTION 3, CHAPTER I.

The following statistics of produce are extracted from Mr. Baden Powell's *Punjab Cn Products* (Class III, Division I, pages 215 to 220).

Produce.

I now come to the last head, *viz*; the productiveness of the land, and the costs and profits of cultivation. The produce per acre in the various Districts may be best gathered from a tabular statement from all Districts; such a one now follows:—

It was compiled from returns supplied to the Lahore Museum in 1860. The rates vary much; but we must bear in mind that the estimate is only a proximate one; and that the differences of local situation, the facilities of irrigation, the absence or presence of "kallar" in the soil, the character and caste of the agriculturists, the prosperity of the District generally, the moderation and justness of the Government assessment (amounting on an average to a third or a fourth of the estimated produce), * the definition and security of proprietary rights,—have all of them great power to modify the agricultural prosperity of a District, and consequently to affect the area of land brought under cultivation, as well as the style of cultivation, and amount of produce.

Division.	District.	Name of grain &c.,	Produce in grain per acre.	Produce in straw	Average height of crops.
			Sérs.	Sérs.	Ft. inches
LAHORE ...	Lahore ...	The particulars are given in a separate and detailed table.	...	...	...
		Wheat ...	...	...	...
		{ Khadir lands	320	...	...
		{ Near the Bár	400	...	...
		{ On the Bár	560	...	...
		Barley ...	300	...	...
		{ Khadir	360to480	...	...
		{ Bár	...	...	...
		{ Sailabi	...	...	...
AMRITSAR ...	Amritsar...	Wheat, white (on rohi land)	240	...	...
		Barley (on dosháhi land)	640	480	3 6
		Red wheat (on rohi land)	480	380	2 0
		Chola (gram) ditto	640	400	2 6
		Saron ditto	560	80	1 3
	Stalkot ...	Vadanak wheat (1st quality)	380	...	3 0
		Red wheat, "lál kanak"	600	480	4 6
		Barley	480	400	4 0
		White wheat from Adálatgarh	...	360	4 0
		Ditto from Syjoke	420	...	...
		Rice from Chak Rám Dás	720	...	...
		Ditto from Siránwálla	480	...	...
		Ditto Bákúpur of Pasrúr	330	...	...
	Gurdáspur	Mustard seed	330	...	...
		Sugar	110	...	...
		Rice	140	...	...
		Wheat	420	...	...
		Linseed	280	...	...
		Taramíra	105	...	...
			140	...	...
RAWALPINDI	Gujrat ...	Wheat, kanak dagar of 1st quality.	...	...	...
		{ Rohi ...	830	350	...
		{ Doshahi...	750	330	...
		{ Maira ...	600	320	...
		{ Rohi ...	700	320	...
		{ Doshahi...	660	310	...
		{ Maira ...	600	310	...

* Or to one sixth in fairly lightly assessed tracts.

Division.	District.	Name of grain &c.	Produce	Produce	Average					
			in grain per acre,	in straw.	height of crops.					
			Sérs.	Sérs.	Ft. inches					
RAWALPINDI- concluded.	Gujrat—conld.	Red wheat "lal kanak" (of 1st quality)	Rohi ...	720	330	...				
			Doshahi...	660	320	...				
			Maira ..	600	330	...				
		Ditto (of 2nd quality) ...	Rohi ...	680	320	...				
			Doshahi...	640	320	...				
			Maira ...	600	310	...				
		Ghoni kanak (of 1st sort) ...	Rohi ...	530	240	...				
			Doshahi...	480	240	...				
			Maira ...	440	240	...				
		Ditto (of 2nd quality) ...	Rohi ...	480	240	...				
			Doshahi...	440	240	...				
			Maira ...	400	230	...				
		Barley, "Jau" (of 2nd quality)	Rohi ...	560	130	...				
			Doshahi...	520	120	...				
		Gram	...	350	...	...		
		Rice (cháwal)	...	560	...	...		
		Maize (makkai)	...	420	...	...		
		Jowar (holcus sorghum)	...	280	...	...		
		Bajra (penicillaria spicata)	...	350	...	...		
		Dál mung (Ph. mungo)	...	280	...	...		
		Dál masúr (lentil)	...	280	...	...		
		Dál másh, or urad (Ph. radiatus)	...	280	...	...		
		Mot kála (Ph. aconitifolius)	...	160	...	...		
		Mot, safaid (cyamopsis psoraloides)	...	160	...	...		
		Chalodra or mandal (eleusine coracana)	...	210	...	...		
		Kaiyini (black pulse)	...	140	...	...		
		Chiná (panicum milliaceum)	...	280	...	...		
		Dáugri (pulse) (cajauns)	...	210	...	...		
		Karain (pulse), (cajauns)	...	210	...	...		
		Kodra, (paspalum scrobiculatum)	...	210	...	...		
		Shahpur	Millet (china)	...	480		
				Do. (Kangni, (P. italicum)	...	440		
				Do. (swank) (oplismenum frumentaceum)	{	200 or		
						240		
				Do. (bajra)	...	320		
				Do. (jowar)	...	360		
				Pulse (mash)	...	280		
				Mung	...	240		
				Masúr	...	280		
				Moth	...	320		
				Lobiya	...	80		
				Gram (chana)	...	400		
				* Kohát	Wheat (kanak), of 1st quality	...	1,360	1,280	5 0
						Ditto (of 2nd quality)	...	1,360	1,280	5 0
				Pesháwar...	...	Barley (jau)	...	1,920	2,400	3½ 0
Barley (jau)	...	1,600	200			2½ 0				
† Hazára ...	...	Wheat (kanak)	...	208	...	...		
		Barley (jau)	...	252	...	...		
DERAJAT ...	Dera Ghazi Khan.	Rice (cháwal)	...	332	...	...		
		Oil seeds (sarshaf)	...	160	...	...		
		Wheat (kanak)	...	420	...	...		
		Ditto (makkewála)	...	210	...	...		
		Ditto (pambaf)	...	280	...	...		
		Barley (jau)	...	350	...	...		
		Black barley	...	350	...	...		
		Rice	...	490	...	...		
		Ditto	...	490	...	...		
		Bajra	...	420	...	...		
		Jowar	...	420	...	...		

* Kohát—I believe this and the Pesháwar rate to be a mistake, unless the maunds are kachá, from 13 to 20 sérs instead of 40.

† The list given by Major Abbott to the Agri-horticultural Society of produce in Hazára (where the soil is classed according to the number of harvests it yields), is as follows:—

Name of grain.	Tín-fasli soil, séra,	Tín-fasli soil.	Ek-fasli soil.
		Séars.	Séars.
Maize ...	480 Séars	320	240
Cotton ...	90	120	80
Rice ...	...	...	480
Jowár ...	...	160	...
Kangni ...	...	...	100
Bájra ...	...	...	80
Mash ...	...	...	48
Múng ...	...	...	80
Moth ...	...	...	80
Rawán ...	Sown always with other grain	...	80
Wheat ...	194	140	352
Barley ...	360	240	180

Division.	District.	Name of grain &c.	Produce in grain.	Produce in straw.	Average height of crops.		
			Séars.	Séars.	Ft. In.		
DERAJAT— <i>continued.</i>	<i>Dera Ghazi Khan</i>	Gram	350	...	...
		Peas	350	...	...
		Moth	140	...	...
		Dál (múng)	210	...	...
		Mohri	350	...	...
		Simuka	140	...	...
		Sawank	210	...	...
		Gram	210	...	...
		<i>Bannu</i>	Kangni	250	296	3 4
				Barley	336	254	2 8
China	360			320	12 0		
MOOLTAN ...	<i>Mooltan</i> ...	Wheat	360	640	3 0		
		Barley	400	480	2 0		
	<i>Jhang</i>	Wheat (called rodi kanak)	499	417	2½—1	
			Ditto (inferior land)	372	310	2—2½	
			Wheat (canal land)	540	621	½—33	
			Ditto (inferior land)	413	345	2—2½	
			Barley (canal land)	504	336	2½—3	
			Ditto (inferior land)	250	166	2—2½	
JULLUNDUR	<i>Jullundur</i>	Wheat ... { Cháhi	400	...	...
		... { Báráni	160	...	...
		Barley ... { Cháhi	440	...	...
		... { Báráni	160	...	...
		Gram	800	...	...
		Bájra	160	...	...
		Maize ... { Cháhi	640	...	...
		... { Inferior	320	...	...
		Chari (Jowár)	200	...	...
		Mash	320	...	...
		<i>Hoshiárpur</i>	...	Wheat (of 2nd quality) ... { Cháhi	320	600	...
				... { Báráni	260	400	...
... { Best rohi	480			880	...		
CH-SUTLEY STATES.	<i>Umballa</i> ...	Ditto (of 1st quality) ... { Cháhi	960	1,000	...		
		... { Báráni	480	800	...		
		Wheat (ransli)	780	2,160	3 0		
		Gram (khadir)	600	1,200	1 6		
		Linseed (khadir)	120	...	1 6		
		Lentils	200	200	1 6		

Division.	District.	Name of grain &c.	Produce	Produce	Average	
			in grain per acre.	in straw.	height of crops.	
			Sers.	Sers.	Ft. inches	
CIS-SUTLEJ STATES—contd.	Ludhiana ...	Wheat	640	...	...
		Rice	560	...	...
		Barley	560	...	...
		Maize	760	...	...
		Jowár	760	...	...
		Bájra	520	...	...
		Gram	760	...	...
		Moth	2,640	...	...
		Másh	...	...	...
		Múng	400	...	...
		Sesamum (til)	240	...	...
		Sarson	440	...	...
		DELHI ...	Delhi ...	Wheat	276	...
Barley	256			...	...
Barley, on unirrigated land	84			...	...
Jowár	210			...	...
Rice	375			...	...
Gram	254			...	...
Jowár	620			...	...
Karnal ...	Wheat ...		{ Irrigated best land	520	600	3 0
			{ Bángar	280	280	2½ 0
			{ Rausli	380	380	2½ 0
	Barley ...		{ Irrigated best land	480	480	2½ 0
			{ Bángar	280	280	1½
			{ Khádir	380	380	2 0
Gram ...	{ Irrigated best land	380	260	2 0		
	{ Bángar	400	320	1½		
	{ Khádir	380	380	1 0		
	{ Sarson	200	200	160 0		
HISSAR ...	Hissar ...	Rice, the kind called bászmati	480	...	...
		Rice (shakarchini)	400	...	...
		Ditto (munji)	400	...	...
		Jawi or javi (oats)	600	...	...
		Jowár	360	...	...
		Gram	720	...	...
		Moth, jowar, múng	360	...	...
	* Rohtak ...	Dánda wheat	Dánda wheat	254
			Rice	294
			Barley	334
			Maize	258
			Kangni	252
			Gram	264
		Múng	126	...	...
		Urd	126	...	...
		Moth	120	...	...

* More recently I have received from the Deputy Commissioner of Rohtak under his letter No. 592 dated 18th August 1864, the following table showing the produce in canal and rain irrigated villages.

					Average produce per packka bigáh of canal villages.	Average produce per packka bigáh of bārañi villages.
Wheat	...	...	...	...	400	280
Paddy	...	...	...	...	480	...
Barley	...	...	...	...	480	200
Imphee	...	...	...	...	240	300
Indian corn.	...	...	...	...	280	320
Bájra	...	...	...	...	240	400
Kangni	...	...	...	...	280	100
Gram	...	...	...	...	480	400
Mung	...	...	...	...	320	280
Urd	...	...	...	...	320	280
Moth	...	...	...	...	...	440
Jowár	...	...	...	...	...	480
Mustard or rape seed	...	...	...	...	280	160
Til	...	...	...	...	...	240
Goor, (molasses from sugar-cane)	...	...	...	...	720	...

One or two Districts, from the peculiarities of the situation, or means of irrigation, could not conveniently be included in the above table; they are given separately.

PRODUCE OF SIRSA. I.—PRODUCE OF TRACT ON THE BANK OF THE SUTLEJ.

Local name of the grain or quality of the grain.	Whether grown with irrigation or not.	Average height of stem.	Soil in which grown.	AVERAGE YIELD PER ACRE.		Remarks as to outward appearance.
				Grain.	Straw.	
Kanak "paman" (wheat of large size, long grain, and translucent appearance).	By irrigation	Feet. 4½	Rausli and dakur.	Sérs. 400	Sérs. 600	Long and dark coloured beard.
Kanak "daudkhani" (wheat of very white colour.)	Ditto ...	3	Ditto ...	300	450	No beard at all; consumed chiefly by wealthy people.
Kanak "lál" (wheat of smaller size, and reddish appearance.)	Ditto ...	3	Ditto ...	360	540	Short and white beard
Jau (barley)	By irrigation and rain.	4	Rausli and bhoor.	480	480	Short beard and ear

II.—PRODUCE OF THE TRACT ON THE BANK OF THE STREAM GHAGAR.

Kanak "lál" wheat of small size, and reddish colour.	By irrigation	3	Rausli and dakur.	480	960	Long and white beard
Jau, (barley)	By irrigation and rain.	3	Rausli, dakur and bhoor.	480	480	Long beard and short ear.
Cholá (gram)	By ditto ...	1½	Dakur and Rausli.	600	1,200	

III.—BY RAIN.

Jau (barley)	By rain ...	2½	Rausli ...	186	372	Long beard and ear.
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KANGRA DISTRICT.

Crop.	Produce per acre.	Quantity of seed required for sowing.	REMARKS.
	Sérs.	Sérs.	
Wheat ..	300	26½	Principally in Kángra valley.
Barley ..	260	35	Grows also higher upon the mountains.
Maize ..	340	320	One return gives about 16 maunds an acre or 10 maunds a bigah ; perhaps this includes the cobs.
Rice ..	580	44	Mr. Barnes mentions that he has counted 1,100 seeds on one head of rice. One return gives only 3¼ maunds of husked rice, but that was a fine quality.
Amaranth (chaulai)	160	...	
Mandal (eleusine) ..	240	..	
Másh ..	80	5½	Usually sown mixed with kúlth,
Gram ..	380	2	
China ..	160	...	Both Kúlth and Kangra.
Ginger ..	160	...	

Statement showing the quantity of the several sorts of grain produced at Lahore.

Name of grain.	Time of sowing.	Number of times of ploughing.	Quantity of seed per acre.	Cost per acre.	Quantity of grain produced.	REMARKS.
			Sérs.		Sérs.	
Wheat ...	October ...	7 or 8 times ...	40 to 45 ...	It does not need hoeing.	1,000 to 1,200	Abundantly produced in Májáh and Kallar lands (high lands from the river), but very little near the Rávi banks; if sown there, the crop produces more grain.
Barley ...	October ...	4 to 5 " ...	35 to 40 ...	Ditto ...	1,400 to 1,600	Kallar land produces more grain and less straw than the others. Barley is mostly used as a food for horses, and very little by the men of lower classes. It is made into sattu, or flour, made after parching the grain. The crop does not need hoeing. Barley parched is called khat, and with gram, chaná-chabina.
Gram ...	September and October.	2 or 3 " ...	12 to 15 ...	Ditto ...	800 to 1,000...	It is eatable when parched, and is used as dál (split gram); when ground into "besan" it is used for making sweetmeats. In its raw state it is food for horses.
Mustard ...	October ...	4 to 5 " ...	10 to 12 chittaks	It needs hoeing	120 to 160 ...	From its seeds oil is extracted, which is used for many purposes: the stalk is useless.
Masúr or lentils...	Ditto ...	2 or 3 " ...	25 to 28 ...	It does not need hoeing.	600 to 800 ...	It is used as dál, and is made into bread: the bhúsá answers well for the food of animals, and the grain is given to bullocks.
Chúrál ...	Ditto ...	2 or 3 " ...	Ditto ...	Ditto ...	Ditto ...	Cooked as dál its flour is baked into chapátís, and its stalk for cattle.
Linseed ...	September and October.	5 or 6 " ...	10 to 28 ...	It needs hoeing twice.	Ditto ...	If it is cultivated for its fibre, it is sown with 28 sérs of seed to an acre, otherwise 10 sérs is sufficient. If grown for oil its stalk is useless: the land is manured before sowing; the crop is watched.
Rice of all descriptions.	May and June	4 to 5 " ...	12 to 15 ...	Rs. 3-8-0 ...	1,400 to 1,600	Kallar land produces very good rice, but not so the Májáh land. It is a very wholesome food; from it are made sweetmeats, the flour is baked into chapátís. The straw is not so useful for fodder as the other straw, therefore its chief use is a litter: the land in which it grows is manured: the crop is watched when standing green in the field.
Sesumum ...	July ...	3 or 4 " ...	10 to 12 chittaks	...	100 to 120 ...	It yields an oil and is used in making sweetmeats. Hindus on one of their fasts use it for food.

Jowár (holcus sorghum.)	July ...	3 or 4 times ...	20 to 25 séra	No need of hosing.			When green answers well as fodder for cattle, and called "charri." The parched grain is eaten by the country people. Its flour is baked into chapátis.
Másh	July and Aug.	2 or 3 "	5 to 8	Ditto	200 to 280		It is used as dál, and mixed with rice, makes "khichri." In famine its flour is made into chapátis by the country people; also "baria" are made of it by soaking the grain in water for a night; next morning the soft grain is gently rubbed to remove the skin, it is next ground on a flat stone and mixed with spices; this paste is made into balls, which are put for a time in the sun till they dry. Dál and khichri is made of this, and very seldom chapátis of its flour.
Moth	June and July	2 or 3 "	5 to 7	Ditto	160 to 200		Ditto ditto ditto ditto.
Múngi	July ...	Ditto ...	3 to 4	Ditto	280 to 320		The people when in need make bread of it and also khichri; it is food for birds; it is much eaten, however, in the tract or country called Pothohar, between the Jhelum and Indus.
Báira	June or July	3 or 4 "	Ditto	Ditto	320 to 360		
Kangni	June or July	2 "	1½ to 2	Ditto	400 to 480		The people when in need make bread of it and also khichri; it is food for birds; it is much eaten, however, in the tract or country called Pothohar, between the Jhelum and the Indus.
China	Ditto	Ditto	2 to 2½	Ditto	320 to 400		Ditto ditto ditto ditto.
Swánk	Ditto	4 times	Ditto	Ditto	Ditto		It is made into "khir" (grain and milk boiled together), khushkáh, grain boiled in water, khichri, &c.
Maize	Ditto	6 or 7 times	28 to 30	Ditto	1,600		It is made into bread; the boiled grain is used for eating. It is generally parched and sold in bazár by people for eating, called "challi" and "sitta" as it is used as dalyá. Useful for making bread, and is a sort of food for animals.
Mandal	July	2 or 3 times	10 to 12	Ditto	400 to 480		Bread is made of it; also khichri, grain and rice boiled in water.
Kodra	Do.	2 or 3 "	10 to 12	Ditto	Ditto		The root is used by natives and Europeans as an article of food. It is procurable at every season of the year.
Arve or ginján	February and March.	8 or 10 "	6 to 7	Rs. 18	4,000 to 4,200		
Potatoe	October	15 times	6 to 7	Rs. 25	5,600		The root is used by natives and Europeans as an article of food. It is procurable in every season of the year.
Sugar-cane	February and March.	15 or 16 times	Rs. 19	Rs. 20	6,000		It is much esteemed by all classes, who chew it as a sweetmeat. The process of sugar making is described later in the book.
Muskmelon, water melon, &c.	Ditto	12 or 14 times	Rs. 3 to 4	Rs. 15 or 16	Rs. 37 or 63		Esteemed as a fruit.
Cotton	April and May	5 or 6 times	9 to 10	Rs. 12	200 to 240		A fibre.
Red-pepper	Ditto	Ditto	Rs. 2½	Rs. 12	Rs. 20		When dry, the produce is about 5 maunds (200 séra) per acre.

CHAPTER I, QUESTION 3.

Abstract of District Officers' replies showing staple food of the people, the estimated consumption of food grains per head per diem; and the annual consumption deduced therefrom.

N. B. The Estimates are given as furnished. But it is believed that the average consumption is overated. The replies in detail will be found appended to Question 5.

1	2	3			4		5		6		7			8			9			10			11			12			13			14			15			16			17			18			19
		POPULATION (REVISED CENSUS).			AVERAGE DAILY CONSUMPTION PER HEAD OF POPULATION PER DIEM IN DECIMALS OF A SER.		PROPORTION IN WHICH THE PRINCIPAL FOOD GRAINS ARE CONSUMED (TOTAL DIET = 100).			TOTAL ANNUAL CONSUMPTION OF FOOD GRAINS AT THE RATE STATED IN COLS: 6-13.			REMARKS.																																		
		Agriculturists.	Non-agriculturists.	Total.	By agriculturists.	By non-agriculturists.	Wheat.	Inferior grains.	Pulses.	Wheat.	Inferior grains.	Pulses.	Wheat.	Inferior grains.	Pulses.	Class of population.	Wheat. Mds.	Inferior grains. Mds.	Pulses. Mds.	Total. Mds.																											
Delhi ...	Delhi ...	2,63,348	3,45,502	6,08,850	0.80	0.59	22	64	14	45	33	22	23	26	Agriculturists ...	4,17,143	12,13,508	2,65,455	18,96,106																												
		Non-agriculturists	8,39,570	6,15,986	4,10,456	18,65,711																												
		Total ...	12,56,713	18,29,493	6,75,911	37,61,817																												
	Gurgaon ...	8,07,492	2,98,154	6,96,646	0.88	0.66	...	62½	37½	17	60	23	23	26	Agriculturists	19,87,491	11,92,445	31,79,936																												
		Non-agriculturists	3,93,137	10,76,954	4,12,833	17,94,924																												
		Total ...	3,05,137	30,64,445	16,05,278	49,74,860																												
Karnal ...	3,04,282	3,06,646	6,10,927	0.79	0.59	28	36	36	48	26	26	26	26	Agriculturists ...	6,13,432	7,88,699	7,88,699	21,90,830																													
	...	...	...	...	...	...	...	...	...	...	...	...	...	Non-agriculturists	7,94,823	4,30,530	4,30,530	16,65,833																
	...	...	...	...	...	...	...	...	...	...	...	...	...	Total ...	14,08,255	12,19,229	12,19,229	38,46,713																
Hissar ...	Hissar ...	3,49,907	1,34,774	4,84,681	0.84	0.52	...	83	17	25	37½	37½	37½	Agriculturists ...	...	22,21,735	4,55,054	26,76,789																												
		...	...	...	...	...	...	...	...	...	...	...	...	Non-agriculturists	1,59,201	2,38,803	2,38,803	6,36,807																	
		...	...	...	...	...	...	...	...	...	...	...	...	Total ...	1,59,201	24,60,538	6,93,857	33,13,596																	
	Rohtak ...	2,90,184	2,46,773	5,36,959	0.85	0.61	...	83	17	71	4	26	26	Agriculturists ...	...	18,67,893	3,82,568	22,50,401																												
		...	...	...	...	...	...	...	...	...	...	...	...	Non-agriculturists	9,81,177	55,278	3,45,485	13,81,940																	
		...	...	...	...	...	...	...	...	...	...	...	...	Total ...	9,81,177	19,23,111	7,28,053	36,32,341																	
Sirsa ...	1,48,866	61,989	2,10,795	1.00	0.80	...	100	...	25	75	...	...	Agriculturists ...	...	13,66,486	...	13,66,486																											
	...	...	...	...	...	...	...	...	...	...	...	...	Non-agriculturists	1,13,038½	3,39,115½	...	4,52,154																		
	...	...	...	...	...	...	...	...	...	...	...	...	Total ...	1,13,038½	17,05,601½	...	18,18,640																		

Umballa	Umballa ...	1,69,928	7,85,560	10,36,488	1.00	0.50	22	35	32	22	24	34	Agriculturists ...	9,64,820	19,29,642	13,98,691	42,88,009
													Non-agriculturists	9,08,289	18,16,870	14,09,720	41,28,688
	Total ...													18,73,109	37,46,512	27,97,351	84,16,697
Ludhiana	Ludhiana ...	8,03,951	2,79,294	6,83,240	1.00	0.74	22	46	52	22	44	44	Agriculturists ...	6,15,505	12,51,010	8,89,062	27,95,577
													Non-agriculturists	4,18,751	8,29,503	6,40,980	18,85,284
	Total ...													10,34,256	20,80,513	15,30,042	46,80,861
Simsa	Simsa ...	13,351	20,644	33,995	0.79	0.69	19	70	11	38	40	40	Agriculturists ...	18,204	67,290	10,578	96,127
													Non-agriculturists	36,788	66,887	7,808	1,11,478
	Total ...													55,092	1,34,177	18,386	2,07,605
Jullundur	Jullundur ...	4,08,954	8,90,810	7,94,764	1.05	0.40	33	53	16	49	52	52	Agriculturists ...	12,16,406	19,16,762	5,52,912	86,86,080
													Non-agriculturists	18,97,878	8,12,900	5,42,036	28,52,813
	Total ...													26,14,284	28,29,662	10,94,948	65,38,893
Hoshiarpur	Hoshiarpur ...	7,12,322	4,26,568	9,38,890	0.88	0.77	25	55	20	49	54	54	Agriculturists ...	10,24,644	22,54,217	8,19,715	40,98,576
													Non-agriculturists	14,68,128	10,15,232	6,07,816	29,85,976
	Total ...													24,87,772	32,69,449	13,27,531	70,84,552
Kangra	Kangra ...	5,27,086	2,16,796	7,43,882	0.78	0.60	15	27	8	29	36	36	Agriculturists ...	5,63,323	28,91,725	8,00,439	37,55,487
													Non-agriculturists	8,44,216	6,64,690	1,78,044	11,86,968
	Total ...													9,07,541	35,56,415	4,78,483	49,42,455
Amritsar	Amritsar ...	2,69,765	5,62,985	8,32,750	0.71	0.37	34	54	12	46	51	51	Agriculturists ...	5,98,888	9,43,238	2,09,607	17,46,728
													Non-agriculturists	13,54,763	13,54,763	2,08,941	29,18,447
	Total ...													19,18,641	22,97,986	4,18,548	46,65,175
Sialkot	Sialkot ...	4,19,804	5,85,700	10,05,004	0.73	0.60	34	57	9	52	53	53	Agriculturists ...	9,43,057	15,81,007	2,49,632	27,73,696
													Non-agriculturists	14,00,994	8,89,093	4,04,138	26,94,220
	Total ...													23,44,051	24,70,100	6,53,770	54,67,916
Gurdaspur	Gurdaspur ...	4,20,882	4,85,344	9,06,126	0.82	0.66	17	30	3	48	48	48	Agriculturists ...	5,36,625	25,25,292	94,698	31,56,615
													Non-agriculturists	13,39,273	13,39,273	2,32,917	29,11,464
	Total ...													18,75,898	38,64,565	3,27,615	60,68,079
Lahore	Lahore ...	8,17,631	4,72,033	7,89,666	0.79	0.67	30	28	22	84	4	4	Agriculturists ...	11,43,471	6,40,344	5,08,128	22,86,943
													Non-agriculturists	20,61,849	98,183	2,94,550	24,54,582
	Total ...													32,05,320	7,38,527	7,97,678	47,41,525
Ferozepore	Ferozepore ...	3,39,842	2,09,411	5,49,253	1.00	0.80	33	50	17	33	50	50	Agriculturists ...	10,26,649	15,55,629	5,28,880	31,11,058
													Non-agriculturists	6,04,471	7,64,350	2,59,879	15,28,700
	Total ...													15,31,120	23,19,979	7,88,759	46,39,758
Gujranwala	Gujranwala ...	2,24,778	3,25,798	5,50,576	0.88	0.79	33	50	17	33	50	50	Agriculturists ...	6,00,824	9,10,339	3,08,615	18,20,878
													Non-agriculturists	7,74,096	11,72,873	3,98,777	23,45,746
	Total ...													13,74,920	20,83,212	7,08,292	41,66,624

CHAPTER I, QUESTION 3.

Abstract of District Officers' replies showing staple food of the people, the estimated consumption of food grains per head per diem; and the annual consumption deduced therefrom.

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1	2	3	4	5	6 7		8 9 10 11 12 13						14 15 16 17 18					19			
					POPULATION (REVISED CENSUS).			AVERAGE DAILY CONSUMPTION PER HEAD OF POPULATION PER DIEM IN DECIMALS OF A SER.		PROPORTION IN WHICH THE PRINCIPAL FOOD GRAINS ARE CONSUMED (TOTAL DIET=100)						TOTAL ANNUAL CONSUMPTION OF FOOD GRAINS AT THE RATE STATED IN COLS: 6-13.					
					Agriculturists.	Non-agriculturists.	Total.	By agriculturists.	By non-agriculturists.	By agriculturists.			By non-agriculturists.			Class of population.	Wheat Mds.		Inferior grains. Mds.	Pulses Mds.	Total Mds.
Wheat.	Inferior grains.	Pulses.	Wheat.	Inferior grains.						Pulses.											
Rawalpindi	Rawalpindi ...	4,73,778	2,37,478	7,11,256	1.06	0.91	.63	29	8	43	44	13	Agriculturists ...	28,59,440	13,16,250	8,63,108	45,98,793				
													Non-agriculturists	8,62,665	8,72,494	2,67,782	19,82,941				
													Total ...	37,12,105	21,88,744	6,20,885	65,21,734				
	Jhelum ...	8,02,594	1,98,894	5,00,988	0.68	0.68	57	27	16	74	17	9	Agriculturists ...	9,05,518	4,28,927	2,54,179	15,88,619				
													Non-agriculturists	7,70,761	1,77,067	98,741	10,41,669				
	Gujrat ...	8,55,182	2,61,198	6,16,347	1.04	0.67	50	40	10	90	...	10	Agriculturists ...	16,78,099	13,42,474	8,36,619	33,56,186				
													Non-agriculturists	14,28,084	...	1,68,676	15,86,760				
													Total ...	31,06,177	13,42,474	4,94,295	49,42,946				
	Shahpur ...	1,66,864	2,03,482	3,68,796	0.75	0.63	37	54	9	81	9	10	Agriculturists ...	4,19,421	6,12,128	1,02,021	11,33,570				
													Non-agriculturists	9,49,544	1,05,505	1,17,228	11,72,277				
													Total ...	13,68,965	7,17,633	2,19,249	23,05,847				
Mooltan	Mooltan ..	1,85,410	2,86,153	4,71,563	0.75	0.70	46	47	7	60	33	7	Agriculturists ...	5,83,374	5,96,066	88,774	12,68,204				
													Non-agriculturists	10,96,225	6,02,966	1,27,896	18,27,087				
													Total ...	16,79,599	11,99,022	2,16,670	30,95,291				
	Jhang ...	1,57,674	1,90,353	3,48,027	0.66	0.72	40	33	27	56	18	26	Agriculturists ...	8,78,418	3,12,194	2,55,432	9,46,044				
													Non-agriculturists	7,03,545	2,26,139	3,26,646	12,56,330				
													Total ...	10,81,963	5,38,333	5,82,078	22,02,374				

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Derajat	Montgomery ...	1,51,527	2,07,910	5,59,457	0.77	0.62	59	84	10	70	18	12	Agriculturists ...	5,99,289	8,68,854	1,07,018	10,70,169
													Non-agriculturists	8,28,659	9,13,082	1,42,064	11,83,789
													Total ...	14,27,941	5,76,996	2,49,070	22,53,947
	Musafargarh...	1,73,442	1,22,106	2,95,547	0.82	0.80	45	46	9	72	22	6	Agriculturists ...	5,86,928	5,99,971	1,17,885	18,04,284
													Non-agriculturists	6,41,344	1,95,966	53,446	8,90,756
												Total ...	12,28,272	7,95,937	1,70,881	21,95,040	
	D. I. Khan ...	1,87,096	2,07,768	3,94,864	1.00	0.70	60	28	12	86	54	10	Agriculturists ...	10,24,351	4,78,080	2,04,870	17,07,261
													Non-agriculturists	4,77,761	71,66,44	1,82,712	18,27,117
													Total ...	15,02,112	11,94,674	3,37,582	30,34,368
	D. G. Khan ...	1,64,729	1,44,111	3,08,840	1.60	1.40	88	55	12	86	54	10	Agriculturists ...	7,98,664	13,22,774	1,88,605	24,06,048
													Non-agriculturists	6,32,766	10,45,540	1,82,712	18,41,018
													Total ...	14,56,430	23,68,314	4,21,317	42,46,061
	Bannu ...	1,93,004	94,543	2,87,547	0.75	0.64	89	57	10	53	87	10	Agriculturists ...	4,88,101	7,48,088	1,31,248	18,12,427
													Non-agriculturists	2,89,373	2,02,014	54,598	5,46,986
													Total ...	7,32,474	9,50,097	1,85,842	18,58,413
Peshawar	Peshawar ...	2,67,284	2,55,888	5,23,152	1.00	0.90	88	59	8	83	58	9	Agriculturists ...	8,02,594	14,34,940	1,94,568	24,32,102
													Non-agriculturists	6,98,277	12,18,467	1,89,076	21,00,840
													Total ...	14,95,871	26,53,427	3,83,644	45,32,942
	Kohat ...	99,215	46,204	1,45,419	0.60	0.60	42	58	...	50	38	17	Agriculturists ...	2,28,145	3,15,057	...	5,48,202
													Non-agriculturists	1,36,484	85,479	43,004	2,52,967
													Total ...	3,54,629	3,98,536	43,004	7,96,169
	Hazara ...	2,67,434	99,784	3,67,218	1.31	1.08	28	72	8	49	48	8	Agriculturists ...	7,36,278	23,04,853	1,60,069	32,01,185
													Non-agriculturists	4,80,094	4,50,704	28,169	9,38,967
													Total ...	11,96,367	27,55,557	1,88,228	41,40,152
	Grand Total ...	91,20,546	84,90,952	1,76,11,498									Grand Total ...	4,87,97,991	6,02,50,866	1,86,10,046	12,76,58,303

TOTALS OF DIVISIONS.

Delhi ...	9,65,122	9,51,801	19,16,423	...	...	...	...	...	...	...	...	...	29,70,105	61,12,867	35,00,418	1,25,89,890
Hissar ...	7,88,947	4,49,488	12,92,435	...	...	...	...	...	...	...	...	...	12,53,416	60,89,250	14,21,910	87,64,577
Umballa ...	7,67,290	8,65,498	15,62,728	...	...	...	...	...	...	...	...	...	29,58,417	59,40,911	43,45,769	1,32,45,997
Jullundur ...	14,49,862	10,34,174	24,77,536	...	...	...	...	...	...	...	...	...	60,09,697	96,55,632	29,00,761	1,85,65,800
Amritsar ...	11,09,951	16,33,929	27,48,880	...	...	...	...	...	...	...	...	...	61,68,590	86,32,614	18,94,928	1,61,96,170
Lahore ...	8,82,251	10,07,244	18,89,495	...	...	...	...	...	...	...	...	...	61,11,360	51,41,618	22,94,729	1,35,47,707
Rawalpindi ...	12,95,888	9,00,499	21,97,587	...	...	...	...	...	...	...	...	...	98,68,521	48,54,845	16,82,349	1,64,00,715
Mooltan ...	6,68,053	8,06,521	14,74,874	...	...	...	...	...	...	...	...	...	54,17,775	31,10,228	12,18,649	97,46,552
Derajat ...	5,44,829	4,46,422	9,91,251	...	...	...	...	...	...	...	...	...	35,81,016	45,13,085	2,44,741	91,38,842
Peshawar ...	6,33,918	4,01,876	10,85,789	...	...	...	...	...	...	...	...	...	30,46,867	58,07,520	6,14,876	94,69,263
Total Ra. ...	91,20,546	84,90,952	1,76,11,498	...	...	...	...	...	...	...	...	...	4,74,80,665	5,98,58,508	2,08,19,130	12,76,58,303
													Acres	Acres	Acres	Acres
													69,54,258	86,27,780	35,37,500	1,85,19,846
													Sers	Sers	Sers	Sers
													299	279	229	276
													Average acreage of these crops per annua			
													Deduced annual consumption per acre thus cultivated			

CHAPTER I, QUESTION 3.

1-3

Statement of imports and exports of Food Grains, Oil seeds and Butter (Ghi), compiled from the Punjab Trade Returns commencing 1869-70 and ending 1877-78.

I

EXPLANATION.—The North Frontier trade is with Bajaur (North of Peshawar) and with Kashmir and Central Asia North thereof. The West Frontier trade is with Afghanistan. The South Frontier trade is with Sind, Bahawalpur, Bikaner and Jaipur. Nearly all the river trade is with Sind. The East Frontier trade is with the North Western Provinces and other British Provinces supplied through them. The Railway exports to Calcutta and Bombay for Europe are consequently included under this head.

ACROSS WHAT FRONTIER.	WHEAT.		OTHER FOOD GRAINS.		GHI.		OIL SEEDS.		OIL.		TOTAL.	
	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.
1873-74												
NORTH FRONTIER—By native carriage	...	...	26,803	10,653	20,963	21	5,074	69	25	...	52,565	10,743
WEST FRONTIER—By native carriage	...	...	901	126	2,670	...	...	...	...	...	3,571	126
SOUTH FRONTIER.	By native land carriage...	...	36,085	4,05,142	3,621	1,419	4,606	13,038	...	4,045	44,322	4,28,644
	By native boats on the Indus	...	49,209	6,51,678	42	7,147	15	1,80,747	2,510	209	51,336	8,39,781
	By Steam Flotilla on the Chenab and Indus	...	Not shewn.	Not shewn.	Not shewn.	Not shewn.	Not shewn.	Not shewn.	Not shewn.	Not shewn.	Not shewn.	Not shewn.
Total	...	...	85,364	10,56,820	3,663	8,566	4,621	1,93,785	2,510	4,254	96,158	12,63,425
EAST FRONTIER.	By native land carriage...	...	2,04,500	14,38,359	770	365	13,471	84,776	310	1,565	2,19,051	15,26,065
	By Sind Punjab and Delhi Railway	Page 10 of Report.	5,94,788	27,01,990	Not shewn.	Not shewn.	Not shewn.	Not shewn.	Not shewn.	Not shewn.	...	32,96,778
	By East Indian State Railway	...	29,483	11,67,512	21,019	746	25,316	1,01,660	...	...	75,818	12,69,918
Total	...	...	5,94,788	23,93,983	21,789	1,111	38,787	1,87,436	310	1,565	2,94,869	60,92,761
GRAND TOTAL	...	...	5,94,788	34,70,651	49,085	9,698	48,482	3,81,290	2,845	5,819	4,47,463	73,67,055
1874-75												
NORTH FRONTIER—By native carriage	20,900	98,059	46,016	55,548	36,093	3,400	7,882	962	1,468	725	1,12,359	1,58,694
WEST FRONTIER—By native carriage	78,438	39,079	16,521	19,387	3,962	13	149	...	1,031	860	94,091	59,339
SOUTH FRONTIER.	By native land carriage...	78,121	1,69,854	1,93,702	6,15,580	6,445	4,821	39,515	88,563	2,034	10,053	3,19,817
	By native boats on the Indus	140	2,56,993	13,770	2,18,196	...	2,896	...	2,06,792	4,012	11,732	17,323
	By Steam Flotilla on the Chenab and Indus	Not shewn.	Not shewn.	Not shewn.	Not shewn.	Not shewn.	Not shewn.	Not shewn.	Not shewn.	Not shewn.	Not shewn.	Not shewn.
Total	78,261	4,56,847	2,07,472	8,33,786	6,445	7,717	39,615	2,46,355	6,046	21,785	3,37,739	15,55,490
EAST FRONTIER.	By native land carriage	4,08,468	10,73,869	1,73,672	3,79,360	2,325	8,302	10,692	34,296	2,284	4,796	5,92,441
	By Sind Punjab and Delhi Railway	6,109	7,28,512	68,163	20,10,449	571	72	2,929	47,007	4,245	19,774	82,007
	By East Indian State Railway	73,674	2,49,523	...	...	30,352	508	...	...	...	1,04,026	2,50,031
Total	4,83,251	20,61,904	2,41,825	23,89,799	33,248	8,682	13,621	81,303	6,529	24,570	7,78,474	45,56,458
GRAND TOTAL	6,55,850	26,45,889	5,10,834	32,98,520	79,738	20,012	61,107	3,27,620	15,074	47,940	13,22,663	63,39,981

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		1875-76											
NORTH FRONTIER—By native carriage		87,808	80,879	84,728	88,402	42,616	8	11,158	1,822	8,618	2,078	1,59,418	1,77,686
WEST FRONTIER—By native carriage		19,048	37,084	7,002	36,970	5,980	2	288	125	58	782	82,674	76,948
SOUTH FRONTIER		80,086	1,68,601	2,46,889	8,46,190	8,987	8,882	79,016	48,680	86,649	4,658	8,96,477	5,56,906
By native land carriage		...	...	...	...	...	...	...	...	...	...	...	...
By native boats on the Indus		4,22,267	8,888	1,82,879	8	2,920	...	2,99,628	609	789	4,187	9,08,488	9,08,488
By Steam Flotilla on the Chenab and Indus		2	1,041	8,617	2	114	...	8,26,587	8,171	24	4,214	8,29,184	8,29,184
Total		80,086	5,76,070	2,51,618	5,32,586	8,994	8,416	79,316	6,78,845	40,229	5,616	4,04,886	17,94,588
EAST FRONTIER		8,67,699	12,180	1,10,380	1,55,218	800	8,194	4,584	87,801	728	8,310	4,84,199	2,44,684
By native land carriage		...	...	...	...	...	...	...	...	...	...	...	...
By Sind Punjab and Delhi Railway		87,740	4,175	2,06,686	2,10,180	496	77	1,147	80,582	5,839	44,789	2,51,901	8,19,767
By East India State Railway		8,88,339	20,639	...	...	15,881	288	26,906	16,862	1,144	2,890	8,80,970	89,039
Total		7,48,672	86,844	8,17,076	8,56,869	16,982	8,528	81,687	1,46,278	7,708	49,488	11,17,070	6,08,460
GRAND TOTAL		8,80,664	7,40,877	6,40,414	10,20,327	68,982	19,960	1,22,092	8,20,887	51,608	87,890	17,16,746	26,62,611
		1876-77											
NORTH FRONTIER—By native carriage		16,758	88,820	88,127	55,752	48,462	11	22,498	539	2,148	1,460	1,17,928	1,46,582
WEST FRONTIER—By native carriage		24,618	49,320	14,984	84,879	8,841	82	469	180	97	898	48,979	1,85,289
SOUTH FRONTIER		41,858	1,48,481	2,78,811	8,29,878	10,969	9,040	1,44,818	88,279	8,229	8,628	4,86,178	5,28,751
By native land carriage		...	...	...	...	...	...	...	...	...	...	...	...
By native boats on the Indus		5,77,756	4,710	1,80,556	...	7,088	88	6,40,782	1,171	2,816	8,914	14,08,478	14,08,478
By Steam Flotilla on the Chenab and Indus		17,597	808	15,742	...	224	...	4,17,829	2,837	4	3,648	4,81,296	4,81,296
Total		41,858	7,48,684	2,84,880	8,26,676	10,969	9,827	1,44,846	11,01,990	11,780	8,948	4,93,789	28,86,520
EAST FRONTIER		5,07,681	26,404	1,17,999	8,06,665	8,889	9,627	4,671	87,412	4,184	1,824	6,87,874	4,00,582
By native land carriage		...	...	...	...	...	...	...	...	...	...	...	...
By Sind Punjab and Delhi Railway		26,736	16,782	2,75,104	5,14,894	79	79	6,706	89,600	8,899	15,577	5,19,174	6,86,482
By East Indian State Railway		68,231	2,16,401	1,09,324	1,65,229	1,875	9,089	87,884	2,81,870	6,994	966	2,24,808	6,56,245
Total		6,04,648	2,68,287	5,02,617	9,75,288	8,948	11,996	49,821	8,78,882	19,627	18,087	11,81,666	16,62,209
GRAND TOTAL		6,87,882	11,40,011	8,86,488	16,91,696	68,618	21,066	2,17,064	14,81,871	88,497	26,358	18,41,996	42,60,600
		1877-78											
NORTH FRONTIER—By native carriage		88,176	2,14,316	88,487	1,27,468	45,427	2	28,160	288	5,406	1,026	1,42,614	8,48,094
WEST FRONTIER—By native carriage		12,684	81,620	7,708	20,246	11,290	7	171	25	186	26	32,084	61,928
SOUTH FRONTIER		60,668	98,291	1,69,342	2,91,956	8,976	2,973	29,956	7,499	2,151	2,488	2,65,991	4,03,131
By native land carriage		...	...	...	...	...	...	...	...	...	...	...	...
By native boats on the Indus		1,866	12,14,584	11,768	8,88,330	60	28,820	881	2,87,108	3,256	...	17,769	18,68,842
By Steam Flotilla on the Chenab and Indus		...	86,176	224	48,570	...	6,124	200	1,26,898	4,658	662	4,980	2,67,926
Total		62,423	18,99,051	1,81,824	6,78,886	4,036	8,917	80,986	4,21,000	9,862	8,096	2,88,780	25,84,898
EAST FRONTIER		7,38,807	1,47,807	78,261	13,68,159	9,658	6,709	21,049	72,887	5,437	748	8,58,177	16,85,760
By native land carriage		...	...	...	...	...	...	...	...	...	...	...	...
By Sind Punjab and Delhi Railway		48,772	9,01,833	1,80,208	88,88,217	1,868	2,022	28,978	12,511	21,987	1,477	2,26,508	67,61,060
By East Indian State Railway		6,788	8,47,672	1,21,868	60,121	5,466	2,078	82,822	82,646	11,672	827	2,27,616	4,42,889
Total		7,94,367	19,96,812	8,29,825	72,51,497	16,466	10,804	1,27,849	1,17,994	88,996	2,662	18,07,002	87,79,669
GRAND TOTAL		9,02,649	80,41,798	5,54,289	80,78,041	77,217	48,780	1,81,676	5,89,807	84,850	6,688	17,70,880	11,709,674

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CH. I.

Abstract of the foregoing.

	1873-74.			1874-75.			1875-76.			1876-77.			1877-78.			AVERAGE OF THE 5 YEARS ENDING 1877-78.		
	Imports.	Exports.	Excess of Exports.	Imports.	Exports.	Excess of Exports.	Imports.	Exports.	Excess of Exports.	Imports.	Exports.	Excess of Exports.	Imports.	Exports.	Excess of Exports.	Imports.	Exports.	Excess of Exports.
Wheat ... ..	...	5,94,788	5,94,788	6,56,880	28,46,888	19,90,039	8,30,654	7,40,577	-90,077	6,87,389	11,40,011	4,52,622	5,02,649	30,41,738	21,89,149	6,16,907	16,89,618	10,17,906
Other food-grains	8,47,001	68,75,480	60,28,479	5,10,834	69,96,820	27,85,986	6,40,414	10,20,327	3,79,913	8,88,488	15,91,590	7,03,102	4,54,289	30,76,041	75,33,762	6,78,608	40,72,769	34,59,184
Total	8,47,001	69,70,268	66,23,197	11,67,714	69,44,408	47,77,725	14,71,068	17,60,904	2,89,836	15,23,820	27,31,601	12,08,786	14,56,938	1,11,19,839	66,42,901	11,88,912	67,05,402	45,16,490
Oil seeds	48,482	8,81,390	8,32,908	61,167	8,27,620	2,66,453	1,22,022	8,20,867	6,98,776	2,17,064	14,61,671	12,44,607	1,81,676	5,99,807	3,57,652	1,30,098	7,10,181	5,80,088
Oil	2,848	5,819	2,974	15,074	47,040	32,966	51,609	87,890	36,281	38,497	36,388	-7,139	84,530	6,698	-47,862	31,674	29,841	-2,978
Gbl	68,089	9,698	89,887	79,728	20,013	-59,715	62,983	13,050	-49,933	66,610	31,068	-47,850	77,217	43,720	-39,487	68,727	21,491	-47,236
Grand Total	4,47,463	73,67,065	69,18,697	12,23,663	69,36,981	50,17,918	17,18,748	36,83,611	9,88,866	18,41,988	42,60,600	24,18,604	17,70,880	1,17,09,874	69,39,104	14,19,249	64,66,588	50,46,916

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CHAPTER I, QUESTION 3.

CH. I.

Surplus of food grains exported from, and deficiency imported into, each District abstracted from the replies of District Officers.

Division.	District.	Surplus exported.	Deficiency imported.	REMARKS.
		Mds.	Mds.	
DELHI	Delhi	...	9,00,000	Wheat, gram, bájra, jowár, rice, pulses, from Gurgaon, Umballa, Amritsar, Meerut, Rohtak, Bhiwáni and Kárnal.
	Gurgaon	10,00,000	...	Wheat, gram, barley, bájra, jowár, moth to Delhi, Alwár, Jeypur and Kari.
	Karnál	9,00,000	3,12,000	Exports principally wheat to Delhi and Umballa. Imports wheat barley, gram, bájra, pulses, from Patnála and Bhiwáni.
HISSAR	Hissar	9,06,136	...	Bájra, mung, moth, gram, to Bikaner, Jeypur, Jodhpur and Delhi.
	Rohtak	16,00,000	...	Jowár 4,00,000
				Barley 3,00,000
				Gram 6,00,000
			Wheat 2,60,000	To the principal marts in the Hissar and Gurgaon Districts.
	Sirsa	...	13,50,000	From Bikaner moth and bájra; from Patnála wheat, barley and gram; from Hissar jowár and mung.
UMBALLA	Umballa	...	29,85,518	Principally wheat, gram, maize, rice and pulses. The rice from North West Provinces, the rest from Patnála State and Punjab Districts.
	Ludhiána	4,00,000	...	Principally wheat and gram; also jowár and maize :-to Hindustan by Rail.
	Síma	...	77,800	Principally wheat and gram from the plains.
JULLUNDUR	Jullundur	65,000	6,50,000	Imports principally gram, moth, and jowár from Ferozepore. Also small quantities of other grains from Amritsar and Hoshiárpur. Exports principally wheat and jowár to Unah, Ludhiána and Umballa, from the Naushahra Tahsil.
	Hoshiárpur	7,00,000	5,60,000	The imports are principally millets and coarser grains from the tracts south of the Sutlej; and they are imported to take the place of large supplies of grain which are sent up into Kángra and other hill Districts. About half of the exports are wheat, rice, gram and barley exported eastwards.
	Kángra	1,00,000	9,00,000	The exports are rice to Ludhiána, Hoshiárpur, Jullundur, Gurdáspur and Amritsar. The imports are wheat, maize, gram and pulses from the same cities.
AMRITSAR	Amritsar	8,84,204	...	The amount entered is the total surplus of a good year, which is either stored or exported to Hindustan and Sind. In a bad year grain is imported from the country-south of the Sutlej and from Sind.
	Sílkot	68,000	2,76,500	The exports are rice to Rawalpindi, Amritsar and Lahore. This year 83,000 maunds besides (nearly all wheat) has been exported north to Jann. This is exceptional. The imports are principally gram 1,61,560 maunds and wheat 60,000 maunds and pulses 29,000 maunds, the pulses from Amritsar and Jullundur, the wheat from Jhelum, Ferozepore and Jullundur, and the gram from Ferozepore.
	Gurdáspur	...	...	No surplus for export. In years of scarcity the deficiency is made up by imports from the country south of the Sutlej and from Amritsar.

Surplus of food grain exported from, and deficiency imported into, each District abstracted from the replies of District Officers.—concluded.

DIVISION.	District.	Surplus exported.	Deficiency imported.	REMARKS.
		Mds.	Mds.	
LAHORE	Lahore ...	9,00,000	9,00,000	Exports wheat, gram and pulses from Tahsil Kasur to Amritsar and Sind, imports of the same grains from Ferozepore, Montgomery and Faridkot. There is no real surplus to speak of.
	Ferozepore ...	65,00,000	...	Of the total produce of the District only $\frac{1}{2}$ is consumed. The remainder goes to Districts where scarcity prevails or to Kurrachi, Bombay and Calcutta; or else accumulates.
	Gujránwála ...	...	6,33,962	Local produce insufficient. Imports principally wheat, gram jowár rice and barley from adjoining Districts especially Ferozepore, Gurdáspur contributes part of the barley.
RAWALPINDI...	Rawalpindi ...	...	2,37,700	Rice, gram, wheat and barley from Kángra, Hazára, Pesháwar and Hazára and Kashmir.
	Jhelum ...	4,50,000	...	Principally wheat, usually to Mooltan and Sind; some to Rawalpindi:—
	Gujrat ...	6,16,000	...	Wheat and bájra, to Jhelum, Gujránwála, Wasirabad, Siákot, Pind Dadán Khan.
	Shahpur ...	...	3,10,200	Wheat from Bannu, Jhelum and Gujrat.
MOOLTAN	Mooltan ...	4,92,000	...	All wheat except 8,000 maunds gram; to Sind by Indus river. In 1877, about twice, this amount was exported owing to the scarcity in Southern India.
	Jhang ...	...	2,00,000	Of this $\frac{1}{2}$ is wheat, and the remainder gram, bájra &c; the exports come mostly from Shahpur, Míanwall, Dera Ismail Khan, Montgomery &c.
	Montgomery ...	12,94,936	...	The surplus stated is wheat. Information concerning other grains not forthcoming. The surplus goes to Mooltan and Lahore, for export to Sind, Calcutta and Bombay. Some goes also to Shahpur.
	Muzaffargarh ...	Data not forthcoming.	...	Data cannot be given; but a large quantity is exported to Sind via Mooltan and Dera Ghási Khan.
DERAJAT	Dera Ismail Khan	Data not forthcoming.	...	Data not given; yield usually in excess of local requirements. There is also a large importation from Meerut (Bannu). The grain exported is mostly wheat, about 60,000 Powindabs enter the District every winter and consume a large quantity of grain.
	Dera Ghási Khan	3,50,000	3,00,000	The exports are jowár, wheat and mustard seed, down the Indus to Sind. The imports are wheat and gram from towns higher up the Indus.
	Bannu ...	5,00,000	...	Three-fourths wheat, the rest gram; mostly down the Indus towards Sind; and some eastwards towards the Jhelum District. Estimate probably under the work.
PESHAWAR	Pesháwar ...	5,00,000	2,75,000	The exports (wheat, barley, and maize) are the produce of lands in the District cultivated by residents of independent territory, who take their crops to their homes. The imports are wheat, from Kohát and Bajour, rice from Swát, Bonair and Tirah, gram pulses from Rawalpindi and Hazára.
	Kohát ...	Data not forthcoming.	...	There is a steady export of wheat from the District especially from the Teri Ilaka.
	Hazára ...	5,600	...	About one per cent. of the produce is exported to Pesháwar and Rawalpindi.

Note.—Hazára suffered unusually from scarcity at the beginning of 1878, owing to the failure of its principal kharif crop. The above answer is presumably due to this fact. But for 12 months in 1872-73 the exports were restricted, and amounted to 2,00,000 maunds, (see settlement report page 178), from a long residence in Hazára I am able to say that there is usually a steady flow of grain south-ward from the District.—E. WACE

QUESTION 3, CHAPTER I.

Punjab Tables of Agricultural Statistics compiled for the International Statistical Congress.

CH. I.

These papers as containing the result of the most general and complete experiments yet made in the Punjab, with a view to ascertaining the average produce of the soil; as well as a variety of other data concerning the agriculture of the Province; are reproduced nearly in full. They are the papers referred to in the reply to this question, under the name of the Financial Commissioner's experiments.

No. 265, dated 15th March 1876.

From—G. W. RIVAZ, Esquire, Officiating Secretary to Financial Commissioner, Punjab,

To—The Officiating Secretary to Government, Punjab,

WITH reference to your No. 192, dated 8th February 1875, and subsequent reminders, calling for certain returns to be compiled upon the basis of forms forwarded with the letter from the Secretary to the Government of India in the Revenue, Agriculture and Commerce Department, No. 5, dated 25th January 1875, I am now desired to submit the accompanying sets of returns, which have been compiled in this office in accordance with the instructions of the Government of India, so far as has been practicable.

2. The statistics of area have been given in terms of acres; those of weight in terms of the local maund, sér, or chitak, of which the equivalents in English weights are as follows:—

(1).—Maund= $82\frac{2}{7}$ lbs. avoird.(2).—Sér= $\frac{1}{16}$ maund= $2\frac{2}{16}$ lbs. avoird.(3).—Chitak= $\frac{1}{12}$ sér= $\frac{9}{10}$ lbs. avoird.

3. The information regarding estimates for 1873 gives the figures for the official year 1873-74, i. e. from 1st April 1873 to 31st March 1874.

4. The column showing average areas, which in accordance with the instructions should embrace the returns for five years, from 1869 to 1873, only give the averages for four years, beginning with the official year 1870-71 and ending with the official year 1873-74. They could not be furnished for 5 years, as statistics in such detail were not forthcoming for the years previous to 1870-71.

5. The averages of seed sown and of out-turn have been obtained from a vast number of experiments reported to the Financial Commissioner in consequence of the enquiries instituted by him in 1871, regarding which instructions were given in this office Book Circular XX. of 1871. No annual returns of this nature have been prepared; but as the experiments, the results of which have now been embodied, extend over a considerable period and number several thousands, the results may be considered to be as general in their nature as if this had been the case. With regard to their accuracy, it is necessary to remark that the facilities for supervision of such returns are limited, and that only of late have attempts been made to procure such statistics upon an extensive scale, and the subject is one which requires considerable experience on the part of those who make the observations, and a careful exclusion of all unreliable data, to an extent which the returns now furnished can hardly claim.

6. The statements constituting the series of the questionnaire have been filled up so far as has been practicable, and these statements comprise the first nine of the series now submitted.

7. The remaining statements, 30 in number, are supplementary to the above, and give the actual area of land under cultivation of each of the principal crops grown in the Punjab, for the 4 years from 1870-71 to 1873-74, with abstracts. The returns of area given in the 10 statements forming the questionnaire series have been extracted from the figures given in these supplementary statements.

8. The Financial Commissioner proposes to utilize such portion of the information contained in these statements as refers to the productive capability of the soil in different parts of the Province for furnishing the local officers with information on this subject, and he has it in contemplation to print some of the returns with this object. He trusts that the accompanying statements, which have involved an amount of labor in calculation which is not adequately represented by the returns themselves, will be found to answer the purpose for which they were prescribed.

FIRST PART.

AREAS.

Extent of land under each description of cultivation.

	According to Surveys.	Estimate for 1873.
	Acres.	Acres.
Cereals and other food crops	} These details cannot be given.	17,555,960
Market garden cultivation		196,153
Cultivation of crops, useful for industrial purposes		1,972,437
Artificial pastures ... ..		.....
Natural grass lands		4,961,352
Arboriculture		58,378
Vineyards		<i>a Nil.</i>
Total cultivated area ...	b 29,602,246	c 24,744,270
Fallow land	} These details cannot be given.	<i>d</i>
Woods and forests		<i>e</i> 7,073,012
Uncultivated lands		<i>f</i> 28,341,596
Total uncultivated area ...	g 35,414,608	35,414,608
TOTAL OF CULTIVATED AND UNCULTIVATED AREA ...	A 63,016,854	60,158,878

Remarks.—As the second column shows the area under cultivation for both crops, as well as natural grass lands, which are not included in the cultivated areas of the Province as ascertained from surveys, the juxtaposition of the two totals for cultivated area is somewhat misleading. There are two kinds of fallow land in the Punjab,—1, land which is allowed to lie fallow for a single crop, in consequence of short rain-fall, or from other causes; 2, land which has been abandoned for some time, or which is only cultivated in very exceptional years. Column I, the cultivated area, according to surveys, contains both kinds, but none of the natural grass lands. Column II, contains natural grass land, but no fallow. The extent of fallow of the second kind, above described, is very large, and there is no reason to conclude from a comparison of column 2 with column 1 that cultivation has in reality decreased.

The natural grass lands entered in column 2 are for the most part extensive, unenclosed wastes, which afford grazing to cattle. These are, for the most part, the property of Government; but portions are also demarcated in village boundaries, and form the common land of the villages.

LAHORE:

The 15th March 1876.

W. M. YOUNG,

Sett. Secy. to Finl. Commr., Punjab.

a Vineyards. There are none distinguished as such in the Punjab.*b* Includes fallow.*c* For both crops—spring and autumn.*d* Cannot be given separately.*e* This area is probably much below the mark, but is the nearest which can be given.*f* This is the uncultivated area of the Province after deducting "woods and forests" and "grazing" lands.*g* Excluding fallow.*A* This does not include the Himalayan and Trans-Himalayan Provinces of Kulu, Lahoul and Spiti, of which the areas are not accurately known, but which are roughly estimated at 4,168,960 acres in the aggregate.

SECOND PART.

PRODUCE OF CROPS.

1st.—Cereals and other food crops.

	No. of cultivated Acres.	SEED SOWN PER ACRE. AMOUNT IN M. S. C.		AVERAGE GROSS PRODUCE PER ACRE.	
		1873.	Average year.	1873.	Average year.
		M. S. C.	M. S. C.	M. S. C.	M. S. C.
<i>Cereals.</i>					
Wheat (<i>Triticum vulgare</i>)	5,820,861	.....	1 1 11	.....	10 30 1
Barley (<i>Hordeum hexastichon et caelesti</i>)	1,784,920	.....	0 35 10	.....	12 28 9
Maize (Indian corn) (<i>Zea Mays</i>)	986,043	.....	0 13 9	.....	7 10 8
Jowar (Great millet) (<i>Holcus sorghum</i>)	2,022,262	.....	0 9 3	.....	7 16 11
Bajra (Spiked millet) (<i>Penicillaria spicata</i>)	2,490,078	.....	0 8 7	.....	5 32 8
Kangri (Italian millet) (<i>Pennisetum Italicum</i>)	99,004	.....	0 9 11	.....	5 17 7
China (<i>Panicum miliaceum</i>)	101,260	.....	0 9 12	.....	5 22 9
	13,304,408				
<i>Farinaceous.</i>					
Rice (<i>Oryza Sativa</i>)	734,957	.....	0 32 5	.....	10 14 11
<i>Pulses and other food crops.</i>					
Gram (<i>Cicer arietinum</i>)	1,306,061	.....	0 20 4	.....	3 2 13
Moth (<i>Phaseolus acoutifolius</i>)	1,171,478	.....	0 4 0	.....	4 31 6
Mash (<i>Phaseolus radiatus</i>)	269,722	.....	0 7 2	.....	5 3 1
Mung (<i>Phaseolus munge</i>)	284,061	.....	0 4 7	.....	5 0 6
Masur (<i>Ervum lens</i>)	167,134	.....	0 12 5	.....	2 29 0
Arhar (<i>Cajanus flayus</i>)	8,417	.....		.....
Matar (<i>Pisum sativum</i>)	111,824	.....	0 39 15	.....	5 39 13
Turmeric (<i>Curcuma longa</i>)	8,805	.....	*	.....	*
Coriander seed (<i>Coriandrum sativum</i>)	5,988	.....	*	.....	*
Ginger (<i>Zinziber officinale</i>)	982	.....	*	.....	*
Chillies (<i>Capiscum frutescens</i>)	36,626	.....	*	.....	*
Other kinds	150,487	*	*
Total	3,516,585				

* No experiment returns for these crops.

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2nd.—Market garden cultivation.

	No. of Acres under cultivation.	VALUE OF THE HARVEST PER ACRE IN Rs. A. P.	
		1873-74.	Average year.
		Rs. A. P.	Rs. A. P.
Fresh vegetables of all kinds (beans, lentils, green peas, cabbages, carrots, turnips, radishes, pumpkins, melons, salads, gourds, cucumbers, baigans, "solauum melongena" &c.)	196,153	21 14 5	21 4 10

The annual value of market garden cultivation has been calculated at twice the rental of tobacco land per acre.

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I. PRODUCE OF CROPS—Continued.
3rd.—Principal crops useful for industrial purposes.

	No. of Acres under cultivation.	SEEDS SOWN PER ACRE IN M. S. C.		GROSS AVERAGE PRODUCE OF SEED PER ACRE.	
		1873.	Average year.	1873.	Average year.
		M. S. C.	M. S. C.	M. S. C.	M. S. C.
<i>Oil-giving plants.</i>					
* Rape seed (Sarson) (Sinapis juncea)	361,178	.....	0 4 6	.....	5 22 11
† Linseed	19,936	.....	0 6 9	.....	4 20 12
Til (Sesamum orientale)	188,547	.....	0 3 14	.....	3 13 8
Taramira (Sinapis campestris or eruca)	152,387	.....	0 6 10	.....	3 32 8
Total	722,648				

* Commonly called "mustard."

† The fibre of the plant is also used for industrial purposes.

	No. of Acres under cultivation.	AVERAGE PRODUCE PER ACRE IN M. S. C.	
		1873.	Average year.
		M. S. C.	M. S. C.
<i>Textile plants.</i>			
Hemp (Crotalaria juncea)	41,268	.....	2 26 12
Cotton	624,459	.....	4 16 9
Total	665,727		

	No. of Acres under cultivation.	Seed sown per Acres in	AVERAGE PRODUCE PER ACRE IN M. S. C.	
			1873.	Average year.
			M. S. C.	M. S. C.
<i>Other principal crops useful for industrial purposes.</i>				
Tea	9,805	.....	.....	.....
Sugar-cane "gur" (raw sugar)	374,125	.....	.....	27 4 14
Tobacco	74,429	.....	.....	13 8 0
Safflower	23,246	.....	.....	.....
Indigo	89,959	0 10 5	.....	0 19 14
Poppy seed	12,498	.....	.....	.....
Total	584,062			

* Is not produced from seed, but the cane itself is cut in lengths of from 9 to 15 inches and planted out about half a yard apart.

† Tobacco is not sown broadcast, but seedlings are transplanted out when 9 inches or a foot high.

‡ No crop experiment return submitted for this crop.

§ The information in regard to this crop is not reliable; hence not entered.

¶ The out-turn cannot be given.

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4th.—Pasture lands.

	Extent in Acres.	TOTAL ANNUAL PRODUCE OF FODDER IN M. S. C.	
		1873.	Average year.
		M. S. C.	M. S. C.
Artificial pastures
Fodder produced annually (herb and vegetable)
Natural grass lands	4,961,352	.....	.....
Orchard meadows
Pasture grounds

The total annual produce cannot be stated.

The following are also used as fodder:—

"Charri" (jowár)—cultivated very extensively and exclusively for fodder.

"Singi"—a species of trefoil or lucerne (medicago) grown for cattle and horse's food.

"Sarson" (rape seed)—separately and intermixed with wheat, barley or gram.

"Moth"—wheat, barley and gram; in the green state Indian corn. The stalks after the coles have been taken off.

"Sugar-cane"—chiefly for elephants.

"Bhusa"—the chaff from wheat, barley, gram, moth, &c. &c.

"Pala" in certain Districts—the dried leaves of the jher-beri (Zizyphus nummularia), extensively used in the Hissar and neighboring Districts.

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5th.—Arboriculture.

	Extent in Acres.	VALUE OF THE ANNUAL HARVEST IN Rs. A. P.	
		1873-74.	Average season.
		Rs. A. P.	Rs. A. P.
Drupe bearing trees ...	58,377 3 38	4,06,461 9 9	3,89,216 9 0
Berry bearing trees ...			
Shrubs ...			

The different classes of trees cannot be given separately.

The following is a detail of those grown in the Punjab :—

English or Vernacular Name.	Botanical Name.	English or Vernacular Name.	Botanical Name.
Mangoe ...	Mangifera indica.	Plantain ...	Musa paradisiaca.
Pomegranate ...	Puni a granata.	Apricot ...	Armeniaca vulgaris.
Gnava (red and white) ...	Faidium pyriflorum.	Jaman ...	Sisymbrium jambolanum.
Peach ...	Amygdalus persica.	Kanrak ...	Averrhoa carambola.
Fig ...	Ficus caricaoides.	Loquat ...	Mespilus Japonica.
Bullas plum ...	Prunus domestica.	Khirus ...	Mimusops kanki.
Bokhara plum ...	Prunus Bokhariensis.	Gondni ...	Cordia Augustifolia.
Tamarind ...	Tamarindus indica.	Falsa ...	Grewia Asiatica.
Shaddock, pomello ...	Citrus decumana.	Corunda ...	Cariass corundata.
Orange ...	Citrus aurantium.	Date ...	Phoenix silvestris.
Citron (sweet and sour) ...	Citrus medica.	Auwala ...	Phyllanthus emblica.
Lemon ...	Citrus limonium.	Rmblic ...	
Lime ...	Citrus bergamotica.	Myrobalan ...	Anona squamosa.
Thin-skinned lemon ...	Citrus acida.	Custard apple ...	Artocarpus integrifolia.
Galgal ...	Citrus galgala.	Jack fruit ...	Uva.
Apple ...	Fyrus malus.	Grapes ...	Rosa centifolia.
Pear ...	Cydonia vulgaris.	Rose ...	Salix Caprea, Egyptisca.
Quince ...	Morus indica et nigra.	Bedmashk ...	
Mulberry ...	Zisypus jujuba.		
Jujube ...			

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W. M. YOUNG,

Sett. Secy. to Finl. Commr., Punjab.

THIRD PART.

FARM CATTLE.

1st.—Cattle living up to 31st December 1873. Number of head.

	Calves from 0 to 3 months.	Yearling Bulls.	Heifers.	Bulls.	Bullocks.	Milch Cows.	Other Cows.	Total.
Horned cattle	65,70,212*

* No separate details available.

	Sucking Pigs.	Boars.	Pigs.	Sows.	Total.
Pigs	48,977*

* No details forthcoming.

	Kids.	He goats.	She goats.	Total.
Goats	1,608,825*

* No details forthcoming.

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2nd.—Average supply of meat from slaughtered Cattle.

	Bullocks.	Cows.	Calves.	Sheep.	Lamba.	Pigs.	Goats.	Kids.
Number of animals slaughtered annually ...	6,469*	42,311	4,338	155,998†	4,625	249	150,624‡	13,797
Weight of living animal in M. S. C. (gross weight) ...	M. S. C.	M. S. C.	M. S. C.	M. S. C.	M. S. C.	M. S. C.	M. S. C.	M. S. C.
Weight of the slaughtered animal (net weight) ...	4 20 4	3 1 1	1 16 12	0 27 2	0 12 5	1 8 14	0 26 10	0 18 0
	2 5 8	1 26 4	0 80 0	0 13 7	0 6 5	0 34 6	0 15 5	0 7 4

* Includes buffaloes slaughtered in Jullundur.

† Includes lambs slaughtered in Amritsar.

‡ Includes kids slaughtered in Amritsar.

Note.—This statement has been prepared from returns supplied by the principal Districts in the Punjab of animals slaughtered at the head quarters of the Districts, and by the Deputy Commissary-General of meat supplied to European troops. No information can be obtained of the number of animals slaughtered for use by the rural population.

3rd.—Other produce from animals.

Suet and tallow ...	...	...	...	...	...	...	...	...
Wax ...	...	...	...	...	...	...	...	...
Honey ...	...	...	...	...	...	...	...	...
Wool (sheep) ...	...	...	...	...	...	...	...	...
Milk ...	...	...	...	...	...	...	...	...
Eggs ...	...	...	...	...	...	...	...	...

} No statistics available.

LAHORE:

The 15th March 1876.

W. M. YOUNG.

Sett. Secy. to Finl. Commr., Punjab.

SUMMARY NO. 5.

Summary of the Statements Nos. 1 to 4, showing the total area of land under cultivation for "Cereals" and other Food Crops, 1870-71 to 1873-74, in "Acres" and "Hectares."

	SPRING CROPS.	Year 1870-71.	Year 1871-72.	Year 1872-73.	Year 1873-74.	TOTAL.	
						Acres.	Hectares.
1	Wheat ...	5,302,473	5,366,977	5,716,867	5,820,861	22,207,178	
2	Jowár (Great millet) ...	200	.....	.....	.....	200	
3	Kangni (Italian millet) ...	18	38	38	.....	89	
4	Barley ...	1,685,694	1,658,002	1,795,843	1,784,920	6,924,469	
5	China (Panicum mliaceum)	3,808	8,092	1,814	4,777	18,491	
6	Mash (Phaseolus radiatus)	.....	.....	.....	127	127	
7	Mung (Phaseolus mungo)	.....	.....	.....	500	500	
8	Masúr (Ervum lens)	155,787	143,842	167,726	166,417	633,772	
9	Arhar (Cajanus flavus)	97	2,810	2,807	4,298	10,012	
	TOTAL ...	7,148,077	7,179,756	7,685,095	7,781,900	29,794,828	

	AUTUMN CROPS.	Year 1870-71.	Year 1871-72.	Year 1872-73.	Year 1873-74.	TOTAL.		GRAND TOTAL, 1870 TO 1873-74.	
						Acres.	Hectares.	Acres.	Hectares.
1	Rice ...	710,742	660,817	728,973	784,957	2,835,489	.....	2,835,489	
2	Wheat ...	.....	.....	.....	.....	.....	.....	22,207,178	
3	Jowár (Great millet) ...	2,101,290	1,925,221	2,149,029	2,022,252	8,197,792	.....	8,197,992	
4	Bajra (Spiked millet) ...	2,352,310	2,480,056	2,648,944	2,490,078	9,971,388	.....	9,971,888	
5	Kangni (Italian millet) ...	110,696	98,905	110,617	99,004	419,222	.....	419,311	
6	Makai (Indian corn) ...	940,449	882,170	907,203	986,043	3,715,865	.....	3,715,865	
7	Barley ...	.....	.....	.....	.....	.....	.....	6,924,459	
8	China (Panicum mliaceum) ...	94,127	69,984	82,367	96,473	342,961	.....	361,442	
9	Mash (Phaseolus radiatus) ...	335,209	287,223	301,775	269,595	1,193,802	.....	1,193,929	
10	Mung (Phaseolus mungo) ...	269,085	225,579	302,405	283,561	1,080,630	.....	1,081,130	
11	Masúr (Ervum lens) ...	1,762	1,071	20	717	3,570	.....	637,342	
12	Arhar (Cajanus flavus) ...	2,535	2,250	3,656	4,119	12,560	.....	22,672	
	TOTAL ...	6,918,205	6,633,276	7,234,989	6,986,799	27,773,269	.....	57,568,097	

LAHORE:

The 15th March 1876.

W. M. YOUNG.

Sett. Secy. to Finl. Commr., Punjab.

SUMMARY NO. 5A.

Statement showing the total area of land under cultivation for "Cereals" and other Food Crops, from 1870-71 to 1873-74, with average year in "Acres" and "Hectares."

No.	Food staple.	Year.	Area	GRAND	Average	Hectares.
			cultivated.	TOTAL.	year.	
			Acres.	Acres.	Acres.	
1	Rice	1870-71	710,742	2,835,489	708,872	
		1871-72	660,817			
		1872-73	728,973			
		1873-74	734,957			
2	Wheat	1870-71	5,302,473	22,207,178	5,551,794	
		1871-72	5,366,377			
		1872-73	5,716,867			
		1873-74	5,820,861			
3	Jowár (Great millet)	1870-71	2,101,490	8,197,992	2,049,498	
		1871-72	1,925,221			
		1872-73	2,149,029			
		1873-74	2,022,262			
4	Bájra (Spiked millet)	1870-71	2,352,310	9,971,388	2,492,847	
		1871-72	2,480,056			
		1872-73	2,648,944			
		1873-74	2,490,078			
5	Kangni (Italian millet)	1870-71	101,714	419,311	104,827	
		1871-72	98,938			
		1872-73	110,655			
		1873-74	99,004			
6	Indian corn	1870-71	940,449	3,715,865	928,966	
		1871-72	882,170			
		1872-73	907,203			
		1873-74	986,043			
7	Barley	1870-71	1,685,694	6,924,459	1,781,114	
		1871-72	1,658,002			
		1872-73	1,795,843			
		1873-74	1,784,920			
8	China (Panicum miliaceum)	1870-71	97,985	361,442	90,860	
		1871-72	78,076			
		1872-73	84,181			
		1873-74	101,260			
9	Mash (Phaseolus radiatus)	1870-71	335,209	1,193,929	298,462	
		1871-72	287,223			
		1872-73	301,775			
		1873-74	269,722			
10	Mung (Phaseolus mungo)	1870-71	269,085	1,081,130	270,282	
		1871-72	225,579			
		1872-73	302,405			
		1873-74	284,061			
11	Masur (Ervum lens)	1870-71	157,549	637,342	159,335	
		1871-72	144,913			
		1872-73	167,746			
		1873-74	167,134			
12	Arhar (Cajanus flavus)	1870-71	2,632	22,572	5,543	
		1871-72	5,060			
		1872-73	6,463			
		1873-74	8,417			
GRAND TOTAL				87,568,097	14,392,024	

LAHORE :

The 15th March 1876.

W. M. YOUNG,

Sett. Secy. to Finl. Commr., Punjab.

* The estimate of the average area of food crops prepared by me includes gram, moth, and peas. In the above series of tables, these crops are shown under Summary No. 28, and their average area is there given as—

Gram	1,117,813 acres.
Peas	109,650 "
Moth	881,094 "

These areas added to the above give a total of 16,500,581 acres. The corresponding result given by my estimate is 12,619,846 acres. The excess is caused mainly by increase in the following crops (stated in round numbers):

Wheat	800,000 acres.
Bájra	400,000 "
Jowár	175,000 "
Gram	600,000 "
Moth	180,000 "

The other plus and minus differences are unimportant.—E. WACE,

SUMMARY NO. 6.

MARKET GARDEN CULTIVATION.

Statement showing the area of land under cultivation for "Vegetables" for the year 1870-71 to 1873-74, in "Acres" and "Hectares."

SPRING.

PUNJAB DIVISIONS.	Year 1870-71.	Year 1871-72.	Year 1872-73.	Year 1873-74.	TOTAL.		REMARKS.
					Acres.	Hectares.	
Delhi	12,863	13,755	14,008	14,644	55,267		
Hissar	2,397	4,794	4,173	2,913	14,277		
Umballa	8,969	13,944	6,875	12,984	41,772		
Jullundur	9,560	9,625	4,656	5,083	28,924		
Amritsar	24,519	19,193	26,094	15,426	85,232		
Lahore	12,499	17,686	20,373	17,095	67,652		
Rawalpindi	27,984	27,619	29,391	14,790	99,784		
Mooltan	40,100	26,431	28,324	14,603	109,358		
Derajat	4,295	5,661	4,654	3,570	18,180		
Peshawar	2,721	3,445	2,677	2,173	11,016		
TOTAL	145,907	142,153	140,123	103,281	531,463		

AUTUMN.

PUNJAB DIVISIONS.	Year 1870-71.	Year 1871-72.	Year 1872-73.	Year 1873-74.	TOTAL.		GRAND TOTAL OF BOTH HARVESTS.	
					Acres.	Hectares.	Acres.	Hectares.
Delhi	10,556	10,044	10,126	9,911	40,637	.....	95,904
Hissar	3,037	2,639	4,531	4,133	14,240	.....	28,517
Umballa	2,159	3,552	6,695	11,366	23,772	.....	65,544
Jullundur	9,443	2,986	6,933	7,727	27,089	.....	56,013
Amritsar	16,806	14,891	21,345	12,377	65,419	.....	1,50,651
Lahore	9,782	19,560	20,828	13,170	63,338	.....	1,50,991
Rawalpindi	5,629	13,447	13,907	13,808	46,791	.....	1,45,575
Mooltan	4,255	3,570	17,115	16,239	41,178	.....	1,50,536
Derajat	2,952	3,097	3,673	2,865	12,592	.....	30,772
Peshawar	2,563	3,368	3,333	1,277	10,541	.....	21,557
GRAND TOTAL	67,182	77,054	108,489	92,872	3,45,597	.....	877,060

LAHORE:
The 15th March 1876.

W. M. YOUNG,
Sect. Secy. to Finl. Commr., Punjab.

SUMMARY NO. 9.

Summary of the Statements Nos. 7 & 8, shewing the area of land under cultivation for crops useful for industrial purposes, viz, "Oil seeds," comprising linseed, mustard, til, and tarāmīra for the years 1870-71 to 1873-74, in "Acres" and "Hectares."

SPRING.	Year 1870-71.	Year 1871-72.	Year 1872-73.	Year 1873-74.	TOTAL.		GRAND TOTAL OF BOTH HARVESTS.	
					Acres.	Hectares.	Acres.	Hectares.
Linseed	17,063	16,860	21,004	19,936	74,863			
Mustard	281,040	257,348	288,159	337,006	1,164,058			
Til (sesamum) ... ..	...	814	9,000	...	9,314		
Tarāmīra (sinapis eruca)	130,388	119,586	129,583	148,166	527,723			
TOTAL	428,491	3,94,608	447,746	505,108	1,775,958			
AUTUMN.								
Linseed ... ..	...	...	...	...	...		74,863
Mustard	12,727	10,936	13,443	24,172	61,336		1,225,391	
Til (sesamum)	168,036	133,303	168,734	188,517	658,610		667,924	
Tarāmīra (sinapis eruca)	1,162	1,233	8,992	4,821	16,208		543,931	
TOTAL	181,925	145,532	191,159	217,540	736,156		2,512,109	

SUMMARY NO. 9A.

Statement shewing the total area of land under cultivation or "Oil seeds," viz, linseed, mustard, til CH. I. and tarmiré, from 1870-71 to 1873-74, with average year.

No.	Oilseeds.	Year.	Area cultivated.	TOTAL.	Average year.	Hectares.
			Acres.	Acres.		
1	Linseed	1870-71	17,063	74,868		
		1871-72	16,860			
		1872-73	21,004			
		1873-74	19,936			
		Total	...			
2	Mustard	1870-71	293,767	1,225,391		
		1871-72	268,844			
		1872-73	901,602			
		1873-74	361,178			
		Total	...			
3	Til (sesamum)	1870-71	168,086	667,924		
		1871-72	133,617			
		1872-73	177,724			
		1873-74	188,647			
		Total	...			
4	Tarmiré (sinapis eruca)	1870-71	131,550	543,931		
		1871-72	120,819			
		1872-73	138,676			
		1873-74	162,987			
		Total	...			
GRAND TOTAL			...	2,512,109		

LAHORE:
The 15th March 1876.

W. M. YOUNG,
Sect. Secy. to Finl. Commr., Punjab.

SUMMARY NO. 14.

Summary of the Statements Nos. 10 to 13 showing the area of land under cultivation for crops useful for industrial purposes, comprising cotton, hemp, tea, sugar-cane and tobacco, for the years 1870-71 to 1873-74, in "Acres" and "Hectares."

SPRING.	Year 1870-71.	Year 1871-72.	Year 1872-73.	Year 1873-74.	TOTAL.		REMARKS.	
					Acres.	Hectares.		
Hemp	25	...	1,703	...	1,728			
Tea	5,527	6,782	7,988	6,005	27,247			
Sugar-cane	...	12	8	173	193			
Tobacco	89,237	91,188	87,127	72,754	340,306			
TOTAL	94,789	96,982	96,821	80,932	369,474			
AUTUMN.	Year 1870-71.	Year 1871-72.	Year 1872-73.	Year 1873-74.	TOTAL.		GRAND TOTAL OF BOTH HARVESTS.	
					Acres.	Hectares.	Acres.	Hectares.
Cotton	801,635	6,95,108	789,762	624,459	2,910,864		2,910,864	
Hemp	51,405	47,698	46,078	41,268	186,449		186,449	
Tea	...	...	...	1,800	1,800		1,800	
Sugar-cane	370,195	333,645	372,816	373,952	1,450,608		1,450,608	
Tobacco	2,085	1,344	885	1,675	5,989		5,989	
TOTAL	1,225,220	1,077,795	1,209,541	1,043,154	4,555,710		4,925,184	

SUMMARY NO. 14A.

I. Statement showing the total area of land under cultivation for crops useful for industrial purposes comprising cotton, hemp, tea, sugar-cane and tobacco, for the years 1870-71 to 1873-74 inclusive (with average year), in "Acres" and "Hectares."

No.	CROPS.	Years.	Area Cultivated.	Total.	Average, yearly.	Hectares.
			Acres.	Acres.	Acres.	
1	Cotton	1870-71	801,535	2,910,864	729,716	
		1871-72	695,108			
		1872-73	789,762			
		1873-74	624,459			
2	Hemp	1870-71	51,430	188,177	47,044	
		1871-72	47,698			
		1872-73	47,781			
		1873-74	41,268			
3	Tea	1870-71	5,527	29,047	7,261	
		1871-72	5,732			
		1872-73	7,983			
		1873-74	9,805			
4	Sugar-cane	1870-71	370,195	1,450,801	362,700	
		1871-72	533,657			
		1872-73	372,824			
		1873-74	374,125			
5	Tobacco	1870-71	91,322	346,295	86,573	
		1871-72	92,532			
		1872-73	88,012			
		1873-74	74,429			
GRAND TOTAL		4,925,184		

LAHORE:
The 15th March 1875.

W. M. YOUNG,
Sett. Secy. to Finl Commr., Punjab.

SUMMARY NO. 19.

Summary of the Statements Nos. 15 to 18 showing the area of land under cultivation for crops useful for industrial purposes, viz., dyes, comprising safflower and indigo, for the years 1870-71 to 1873-74, in "Acres" and "Hectares."

SPRING.	Year	Year	Year	Year	TOTAL.	
	1870-71.	1871-72.	1872-73.	1873-74.	Acres.	Hectares.
Safflower	19,694	13,917	35,556	23,209	92,376	
Indigo.	197	88	961	...	1,246	
TOTAL ...	19,891	14,005	36,517	23,209	93,622	

AUTUMN.	Year	Year	Year	Year	TOTAL.		GRAND TOTAL OF BOTH HARVESTS	
	1870-71.	1871-72.	1872-73.	1873-74.	Acres.	Hectares.	Acres.	Hectares.
Safflower	49	...	10	37	96	...	92,472	
Indigo.	61,242	67,648	71,713	89,959	290,562	...	291,808	
TOTAL ...	61,291	67,648	71,723	89,996	290,658	...	384,280	

Statement showing the total area of land under cultivation for dyes, viz., safflower and indigo, for the CH. years 1870-71, to 1873-74, with average year.

No.	DYES.	Year.	Area. Cultivated.	Total.	Average. Year.	Hectares.
1	Safflower	1870-71	19,748	92,472	23,118	
		1871-72	18,917			
		1872-73	85,566			
		1873-74	28,246			
2	Indigo	1870-71	61,439	291,808	72,952	
		1871-72	67,786			
		1872-73	72,674			
		1873-74	89,969			
GRAND TOTAL				384,280		

LAHORE:
The 15th March 1876.

W. M. YOUNG,
Sect. Secy. to Finl. Commr., Punjab.

SUMMARY NO. 24.

Summary of the Statements Nos. 20 to 23, showing the area of land under cultivation for crops used for industrial purposes, viz., drugs and spices, comprising poppy, turmeric, coriander seed, ginger, chillies and other kinds, for the years 1870-71 to 1873-74, in "Acres" and "Hectares."

SPRING.	Year 1870-71.	Year 1871-72.	Year 1872-73.	Year 1873-74.	TOTAL.	
	Acres.	Acres.	Acres.	Acres.	Acres.	Hectares.
Poppy	17,279	12,258	11,188	12,158	52,873	
Turmeric	225	180	76	70	501	
Coriander seed	11,394	9,982	9,086	5,961	36,423	
Ginger	75	115	85	.....	275	
Chillies	2,190	1,797	4,964	22,997	31,948	
Other kinds	147,064	139,726	110,873	80,365	478,028	
TOTAL	178,227	164,008	186,262	121,646	600,088	

AUTUMN.	Year 1870-71	Year 1871-72.	Year 1872-73.	Year 1873-74	TOTAL.		GRAND TOTAL OF BOTH HARVESTS.	
	Acres.	Acres.	Acres.	Acres.	Acres.	Hectares.	Acres.	Hectares.
Poppy ... ..	.....	.....	.....	845	845	.....	58,218	
Turmeric	7,878	5,665	3,698	3,735	20,476	.....	20,977	
Coriander seed	60	10	10	27	107	.....	36,680	
Ginger	1,132	1,043	1,082	932	4,239	.....	4,514	
Chillies	16,684	12,946	12,205	13,629	55,464	.....	87,402	
Other kinds	115,004	158,441	81,008	70,122	419,575	.....	897,603	
TOTAL	1,140,458	178,005	97,908	88,840	500,206	.....	1,100,244	

LAHORE:
The 15th March 1876.

W. M. YOUNG,
Sect. Secy. to Finl. Commr., Punjab.

ABSTRACT NO. 24A.

I. Statement showing the total area of land under cultivation for drugs and spices, comprising poppy, turmeric, coriander seed, ginger, chillies and other kinds, from 1870-71 to 1873-74, with average year, in "Acres" and "Hectares."

No.	Drugs and Spices.	Year.	Area cultivated.	Total.	Average year.	Hectares.
			Acres.	Acres.	Acres.	
1	Poppy	1870-71	17,279	53,218	13,304	
		1871-72	12,263			
		1872-73	11,188			
		1873-74	12,498			
2	Turmeric	1870-71	7,808	20,977	5,244	
		1871-72	5,695			
		1872-73	3,674			
		1873-74	3,805			
3	Coriander seed	1870-71	11,454	36,530	9,132	
		1871-72	9,992			
		1872-73	9,096			
		1873-74	5,988			
4	Ginger	1870-71	1,207	4,514	1,128	
		1871-72	1,158			
		1872-73	1,167			
		1873-74	982			
5	Chillies	1870-71	18,374	87,402	21,850	
		1871-72	14,743			
		1872-73	17,159			
		1873-74	56,826			
6	Other kinds	1870-71	262,068	897,608	224,400	
		1871-72	293,167			
		1872-73	191,881			
		1873-74	150,487			
GRAND TOTAL				1,100,244		

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GENERAL SUMMARY NO. 25.

Of the principal crops used for industrial purposes, comprising oil-giving plants, textile plants, tea, sugar-cane, tobacco, dyes, drugs and spices, for the years 1870-71 to 1873-74.

Class.	Area in Acres.	Grand Total.	Hectares.
<i>Oil-giving Plants.</i>			
ABSTRACTS Nos. 7 & 8	Linseed...	74,863	SUMMARY No. 9.
	Mustard...	1,225,391	
	Til...	667,924	
	Taramira...	643,931	
			2,512,109
<i>Textile Plants.</i>			
ABSTRACTS Nos. 10 to 13	Cotton...	2,910,864	SUMMARY No. 14
	Hemp...	188,177	
			3,099,041
<i>Other Crops.</i>			
ABSTRACTS Nos. 10 to 13	Tea...	29,047	SUMMARY No. 24.
	Sugar-cane...	1,450,801	
	Tobacco...	346,295	
			1,826,143
<i>Dyes.</i>			
ABSTRACTS Nos. 15 to 18	Safflower...	92,472	SUMMARY No. 19.
	Indigo...	291,608	
			384,280
<i>Drugs and Spices.</i>			
ABSTRACTS Nos. 20 to 23	Poppy...	53,218	SUMMARY No. 24.
	Turmeric...	20,977	
	Coriander...	36,530	
	Ginger...	4,514	
	Chillies...	87,402	
	Other kinds...	897,608	
			1,100,244
GRAND TOTAL			8,921,517

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NOTE.—The total here shown is the "actual extent" of land under cultivation for the crops named in the margin. Vide Statements—J.B.

SUMMARY NO. 28.

Statement showing the total area of land under cultivation for Artificial Pastures (including herbaceous, leguminous and root fodders) from 1870-71 to 1873-74, in "Acres" and "Hectares." CH. I.

SPRING.	Year 1870-71.	Year 1871-72.	Year 1872-73.	Year 1873-74.	TOTAL.		REMARKS.
					Acres.	Hectares.	
Gram (<i>Cicer arietinum</i>)	1,014,098	903,158	1,247,936	1,306,061	4,471,258	.....
Peas	107,547	106,875	111,900	111,807	438,129	.....
Moth (<i>Phaseolus acutifolius</i>) ...	.....	3	345	358	705	.....
TOTAL ..	1,121,645	1,010,036	1,360,181	1,418,226	4,910,087	.....

AUTUMN.	Year 1870-71.	Year 1871-72.	Year 1872-73.	Year 1873-74.	TOTAL.		GRAND TOTAL OF BOTH HARVESTS.		REMARKS.
					Acres.	Hectares.	Acres.	Hectares.	
Gram (<i>Cicer arietinum</i>) ... ..	.....	.....	.....	.....	.....	.....	4,471,258	.....
Peas	189	15	251	17	472	.....	438,601	.....
Moth (<i>Phaseolus acutifolius</i>) ...	645,039	752,323	955,187	1,171,120	3,523,669	.....	8,524,374	.....
TOTAL ...	645,228	752,338	955,438	1,171,137	3,524,141	.....	8,434,228	.....

LAHORE:
The 15th March 1876,

W. M. YOUNG,
Sect. Secy. to Fial. Commr., Punjab.

SUMMARY NO. 28A.

Statement showing the total area of land under cultivation for Artificial Pastures (including herbaceous, leguminous, and root fodders) from 1870-71 to 1873-74, with average year, in "Acres" and "Hectares."

No.	Fodders.	Year.	Area culti-	TOTAL.	Average	Hectares.
			vated.			
			Acres.	Acres.	Acres.	
1	Gram (<i>Cicer arietinum</i>)	1870-71	1,014,098	4,471,258	1,117,818	
		1871-72	903,158			
		1872-73	1,247,936			
		1873-74	1,306,061			
2	Peas	1870-71	107,547	438,601	1,09,560	
		1871-72	106,875			
		1872-73	111,900			
		1873-74	111,807			
3	Moth (<i>Phaseolus acutifolius</i>) ...	1870-71	8,524,374	8,51,095	
		1871-72	3			
		1872-73	345			
		1873-74	358			
GRAND TOTAL				8,434,228		

SUMMARY NO. 29.

Statement showing the area of orchards and fruit tree gardens in the value of annual out-turn for the years 1870-71 to 1873-74.

DISTRICT.	Area of Plantations.			OUT-TURN.									
				1870-71.		1871-72.		1872-73.		1873-74.		Total.	
				Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.
Delhi	5,775	2 36	52,578	4 0	55,472	8 0	57,937	12 0	56,285	8 0	2,22,274	0 6	
Gurgaon	1,610	3 57	7,126	7 6	7,114	3 0	6,800	5 0	7,261	0 0	28,301	15 0	
Karnal	2,645	0 0	12,296	0 0	13,923	8 0	15,462	8 0	17,038	8 0	58,760	4 0	
Hissar	203	0 20	3,844	0 0	3,405	0 0	3,431	0 0	3,753	0 0	14,138	0 0	
Rohtak	935	3 27	5,045	0 0	5,017	6 0	5,440	11 0	5,399	8 0	20,902	0 0	
Sirsa	107	0 0	499	0 0	600	0 0	704	0 0	783	0 0	2,686	0 0	
Umballa	94	2 13	455	1 3	425	7 9	600	7 9	495	2 6	1,877	8 3	
Ludhiana	63	1 16	725	0 0	690	0 0	650	0 0	647	0 0	2,713	0 0	
Simla	11	0 0	1,192	7 6	1,479	8 3	194	0 0	1,252	7 0	4,118	6 9	
Jullundur	1,006	1 18	13,669	12 0	13,756	12 0	13,636	0 0	14,560	9 0	55,823	1 0	
Hoshiarpur	6,835	2 3	49,474	0 0	49,080	0 0	45,766	0 0	61,188	0 0	2,04,508	0 0	
Kangra	1,863	3 26	5,752	4 0	5,275	2 0	5,080	15 0	5,052	1 0	21,190	6 0	
Amritsar	724	0 18	16,702	0 0	14,770	0 0	15,832	0 0	16,038	0 0	63,347	0 0	
Gurdaspur	1,142	3 0	13,273	0 0	14,575	0 0	15,456	0 0	15,383	0 0	58,687	0 0	
Sialkot	497	1 9	11,052	0 0	11,307	0 0	11,991	0 0	10,005	0 0	44,356	0 0	
Lahore	1,502	1 15	31,849	0 0	33,768	0 0	36,926	0 0	39,389	0 0	1,41,932	0 0	
Gujranwala	445	1 29	6,083	7 0	6,375	14 0	6,337	12 4	6,485	14 0	25,232	15 4	
Ferozepore	74	1 17	807	0 0	791	4 0	843	10 6	691	1 6	3,135	0 0	
Rawalpindi	171	0 19	1,541	0 0	2,214	0 0	2,366	12 0	1,152	4 0	7,974	0 0	
Jhelum	53	3 34	993	4 11	103	5 2	282	15 11	295	13 6	1,075	7 6	
Gujrat	90	0 0	881	0 0	807	0 0	901	0 0	891	0 0	3,680	0 0	
Shahpur	52	0 0	221	0 0	446	0 0	335	0 0	429	0 0	1,431	0 0	
Mooltan	907	0 0	23,230	0 0	23,122	0 0	26,101	0 0	26,939	0 0	99,392	0 0	
Jhang	347	0 0	8,139	0 0	7,888	0 0	7,392	0 0	6,985	0 0	30,934	0 0	
Montgomery	118	2 0	1,563	12 0	1,494	0 0	2,008	4 0	2,097	12 0	7,168	12 0	
Muzaffargarh	639	1 18	15,977	1 0	16,355	6 0	17,605	4 0	17,517	2 0	67,454	13 0	
Dera Ismail Khan	334	1 6	7,845	15 0	8,120	7 0	8,393	2 0	7,161	6 0	31,510	14 0	
Dera Ghazi Khan	28,887	0 0	36,437	0 0	35,879	0 0	40,939	0 0	36,992	0 0	1,50,247	0 0	
Bannu	109	1 36	2,507	2 0	2,601	10 0	2,723	7 5	2,467	9 3	10,299	12 8	
Peshawar	1,129	3 6	30,168	8 0	31,904	0 0	34,062	0 0	37,470	0 0	1,33,504	8 0	
Hazara	299	2 38	5,636	0 0	5,636	0 0	5,636	0 0	5,636	0 0	14,554	0 0	
Kohat													
TOTAL	58,377	3 38	3,64,665	6 2	3,71,503	5 2	3,90,235	14 11	4,06,461	9 9	15,32,865	4 0	

LAHORE:
The 15th March 1876.

W. M. YOUNG,
Sect. Secy. to Fnl. Commr., Punjab.

ABSTRACT NO. 30.
Woods and Forests.

DISTRICTS.	1870-71.	1871-72.	1872-73.	1873-74.	REMARKS.
	Acres.	Acres.	Acres.	Acres.	
<i>Government Forests.</i>					
Delhi	5,177	5,177	5,177	5,177	
Gurgaon	...	...	...	...
Karnal	4,638	4,638	4,638	4,638	
Hissar	...	...	...	...
Rohtak	11,422	11,422	11,422	11,422	
Sirsa	...	...	...	...
Umballa	9,223	9,223	9,223	9,223	The area of private and village forests is not given in this statement.
Ludhiana	190	190	190	190	
Simla	...	...	...	...
Jullundur	1,721	1,721	1,721	1,721	There are some unreserved forests in the Hoshiarpur District under the District authorities; these areas are not included.
Hoshiarpur	49,823	49,823	49,823	49,823	
Kangra	156,854	156,854	156,854	156,854	
Amritsar	3,512	3,512	3,512	3,512	
Gurdaspur	...	...	...	...
Sialkot	...	...	...	...
Lahore	291,780	291,780	291,780	291,780	The areas of tracts left with villages are also not included.
Gujranwala	153,060	153,060	153,060	153,060	
Ferozepore	20,375	20,375	20,375	20,375	
Rawalpindi	521,452	521,452	521,452	521,452	
Jhelum	328,718	328,718	328,718	328,718	
Gujrat	66,264	66,264	66,264	66,264	
Shahpur	282,101	282,101	282,101	282,101	
Mooltan	77,573	77,573	77,573	77,573	
Jhang	72,589	72,589	72,589	72,589	
Montgomery	2,414,961	2,414,961	2,414,961	2,414,961	
Muzaffargarh	991,731	991,731	991,731	991,731	
Dera Ismail Khan	411,714	411,714	411,714	411,714	
Dera Ghazi Khan	220,311	220,311	220,311	220,311	
Bannu	...	...	...	...
Peshawar	...	...	...	...
Hazara	876,250	876,250	876,250	876,250	
Kohat	...	...	...	...
Leased Forests	101,273	101,273	101,273	101,273	
TOTAL	7,073,012	7,073,012	7,073,012	7,073,012	

LAHORE:
The 15th March 1876.

W. M. YOUNG,
Sect. Secy. to Fnl. Commr., Punjab.

CHAPTER I, QUESTION 3.

The following tables of the average produce per acre of food grains on the lands irrigated by the principal canals in the Punjab, are taken from annual Irrigation Reports of the Province for the 5 years ending 1877-78. The average rates of produce thus returned are obtained by the Canal Officers from the Deputy Commissioners of the Districts concerned. They are rather of the nature of rough approximations, than reliable estimates. The results for the whole series of canals compare thus;—

Food Grains.	Average produce per acre for the 5 years ending 1877-78; stated in seers.							
	Delhi and Gurgaon Irrigation works.	Western Jumna canal.			Bari Doab canal.	Upper Sutlej canal.	Lower Sutlej and Chamba Irrigation canals.	Derajat Circle Indus Irrigation canals.
		Karnal Division.	Hansi Division.	Delhi Division.				
Wheat	800	604	328	800	784	345	360	640
Barley	800	716	360	800	560	345	360	...
Rice	1,000	551	920	1,080	910	528	400	480
Jowar	848	282	760	400	656	202	240	400
Bajra	960	282	760	480	...	160	200	400
Maize	960	330	960	800	1,076	338	400	...
Kangni	...	196	720	200	800	224	204	...
Ohina	...	300	640	480	554	171	240	200
Gram	800	642	288	800	716	288	240	800
Masur	...	474	512	400	232	128	240	...
Moth	853	...	720	400	...	243	200	240
Mung and Mash	...	164	720	480	...	126	240	240
Peas	...	...	1,200	800	...	...	240	800
Mixed Grains	800	712	510	720	610	288	...	...

Western Jumna Canal Circle.—DELHI AND GURGAON IRRIGATION WORKS.

Average produce per acre, as reported in the annual returns, of crops irrigated by above canals, from 1873-74 to 1877-78, stated in seers of 80 tolahs each.

Crop.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	Average of these 5 years.
Waternuts	3,200	3,200	3,200	3,200	3,200	3,200
Cotton	120	120	120	120	120	120
Bajra	960	960	960	960	...	960
Jowar	960	960	960	960	400	848
Moth	800	800	...	960	...	853
Arhar	400	...	400	...	...	400
Vegetables	Rs. 50	Rs. 50	Rs. 50	Rs. 50	Rs. 50	Rs. 50
Tobacco	200	200	200	...	...	200
Wheat	800	800	800	800	800	800
Gram	800	800	...	800	800	800
Saru (oil seed) or Sarson	600	...	600	...	...	600
Sugar-cane	1,360	1,360	...	1,360	...	1,360
Rice	1,000	1,000	1,000	1,000	...	1,000
Maize	...	960	...	...	...	960
Onions	...	...	3,200	...	...	3,200
Mixed Grains (food)	...	800	800	800	...	800
Barley	...	...	...	800	800	800
Carrots	...	...	...	Rs. 50	...	Rs. 50
Melons	...	...	...	...	3,200	3,200

Western Jumna Canal.

Average produce per acre, as reported in the annual returns, of crops irrigated by above canal, from 1873-74 to 1877-78, stated in sers of 80 tolas each.

Crop.	Years.	1873-74.			1874-75.			1875-76.			1876-77.			1877-78.			Average of these 5 years.			
		Divisions.	Karnal.	Hansi.	Delhi.	Karnal.	Hansi.	Delhi.	Karnal.	Hansi.	Delhi.	Karnal.	Hansi.	Delhi.	Karnal.	Hansi.	Delhi.	Karnal.	Hansi.	Delhi.
Gardens	Rs. 80	Rs. 80	Rs. 80	Rs. 80	Rs. 80	Rs. 80	Rs. 80	Rs. 80	Rs. 80	...	...	Rs. 80	Rs. 80	Rs. 80	Rs. 80	Rs. 80	Rs. 80	Rs. 80	Rs. 80
Sugar-cane	520	1,280	1,360	536	1,280	1,360	536	1,280	1,360	536	1,280	1,360	520	1,280	1,360	529	1,280	1,360	529
Rice	580	920	1,000	546	920	1,400	546	920	1,000	546	920	1,000	560	920	1,000	551	920	1,000	551
Vegetables	3,200	3,200	Rs. 50	3,200	3,200	Rs. 50	3,200	3,200	Rs. 50	3,200	3,200	Rs. 50	3,200	3,200	Rs. 50	3,200	3,200	Rs. 50	3,200
Chillies	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...	3,200
Water-nuts	760	3,200	3,200	760	3,200	3,200	760	3,200	3,200	760	3,200	3,200	760	3,200	3,200	760	3,200	3,200	760
Melons	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...	3,200
Tobacco	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...	3,200
Cotton	240	160	120	244	160	120	244	160	120	244	160	120	240	160	120	242	160	120	242
Indigo	4	5	7	4	5	7	4	5	7	4	5	7	4	5	7	4	5	7	4
Oil seed, Toria	160	480	820	176	480	...	160	480	320	176	200	...	160	480	320	166	480	320	166
Fodder—Lucerne grass	1,600	1,600	...	1,600	720	...	1,600	2,000	2,000	1,600	2,000	...	1,600	2,000	2,000	1,600	2,000	2,000	1,600
Maise	320	1,120	800	387	920	800	387	920	800	387	920	800	320	1,120	800	330	960	800	330
Jowar	280	760	400	284	760	400	284	760	400	284	760	400	280	760	400	282	760	400	282
Mundwa	200	480	480	192	480	480	192	480	480	192	480	480	200	480	480	196	480	480	196
Bajra	760	480	...	760	480	...	760	480	...	760	480	...	760	480	...	760	480	...
Kangri	720	200	...	720	200	...	720	200	...	720	200	...	720	200	...	720	200	...
Gowar	480	880	...	480	880	...	480	880	...	480	880	...	480	880	...	480	880	...
China	760	480	400	600	480	...	760	480	...	760	480	...	760	480	...	760	480	...
Mixed grains	720	...	...	600	480	...	720	...	...	600	480	...	720	...	...	600	480	...
Til (sesamum)	360	...	...	360	800	...	360	800	...	360	800	...	360	800	...	360	800	...
Mash, urd	160	720	480	172	720	480	...	160	720	480	...	160	720	480	...	160	720	480	...
Mung	720	...	...	720	...	...	720	...	...	720	...	...	720	...	...	720	...	...
Moth	720	400	...	720	400	...	720	...	...	720	400	...	720	...	...	720	400	...
Lobia	480	...	...	480	...	...	480	...	...	480	...	...	480	...	...	480	...	...
Hemp	200	480	200	148	480	200	148	480	200	148	480	200	160	480	200	161	480	200	161
Country grass	2,400	...	3,000	2,400	...	...	2,400	...	...	2,400	...	...	2,400	...	3,000	2,400	...
Poppy	80	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ajwain (spices)	160	200	240	74	200	240	169	200	240	169	200	240	160	200	...	146	200	...	146
Corianderseed	2,800	...	...	2,800	...	...	2,800	...	...	2,800	...	...	2,800	...	...	2,800	...	...
Fallown	2,800	...	...	2,800	...	...	2,800	...	...	2,800	...	...	2,800	...	...	2,800	...	1,880
Chillies	2,800	...	...	2,800	...	...	2,800	...	...	2,800	...	...	2,800	...	...	2,800	...	1,736
Aniseed	200	...	...	200	...	...	200	...	...	200	...	...	200	...	...	200	...	3,100
Carrots	3,200	...	...	3,200	...	...	3,200	...	...	3,200	...	...	3,200	...	...	3,200	...	3,100
Meshi	200	160	278	200	160	250	200	160	250	200	160	240	200	160	254	200	160	254
Melons	3,200	...	...	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...
Onions	3,200	...	...	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...	3,200	3,200	...
Garlic	2,800	...	...	2,800	3,200	...	2,800	3,200	...	2,800	3,200	...	2,800	3,200	...	2,800	3,200	...
Oats	1,600	...	...	1,600	800	...	1,600	800	...	1,600	800	...	1,600	800	...	1,600	800	...
Wheat	640	320	800	634	360	800	634	320	800	634	320	800	640	320	800	604	320	800	604
Barley	760	360	...	740	360	800	740	360	800	740	360	800	760	360	800	716	360	800	716
Gram	680	360	...	684	360	...	684	360	...	684	360	...	680	360	...	642	360	...	642
Mustard	280	320	320	320	320	320	320	320	320	170	200	320	220	320	320	222	320	320	222
Linseed	160	...	...	170	...	...	170	...	...	...	...	120	...	...	...	155	...	...	155
Pulses, Masour	480	1,120	400	496	360	400	496	360	400	496	360	400	480	400	400	474	400	400	474
Peas	1,200	...	...	1,200	800	...	1,200	800	...	1,200	800	...	1,200	800	...	1,200	800	...
Safflower	40	...	...	40	60	...	40	60	...	40	60	...	40	60	...	40	60	...
Charri	3,400	...	...	2,000	...	...	2,000	880	...	2,000	880	...	2,000	...	...	2,000	880	...
Country grass	2,400	...	...	...	...	3,200	2,400	...	2,000	2,400	...	2,000	...	...	2,000	2,400	...
Kasni	200	...	...	...	...	...	...	200	...	...	...	...	200	...	200
Arhar	200

Upper Bari Doab Canal.

Average produce per acre, as reported in the annual returns, of crops irrigated by Ch. I. above canal, from 1873-74 to 1877-78; stated in sers of 80 tolas each.

Crop.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	Average of these 6 years.
Sugar-cane	1,040	1,000	840	1,000	1,000	1,048
Gardens	Rs. 66	Rs. 66	Rs. 66	Rs. 66	Rs. 66	Rs. 66
Indigo	...	4	4	...	...	4
Cotton	360	360	360	360	360	360
Hemp	120	200	160	200	180	172
Rice	920	960	960	920	790	910
Oil seed til (sesamum)	80	80	80	80	80	80
" Toria	...	320	820	400	280	284
" Linseed	60	80	100	120	80	88
" Sarsu	200	240	360	360	360	304
Vegetables	Rs. 36	Rs. 36	Rs. 36	Rs. 36	Rs. 36	Rs. 36
Orchards	Rs. 66	Rs. 66	Rs. 66	Rs. 66	Rs. 66	Rs. 66
Tea	...	...	...	200	...	200
Jowar	680	600	680	680	640	656
Kangri	800	800	800	800	800	800
China	...	...	...	520	600	554
Maize	1,120	840	1,120	1,180	1,120	1,076
Miscellaneous food grains	Rs. 15	Rs. 17	Rs. 17	Rs. 15	Rs. 18	Rs. 16
Turmeric	...	360	...	480	...	440
Tukhambalanga	690	...	...	...	40	600
Safflower	...	40	...	...	40	40
Poppies	120	160	160	160	160	152
Tobacco	1,400	1,080	1,080	1,080	1,000	1,128
Wheat	800	800	780	780	780	784
Barley	560	590	560	560	560	560
Gram	780	720	720	680	680	716
Mastr	200	240	240	240	240	232
Mixed grains	...	480	480	920	560	610
Grass	Rs. 1-8	Rs. 1-8	Rs. 1-3	Rs. 1-8	Rs. 1-8	Rs. 1-8
Singhi	Rs. 14	Rs. 14	Rs. 14	Rs. 14	Rs. 14	Rs. 14
Other miscellaneous crops	Rs. 15	Rs. 18	Rs. 14	Rs. 15	Rs. 18	Rs. 16

Upper Sutlej Inundation Canals.

Average produce per acre, as reported in the annual returns, of crops irrigated by above canals, from 1873-74 to 1877-78; stated in sers of 80 tolas each.

Crop.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	Average of these 6 years.
Sugar-cane	Rs. 80	Rs. 89	Rs. 80	Rs. 80	Rs. 80	Rs. 80
Rice	640	600	680	400	822	528
Cotton	200	220	180	160	241	200
Hemp	100	100	220	120	120	132
Til (sesamum)	80	100	100	80	80	88
Jowar	120	120	460	160	160	202
Bajra	160	160	160	160	160	160
Kangri	120	120	460	220	200	224
Maize	400	800	640	240	210	338
Mung and маш	80	160	80	150	160	125
China	...	...	100	200	213	171
Vegetables	2,080	2,600	1,440	Rs. 36	Rs. 36	Rs. 36
Wheat	300	280	600	808	240	345
Barley	280	240	680	266	260	345
Mixed grains	820	280	280	280	280	288
Sarrd. (oil seed)	80	...	120	156	...	119
Gram	200	240	200	400	400	288
Mastr	160	160	120	100	100	128
Gardens	...	...	Rs. 86	Rs. 86	Rs. 86	Rs. 86
Chillies	...	...	Rs. 8	Rs. 8	Rs. 8	Rs. 8
Moth (pulses)	...	...	970	180	180	248
Indigo	...	...	12	12	12	12
Tobacco	...	...	1,000	...	...	1,000
Charri	...	...	Rs. 16	4,200	3,200	Rs. 16 or 3,700
Grasses	...	...	Rs. 8	Rs. 8	Rs. 8	Rs. 8
Turmeric	...	...	Rs. 86	...	...	Rs. 86
Poppies	...	...	240	...	...	240
Coriander seed	...	...	Rs. 8	...	...	Rs. 8
Methra (grass)	...	...	Rs. 8	...	...	Rs. 8

Lower Sutlej and Chenab Inundation Canals.

L. Average produce per acre, as reported in the annual returns, of crops irrigated by above canals, from 1873-74 to 1877-78, stated in sers of 80 tolas each.

Crop.	1873-74	1874-75	1875-76	1876-77	1877-78	Average of these 5 years.
Sugar-cane	640	640	640	640	640	640
Rice	400	400	400	400	400	400
Gardens	Rs. 200	Rs. 200	Rs. 200	Rs. 200	Rs. 200	Rs. 200
Cotton	80	80	80	80	80	80
Hemp	200	...	...	200	240	213
Indigo	12	12	12	12	15	13
Chillies	240	240	240	240	240	240
Til (sesamum)	240	240	240	240	240	240
Vegetables	Rs. 34	Rs. 34	Rs. 34	Rs. 34	Rs. 34	Rs. 34
Jowár	240	240	240	240	240	240
Báira	200	200	200	200	200	200
Kangni	200	200	200	220	200	204
Maize... ..	400	400	400	400	400	400
Wheat	360	360	360	360	360	360
Barley	360	360	360	360	360	360
Tobacco	320	320	320	320	320	320
Poppies	240	240	540	240	...	240
Mustard	200	200	200	200	200	200
Turnips	Rs. 25	Rs. 25	Rs. 25	Rs. 25	Rs. 25	Rs. 25
Carrots	Rs. 30	Rs. 30	Rs. 30	Rs. 30	Rs. 30	Rs. 30
Gram... ..	240	240	240	240	240	240
Sawánk ... ..	...	...	...	240	240	240
Moth... ..	...	...	...	240	160	200
Mung ... ..	...	...	...	240	240	240
Mash ... ..	...	...	...	240	240	240
Bawán (beans) ... ..	...	...	...	40	40	40
Kaláli ... ..	...	...	...	400	400	400
Nángni (medicine) ... ..	...	...	...	160	160	160
Nilofar (medicine) ... ..	...	...	...	40	...	40
Gower ... ..	...	...	...	320	520	320
Tíránira ... ..	...	...	...	200	...	200
Méthra ... ..	...	...	...	200	200	200
Shakarkandi ... ..	...	...	...	800	800	800
Peas ... ..	...	...	...	240	240	240
Masur ... ..	...	...	...	240	...	240
Coriander seed... ..	...	...	...	160	160	160
Onions ... ..	...	...	...	1,200	1,200	1,200
Mehndi (dyes)... ..	...	...	...	320	320	320
China ... ..	...	...	...	240	240	240

Derajat Circle Inundation Canals.

Average produce per acre, as reported in the annual returns, of crops irrigated by above canals, from 1873-74 to 1877-78, stated in sers of 80 tolas each.

Crop.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	Average of these 5 years.
Sugar-cane	3,200	3,200	3,200	3,200	3,200	3,200
Gardens	1,200	1,200	1,200	1,200	1,200	1,200
Rice	480	480	480	480	480	480
Cotton	80	80	80	80	80	80
Indigo	20	20	20	20	20	20
Mahndi (dyes)... ..	40	40	40	40	40	40
Chillies	160	160	160	160	160	160
Til (sesamum)	200	200	200	200	200	200
Vegetables	1,200	1,200	1,200	1,200	1,200	1,200
Jowár	400	400	400	400	400	400
Báira	400	400	400	400	400	400
Sawánk	400	400	400	400	400	400
China	200	200	200	200	200	200
Moth	240	240	240	240	240	240
Mung... ..	240	240	240	240	240	240
Grass... ..	4,000	4,000	4,000	4,000	4,000	4,000
Wheat	640	640	640	640	640	640
Sarson (oil seed)	320	320	320	320	320	320
Poppies	200	200	200	200	200	200
Tobacco	400	400	400	400	400	400
Gram... ..	800	800	800	800	800	800
Peas	800	800	800	800	800	800
Hemp ... ..	...	...	160	...	...	160

QUESTION 4, CHAPTER I.

What area of your province and its several districts is protected from drought in an average year by irrigation from wells, tanks or jhils, canals or channels from rivers? How much of the area so protected is devoted to food crops, and what is the total amount of produce from that area?

Statistics on this subject have been received from District Officers, and are compiled in a statement appended. It will be seen from it, that (speaking in round numbers) of an annual average crop area amounting in 21 millions we have—

	MILLIONS OF ACRES.		
	Irrigated.	Unirrigated.	Total.
Under food grains, pulses included ...	4½	14	18½
Under other crops ...	1	1½	2½
Total ...	5½	15½	21

Of the 14 million acres of unirrigated food grains, about 1½ millions are grown on sailab land; that is to say, on the moist alluvial lands situate in the beds and on the banks of the Punjab rivers, where owing to the excessive dews and percolation from the rivers very little rain is needed by the crops.

In a country such as the Punjab, where the rainfall varies from an abundant and almost certain supply in the submontane Districts to a quantity in the southern tracts so small, that cultivation is possible only where aided by irrigation or river sailab; next in importance to a knowledge of the extent of irrigation is to know, how much of the unirrigated food crops are grown under an abundant rainfall.

The leading facts on the subject, shown in the statement appended (summarised for more convenient reference in the foot note below*) indicate the following results. In the

* The rainfall given is that of the head-quarter station of each Division. As regards Rawalpindi it exceeds the average of the Division; in Peshawar it understates it; for corrections on this point, see the next foot note, where the fall of each District is given. As regards the 2 last columns of the statement; it cannot be stated exactly how much sailab land is under food grains, but it may be taken broadly, that nearly all is; the area irrigated and not under food grains is added for convenience of reference, as it has an obvious bearing on the subject under discussion.

Division.	Rainfall.	Harvest.	Area of food grains.			Sailab area.	Area irrigated which is not cultivated with food crops.
			Total.	Of which irrigated.	Balance unirrigated including sailab.		
Delhi	28½	Rabi	8,29,665	8,69,775	4,69,880	18,600	1,09,361
		Kharif	10,66,281	1,61,840	8,94,481		
		Total	18,95,946	10,31,615	13,64,361		
Hissar	16½	Rabi	8,10,140	1,18,210	4,91,930	2,05,610	51,230
		Kharif	28,60,369	49,624	28,11,745		
		Total	29,71,092	1,67,834	28,08,268		
Umballa	28½	Rabi	8,98,877	1,16,660	7,82,217	16,688	18,450
		Kharif	6,80,021	1,46,616	5,33,405		
		Total	16,78,898	2,63,276	13,15,622		
Jullundur	28½	Rabi	10,98,869	1,81,080	8,17,789	82,280	74,702
		Kharif	7,92,181	1,69,080	6,23,101		
		Total	18,91,050	3,50,160	14,40,890		
Amritsar	28½	Rabi	12,97,159	4,92,448	1,04,898	9,94,498	1,11,289
		Kharif	9,12,624	2,69,238	2,42,291		
		Total	22,09,783	7,61,686	1,27,189		
Lahore	18½	Rabi	12,01,627	6,17,967	6,88,670	1,79,168	1,46,894
		Kharif	7,93,771	2,61,148	5,32,623		
		Total	19,95,398	8,79,115	12,21,293		
Rawalpindi	31½	Rabi	14,64,672	1,60,674	12,03,998	1,62,778	77,589
		Kharif	9,97,772	77,671	9,20,101		
		Total	24,62,444	2,38,345	21,24,099		
Mooltan	31	Rabi	10,34,448	6,12,298	4,32,145	2,76,619	2,88,979
		Kharif	2,67,991	2,39,666	34,325		
		Total	13,02,439	8,51,964	4,66,470		
Derajat	30	Rabi	8,47,151	2,59,124	5,87,927	2,68,099	91,810
		Kharif	8,70,426	1,17,868	7,52,558		
		Total	17,17,577	3,76,992	13,40,585		
Peshawar	12½	Rabi	7,89,388	1,19,087	6,40,299	23,183	44,308
		Kharif	4,11,487	1,84,914	2,26,573		
		Total	12,00,875	3,04,001	8,66,872		
GRAND TOTAL	28½	Rabi	90,66,439	29,77,408	69,89,021	16,28,360	10,07,987
		Kharif	86,63,417	16,60,441	69,92,976		
		Total	1,77,29,856	46,37,849	1,37,82,007		

Mooltan Division, which has the smallest rainfall, of $4\frac{1}{2}$ lakhs acres of food crops which are not irrigated, nearly the whole is aided by river sailab. In the Derajat Division, where the rainfall is almost as small, of $10\frac{1}{2}$ lakhs unirrigated, nearly one fourth is sailab; of the remaining three-fourths probably at least half is aided by floods from the Sulafman range, and the balance is most of it situate in the. Bannu District at the north end of the

†Owing to an error which has occurred in the return of the Dera Ismail Khan District and which was discovered too late for correction, the unirrigated area in this Division is considerably over-estimated.

Division where the rainfall is much above the average of the Division.† In the Hissar Division, with only 17 inches of rainfall, the entire cultivation, nearly 3 millions of acres (the proportion irrigated is insignificant) is dependent on rain; and though $3\frac{1}{2}$ lakhs of acres are said to be aided by sailab, the

majority is in the Hissar District, where the aid so described is far less certain than on the Punjab rivers. In the remaining Divisions the rainfall is as a rule abundant; but making

allowances for those tracts in each Division where the contrary is the case, say 3 millions of acres † and adding that to the area similarly circumstanced in the Hissar Division, the cultivation of food grains in the Province may be classified

for the purposes of the question under reply, as follows:—

	Millions of acres.
Irrigated	4½
Not irrigated, in 3 classes,—	
1.—Sailab, &c, usually safe owing to aid received from river floods and percolation	14
2.—Safe, because grown under an abundant and reliable rain-fall	6½
3.—Dependent on a less certain rain-fall	6
Total	18½

The proportion of the whole supply of food grains which is produced on irrigated land is a question of some difficulty; for this reason that, as noticed in the reply to question 3, the annual estimates of crop areas and yield are given in the gross for each district, and do not distinguish the areas and yield of crops under irrigation from that of land not so advantaged. District Officers have been asked to state broadly in what ratio the produce (food grains) of 1 acre of irrigated land stands to that 1 acre unirrigated. The reply for the whole province is as 3 to 2. Therefore $18\frac{1}{2}$ millions of acres being the average annual area of food grains, and of this $4\frac{1}{2}$ millions being irrigated; it follows that of the total yield one-third is supplied from the irrigated lands, and two-thirds from the unirrigated. The figures for each Division calculated on the same principle are:—

Division.	Rainfall.	Percent of area under food grains which is irrigated.	In what ratio does the produce (food crops) of 1 acre of irrigated land stand to that of 1 acre of unirrigated in an average year.	Of the average annual yield of food grains raised on irrigated land.	REMARKS.
Delhi	25.5	29	5 to 3	41	
Hissar	16.9	6	2 to 1	11	
Umballa	35.3	18	3 to 2	25	
Jullundur	29.8	18	3 to 2	25	
Amritsar	28.1	38	2 to 1	55	
Lahore	18.6	44	3 to 2	54	
Rawalpindi	31.5	10	3 to 2	14	
Mooltan	6.1	65	3 to 2	74	
Derajat	8.0	27	3 to 2	36	
Peshawar	12.9	22	2 to 1	36	*A considerable portion of the division has smaller rainfall.
Total		25	3 to 2	83	

* The following table gives the same data for each district.

Division.	District.	Rainfall at head quarters.	Percent of area under food crops which is irrigated.	In what ratio does the produce (food crops) of 1 acre of irrigated land stand to that of 1 acre of unirrigated in an average year.	Of the average annual yield of food grains raised on irrigated land.	Division.	District.	Rainfall at head quarters.	Percent of area under food crops which is irrigated.	In what ratio does the produce (food crops) of 1 acre of irrigated land stand to that of 1 acre of unirrigated in an average year.	Of the average annual yield of food grains raised on irrigated land.
Delhi	Delhi	25.5	29	5 to 3	41	Lahore	Lahore	18.6	44	3 to 2	54
	Gurgaon	28.5	18	3 to 2	25		Farazkote	20.0	18	3 to 2	27
	Karnal	30.4	48	3 to 1	66		Gujranwala	28.3	69	3 to 2	77
	Meerut	18.9	14	3 to 2	6		Rawalpindi	31.5	2	2 to 1	4
Hissar	Hissar	16.9	6	2 to 1	11	Rawalpindi	Rawalpindi	31.5	2	2 to 1	4
	Rohat	18.2	18	3 to 1	30		Jhelum	18.8	8	3 to 2	6
	Sirsa	14.2	9	2 to 1	9		Gujrat	22.2	14	3 to 2	20
	Thanesar	28.1	38	2 to 1	55		Mooltan	Shahpur	22.0	38	2 to 2	45
Umballa	Umballa	35.3	17	3 to 2	25	Mooltan		6.1	78	3 to 1	94
	Ludhiana	25.3	1	2 to 1	28	Jhang		10.3	64	2 to 2	73
	Jullundur	29.8	17	3 to 2	25	Montgomery		8.7	63	4 to 3	69
	Hoshiarpur	33.7	2	3 to 2	4	Muzaffargarh	21	37	3 to 2	67	
Amritsar	Hingra	22.6	39	2 to 1	45	Derajat	D. I. Khan	8.0	19	3 to 4	23
	Amritsar	28.1	38	2 to 1	55		D. G. Khan	7.2	65	3 to 3	74
	Sialkot	39.0	57	3 to 2	67		Bannu	12.0	15	2 to 1	35
	Gurdaspur	30.9	18	2 to 1	21		Peshawar	Peshawar	12.9	37	2 to 1	43
					Kohat	30.2		17	3 to 1	33	
					Hassk	45.2		13	3 to 2	13	

We may carry the question further on the same principle as that applied to the areas, **CH. I.** and inquire what proportion of the total produce of unirrigated land is fairly secure, and what proportion depends on a precarious fall. The abundance of the rainfall in the sulmontane tracts, and assistance by river sailab or hill floods in other places, will be admitted to have an effect on the yield as compared with that of unirrigated land less advantaged, not dissimilar to the advantage enjoyed by irrigated over unirrigated land.

There is nothing more certain and noteworthy, or more clearly shown by such produce statistics as we possess, than the great difference in yield between the better and worse classes of unirrigated land. But as the classification necessarily adopted is a very broad one, it will be safer not to assume the difference applicable thereto as greater than 3 to 2. The estimate of the extent to which the total yield of food grains in the province is secured against drought will then stand as follows :—

Classification of cultivation.	Area cultivated millions of acres.	Proportionate rate of yield.	Percentage of total yield of food grains contributed by each class.
Irrigated land	4½	45	36
Not irrigated, but aided by sailab or floods, or protected by abundant rainfall.	8	3	43
Not irrigated, and dependent on a smaller and more precarious rainfall.	6	2	21
Total ...	18½	...	100

Note.—The last column of this statement is arrived at thus ;

4½ × 45 = 20¼ ;
8 × 3 = 24
6 × 2 = 12
Total ... 56½

Then 56½ : 20¼ :: 100 : 36—and similarly for the other two items.

To how much of the area is the protection complete and permanent, and how much is dependent on the local rain. Supposing canals, tanks, wells, and jhils to be utilised to the utmost extent and kept in the highest possible order, what extent of the country would be protected from drought in a year when there is a failure of rain ?

I am not certain in what sense the term "protected by irrigation" is used in this question. In the previous portion of this reply I have answered as if it was equivalent to the term "irrigated." In the Irrigation Department a tract is said to be "protected by irrigation" of which a third part is or can be irrigated in a season of drought by a canal drawn from a permanent river or by wells not liable to dry up.

I shall avoid technicalities of this nature and confine myself to the actual area irrigated. In the whole Punjab this is 26 per cent. of the cultivation, or 5½ million acres out of 21 millions. The details of the irrigation are roughly—

	Millions of acres.	Per cent. of irrigation.
By wells	3	55
By inundation canals ...	1	18
By perennial canals ...	½	14
By small channels and streams	½	11
By tanks and jhils, less than	½	2
Total ...	5½	100

I. The complete figures for each division are given in a footnote below. *

As regards the well irrigation it will be seen from that footnote, that the greater part of this is situate in submontane districts with a reliable rainfall. In the Mooltan Division, where the contrary is the case, the wells are largely aided by canals or by river sailab. Well cultivation may be said broadly to be never independent of aid by rain or by other means. It is not an absolute insurance against famine; it is only an insurance against its milder forms. In the reply to question 2, it has been shown that famine is commonly caused by the failure of the kharif harvest followed by the failure of the rabi sowings. A little reflection will shew the effect of this upon wells. The well cattle depend for their winter fodder largely on the kharif harvest. All aid from rain failing, they are thrown for support entirely on the produce of the water raised by their labour. At the same time the winter rains failing, that labour becomes unusually continuous and severe. On the other hand it becomes a question of increasing perplexity to the well owner, how he is to feed both his cattle and his own family. There is also this additional trouble, that the drought has made both air and soil so dry, that the water does far less irrigating duty than usual. In the end, if the drought really lasts a year; that is to say, if it comes in with the failure of the kharif, and is followed by a similar failure of the winter rains, it is perfectly certain that a vast number of the well cattle will have died of hunger and fatigue before the next autumn rains are due; and that the area before irrigated by the wells will have greatly contracted, wherever not aided by canal irrigation. The eventual breaking down of the wells under such circumstances is merely a question of time. In short the main defect of well irrigation in its relation to famine is, that it depends on animal power, requiring for its support large quantities of fodder. In ordinary years it adds greatly to the agricultural wealth of the country. In bad seasons not amounting to famine it is the saving of the tracts where it exists. In prolonged famine its breaking down is mainly a question of time; at any rate the food supplied by such well irrigation as survived would bear no proportion to that raised on the well irrigated lands in the previous prosperous seasons †

Canal irrigation possesses no similar drawback. It can be absolutely depended upon in the worst famines; and by far the greater portion of it being by flow, and not by lift, it is applied to the land with little or no expenditure of labour. The heads of the inundation canals are no doubt less to be depended on, than those of the perennial canals; but as a matter of experience the irrigation from the inundation canals, when superintended by properly trained canal officers, has proved to be fairly certain;

* Details of Punjab irrigation, abstracted from the more complete statement appended to this reply.

Division.	Rainfall.	Per cent of cultivated area irrigated.	DETAIL OF IRRIGATION.					Average area of un-irrigated crops.	
			Perennial canals.	Autumnal inundation canals.	Wells.	Tanks and jhills.	Small channels from rivers and streams.		Total irrigated.
Delhi ...	25.5	32	2,24,717	...	2,96,939	98,327	30,993	6,50,976	14,63,350
Hisar ...	16.9	7	1,68,670	...	32,919	...	27,466	2,19,054	29,98,218
Umballa ...	35.3	14	8,490	...	1,80,497	26,612	86,226	2,95,825	14,65,906
Jullundur ...	29.6	21	5,619	...	2,43,649	...	515	1,65,079	4,14,862
Amritsar ...	23.1	35	1,71,630	...	6,13,200	10,722	17,463	8,12,915	13,53,491
Lahore ...	18.5	40	1,40,432	62,967	8,10,939	7,502	3,654	10,25,494	12,87,677
Rawalpindi ...	31.5	20	...	52,000	2,54,276	...	9,758	3,16,034	25,22,069
Mooltan ...	6.1	69	...	6,02,403	5,24,297	...	7,830	11,34,530	5,09,335
Derajat ...	8.0	35	...	2,16,574	1,85,218	...	66,000	4,67,792	11,59,115
Peshawar ...	12.9	24	35,187	...	34,140	558	2,28,419	2,98,304	9,74,918
Total ...	...	26	7,39,645	9,33,944	81,76,074	1,43,236	6,42,887	56,35,786	1,54,76,870

† A complete statement of the extent and cost of well irrigation in the Punjab will be found appended to this reply. It has been completed from data furnished by district officers, with the object of showing the cost of well irrigation and the extent to which it is taxed. I have also appended a memorandum by the Financial Commissioner, dated September 1870, in which the difficulties involved in any attempt to extend rapidly this form of irrigation are noticed.

and with the increasing attention paid to them, it is likely to prove still more reliable Cā. I. in the future.

The irrigation from the small channels and streams is in most instances certain and reliable; as also that from our great perennial canals, the Bari Doáb and Western Jumna.

It remains to explain what would be the probable effect of a year of drought in expanding or contracting the area irrigated from these 3 classes of canals. The volume of the rivers from which their supply is drawn would be affected, but not materially so; for these rivers have their sources in the glaciers of the Himalayas. The drought reduces the duty which the water is capable of doing; the dryness of the atmosphere increases the rate of evaporation; the soil is more thirsty; and owing to the absence of rain a greater number of waterings is required by each crop. On the other hand every one has the strongest motives for making the water go as far as possible; so the waste due to carelessness of application in ordinary years is saved. And our canal administration can be depended on to make unusual exertions to send the largest possible amount of water into the canals and to distribute it in the best way.

To test what happens on our perennial canals under such circumstances, I have obtained 3 returns * of the annual irrigation on the Western Jamna and Bari Doáb Canal; which are appended. The following figures of the Western Jamna canal,—a canal that irrigates tracts where famine is most felt in this province,—furnish remarkable evidence of the stability and elasticity of canal irrigation under the pressure of Famine:

Year.	Acres irrigated.	REMARKS.
1822-3 ...	30,749	
1823-4 ...	51,609	Drought.
1824-5 ...	38,185	Famine.
1825-6 ...	69,320	
1832-3 ...	94,299	
1833-4 ...	2,13,206	Famine.
1836-7 ...	2,19,503	
1837-8 ...	3,90,318	Drought.
1860-1 ...	4,54,292	Famine.
1861-2 ...	3,72,680	
1867-8 ...	3,31,037	
1868-9 ...	4,86,876	Famine.
1876-7 ...	3,66,482	
1877-8 ...	5,07,974	Scarcity.

And I would point out, as not the least valuable point in the above figures, that the increased irrigation attained under the pressure of each famine year is always maintained, after the famine has passed away. I cannot give similar figures for the other canals. The tracts watered by the Bari Doáb canal have not suffered by famine since it was opened. And the inundation canals flow in a country, where but for them, there would be no cultivation.

To resume; the well irrigation, 3 millions of acres, would certainly contract greatly under pressure of drought. But it is for the most part situate in submontane tracts, where a complete failure of rain-fall is unusual. That of the Mooltan Division is mostly aided by canals or sailab. The canal irrigation, 2½ millions of acres, on the other hand would not contract in a year of drought; but on the best managed canals would probably extend. The small area irrigated from tanks and jhils, 1,40,000 acres, would contract very largely.

* Western Jumna 1, irrigation from 1819 to 1842.
Ditto 2, Ditto 1860 to 1877.
Bari Doáb Canal 3, Ditto Ditto.

The first has been supplied by the Settlement Officer of Karnal, the others by the Assistant Secretary, Irrigation Department.

In conclusion, before leaving this question, the Financial Commissioner desires to bring to the attention of Government, the urgency of developing kharif irrigation from the western Jumna canal in the dry tracts of the Delhi and Hissar Divisions. The reply to question 2 has shewn that, whenever bad years come, it is in this part of the province that they are most severely felt. In the Hissar Division, of a cultivated area of 3 millions of acres, little more than 2,00,000 are irrigated. A scheme is now pending the sanction of Government, whereby kharif irrigation will be supplied from the Western Jumna canal to 25,000 acres in the Karnál District, and 32,000 acres in the Rohtak District ; of which the cost is small and the difficulties of execution *nil*. But a much more important scheme was set aside about the year 1871 on reference to the Secretary of State ; whereby a kharif irrigation branch would have been taken out from the main line of the Western Jumna canal above Karnál, and have been carried into the eastern portion of the Sirsa District. This branch would water from 1,50,000 to 2,00,000 acres in the most Famine-stricken tract in the Paujab. The scheme would cost 20 lakhs and would probably yield an annual gross revenue of from 3 to 4 lakhs.* It has hitherto been set aside because it was inconvenient to provide the money, and because other works were in progress on the Western Jumna canal. But judging by the results of the famines of 1860-61 and 1868-69 and of the late scarcity in 1877-78, it is probable that no canal extension can be either more urgent or more profitable than this. If this scheme is carried out, and if a further extension of irrigation in the western end of the Sirsa District can be obtained by means of the Abohar branch of the Sirhind canal, very important progress will have been made towards protecting the Hissar Division from famine.

What is the effect of the irrigation of crops other than food crops in adding to the powers of the population to resist famine ?

It has been stated above that of 5½ millions of acres irrigated, all but one million is devoted to the cultivation of food grains. I propose to answer this question by giving such information as is available concerning the crops of which this one million not devoted to food grains is made up. This can be done mainly by the aid of the crops statement appended to question 3. We know that the entire crop of indigo and nearly all the sugar-cane is irrigated ; the same is true of poppy, tobacco, turmeric, coriander seed, ginger and chillies. Of vegetables also the major portion is cultivated on irrigated land. And the annual cotton report for 1876-77 shows that of the cotton crop more than 3,50,000 acres are irrigated. These items added together total—

	<i>Acres.</i>
Indigo	101,650
Sugar-cane	356,142
Cotton	350,000
Vegetables (say ¼ the area returned)	132,500
Poppy	11,042
Tobacco	71,698
Turmeric	3,508
Coriander seed, ginger and chillies	23,743
Total ...	1,050,283

If we omit indigo and poppy, there is not one of these crops, which is not as necessary to the sustenance of the people as the ordinary food grains. The area under the valuable crops of indigo and poppy is insignificant compared with the total area (5½ millions) irrigated. Moreover, cotton excepted, of which the cultivation is easy, we may say that these crops represent the efforts of the best cultivators of the Province. And they are far more profitable than the ordinary food crops.

Papers appended.

Statement showing extent of irrigation in each district, &c.

Statement showing cost, results, and assessment of well irrigation in each district.

Extract from Memorandum by the Financial Commissioner, dated September 1870, noticing the difficulties attending attempts to increase irrigation rapidly.

3 Statements showing the progress of irrigation on the Western Jumna and Bári Doáb canals.

* These data have been obtained from the Irrigation Department.

CHAPTER I, QUESTION 4.

Statement showing for each District in the Punjab, the extent to which each District is protected by irrigation, and the proportion of that area devoted to food crops; the ratio by which irrigation increases the yield of land; and the proportion of the total yield of food grains due to irrigation; also area still uncultivated and total population.

Prefatory remarks.—In the cultivated area double crop lands are reckoned twice, so that the acreage given is the gross acreage of the annual crops.

Columns 12 to 21 have been filled in from the replies received from District Officers. In Columns 22—27 the total areas are the same as those given in the statement of crops appended to the reply to Question 3; the irrigated areas are copied from Columns 12 to 21 of this statement; and the unirrigated areas are the difference.

The total areas given in Columns 21 and 27 disagree by the amount stated in Column 28. The total difference between these Columns for the whole Province is $2\frac{1}{2}$ per cent; in all but eight Districts the 2 Columns agree approximately; and were a little more time at my disposal, it would be easy to eliminate the discrepancies by reference to District Officers. But the total difference being only $2\frac{1}{2}$ per cent., it seems scarcely worth while to do so, more especially as from the manner in which the irrigated areas in Columns 22—27 have been reckoned, it is certain that the irrigated areas have not been over-estimated.

I.

CHAPTER I,

Statement showing for each District in the Punjab, the extent to which cultivation is protected by the yield of land; and the proportion of the total yield of food grains

1	2	3			4				11	13							
		POPULATION BY CENSUS OF 1881.			PERCENTAGES OF CULTIVATION.					DETAIL OF CULTIVATED AREA (IN ACRES)							
		Total acres.	Per square mile of.		Average annual rain-fall.	Of unirrigated land.	Of irrigated cultivation.	Of sabb cultivation.		Of cultivation dependent solely on rains.	AVERAGE AGRICULTURE						
			Total cultivation.	Irrigation.							Perennial canals.	Artificial irrigation canals.	Wells.	Tanks and Jills.			
DELHI.	Delhi	608,800	684	2,908	28.6	89	87	2	81	817,817					Food grains and pulses.	Rabi ..	39,416	..	25,634	9,328
												Kharif ..	31,188	..	28,261	4,719	
												Total ..	70,749	..	63,899	14,047	
												Other produce ..	24,597	..	18,603	6,374	
												Total ..	95,346	..	77,499	17,021	
		Gurgaon ..	697,841	381	2,840	28.5	31	19	..	81	1,387,333	Food grains and pulses.	Rabi ..	12,967	..	78,068	46,182
													Kharif ..	5,174	..	8,938	16,428
											Total ..	18,041	..	87,019	61,616		
											Other produce ..	4,016	..	5,388	14,770		
											Total ..	22,057	..	92,407	76,386		
HISSAR.	Karnal	610,927	482	1,468	30.4	132	89	1	60	1,606,171	Food grains and pulses.	Rabi ..	44,428	..	74,244	671	
												Kharif ..	40,748	..	35,787	198	
												Total ..	85,176	..	110,031	869	
												Other produce ..	22,144	..	17,005	87	
												Total ..	107,320	..	127,036	956	
		Hissar	484,631	242	4,406	16.9	77	8	28	72	2,265,429	Food grains and pulses.	Rabi ..	31,290	..	843	..
													Kharif ..	18,864	..	122	..
											Total ..	50,154	..	965	..		
											Other produce ..	12,174	..	428	..		
											Total ..	62,328	..	1,393	..		
	Rohtak	636,914	374	2,902	19.7	38	13	1	86	1,118,868	Food grains and pulses.	Rabi ..	44,298	..	18,144	..	
												Kharif ..	22,012	..	271	..	
											Total ..	67,310	..	18,415	..		
											Other produce ..	28,431	..	8,907	..		
											Total ..	95,741	..	27,322	..		
	Sirsa	310,784	140	4,352	14.3	107	8	8	22	1,997,827	Food grains and pulses.	Rabi ..	..	..	6,928	..
												Kharif ..	..	..	2,076	..
											Total ..	..	..	9,004	..	
											Other produce ..	..	..	270	..	
											Total ..	..	..	9,274	..	

QUESTION 4.

irrigation, and the proportion of that area devoted to food crops; the ratio by which irrigation increases due to irrigation; also area still uncultivated and total population. CH. I.

SHOWING SOURCE OF IRRIGATION.					DISTRIBUTION OF IRRIGATION BETWEEN FOOD GRAINS AND OTHER CROPS.												
OF CROPS.					OF CROPS.												
Small obtained from rivers and streams.		Total irrigated.	Unirrigated but aided by alluvial water from rivers (saline).	Strictly dependent on rain.	Total average area of crops.		Food grains.			Other produce.	Total cultivation.	No. of acres by which previous column exceeds column 21 or is less than column 21.	In what ratio does the produce (food crops) of 1 acre of irrigated land to that of 1 acre of unirrigated in an average year.	Per cent. of area under food grains which is irrigated.	Of the average annual yield of food grains irrigated area is probably raised on irrigated land.		
...	...						Spring.	Autumn.	Total.								
...	84,578	...	...	...	...	Irrigated	84,578	64,113	148,691	45,174	198,865				
...	64,113	...	...	...	...	Unirrigated	162,408	174,304	336,712	34,347	371,059				
...	148,691	...	...	...	...	Total	246,986	238,417	505,403	79,521	584,924	+85,959	3 to 2	30	41
...	45,174	...	...	...	...								
...	198,865	...	8,000	516,397	818,462												
...	128,135	...	...	...	...	Irrigated	128,135	80,640	208,775	34,071	242,846				
...	80,640	...	...	...	...	Unirrigated	192,707	567,851	760,558	65,383	825,941				
...	166,675	...	...	...	...	Total	320,842	648,491	969,333	99,454	1,068,787	+88,939	3 to 2	18	27
...	24,071	...	...	...	...								
...	190,748	...	2,000	798,793	989,478												
19,619	138,063	...	...	...	...	Irrigated	138,063	87,197	225,260	40,106	265,366				
10,474	87,197	...	...	...	...	Unirrigated	88,775	142,328	231,103	19,348	250,451				
30,098	226,358	...	...	...	...	Total	226,838	229,525	456,363	59,454	515,817	-107,294	2 to 1	45	66
900	40,106	...	...	...	...								
30,998	266,365	...	2,500	414,144	684,009												
4,820	37,072	...	...	...	...	Irrigated	37,072	19,486	56,558	18,612	75,170				
800	19,458	...	...	...	...	Unirrigated	102,487	1,308,358	1,310,845	81,804	1,392,649				
6,120	56,558	...	...	...	...	Total	139,559	1,327,844	1,367,403	99,416	1,466,819	+100,418	3 to 2	4	8
1,000	12,612	...	...	...	...								
6,120	70,171	...	261,094	921,267	1,262,562												
...	57,748	...	...	...	...	Irrigated	57,748	28,288	86,036	37,338	123,374				
...	28,288	...	...	...	...	Unirrigated	204,861	389,316	594,177	78,480	672,657				
...	81,026	...	...	...	...	Total	262,609	417,604	680,213	115,818	798,031	-77,764	2 to 1	11	20
...	27,338	...	...	...	...								
...	118,364	...	2,700	790,701	911,765												
16,568	22,294	...	...	...	...	Irrigated	22,294	6,285	28,579	270	28,849				
4,779	6,285	...	...	...	...	Unirrigated	124,422	715,554	840,076	64,696	904,772				
21,246	30,249	...	...	...	...	Total	146,716	721,839	868,655	64,966	933,621	-21,254	2 to 1	2	2
...	270	...	...	...	...								
21,246	30,519	...	51,516	682,430	804,765												

Statement showing for each District in the Punjab the extent

1	2	3				4				11	13					
		POPULATION BY CENSUS OF 1881.				PERCENTAGES ON CULTIVATION.					DETAIL OF CULTIVATED AREA (IN ACRES)					
		Total souls.	Per square mile of.			Average annual rain-fall.	Of uncultivated land.	Of irrigated cultivation.	Of salab cultivation.		Of cultivation dependent solely on rain.	Total area in acres.	AVERAGE ACREAGE			
			Total cultivation.	Irrigation.												
District.	Total souls.	Total cultivation.	Irrigation.	Average annual rain-fall.	Of uncultivated land.	Of irrigated cultivation.	Of salab cultivation.	Of cultivation dependent solely on rain.	Total area in acres.	Irrigated						
										Perennial canals.	Seasonal inundation canals.	Wells.	Tanks and Bils.			
UMBALLA.	Umballa	1,026,489	636	3,765	85.3	88	18	1	81	1,477,337	Food grains and pulses	Rabi	1,305	..	32,788	6,200
												Kharif	2,184	..	24,100	30,412
												Total	3,489	..	56,888	36,612
												Other produce .. ..	..	..	4,307	..
												Total	3,490	..	61,195	36,612
UMBALLA.	Ludhiana	683,345	521	2,136	25.8	28	17	1	82	875,761	Food grains and pulses	Rabi .. ..	..	..	62,110	..
												Kharif .. ..	..	..	48,082	..
												Total .. ..	..	..	110,192	..
												Other produce .. ..	..	..	9,128	..
												Total .. ..	..	..	119,320	..
UMBALLA.	Simsa	32,996	1,999	33,995	65.1	9	6	..	94	11,620	Food grains and pulses	Rabi .. ..	..	..	..	..
												Kharif .. ..	..	..	..	..
												Total .. ..	..	..	..	..
												Other produce .. ..	..	..	..	..
												Total .. ..	..	..	..	..
JULLUNDUR.	Jullundur	794,764	786	2,371	29.8	33	4	..	63	948,625	Food grains and pulses	Rabi .. ..	..	..	111,574	..
												Kharif .. ..	..	..	68,607	..
												Total .. ..	..	..	180,181	..
												Other produce .. ..	..	..	48,998	..
												Total .. ..	..	..	229,179	..
JULLUNDUR.	Hoshiarpur	328,930	726	22,901	33.7	77	2	..	94	1,325,622	Food grains and pulses	Rabi	5,632	..	10,412	287
												Kharif	1,267	..	5,268	128
												Total	6,899	..	15,680	415
												Other produce	300	..	3,079	..
												Total	7,199	..	18,759	415
JULLUNDUR.	Kangra	742,862	790	2,894	128.6	186	27	..	72	1,682,410	Food grains and pulses	Rabi .. ..	..	..	..	..
												Kharif .. ..	..	..	..	..
												Total .. ..	..	..	..	..
												Other produce .. ..	..	..	..	..
												Total .. ..	..	..	..	..

to which cultivation is protected by irrigation—continued.

Ch. I.

SHOWING SOURCE OF IRRIGATION.					DISTRIBUTION OF IRRIGATION BETWEEN FOOD GRAINS AND OTHER CROPS.												
OF CROPS.					OF CROPS.												
by.					by.												
Small channels from rivers and streams.	Total irrigated.	Unirrigated but aided by alluvial soil from rivers (column 18).	Entirely dependent on rain.	Total acreage area of crops.	Irrigated	Unirrigated	Total	Food grains.			Other products.	Total cultivation.	No. of acres by which previous column exceeds column 21 or is less than column 21.	In what ratio does the product (food crops) of 1 acre of irrigated land to that of 1 acre of unirrigated in an average year.	Per cent. of area under food grains which is irrigated.	Of the average annual yield of food grains irrigated is probably raised on irrigated land.	
				Spring.				Autumn.	Total.								
14,659	88,836				...	...	...	...	...	...	...	...	...	...	...	...
71,028	117,738				...	...	...	...	...	...	...	...	...	...	...	...
85,595	171,569				...	...	...	...	...	...	...	...	...	...	...	...
...	4,307				...	...	...	...	...	...	...	...	...	...	...	...
85,595	175,876	10,000	757,184	853,060	...	...	...	...	...	...	...	...	...	...	...	...
...	82,115				...	...	...	...	...	...	...	...	...	...	...	...
...	46,062				...	...	...	...	...	...	...	...	...	...	...	...
...	110,197				...	...	...	...	...	...	...	...	...	...	...	...
...	9,126				...	...	...	...	...	...	...	...	...	...	...	...
...	119,822	8,838	889,522	715,482	...	...	...	...	...	...	...	...	...	...	...	...
609	609				...	...	...	...	...	...	...	...	...	...	...	...
...	
609	609				...	...	...	...	...	...	...	...	...	...	...	...
18	18				...	...	...	...	...	...	...	...	...	...	...	...
627	627		10,475	11,102	...	...	...	...	...	...	...	...	...	...	...	...
...	111,574				...	...	...	...	...	...	...	...	...	...	...	...
...	68,607				...	...	...	...	...	...	...	...	...	...	...	...
...	180,181				...	...	...	...	...	...	...	...	...	...	...	...
...	43,998				...	...	...	...	...	...	...	...	...	...	...	...
...	224,179	27,280	410,050	670,509	...	...	...	...	...	...	...	...	...	...	...	...
272	14,706				...	...	...	...	...	...	...	...	...	...	...	...
274	8,274				...	...	...	...	...	...	...	...	...	...	...	...
649	22,880				...	...	...	...	...	...	...	...	...	...	...	...
82	3,803				...	...	...	...	...	...	...	...	...	...	...	...
681	26,250	25,000	776,056	827,341	...	...	...	...	...	...	...	...	...	...	...	...
84,800	84,800				...	...	...	...	...	...	...	...	...	...	...	...
82,169	82,169				...	...	...	...	...	...	...	...	...	...	...	...
134,999	134,999				...	...	...	...	...	...	...	...	...	...	...	...
27,899	27,899				...	...	...	...	...	...	...	...	...	...	...	...
164,298	164,298		480,167	602,555	...	...	...	...	...	...	...	...	...	...	...	...

Statement showing for each District in the Punjab the extent

1	2	3			6	7				11	12				13	14	15	16		
		POPULATION BY CENSUS OF 1908.				PERCENTAGES ON CULTIVATION.					DETAIL OF CULTIVATED AREA (IN ACRES)									
		Total souls.	Per square mile of.			Average annual rain-fall	Of uncultivated land.	Of irrigated cultivation.	Of silted cultivation.		Of cultivation dependent solely on rain.	Total area in acres.	AVERAGE ACREAGE							
			Total cultivation.	Irrigation									Perennial canals.	Seasonal inundation canals.					Wells.	Tanks and dhik.
DIVISION.	District.	Total souls.	Total cultivation.	Irrigation	Average annual rain-fall	Of uncultivated land.	Of irrigated cultivation.	Of silted cultivation.	Of cultivation dependent solely on rain.	Total area in acres.	DETAIL OF CULTIVATED AREA (IN ACRES)				Perennial canals.	Seasonal inundation canals.	Wells.	Tanks and dhik.		
											Food grains and pulses	Rabi	Total	Other produce					Total	
												Kharif								
											AMRITSAR.	Amritsar	1,088,691	1,018					2,622	28.1	87	89	3	58	809,660	Food grains and pulses	Rabi	52,208	...	88,018	27
												Kharif	26,802	...	42,508	18				
												Total	79,010	...	130,526	45				
												Other produce	28,200	...	29,079	...				
											Total	108,005	...	168,605	40					
	Sialkot	1,002,000	788	1,511	39.4	54	50	10	40	1,261,651	Food grains and pulses	Rabi	...	...	240,118	3,008		
												Kharif	...	...	121,474	4,877		
												Total	...	...	361,592	7,885		
												Other produce	...	...	39,184	...		
												Total	...	...	400,748	7,882		
	Gurdaspur	655,282	549	8,413	20.9	53	16	10	66	1,163,689	Food grains and pulses	Rabi	14,815	...	31,327	1,388				
												Kharif	40,850	...	18,281	788				
												Total	55,665	...	49,608	2,176				
												Other produce	7,760	...	6,044	679				
												Total	63,425	...	55,652	2,855				
	Lahore	789,666	411	1,131	18.6	34	37	9	54	2,241,428	Food grains and pulses	Rabi	90,788	16,611	169,967	...				
												Kharif	26,067	2,000	101,894	...				
												Total	116,855	18,611	271,861	...				
												Other produce	13,600	2,387	21,648	...				
												Total	130,455	21,498	293,509	...				
	Ferozepore	649,751	276	1,941	20.0	40	16	3	83	1,755,250	Food grains and pulses	Rabi	...	21,543	85,434	...				
												Kharif	...	18,513	47,782	...				
												Total	...	40,056	133,216	...				
												Other produce	...	1,418	5,226	...				
												Total	...	41,474	138,442	...				
	Gujranwala	650,676	637	904	26.3	203	70	4	26	1,640,222	Food grains and pulses	Rabi	...	...	323,227	...		
												Kharif	...	...	44,478	7,802		
												Total	...	...	377,705	7,802		
												Other produce	...	...	101,888	...		
												Total	...	...	378,593	7,802		

to which cultivation is protected by irrigation—continued.

SHOWING SOURCE OF IRRIGATION.					DISTRIBUTION OF IRRIGATION BETWEEN FOOD GRAINS AND OTHER CROPS.											
OF CROPS.																
Small channels from rivers and streams.	Total irrigated.	Unirrigated but aided by alluvial soil from river (akhu).	Entirely dependent on rain.	Total acreage area of crops.	Irrigated	Unirrigated	Total	Food grains.			Other produce.	Total cultivation.	No. of acres by which previous column exceeds column 21 or is less than column 21.	In what ratio does the produce (food crops) of 1 acre of irrigated land to that of 1 acre of unirrigated in an average year.	Percent of area under food grains which is irrigated.	Of the average annual yield of food grains irrigated in previous column on irrigated land.
								Spring.	Autumn.	Total.						
18	188,281				Irrigated	188,281	69,180	207,891	57,579	264,670						
7	68,130				Unirrigated	264,008	116,817	868,820	48,361	418,071						
26	207,891				Total	392,384	186,047	877,311	106,589	682,741		+ 1,891	3 to 1	86	63	
20	264,670	22,154	294,088	680,920												
3,000	366,170				Irrigated	366,170	140,071	388,341	39,404	436,646						
12,727	146,071				Unirrigated	216,166	78,858	299,022	58,960	277,983						
16,770	286,241				Total	461,236	216,927	678,363	126,364	608,827		-46,294	3 to 2	87	67	
260	39,404															
17,020	436,544	24,404	237,672	947,921												
188	48,019				Irrigated	48,019	60,082	108,644	14,558	122,600						
188	60,082				Unirrigated	236,927	150,618	476,145	81,298	567,438						
260	108,644				Total	374,889	210,650	584,189	96,843	680,088		-88,419	2 to 1	10	31	
78	14,558															
458	132,600	117,928	638,122	768,657												
..	277,343				Irrigated	277,343	189,681	417,004	38,186	465,140						
..	189,681				Unirrigated	189,228	60,637	199,889	40,871	260,296						
..	417,004				Total	416,571	200,298	616,869	98,507	716,376		-518,292	3 to 2	66	76	
..	26,138															
..	446,140	106,069	687,623	1,238,662												
..	107,977				Irrigated	107,977	66,286	174,272	6,828	180,910						
..	66,286				Unirrigated	406,911	277,231	786,182	80,827	866,999						
..	174,272				Total	614,888	443,546	960,454	87,675	1,047,909		-227,069	3 to 2	16	27	
..	8,828															
..	180,910	42,268	1,061,064	1,274,972												
410	282,687				Irrigated	282,687	85,167	287,824	101,619	389,443						
2,210	66,187				Unirrigated	36,891	94,740	120,271	20,173	160,448						
1,620	287,834				Total	266,168	149,927	418,095	121,791	549,886		-2,696	3 to 2	69	77	
24	101,619															
2,644	389,443	28,114	140,928	558,485												

Statement showing for each District in the Punjab the extent

1	2	3			6	7				11	12				13	14	15	16		
		POPULATION BY CENSUS OF 1881.				PERCENTAGES OF CULTIVATION.					DETAIL OF CULTIVATED AREA (IN ACRES)									
		Total souls.	Per square mile of			Average annual rain-fall.	Of uncultivated land.	Of irrigated cultivation.	Of tank cultivation.		Of cultivation dependent solely on rain.	Total area in acres.	AVERAGE ACREAGE							
			Total cultivation.	Irrigation.									Perennial canals.	Artificial inundation canals.					Wells.	Tanks and Jills.
DIVISION.	District.																			
		RAWALPINDI.																		
		Hawalpindi ...	711,266	546	28,450	31.6	279	2	...	59	3,979,697	Food grains and pulses	Rabi	18,861	
													Kharif	
													Total	18,861	
													Other produce	1,440	
													Total	14,501	
		Jhelum ...	500,986	349	10,224	18.6	172	3	...	94	3,502,400	Food grains and pulses	Rabi	14,598	
													Kharif	10,084	
													Total	24,927	
											Other produce	...	...	4,599	...	...	...
											Total	...	...	29,520	...	...	...
Gujrat ...	615,347	550	4,280	29.2	84	13	...	78	1,298,560	Food grains and pulses	Rabi	...	...	58,934	...	...	...
											Kharif	...	...	28,704	...	...	...
											Total	...	...	88,638	...	...	...
											Other produce	...	...	8,622	...	...	...
											Total	...	...	86,260	...	...	...
Shahpur ...	368,766	657	1,341	13.0	95	64	...	17	3,007,607	Food grains and pulses	Rabi	...	18,000	59,456	...	...	...
											Kharif	...	14,000	22,240	...	...	...
											Total	...	...	37,000	81,696	...	...	
											Other produce	...	...	25,000	42,000	...	...	
											Total	...	...	52,000	123,696	...	...	
Mooltan ...	471,573	582	736	6.1	654	79	...	21	3,728,280	Food grains and pulses	Rabi	...	164,787	27,024	...	...	...
											Kharif	...	78,818	10,500	...	...	...
											Total	...	...	248,706	37,524	...	...	
											Other produce	...	...	90,867	34,417	...	...	
											Total	...	...	324,667	72,041	...	...	
Jhang ...	348,027	661	960	10.9	1,020	69	...	30	3,640,651	Food grains and pulses	Rabi	...	311	131,846	...	...	...
											Kharif	...	26	35,992	...	...	...
											Total	...	...	337	167,837	...	...	
											Other produce	...	...	20	86,436	...	...	
											Total	...	...	357	224,273	...	...	
Montgomery ...	359,432	596	956	8.7	826	62	...	31	3,566,926	Food grains and pulses	Rabi	...	30,226	122,699	...	...	...
											Kharif	...	22,800	57,159	...	...	...
											Total	...	...	53,026	180,858	...	...	
											Other produce	...	...	5,662	18,672	...	...	
											Total	...	...	58,688	180,530	...	...	
MOOLTAN.																				

to which cultivation is protected by irrigation—continued.

SHOWING SOURCE OF IRRIGATION.				DISTRIBUTION OF IRRIGATION BETWEEN FOOD GRAINS AND OTHER CROPS.										
OF CORPS.														
Small channels, from rivers and streams.	Total irrigated.	Unirrigated but irrigated by artificial floods and precipitation from river (rainfall).	Entirely dependent on rain.	Total average area of crops.	Food grains.			Other produce.	Total cultivation.	No. of acres by which previous column exceeds column 21 or is less than column 21.	In what ratio does the produce (food crops) of lands irrigated land to that of lands unirrigated in an average year.	Percent of area under food grains which is irrigated.	Of the average annual yield of food grains what percentage is probably raised on irrigated land.	
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
				Spring.			Autumn.			Total.				
1,281	14,592				Irrigated	14,592		14,592	1,568	16,167				
...	...				Unirrigated	441,479	388,838	776,014	112,384	887,398				
1,281	14,592				Total	456,071	388,838	789,906	113,952	902,456	+ 69,469	2 to 1		
132	1,563													
1,286	16,167	735	817,110	828,992										
1,016	15,908				Irrigated	15,908	11,049	26,957	4,692	31,649				
1,016	11,049				Unirrigated	668,028	237,868	760,431	81,267	841,678				
2,030	26,967				Total	478,948	248,917	777,877	86,959	868,827	- 69,287	3 to 2		
99	4,692													
3,128	31,649	26,394	863,671	931,714										
2,768	67,719				Irrigated	67,719	80,182	67,901	4,240	92,141				
1,478	80,182				Unirrigated	286,667	228,961	517,628	128,916	646,544				
5,246	87,901				Total	346,386	249,143	605,529	133,156	738,685	+ 29,268	3 to 2	14	30
618	4,240													
5,864	92,141	64,738	847,548	704,427										
200	72,665				Irrigated	72,665	86,840	108,908	67,092	176,007				
100	86,840				Unirrigated	110,617	70,820	180,837	...	161,546				
300	106,990				Total	183,172	106,660	289,822	67,104	346,926	+ 62,611	3 to 2	38	48
92	67,092													
392	176,087	80,921	48,017	276,025										
...	191,811				Irrigated	191,811	91,118	289,924	127,876	410,800				
1,600	91,118				Unirrigated	109,827	...	109,827	21,247	132,084				
1,600	262,924				Total	295,648	91,118	385,761	148,628	536,884	+ 16,212	2 to 1	78	84
2,092	127,876													
4,692	410,800	107,187	1,688	519,172										
1,868	1,881,516				Irrigated	188,516	85,578	170,090	57,014	327,104				
567	86,670				Unirrigated	78,067	21,020	94,077	4,748	98,825				
1,916	170,090				Total	206,572	67,698	264,167	61,762	325,929	- 828	3 to 2	64	78
846	67,074													
2,464	237,104	96,581	3,067	336,752										
1,266	165,290				Irrigated	165,290	80,048	215,868	26,294	240,692				
909	60,068				Unirrigated	111,430	18,013	124,448	20,918	145,366				
1,674	214,858				Total	276,720	68,061	338,901	46,744	385,948	...	4 to 3	63	69
...	26,294													
1,674	240,692	80,866	114,600	335,948										

Statement showing for each District

1	2	3			6	7				11	12					13	14	15	16		
		POPULATION BY CENSUS OF 1881.				PERCENTAGES OF CULTIVATION.					DETAIL OF CULTIVATED AREA (IN ACRES)										
		Total souls.	Per square mile of.			Average annual rain-fall.	Of uncultivated land.	Of irrigated cultivation.	Of sabbé cultivation.		Of cultivation dependent solely on rain.	Total area in acres.	AVERAGE ACREAGE								
			Total cultivation.	Irrigation.									Perennial canals.	Artificial inundation canals.	Wells.					Tanks and jilla.	
MOULTAN.	Musaftargah ...	235,547	476	737	61	377	65	38	..	1,890,560	Food grains and pulses	Rabi ...	108,860	18,032	...	...	...	...
												Kharif ...	48,278	7,118	...	...	...	...
												Total ...	157,138	25,150	...	...	...	...
												Other produce	56,452	22,808	...	...	...	...
DERAJAT.	Dera Ismail Khan ...	394,864	547	1,687	80	888	82	86	88	4,641,500	Food grains and pulses	Rabi ...	25,000	68,000	...	...	...	...
												Kharif ...	18,000	12,000	...	...	...	...
												Total ...	43,000	80,000	...	...	...	...
												Other produce	10,000	10,000	...	...	...	...
DERAJAT.	Dera Ghisai Khan ...	308,891	485	784	72	598	67	10	32	5,088,812	Food grains and pulses	Rabi ...	87,208	80,221	...	...	...	...
												Kharif ...	69,938	1,000	...	...	...	...
												Total ...	157,146	81,221	...	...	...	...
												Other produce	49,418	10,897	...	...	...	...
PESHAWAR.	Bannu ...	287,647	392	2,652	120	382	15	12	72	2,028,440	Food grains and pulses	Rabi ...	...	1,800	...	...	...	...
												Kharif ...	...	400	...	...	...	...
												Total ...	...	2,000	...	...	...	...
												Other produce	...	1,000	...	...	...	...
PESHAWAR.	Peshawar ...	522,182	869	1,888	129	88	25	2	72	1,698,416	Food grains and pulses	Rabi ...	...	9,708	870	...	...	...
												Kharif ...	...	12,118	180	...	...	...
												Total ...	...	21,826	800	...	...	...
												Other produce	...	10,519	58	...	...	...
PESHAWAR.	Kohat ...	145,892	376	2,896	202	181	38	2	60	1,516,600	Food grains and pulses	Rabi ...	20,692	240	...	...	...	...
												Kharif ...	11,240	257	...	...	...	...
												Total ...	31,932	497	...	...	...	...
												Other produce	5,148	64	...	...	...	...
PESHAWAR.	Hasara ...	267,226	544	5,245	620	884	10	...	90	1,814,528	Food grains and pulses	Rabi ...	...	322	...	...	...	...
												Kharif ...	...	404	...	...	...	...
												Total ...	...	726	...	...	...	...
												Other produce	...	...	...	...	...	...

in the Punjab, the extent to which cultivation is protected by irrigation—continued.

Ch. I.

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
SHOWING SOURCE OF IRRIGATION					DISTRIBUTION OF IRRIGATION BETWEEN FOOD GRAINS AND OTHER CROPS									
OF CROPS.														
Small amounts from rivers and streams		Total irrigated.	Unirrigated has aided by artificial floods and percolation from river (salab).	Entirely dependent on rain.	Total average area of crops.	Food grains.			Other produce.	Total cultivation.	No. of acres by which production exceeds column 21 or is less than column 21.	In what ratio does the production of crops of 1 acre of irrigated land to that of 1 acre of unirrigated in an average year.	Per cent. of area under food grains which is irrigated.	Of the average annual yield of food grains what percentage is probably raised on irrigated land.
Irrigated	Unirrigated	Total				Spring.	Autumn.	Total.						
131,633	66,097	197,730	140,366	...	387,539	131,633	66,097	197,730	78,755	265,884	...	...	...	...
...	...	78,758	...	...	...	132,821	105	132,926	6,144	140,070	...	...	...	...
...	...	354,684	...	...	...	306,608	66,302	372,910	84,899	456,804	-925	3 to 2	57	67
103,000	37,000	140,000	160,000	182,000	482,000	103,000	37,000	140,000	30,000	160,000	...	...	...	...
...	...	180,000	...	...	...	269,378	268,187	537,565	101,316	638,778	...	...	...	...
...	...	160,000	...	...	...	371,376	266,187	637,563	131,316	768,778	+ 236,778	5 to 4	19	23
117,624	70,358	187,982	41,034	144,069	432,054	117,624	70,358	187,982	40,310	228,292	...	...	...	...
...	...	168,429	...	...	...	84,166	66,484	150,650	5,609	106,259	...	...	...	...
...	...	40,810	...	...	...	161,890	157,422	319,312	65,919	385,231	-75,919	3 to 2	63	74
37,000	38,400	75,400	62,000	329,000	470,000	37,000	19,400	56,400	11,000	67,400	...	...	...	...
19,000	19,400	38,400	...	...	...	285,686	117,417	403,103	11,126	414,229	...	...	...	...
...	...	10,000	...	...	...	324,166	126,817	450,983	22,126	473,109	+ 18,000	2 to 1	13	23
72,501	82,576	155,077	30,846	621,407	889,450	82,576	97,991	180,567	86,920	267,487	...	...	...	...
...	...	168,243	...	...	...	432,327	63,664	495,991	24,631	520,622	...	...	...	...
...	...	104,186	...	...	...	604,908	160,655	765,563	61,467	827,030	-122,441	2 to 1	27	48
...	...	31,033	...	...	...	31,033	11,702	42,735	3,312	46,047	...	...	...	...
...	...	11,702	...	...	...	88,496	78,944	167,440	12,657	180,097	...	...	...	...
...	...	22,735	...	...	...	109,831	84,746	194,577	16,670	211,247	+ 114,641	3 to 1	17	28
...	...	8,216	1,497	67,881	86,108	...	...	...	...	...	...	...	...	...
16,148	15,478	31,626	...	...	...	16,148	26,321	42,469	4,370	46,839	...	...	...	...
...	...	39,963	...	...	...	129,474	140,896	270,370	30,943	301,313	...	...	...	...
...	...	4,370	...	...	...	144,852	166,986	311,838	35,226	347,064	-36,448	3 to 2	13	18
44,233	44,969	89,202	...	286,750	431,724	...	...	...	...	...	...	...	...	...

I.

Statement showing for each District

1	2			5	6				10	11						
	POPULATION BY CENSUS OF 1868.				PERCENTAGES ON CULTIVATION.					DETAIL OF CULTIVATED AREA (IN ACRES)						
	Total souls.	Per square mile of			Average annual rain-fall.	Of uncultivated land.	Of irrigated cultivation.	Of salab cultivation.		Of cultivation dependent solely on rain.	Total area in acres.	AVERAGE ACREAGE				
Total cultivation.		Irrigation.	Perennial canals.	Autumnal inundation canals.					Wells.			Tanks and dhuls.				
Delhi	1,917,118	489	1,539	28.1	77	82	1	67	2,550,320	Food grains and pulses. { Rabi .. 98,911 .. 168,064 65,181 Kharif .. 77,080 .. 72,981 21,346 Total .. 175,991 .. 241,045 74,526	Other produce .. 50,766 .. 55,804 21,601	Total .. 224,717 .. 296,849 96,327				
Hissar	1,232,800	819	3,900	16.6	71	7	10	88	5,421,748	Food grains and pulses. { Rabi .. 76,489 .. 20,835 .. Kharif .. 41,570 .. 2,469 .. Total .. 118,059 .. 23,304 ..	Other produce .. 40,600 .. 9,619 ..	Total .. 158,670 .. 32,919 ..				
Umballa	1,682,728	1,072	18,632	41.9	42	14	1	85	2,554,818	Food grains and pulses. { Rabi .. 1,303 .. 84,833 5,300 Kharif .. 2,185 .. 72,162 20,419 Total .. 3,490 .. 157,065 25,612	Other produce 13,422 ..	Total .. 3,490 .. 180,407 25,612				
Jullundur	2,477,276	758	9,355	65.0	101	21	2	77	2,767,768	Food grains and pulses. { Rabi .. 5,532 .. 121,966 387 Kharif .. 1,887 .. 74,592 128 Total .. 5,419 .. 196,478 615	Other produce .. 200 .. 47,071 ..	Total .. 5,619 .. 243,549 615				
Amritsar	2,748,666	776	2,516	31.0	55	35	9	66	3,414,320	Food grains and pulses. { Rabi .. 68,118 .. 226,660 4,417 Kharif .. 67,452 .. 192,263 5,826 Total .. 135,570 .. 418,923 10,043	Other produce .. 25,950 .. 74,277 679	Total .. 171,520 .. 493,200 10,722				
Lahore	1,889,693	441	1,319	21.6	112	40	5	55	5,784,912	Food grains and pulses. { Rabi .. 90,765 .. 23,154 489,929 .. Kharif .. 26,067 .. 20,512 199,851 7,802 Total .. 116,832 .. 43,667 689,780 7,802	Other produce .. 13,600 .. 4,309 128,460 ..	Total .. 130,432 .. 48,000 818,240 7,802				

in the Punjab the extent to which cultivation is protected by irrigation—continued

CH. I.

SHOWING SOURCE OF IRRIGATION.					DISTRIBUTION OF IRRIGATION BETWEEN FOOD GRAINS AND OTHER CROPS											
OF CROPS.																
No.	Small channels from rivers and streams.	Total irrigated.	Unirrigated but added by artificial floods and percolation from river (rain).	Entirely dependent on rain.	Total average area of crops.	Food grains			Other produce.	Total cultivation.	No. of acres by which previous column exceeds column 21 or is less than column 21.	In what ratio does the product (crop) of 1 acre of irrigated land to that of 1 acre of unirrigated in an average year.	Per cent. of area under food grains which is irrigated.	Of the average annual yield of food grains what percentage probably raised on irrigated land.		
						Spring.	Autumn.	Total.								
TOTALS.						Irrigated										
19,619	869,775					359,775	161,560	521,335	109,851	631,186						
10,474	181,850					489,890	884,481	1,374,371	108,978	1,483,349						
30,093	1,051,625					Total		1,895,706	218,829	2,114,535	-77,629	5 to 3	29	41		
300	109,361															
30,393	1,160,986	18,500	1,227,478		3,191,949											
30,888	118,510					Irrigated										
5,579	49,824					116,210	49,624	165,834	51,220	217,054						
36,467	168,334					491,890	2,811,828	3,303,718	194,960	3,498,678						
1,000	51,220					Total		3,419,532	246,180	3,665,712	+51,200	2 to 1	9	11		
37,467	219,554	262,610	2,694,408		3,168,072											
38,172	116,560					Irrigated										
71,086	166,836					116,560	165,816	282,376	18,450	298,826						
86,308	289,376					782,477	514,216	1,296,693	169,278	1,465,971						
19	18,460					Total		898,977	680,031	1,579,008	189,728	1,768,736	+52,067	3 to 2	16	26
84,326	296,826	16,688	1,287,181		1,679,644											
85,176	181,050					Irrigated										
88,478	169,060					181,050	159,060	340,110	74,709	414,819						
137,648	840,160					912,279	682,061	1,594,340	197,261	1,791,601						
27,431	74,702					Total		1,098,269	782,181	1,880,450	271,268	2,151,718	+57,089	3 to 2	18	28
166,079	414,819	82,280	1,629,273		2,100,416											
9,248	482,648					Irrigated										
38,899	269,228					482,648	269,228	751,876	111,289	863,165						
17,140	701,676					786,686	842,291	1,628,977	216,504	1,845,481						
828	111,289					Total		1,273,189	612,994	1,886,183	328,743	2,214,926	-136,092	2 to 1	38	68
17,468	812,916	224,499	1,265,090		2,292,488											
410	617,967					Irrigated										
8,210	261,149					617,967	261,149	879,116	146,894	1,025,990						
8,620	879,116					888,670	532,628	1,421,298	171,878	1,593,176						
84	146,894					Total		1,801,237	793,771	2,595,008	318,772	2,913,780	-748,867	3 to 2	44	54
8,854	1,026,484	172,188	1,268,446		2,067,128											

I.

Statement showing for each District

1 DIVISION.	2 POPULATION BY CENSUS OF 1888.				3 PERCENTAGES ON CULTIVATION.				10 Total area in acres.	11 DETAIL OF CULTIVATED AREA (IN ACRES)				
	Total souls.	Per square mile of.		Average annual rain-fall.	Of uncultivated land.	Of irrigated cultivation.	Of sedab cultivation.	Of cultivation dependent solely on rain.		AVERAGE ABBRAGE				
		Total cultivation.	Irrigation.							Perennial canals.	Annual inundation canals.	Wells.	Tubs and pits.	
Bawalpindi ..	2,187,857	578	11,074	28.1	408	20	8	72	10,768,264	Food grains and pulses. { Rabi 18,000 141,643 .. Kharif 14,000 80,878 .. Total 37,000 202,821 .. Other produce 25,000 81,868 .. Total 62,000 284,278 ..	18,000	141,643	..	..
Medinan ..	1,474,579	884	887	7.8	714	69	23	8	12,900,819	Food grains and pulses. { Rabi 288,974 810,600 .. Kharif 150,818 80,856 .. Total 449,492 891,456 .. Other produce 182,911 182,828 .. Total 602,403 524,297 ..	288,974	810,600	..	..
Desajat ..	891,842	466	1,718	9.1	606	85	19	46	9,604,552	Food grains and pulses. { Rabi 72,208 149,271 .. Kharif 84,268 18,400 .. Total 157,161 168,221 .. Other produce 68,000 21,897 .. Total 216,574 189,219 ..	72,208	149,271	..	..
Peshawar ..	1,036,780	680	3,127	26.6	200	24	2	74	5,229,648	Food grains and pulses. { Rabi 20,899 .. 10,877 370 Kharif 11,845 .. 12,880 120 Total 32,028 .. 23,287 609 Other produce 3,149 .. 10,828 68 Total 35,187 .. 34,140 688	20,899	..	10,877	370
GRAND TOTAL ..	17,612,921	818	3,008	26.2	137	26	6	66	69,16,554	Food grains and pulses. { Rabi 357,813 422,821 1,885,897 66,656 Kharif 237,562 269,980 766,463 56,143 Total 696,376 692,320 2,650,062 120,698 Other produce 144,370 241,534 826,012 22,338 Grand Total 739,646 833,844 2,176,074 143,236	357,813	422,821	1,885,897	66,656

In the Punjab the extent to which cultivation is protected by irrigation—concluded.

CH. I.

SHOWING SOURCE OF IRRIGATION.					DISTRIBUTION OF IRRIGATION BETWEEN FOOD GRAINS AND OTHER CROPS.									
OF CROPS.														
By.		Unirrigated but aided by at- livial floods and permea- tion from river (salub.).	Solely dependent on rain.	Total average area of crops.	Food grains.			Other produce.	Total cultivation.	No. of acres by which previous year's crop was less than column 21, or more than column 21.	In what ratio does the produce (foot note) of the irrigated area of 1 acre of unirrigated in an average year.	Per cent. of area under food grains which is irrigated.	Of the average annual yield of food grains what percentage is probably raised on irrigated land.	
Small channels, from rivers and streams.	Total irrigated.				Spring.	Autumn.	Total.							
TOTALS.														
6,281	160,874				Irrigated ...	160,874	77,571	238,445	77,589	316,034				
2,598	77,571				Unirrigated ...	1,308,638	920,207	2,228,845	298,169	2,527,014				
8,879	238,445				Total ...	1,469,512	997,778	2,467,290	375,758	2,843,048	+ 102,945	3 to 2	16	
594	77,589	142,778	2,376,246	2,736,118										
3,734	612,298				Irrigated ...	612,298	288,889	901,187	288,879	1,190,066				
2,466	238,633				Unirrigated ...	423,148	84,188	507,336	88,069	595,405				
5,190	846,161				Total ...	1,035,446	373,077	1,408,523	376,948	1,784,471	+ 14,464	3 to 2	20	
2,640	238,579	875,819	119,253	1,029,401										
7,230	1,124,630				Irrigated ...	269,124	117,268	386,392	91,310	477,702				
27,000	269,124				Unirrigated ...	887,997	483,098	1,371,095	118,060	1,489,155				
19,000	117,268				Total ...	847,121	600,366	1,417,487	309,370	1,726,857	+ 260,965	3 to 2	27	
66,000	376,492													
10,000	91,210	263,002	635,069	1,368,564										
66,000	467,702				Irrigated ...	119,087	184,914	304,001	44,808	348,809				
87,647	119,087				Unirrigated ...	640,229	276,578	916,807	88,048	1,004,855				
110,599	184,914				Total ...	759,316	461,492	1,220,808	132,856	1,353,664	-119,268	2 to 1	22	
198,208	54,001													
90,212	44,808	22,163	1,066,023	1,388,480										
238,419	269,804													
174,112	2,917,408				Irrigated ...	2,917,408	1,660,441	4,577,849	1,007,937	5,585,786				
821,282	1,660,441				Unirrigated ...	6,989,021	6,902,976	13,891,997	1,884,673	15,776,670				
669,894	4,577,849				Grand Total ...	9,906,429	8,563,417	18,619,846	2,892,610	21,512,456	-492,345	3 to 2	26	
78,493	1,007,937													
642,287	4,585,786	1,636,350	14,838,867	21,004,699										

QUESTION 4.

Statement of Cost, Results, and Assessment of Well

1 DIVISION.	2 District with per cent. of average annual cultivation irrigated and unirrigated.	3 Inches of rain-fall per annum.	4 Total acres irrigated by wells.	5 NO. OF WELLS.		6 No. of wells of each depth.	7 Depth of water in feet.	8 APPROXIMATE COST.		9 PAIRS OF BULLOCKS USED PER WELL.		10 Cost of gear.	11 AREA USUALLY IRRIGATED PER WELL.	
				Falks.	Kachs.			Falks & lined with brick or masonry.	Kachs & c., not so lined.	No. of pairs.	Total cost per well.		Rabi.—Acres.	Kharif.—Acres.
DEHLI.	<i>Dehli.</i> Canal irrigated 22 Irrigated by wells 15 Unirrigated 63	25-5	77,498	5,884	1,649	7,462	20 ft. and under 61 From 20 to 30 ft. 10 From 30 to 40 ft.	350 470 600	55	2 per lac	Rs. 170 cost of 2 pairs.	Bucket 15 per lac Persian wheel 49 per wheel.	7 per lac	4
	<i>Gurgaon.</i> Canal irrigated 10 Irrigated by wells 9 Unirrigated 81	28-6	107,137	7,386	2,448	1,871 2,156 2,267 2,073 1,187 426	20 ft. and under From 20 to 30 ft. " 30 to 40 ft. " 40 to 60 ft. " 60 to 80 ft. Above 80 feet	500 700 800 950 1,000 1,200	20 36 85 40 50 ..	2 2 2 2 3 3	120 120 160 160 300 300	22 22 22 22 25 25	9 9 8 7 6 6	3 3 3 3 2 2
	<i>Karnal.</i> Canal irrigated 20 Irrigated by wells 19 Unirrigated 61	30-4	127,136	8,263	671	1,930 3,752 125 1,464 992	20 ft. and under From 20 to 30 ft. " 30 to 40 ft. " 40 to 60 ft. Above 80 feet.	150 225 300 550 800 1,200	5 10	2 2 4 4 4 4	100 125 300 400 500	25 25 30 35 40	8 8 7 7 6	6 6 3 3 2
HISSAR.	<i>Hissar.</i> Canal irrigated 5 Irrigated by wells 0-11 Unirrigated 96	16-9	8,245	416	428	522 322	20 to 30 feet 30 to 40 feet.	2,000	200	2	100	18	4	6

CHAPTER I.

Ch. I

Irrigation in each District of the Punjab.

12 How worked; by Persian wheel or by buckets.	13 RATE PER ACRE CHARGED AS LAND REVENUE.			14 Occupier's water rate on adjacent canal irrigated land.	15 Remarks noting the tracts in which the wells of the several depths exist.
	On land irrigated by these wells.	On adjacent dry (Barani) cultivation for soil of similar natural quality.	On adjacent canal irrigated land.		
	Rs. A. P.	Rs. A. P.	Rs. A. P.		
By both Persian wheel and buckets, the latter being used to greater extent. Persian wheels are used only in the Northern part of Sonapat Tahsil.	3 2 0	1 8 0	Sagar cane- Rice ... Wheat gram, jowar and cotton. Indian corn	0 0 0 0 0 0 4 0 0 1 10 0	The spring level throughout the District does not as a rule exceed 20 feet. The exceptional places where this depth is exceeded lie in the Kohi chak, partly in Delhi, partly in Ballabgarh Tahsil; this tract may be described as within a radius of 7 miles from Mahrauli and the Kutub. At present there is no distinction in the Land Revenue on canal irrigation between 1. Bairani rate. 2. Owner's rate. The aggregate of both is at present probably Rs. 3-8-0 approximately; at regular Settlement an all round rate was levied varying from 1-12-0 to 3-1-0 on cultivated acre. Column 13 has not been well understood by the Superintendents. But I trust what is written above will elucidate the facts required. In the Revenue Rates Report for Delhi lately submitted, Mr. Wood put down 1-0-0 as the average charge per acre for owner's rate. The assessments now being made in the Bangar Canal villages are all on the "unirrigated aspect" of the land. If this is carried out honestly, the owner's rate would certainly be worth more than 1-0-0, not less than 1-8-0; the highest <i>barani</i> rate could not be more than 2-0-0 or 2-4-0. There can be no doubt that the prospect of a revision of settlement causes the Zamindars here to refrain from building, or rather sinking new wells. They do build them, i. e., the "Kothis" and wait till the Jama is announced before they sink them. This shows how well they understand the regularity of our procedure. In my inspections this year, I have seen numbers of these wells being sunk—the people fully relying on the fact that the assessments will be made on the irrigation of the years of measurement. It is also a practice, well known doubtless to yourself, that the Zamindars allow wells to fall temporarily into disuse, in the hope of avoiding the <i>chahi</i> parts at the time of assessment. In certain cases too, of kacha wells, I have known them to fill in earth to be dug out again after assessment.
Rope and buckets	From Rs. 2-4 0 to 3 0 0	From 0 10 0 to Rs. 1 8 0	By flow, Rabi crops and cotton from Rs. 1-10-0 to 2-8-0. Kharif crops, from Rs. 1-5-0 to 2-8-0. By lift, Babi and cotton from Rs. 1-9-0 to 2-0-0. Kharif from Rs. 0-15-0 to 1-18-0	Rs. A. P. 3 0 0 2 0 0 1 8 0 1 0 0	Near canal in Palwal, Nuh and Ferozepore. In the Landoha valley in Ferozepore; and near the Jumna and the Najafgarh and Kotla Jhils. Generally throughout the District. In the west of Rewari Tahsil. The average area irrigable per well is 11 acres, and the average increase of land revenue per well is Rs. 17.
Persian wheels. Buckets.	2 14 0 2 14 0 1 14 0 ... 1 14 0	1 8 0 1 8 0 0 9 0 ... 0 9 0	2 14 0 2 14 0 1 14 0	Average. 2 8 0 ditto ... ditto	Chak Chitara in Kaithal; and the Jumna riverain tract. As above, and the edges of the canal tract. The lower Nardak and on the Jumna watershed. Higher Nardak and Chika in Kaithal Tahsil. Higher Nardak; and Kularan and Assaudh in Tahsil Kaithal.
Worked by large leather buckets.	Rate per acre is the same as on Barani lands.	0 5 10	2 8 8	2 8 0 per acre.	Depth of wells most common in this District is 80 feet, from the surface of the earth to the surface of the water in the well.

Statement of Cost, Results, and Assessment of well

1	2	3	4	5		6	7	8		9		10	11				
				No. OF WELLS.				APPROXIMATE COST.	PAIRS OF BULLOCKS USED PER WELL.		AREA USUALLY IRRIGATED PER WELL.						
				Fakka.	Kacha.				Rs.	Rs. (a)			No. of pairs.	Total cost per well.	Rabi.—Acres.	Kharif.—Acres.	
DIVISION.	District with percent. of average annual cultivation irrigated and unirrigated.	Inches of rain-fall per annum.	Total acres irrigated by wells.	Fakka.	Kacha.	No. of wells of each depth.	Depth of water in feet.	Fakka & lined with brick or masonry.	Kacha & not so lined.	No. of pairs.	Total cost per well.	Cost of gear.	Rabi.—Acres.	Kharif.—Acres.			
								Rs.	Rs. (a)						Rs.	Rs. (a)	
								Rs. (b)	Rs. (c)						Rs. (b)	Rs. (c)	
								Rs. (b)	Rs. (c)						Rs. (b)	Rs. (c)	
HISSAR.	Rohtak. Canal irrigated 11 Irrigated by wells 2 Unirrigated 87	19-2	22,322	1,719	366	626	20 ft. and under	457	40	2	160	20	12 1 38	(5)			
							20 to 30 ft.	605	37	3	240	20	7 3 26	1 2 6			
							30 to 40 ft.	600	35	3	240	19	0 0 56	...			
							40 to 60 ft.	772	35	3	195	19	11 2 27	0 0 12			
HISSAR.	Sivani. Canal irrigated 2 Irrigated by wells 1 Unirrigated 97	14-3	9,174	272	83	268	20 ft. and under	300	100	2	100	22	20	6			
							20 to 30 ft.	400	...	3	150	33					
							30 to 40 ft.	550	...	4	200	44					
							40 to 60 ft.	700	...	5	150	55					
UMBALLA.	Umballa. Canal irrigated 12 Irrigated by wells 6 Unirrigated 82	35-3	61,175	8,839	2,836	...	20 ft. and under	500	25	2 @ 60=120	700	5	8	8			
							20 to 30 ft.
							30 to 40 ft.
							40 to 60 ft.
UMBALLA.	Ludhiana. Canal irrigated ... Irrigated by wells 17 Unirrigated 83	25-3	119,322	9,068	2,350	Cannot be given.	20 ft. and under	70 to 150	5 to 10	4 pairs per bucket.	50 to 60 per pair	10	6	9			
							20 to 30 feet	200 to 300	...	...	60 to 80 per pair	10	10	6	
							30 to 40 feet	300 to 450	...	...	80 to 100	10	10	6	
							40 to 60 feet.	450 to 550	...	...	100 to 200	10	10	6	
JULLUNDUR.	Simla. Canal irrigated 6 Irrigated by wells ... Unirrigated 94	65-1	...	...	...	...	...	...	...	...	...	...	...
									
JULLUNDUR.	Jullundur. Canal irrigated ... Irrigated by wells 33 Unirrigated 67	29-8	224,178	22,987	100	17,265	20 feet and under	210	25	...	70	6	5				
							From 20 to 30 ft	400	...	100							
							From 30 to 40 ft.	400	...	...	140				

Irrigation in each Districts of the Punjab—continued.

12 How worked by Persian wheel or by buckets.	13 RATE PER ACRE CHARGED AS LAND REVENUE.				14 Occupier's water-rate on adjacent canal irrigated land.	15 Remarks noting the tracts in which the wells of the several depths exist.
	On land irrigated by these wells.		On adjacent dry (Barāni) cultivation for soil of similar natural quality.	On adjacent canal irrigated land.		
	Rs. A. P.	Rs. A. P.				
Bucket ...	(g) (A)	(h) (j)	(i) (j)	(k)	(e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)	
Do. ...	2 14 0	1 5 9	2 12 0	2 12 3	(e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)	
Do. ...	2 8 6	1 3 9	2 12 0	2 8 11	(e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)	
Do. ...	2 3 0	1 2 7	2 8 0	2 8 11	(e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)	
Do. ...	2 3 0	1 0 4	2 6 0	2 8 5	(e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)	
Do. ...	2 0 0	1 0 9½	...	...	(e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)
Do. ...	2 0 0	0 11 1	...	...	(e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)
On the borders of the Sutlej by Persian wheels; otherwise by buckets	1 9 7	0 4 0	0 12 9	No canal in this District.	Wells of 20 feet and under are situated on the borders of the Sutlej in Tahsil Fazilka, and those of 30 feet deep are on lands of Tahsil Fazilka irrigated by the cuts of the Sutlej. Wells of 40 feet deep are on the borders of Ghaggar which traverses Tahsil Sirsa and irrigates a small portion of Tahsil Dabwali. Wells of the depth of 40 feet and above 80 feet are on Barāni lands of all the three Tahsils.	
By both	including abiana.	1 8 0	3 5 5	...	Ordinary depth upon an average of wells in District 39 feet, but this is merely the average for the whole District. In many places water is as deep as 70 feet.	
Rope and bucket.	2 to 5	0-12-0 to 1-4-0	No canal in this District.	...	(1). In the bet or low land the wells are all 10 to 15 feet. Most wells in the Bangar are 30 to 40 feet and very few above 40. (2) and (3).—The depth of the water in the wells is 6 to 8 feet, besides the depth shown on (2) the kacha wells are mere excavations from which the water is raised by the hand with a pole from the end of which is suspended a single "bind" or earthen pot. (5) and (6).—A well in the District is the property of a number of sharers of whom each is entitled to a turn or "vari" of two or three hours. No one lives at the well, nor are the cattle kept there. It is not worked by night. A well may have 1, 2, 3, or 4 buckets. It is thus impossible to say how many pairs are required for a well. Two pairs work one bucket and rope at the same time, and would go on for half a day. (7). The gear is the same in all cases; the only difference being the length of rope which is of trifling value. (8). Most of the land shown here yields two harvests. (7) and (8).—The area irrigated by a kacha well is generally less than one acre. The irrigation by a pakka well is least in the bet. The proportion of land yielding two harvests is about ¼ in the bet and ½ in the Bangar.	
...	...	...	...	...	There are no wells in the Simla District.
Worked by Persian wheel 13,928. Do. by buckets 7,558	5 18 2	2 14 9	...	...	Wells of 30 feet depth in low land villages along banks of Sutlej; and in the sailab lands of Adampur and Kartarpur Parganahs. Ditto of 45 and 55 ditto. In high land ditto. Such as Nakodar, Nawashahr and Phillour. As regards agriculturists holding back from constructing new wells the last 3 or 4 annual Revenue Reports of this District have alluded to the practice as extant, in Jullundur a new Settlement being about to take place next year.

Statement of Cost, Results, and Assessment of Well

1	2	3	4	5		6	7	8		9		10	11		
				No. OF WELLS.				APPROXIMATE COST.	PAIRS OF BULLOCKS USED PER WELL.		AREA USUALLY IRRIGATED PER WELL.				
				Fakka.	Kacha.				Rs.	Rs. (a)			No. of pairs.	Total cost per well.	Rabi.—Acres.
HISSAR.	<i>Rohtak.</i> Canal irrigated 11 Irrigated by wells 2 Unirrigated 87	19-2	22,322	1,719	366	626	20 ft. and under	457	40	2	160	20	12 1 38	5	
						661	20 to 30 ft.	505	37	3	240	20	7 3 26	1 2 6	
						35	30 to 40 ft.	600	35	3	240	19	0 0 36	...	
						660	40 to 60 ft.	772	35	3	195	19	11 2 27	0 0 12	
						53	60 to 80 ft.	1,000	...	2	160	20	3 1 32	0 2 4	
						50	Above 80 ft.	1,282	...	2	160	20	3 3 4	0 3 2	
UMBALLA.	<i>Sirsa.</i> Canal irrigated 2 Irrigated by wells 1 Unirrigated 97	14-3	9,174	272	83	263	20 ft. and under	300	100	2	100	22			
						20	from 20 to 30 ft.	400	...	3	150	33			
						34	from 40 to 60 ft.	550	...	4	200	44	20		
						21	above 80 feet.	700	...	5	160	55			
					12		1,000	...	6	300	66				
	<i>Umballa.</i> Canal irrigated 12 Irrigated by wells 6 Unirrigated 82	35-3	61,178	3,839	2,836	...	20 ft. and under	500	25	2 @ 60=120	700	5	3	2	
JULLUNDUR.	<i>Ludhiana.</i> Canal irrigated ... Irrigated by wells 17 Unirrigated 83	25-3	19,322	9,068	2,350	Cannot be given.	20 ft. and under	70 to 150	5 to 10	4 pairs per bucket.	50 to 60 per pair.	10	6	9	
							20 to 30 feet	200 to 300			60 to 80 per pair	10	10	6	
							30 to 40 feet	300 to 450			80 to 100 per pair	10	10	6	
							40 to 60 feet.	450 to 550			100 to 200	10	10	6	
	<i>Simla.</i> Canal irrigated 6 Irrigated by wells ... Unirrigated 94	65-1	...	...	...	...	...	...	...	...	...	...	...	...
	<i>Jullundur.</i> Canal irrigated ... Irrigated by wells 33 Unirrigated 67	29-8	224,178	22,987	100	17,265	20 feet and under	210	25	2	70				
						5,117	from 20 to 30 ft	400	...		100				
						705	from 30 to 40 ft.	400	...		140				

Irrigation in each Districts of the Punjab—continued.

12 How worked by Persian wheel or by buckets.	13 RATE PER ACRE CHARGED AS LAND REVENUE.				14 Occupier's water-rate on adjacent canal irrigated land.	15 Remarks noting the tracts in which the wells of the several depths exist.
	On land irrigated by these wells.		On adjacent dry (Barāni) cultivation for soil of similar natural quality.	On adjacent canal irrigated land.		
	Rs. A. P.	Rs. A. P.				
Bucket ...	(g) (A)	(H) (j)	(i) (j)	(A)	(a) — Apparently anomaly due to nature of soil. These are averages of all wells in the District. (b) — Extra bullocks are not kept as the wells being too deep, irrigation does not pay in dry seasons a few acres only are put under vegetables. (c) — Tahsil Jhajjar; as a rule the people find that less valuable bullocks answer well enough in this tract. (d) — These 35 wells are in the canal tract to the north of the District. A very small area is cropped with dhania, chillies, and such like garden produce. Well irrigation is better than canal for such produce. (e) — See (3). (f) — Only small areas are cropped with vegetables. (g) — The information cannot be given in detail for the wells of various depths. (h) — According to proposed rates of new Settlement. (i) and (j) ditto ditto. (k) — These rates are the average of 10 years of the different rates for the various crops. (l) — Vide accompanying map; the information will be found more convenient in this form.	
Do. ...	2 14 0	1 5 9	2 12 0	2 12 3		
Do. ...	2 8 6	1 3 9	2 12 0	2 8 11		
Do. ...	2 3 0	1 2 7	2 8 0	2 8 11		
Do. ...	2 3 0	1 0 4	2 6 0	2 8 5		
Do. ...	2 0 0	1 0 9 ½		...		
Do. ...	2 0 0	0 11 1		...		
Former Settlement now current, irrigated average rate 2-2-1.						
Former Settlement now current, Barāni average rate 1-10-0.						
Former Settlement, Average rate Rs. 2-12-0.						
On the borders of the Sutlej by Persian wheels; otherwise by buckets	1 9 7	0 4 0	0 12 9	No canal in this District.	Wells of 20 feet and under are situated on the borders of the Sutlej in Tahsil Fazilka, and those of 30 feet deep are on lands of Tahsil Fazilka irrigated by the cuts of the Sutlej. Wells of 40 feet deep are on the borders of Ghaggar which traverses Tahsil Sirsa and irrigates a small portion of Tahsil Dabwāl. Wells of the depth of 40 feet and above 80 feet are on Barāni lands of all the three Tahsils.	
By both	including abiana.	1 8 0	3 5 5	...	Ordinary depth upon an average of wells in District 39 feet, but this is merely the average for the whole District. In many places water is as deep as 70 feet.	
Rope and bucket.	2 to 3	0-12-0 to 1-4-0	No canal in this District.	...	(1). In the bet or low land the wells are all 10 to 15 feet. Most wells in the Bangar are 30 to 40 feet and very few above 40. (2) and (3).—The depth of the water in the wells is 6 to 8 feet, besides the depth shown on (2) the kacha wells are mere excavations from which the water is raised by the hand with a pole from the end of which is suspended a single "sind" or earthen pot. (5) and (6).—A well in the District is the property of a number of sharers of whom each is entitled to a turn or "vari" of two or three hours. No one lives at the well, nor are the cattle kept there. It is not worked by night. A well may have 1, 2, 3, or 4 buckets. It is thus impossible to say how many pairs are required for a well. Two pairs work one bucket and rope at the same time, and would go on for half a day. (7). The gear is the same in all cases; the only difference being the length of rope which is of trifling value. (8). Most of the land shown here yields two harvests. (7) and (8).—The area irrigated by a kacha well is generally less than one acre. The irrigation by a pakka well is least in the bet. The proportion of land yielding two harvests is about ½ in the bet and ¼ in the Bangar.	
...	...	...	...	...	There are no wells in the Simla District.
Worked by Persian wheel 13,928. Do. do. buckets 7,558	5 13 2	2 14 9	...	...	Wells of 30 feet depth in low land villages along banks of Sutlej; and in the sailab lands of Adampur and Kantapur Farganahs. Ditto of 45 and 55 ditto. In high land ditto. Such as Nakodar, Nawshahr and Phillour. As regards agriculturists holding back from constructing new wells the last 3 or 4 annual Revenue Reports of this District have alluded to the practice as extant, in Jullundur a new Settlement being about to take place next year.

Statement of Cost, Results, and Assessment of well

I.

1	2	3	4	5		6	7	8		9		10		11	
				No. OF WELLS.				No. of wells of each depth.	Depth of water in feet.	APPROXIMATE COST.		PAIRS OF BULLOCKS USED PER WELL.		Cost of gear.	AREA USUALLY IRRIGATED PER WELL.
DIVISION.	District with per cent. of average annual cultivation irrigated and unirrigated.	Inches of rain-fall per annum.	Total acres irrigated by wells.	Pakka.	Kacha.	Pakka & c. lined with brick or masonry.	Kacha & c. not so lined.			No. of pairs.	Total cost per well.	Rs.	Rs.		Rabi.—Acres.	Khadd.—Acres.
JULIANDUR— concluded.	<i>Hoshiarpur.</i>														
	Canal irrigated 1 Irrigated by wells 2 Unirrigated 97	33.7	19,470	4,627	9,525	Cannot be given	20 ft. and under From 20 to 30 ft. " 30 to 40 ft.	Rs. 165 250 13	Rs. 10 13 2	2 2 100	Rs. 60 100 17	Rs. 15 17	2 2	2 2	
AMRITSAR.	<i>Kangra.</i>														
	Canal irrigated 27 Irrigated by wells... Unirrigated 73	125.6	...	No wells	No wells	in the District.		...	...	...	...	...	...	...
AMRITSAR.	<i>Amritsar.</i>														
	Canal irrigated 18 Irrigated by wells 23 Unirrigated 61	23.1	156,585	8,517	20	1,125	20 ft. and under From 20 to 30 ft. " 30 to 40 feet. " 40 to 60 feet.	Rs. 175 250 350 400	From 5 to 10	4 6 8 8	Rs. 160 360 560 800	Rs. 45 50 60 60	8 11 13 13	6 7 8 8	
AMRITSAR.	<i>Sialkot.</i>														
	Canal irrigated 8 Irrigated by wells 47 Unirrigated 50	39.0	425,645	18,325	155	...	20 ft. and under Ditto From 20 to 30 ft. " 30 to 40 ft. " 40 to 60 ft.	100 150 200 300	... 10	8 5 6 4	Rs. 320 200 240 160	Rs. 39 40 41 42	28 16 22 17	19 1 16 15 17	
AMRITSAR.	<i>Gurdaspur.</i>														
	Canal irrigated 9 Irrigated by wells 7 Unirrigated 84	30.9	55,852	4,044	2,545	...	20 ft. and under From 20 to 30 ft. " 30 to 40 ft.	Rs. 250 350 500	10 15 ...	1 1 1	Rs. 50 70 90	Rs. 25 30 35	7 9 10	6 8 9	
LAHORE.	<i>Lahore.</i>														
	Canal Irrigated 13 Irrigated by wells 24 Unirrigated 63	18.5	293,210	11,024	1,703	...	20 ft. and under From 20 to 30 feet 20 to 40 feet. 40 to 60 feet. From 60 to 80 feet.	Rs. 185 260 370 520 500	81 150 300 450 462	6 6 8 8 8	Rs. 300 320 425 535 585	Rs. 45 45 62 65 50	17 16 17 15 16	8 10 8 8	
LAHORE.	<i>Ferozepore.</i>														
	Canal Irrigated 3 Irrigated by wells 11 Unirrigated 86	20.0	139,442	7,022	1,691	580 6,065 1,377 611 626 20	20 ft. and under 20 to 30 feet ... From 30 to 40 ft. 40 to 60 feet ... 60 to 80 feet ... Above 80 feet...	Rs. 100 25 250 300 700 900	5 each. 25 50	3 3 4 4 6	Rs. 200 240 300 400 475	Rs. 2 47 54 54 55 60	2 14 15 18 15 18	1 7 16 12 10 12	
LAHORE.	<i>Gujranwala.</i>														
	Canal Irrigated 2 Irrigated by wells 68 Unirrigated 80	26.3	378,287	10,707	...	1,456 5,330 2,064 1,088 772	20 feet and under 20 to 30 feet ... 30 to 40 " ... 40 to 60 " ... 60 to 80 " ...	Rs. 125 150 200 250 275 360 500	... ... ... ... ... ... ...	4 5 & 7 6 & 7 8 9	Rs. 160 300 and 420 360 and 490 640 720	Rs. 52 0 0 52 8 0 53 0 0 53 8 0 54 0 0	12 18 24 27 36	13 13 16 23 25	

Irrigation in each District of the Punjab—continued.

12 How worked by Persian wheel or by buckets, Generally by charrae Do.	13 RATE PER ACRE CHARGED AS LAND REVENUE.			14 Occupier's water-rate on adjacent canal irrigated land.	15 Remarks noting the tracts in which the wells of the several depths exist.
	On land irrigated by these wells.	On adjacent dry (Berani) cultivation for soil of similar natural quality.			
		On adjacent canal irrigated land.	On adjacent canal irrigated land.		
	Ra.	Ra.	rates assessed on area.	Ra.	
...	...	...	...	...	Wells are more common to the south west boundary of the District at some distance from the hills. On the slope of the hills wells for irrigation cannot easily be constructed. The majority of wells are about 20 feet deep.
By Persian wheel, ditto, ditto.	2 1 7	1 2 3	2 3 10 1 Wheat. 2 Rice. 3 millet (makka). 4 Sugar-cane. 5 Cotton.	3 4 0	In the Amritsar Tahsil, the depth of water is generally from 30 to 40 feet, but on high lands, on the banks of the Beas, it is from 40 to 50 feet. In the Tara Ekran Tahsil, the depth of water is generally from 40 to 60 feet, excepting on lands in the Bet, where it is 12 or 13 feet. In the Ajnala Tahsil, the depth of water is from 20 to 30 feet except in chaks silaba and sakki where it is under 20 feet.
Persian wheel Bucket Persian wheel	1 6 2 4 8 0 1 12 9 1 10 10 3 2 4	1 0 0 3 0 0 0 14 5	...	...	The depth of wells generally in this District is from 20 to 80 and 80 to 40 feet, those from 40 to 60 are only found in the Siālkote Tahsil. The figures in this table, with the exception of those in columns 3 and 7, are taken from Settlement records. The number of bullocks employed appears to depend rather on the amount of land irrigated than the depth of the well.
Persian wheel.	2 2 0 2 2 0 2 2 0	0 14 6 0 14 6 0 14 6	6 12 6 6 12 6 6 12 6	...	The depth of wells in the several Tikas are as follows:— Riarke 60 to 80 feet Bharri 40 to 50 " Dhyachamb 35 to 40 " Bet 20 to 30 " Other parts of the District under 25 feet. The wells in this District generally are not very deep and only a small area of land is irrigated by each; one pair of bullocks is only used per well.
Persian wheel.	1 5 10 1 8 6 1 4 10 1 0 4 0 10 9	0 15 2 0 13 3 0 11 0 0 9 6 0 7 4	1 8 9 3 1 0 2 8 0 2 8 2 3 0 0	0 8 10 0 9 7 3 0 0 3 4 1 3 8 0	
By hand. Persian wheel. Ditto. By Persian wheel and bullock. By buckets. Ditto.	1 8 0 1 1 0 1 3 7 1 6 0 0 11 9 1 0 7	0 12 0 0 8 6 0 11 0 0 7 4 0 6 0 0 8 5	...	...	Wells of 20 feet depth and under exist on the banks of the River Sutlej, of 20 to 30 feet and of 30 to 40 feet in "Bet" or "khadir" lands (low lands); and of 40 to 60 and above 60 feet in "rabi" lands (uplands).
Persian wheel	1 5 6 1 4 0 1 0 7 0 11 2 0 9 14	0 11 3 0 11 9 0 10 7 0 8 0 0 7 0	...	...	Chak Bet, Tahsil Wazirabad and Hafizabad, and chak Deg Tahsil Gujranwala. Chak Charakhry, Tahsil Gujranwala and Wazirabad, and chak Kablar Tahsils Wazirabad and Hafizabad. Chak Bagar and Mahra in the whole District. Chak adjoining Bar, Tahsil Gujranwala and Hafizabad. Chak Bar, Tahsil Hafizabad.

Statement of cost, results, and Assessment of well

1	2	3	4	5		6	7	8		9		10	11		
				NO. OF WELLS				APPROXIMATE COST.		PAIRS OF BULLOCKS USED PER WELL.			AREA USUALLY IRRIGATED PER WELL.		
DIVISION.	District with per cent. of average annual cultivation irrigated and unirrigated.	Inches of rain-fall per annum.	Total acres irrigated by wells.	Pakka.	Kacha.	No. of wells of each depth.	Depth of water in feet.	Pakka i. e., lined with brick or masonry.	Kacha i. e., not so lined.	No. of pairs.	Total cost per well.	Cost of gear.	Rabl. Acres.	Kharif. Acres.	
RAWALPINDI.	<i>Rawalpindi.</i>														
	Canal irrigated ...	81.5	14,992	1,640	2,710	Cannot be given	20 ft. and under	450	160	1 pair bullocks or one buffalo.	45	50	5	5	
	Irrigated by wells 2						20 to 30 feet ...	725	200	Ditto.	45	60	3	3	
	Unirrigated 98						30 to 40 feet ...	950	...	or Ditto.	16	41	2	2	
							60 to 80 feet ...	1,000	...	1 pair bullocks	28	50	1	1	
											1 pair.	40			
	<i>Jhelum.</i>														
	Canal irrigated ...	18.6	25,817	3,638	434	4,064	20 ft. and under	220	30	3	180	40	4	3	
	Irrigated by wells 3						From 20 to 30 ft.								
	Unirrigated 97						" 30 to 40 feet.								
							" 40 to 60 feet.								
							" 60 to 80 feet.								
						Above 80 feet.									
<i>Gujrat.</i>															
Canal irrigated 1	29.2	86,260	7,858	108	5,363	20 ft. and under	300	5	4	240	35	18	12		
Irrigated by wells 12						20 to 40 feet.	350	...	5	350	40	20	13		
Unirrigated 87						30 to 40 feet.	400	...	5	450	50	24	16		
<i>Shahpur.</i>															
Canal irrigated 19	13.0	133,695	6,130	...	2,978	20 ft. and under	100	...	6	300	20	28	12		
Irrigated by wells 45						20 to 30 feet	150	...	6	300	25	28	12		
Unirrigated 36						30 to 40 feet.	250	...	6	300	30	21	11		
						40 to 60 feet.	300	...	6	300	30	21	9		
						60 to 80 feet.	500	...	6	550	35	18	9		
						Above 80 feet.	600	...	6	650	35	14	6		
<i>Mooltan.</i>															
Canal irrigated 66	6.1	335,276	13,177	...	6,239	20 ft. and under	275	...	4	...	...	20	5	
Irrigated by wells 14						20 to 30 feet.	375	...	5	...	...	15	10	
Unirrigated 21						30 to 40 feet.	500	...	5	...	...	10	10	
						40 to 60 feet.	550	...	6	...	...	10	5	
<i>Mooltan.</i>															

12 How worked by Persian wheel or by buckets.	13 RATE PER ACRE CHARGED AS LAND REVENUE.			14 Occupier's water-rate on adjacent canal irrigated land.	15 Remarks noting the tracts in which the wells of the several depths exist.																									
	On land irrigated by these wells.	On adjacent dry (Barani) cultivation for soil of similar natural quality.	On adjacent canal irrigated land.																											
						Rs. A. P.	Rs. A. P.	Rs. A. P.																						
Persian wheel.	6 6 0	1 2 0	2 0 0	No water rate here, the canals being owned by zamindars	The common depth of wells in this District is 20 feet. Of wells with 30 to 40 feet depth of water there are only 2 in Tahsil Gujjar Khan, and there is only one well in Tahsil Kahuta with depth of water from 60 to 80 feet.																									
Ditto.	6 12 0	1 4 2	2 0 0																											
Ditto.	6 0 0	1 4 7	...																											
Ditto.	10 0 0	1 5 0	...	Do.																										
By Persian wheel.	3 8 0	1 0 0	There is very little well cultivation in this District, and few new ones are at any time being sunk.																									
Persian wheel.	1 6 6	1 1 0	In the vicinity of the Chenab and Jhelum rivers depth is under 20 feet; more remote tracts 20 to 30 feet; and in central 30 to 40 feet.																									
Ditto.	1 7 6	1 2 3																										
Ditto.	1 10 0	1 4 0																										
Persian wheel.	Various i.e. 1-0-0 1-10-0 & 1-12-0 per acre.	0 8 0	0 8 0	2 8 0	Generally in Hithar. Nakka. Bar.																									
Ditto.		per acre.	per acre.	per acre.																										
Ditto.		per acre.																												
Ditto.																														
Ditto.																														
By Persian wheel.	0 12 0 to 1 2 0 0 12 0 to 1 8 0 0 12 0 to 0 14 0 0 9 0 to 0 14 0	No barani in this District	1 2 0 to 3 2 0 1 0 0 to 2 2 0 1 2 0 to 1 10 0 1 0 0 to 1 7 0	...	<p>The wells under 20 feet are in the tracts near the rivers, the depth of the water increases as we go inland, until it is from 40 to 50 feet beyond which cultivation is impossible. The rates in Col. 13 are the revenue rates of the revised settlement. The 3rd head under Col. 13 is for wells aided by canals. The area given in Col. 4 is the one well alone, 2 sailab and well, and 3 canal and well, area of the present settlement. Much of this cultivation is really due to sailab and canals, the area really protected by wells is Col. 6 x 11—thus:—</p> <table style="margin-left: 20px;"> <tr><td>6,239</td><td>x</td><td>25</td><td>=</td><td>1,55,975</td></tr> <tr><td>5,629</td><td>x</td><td>25</td><td>=</td><td>1,38,225</td></tr> <tr><td>785</td><td>x</td><td>20</td><td>=</td><td>15,700</td></tr> <tr><td>624</td><td>x</td><td>15</td><td>=</td><td>9,360</td></tr> <tr><td colspan="4">Total</td><td>8,19,260</td></tr> </table> <p>My opinion most decidedly is that the fact that a Settlement is impending certainly checks improvements, especially the sinking of new wells. This is shown by the fact that at any rate until measurements have been completed a general stagnation is to be observed every where. Even if there is not a wilful abandonment of cultivation, repairs which are really required are postponed. But as soon as the new jamas have been finally given out there is a general awakening.</p> <p>The rules for protective pattahs have not much effect in checking this stagnation; they are not generally known, and even where the people know them they doubt our carrying them out in their integrity; at any rate it is safer to wait and it has been ruled by the Settlement Commissioner and Financial Commissioner that the pattah, whilst it protects the new well from extra assessment by Government, does not protect it from bearing a share of the village jama. This ruling though no doubt correct, renders the pattah rather useless, for if the well is assessed at all, it matters little to the owner whether its assessment goes to Government or is used to lighten that of the village wells. I may perhaps observe that these protective pattahs appear to me not suited to a District like Mooltan. In Districts near the hills like those of the Lahore, Amritsar, Jullundur Divisions, cultivation can ordinarily be carried on without a well, and simple barani land pays a very fair revenue. The sinking of a well</p>	6,239	x	25	=	1,55,975	5,629	x	25	=	1,38,225	785	x	20	=	15,700	624	x	15	=	9,360	Total				8,19,260
6,239	x	25	=	1,55,975																										
5,629	x	25	=	1,38,225																										
785	x	20	=	15,700																										
624	x	15	=	9,360																										
Total				8,19,260																										

Statement of cost, results, and Assessment of well

1 DIVISION.	2 District with per cent of average annual cultivation irrigated and unirrigated.	3 Inches of rain-fall per annum.	4 Total acres irrigated by wells.	5 NO. OF WELLS		6 No. of wells of each depth.	7 Depth of water in feet.	8 APPROXIMATE COST.		9 PAIRS OF BULLOCKS USED PER WELL.		10 Cost of gear.	11 AREA USUALLY IRRIGATED PER WELL.		
				Pakka.	Kacha.			Pakka & c. lined with brick or masonry.	Kacha & c. not so lined.	No. of pairs.	Total cost per well.		Rs.	Acres.	Acres.
MOOLTAN.	Mooltan—concluded.	...	...	...	...	...	...	...	...	...	...	...	...	...
	Jhang.														
	Canal irrigated	103	224,273	10,827	40	7,052	20 ft. and under	185	25	3	102	38	18	7	
	Irrigated by wells 68					3,220	20 to 30 feet ...	250	...	4	160	40	16	7	
Unirrigated	31					598	30 to 40 feet ...	350	...	4	200	45	15	6	
	Montgomery.														
	Canal irrigated	14	87	180,530	7,171	24	...	Cannot be given	300	20	4, 6, 8	200	18	6	
	Irrigated by wells	47							400	30	300	300			
	Unirrigated	89							500		400				
	Muzaffargarh.														
	Canal irrigated	53	61	204,838	11,802	...	11,420	20 ft. and under	225	Lined with timber	Four	320	40	Wells assisted by canal, total 23 acres.	
	Irrigated by wells	12					355	20 to 30 feet	381	100				Rabi 23, Kharif 12	
	Unirrigated	35					27	30 to 40 feet		Lined with wattles				Wells assisted by saibai, total 21 acres.	
										35				Rabi 21, Kharif ...	
										100				Wells un assisted, total 17 acres.	
														Rabi 15, Kharif 2	

12 How worked by Persian wheel or by buckets.	13 RATE PER ACRE CHARGED AS LAND REVENUE.			14 Occupier's water-rate on adjacent canal irrigated land.	15 Remarks noting the tracts in which the wells of the several depths exist.
	On land irrigated by these wells.				
	On adjacent div. (Barani) cultivation for soil of similar natural quality.	On adjacent canal irrigated land.			
	Rs. A. P.	Rs. A. P.	Rs. A. P.		
...	...	...	...	...	is not a necessity but merely an improvement tending to the security of the harvest which the Government desires to encourage; and as the extra assessment to be paid by well lands is not very great. Government can well afford to remit it for a long period. But here, out of the immediate reach of the rivers and canals, no cultivation can be carried on except by wells. There are no "barani" crops, and unirrigated lands pay nothing. To assess a well at unirrigated rates is therefore to release it from assessment altogether; such an exemption has never hitherto been enjoyed by the people, and it appears to me wholly unnecessary.
By Persian wheel.	1 0 0 to 1 15 0	0 8 0 to 0 8 0	On land irrigated by inundation canals 0 13 0	...	<p>The average depth to water is shown. There is from 5 feet to 10 feet of brick work under water. Cols. 9 and 11.—The figures in these columns must be compared with one another. The area irrigated from a well does not depend so much on the depth of the well as on the number of the bullocks, their power, the quality of the soil, the amount of rain-fall, the assistance of surface drainage—according to the settlement returns, which are borne out by my own personal knowledge, the well cultivated areas are largest in the upland circles of the Chinot Tahsil where the wells are comparatively deeper than in any other portion of the District. The wells are well and strongly yoked, the soil is good and not thirsty; and the rain-fall is heavier than in the other portions of the District. In the upland of Shorkot the wells are only $\frac{1}{4}$ of the depth of those in Chinot, while their average cultivated area is only a little more than half of that on the Chinot wells. It is quite a different matter to talk theoretically of the area irrigable by wells of different depths and to discuss areas actually irrigated by wells of different depths. No theory as to the areas irrigable by wells of different depths can hold good unless the climate, the rain-fall, the number and power of the bullocks, the soil, the crops cultivated are uniform and the same in the case of all the wells.</p> <p>Column 13.—The rates I have shown are the rates that I have proposed, and intend to propose for sanction in my assessment reports. Roughly speaking, the rates are for chahi sailab, chahi nahri, and chahi jhallari, 2-6-0; for chahi khails in riverside villages 1-4-0 for chahi khails; in the intermediate villages Rs. 1-0-0 to 1-3-0; and in the Bar villages Rs. 0-14-0 to 1-0-0.</p> <p>Column 15.—The area under assessment or the cultivated portion of this District, consists of a strip of country from 10 to 16 miles broad, along the banks of the Jhelum and Chenab rivers. The remainder of the District consists of the Bar jungle and the Thal desert, both the property of Government. The wells in the villages fringing the river's bank are usually under 20 feet deep, those in the villages beyond are in the northern half of the District from 16—25 feet deep, and those in the villages lying underneath the Bar, both of the Jech and the Rechna Doab, are usually 30 feet and more in depth. As the Ravi is neared the depth of the wells sensibly decreases. Speaking generally the wells in the villages under the Bar may be said to diminish in depth from Shorkot Tahsil boundary southwards. On the west of the Jhelum the wells in villages lying between the Thal of the Sind Sangor Doab and the riverside villages are much the same in depth, viz., slightly over 20 feet, whether near the Thal or near the river.</p>
Persian wheel.	...	...	...	...	Wells near rivers and canals, e. g., at Sayadwala, Hujra, &c., in the Gugera and Dipalpur Tahsils, the depth is about 13 feet, and depth of water about 8 feet. Those far from rivers and canals the depths are respectively about 55 and 8 deep.
Persian wheel.	Wells assisted by canal. 1 9 8 Wells assisted by sailab. 1 3 6 Unassisted well 1 2 9	No barani cultivation in this District.	Flow irrigation. 1 2 0 Lift irrigation. 1 0 0	...	<p>The depth of the water is very uniform, varying only from 9 to 12 feet in the greater part of the District. The depth is least in the south of the District and on the banks of the rivers. In the barren tract known as the Thal, which occupies the northern part of the centre of the District, the depth is greatest. In the Thal the average depth is 24 feet.</p> <p>Column 8. No wells unlined with either masonry, timber, or wattles are in use. The soil is so fine that unlined wells cannot be made.</p>

Statement of cost, results, and assessment of well

1	2	3	4	5		6	7	8		9		10	11	
				No. OF WELLS.				APPROXIMATE COST.		PAIRS OF BULLOCKS USED PER WELL.			AREA USUALLY IRRIGATED PER WELL.	
DIVISION.	District with per cent. of average annual cultivation irrigated and unirrigated.	Inches of rain-fall per annum.	Total acres irrigated by wells.	Pakka.	Kacha.	No. of wells of each depth.	Depth of water in feet.	Pakka i. e. lined with brick or masonry.	Kacha i. e. not so lined.	No. of pairs.	Total cost per well.	Cost of gear.	Rabi.—Acres.	Kharif.—Acres.
DERAJAT.	<i>Dera Ismail Khan</i>													
	Canal irrigated 13	80	92,766	5,023	333 Jhalra.	4,012	20 ft. and under	317	...	3	317	30	10 2 usually (3 in tahsil)	
	Irrigated by wells 19					116	30 to 30 feet ...	567	...	2	567	35	15 Letah.	
	Unirrigated 68					706	30 to 40 feet ...	425	...	6	425	40	8 ...	20 3 in Laliah
						144	40 to 60 feet ...	475	...	5	475	40	23 7 in Bhakkar	9
						45	Not known.							
DERAJAT.	<i>Dera Ghazi Khan</i>													
	Canal irrigated 36	72	133,860	6,693	Not many, about 40 or 50 included in the sailab circle as sailab.	Cannot be given.	20 ft. and under	300	50	4	540	40	20 with aid of canal water	10 or 11 acres.
	Irrigated by wells 21						20 to 30 feet ...	500	...	...	640			
	Unirrigated 43						30 to 40 feet ...	700	...	...	840			
							40 to 60 feet ...	1,000	...	...	1,240			
							60 to 80 feet ...	2,000	...	...	2,240			
							Above 80 feet.	3,000 to 6,000	...	...	3,240 to 6,240			
PESHAWAR.	<i>Bannu</i>													
	Canal irrigated 14	120	1,316	281	13	10	20 ft. and under	295	60	2	70	82	2	1
	Irrigated by wells 4					45	20 to 30 feet ...							
						60	30 to 40 feet ...							
						88	40 to 60 feet ...							
PESHAWAR.	<i>Peshmar</i>													
	Canal Irrigated 21	129	26,132	3,634	2,414	1,554	20 ft. and under	200	80	2	80	50	2 acres	2 acres
	Irrigated by wells 4					4,396	20 to 30 feet ...	250	55	2 1/2	110	60	2 acres 30 poles	2 acres 1 pole
						96	30 to 40 feet ...	400	95	3	145	75	2 acres	2 acres 1 pole
PESHAWAR.	<i>Kohat</i>													
	Canal irrigated 37	202	822	6	204	210, of which 26 maas 184 khalsa	20 feet and under	350	95	1 Bu-faloe or 1 pair of bullocks.	40	66	2	2
	Irrigated by wells 1										50 to 60			
	Unirrigated 62													
PESHAWAR.	<i>Hasrat</i>													
	Canal irrigated 10	463	744	...	186	186	20 feet and under	...	200 each	1 1/2 pairs or 3 bullocks or buffaloes one yoked at a time.	25 each or 75 for the 3	50	4	4
	Irrigated by wells 0													
	Unirrigated 90													

12	13			14	15
	RATE PER ACRE CHARGED AS LAND REVENUE				
How worked by Persian wheel or by buckets.	On land irrigated by these wells.	On adjacent dry (Barani) cultivation for soil of similar natural quality.	On adjacent canal irrigated land.	Occupier's water-rate on adjacent canal irrigated land.	Remarks noting the tracts in which the wells of the several depths exist.
	Rs. A. P.	Rs. A. P.	Rs. A. P.		
By Persian wheel.	Nasbeh 1 0 0 to 1 8 0	Sailaba 11 annas to 14 annas. Thal. 4 annas	None.	...	<p>In Tahsil Bhakkar, of 1,364 wells 823 are under 20 feet in depth, and lie on the Indus Bank (Nasbeh). The rest are in the Thal. In Tahsil Leiah, of 3,186 wells, 2,877 average 12 feet in depth being situated mostly in the Nasbeh. The deeper wells lie to the North and East in the Thal.</p> <p>In Tahsil Dera, of 428 wells, 312 are under 20 feet and lie mostly in the Paharpur tract which is partly irrigated from the Indus.</p> <p>I have given the cost of the gear in Col. 7 where shaham wood is made use of. If ber and kikar are used, the price would be Rs. 5 less. The prices given cover the Chob Chakal only. The price of the Kanjan and Nasar is about Rs. 10 more.</p>
	0 12 3 to 0 10 0				
Persian wheel and buckets in pached.	9 annas to 6 annas -- 3rd the Chahi Nahri rate	None	* 1/2 to 15 annas -- 1/3rd the Chahi Nahri rate	...	<p>Banghar, 21 feet. Dera Ghazi Khan, 33 feet. Jampur, 24 Rajampur, 12 Depth to water edge. The depth in the Pached is from 50 to 300 feet. * In this District the rate for well and canal irrigated land is one, but for purposes of account, 1/3rd of the rate are credited to canals, and 1/3rd to wells.</p>
Mostly by Persian wheel.	1 8 10	0 15 2	...	...	<p>The shallow wells are mostly in the Kacha of the Indus or near the bank are half for drinking and only supplement Sailab. The great irrigation wells are those of the Thal in Midwadi or on the high banks of the Indus, with a depth to water ranging from 35 to 47 feet.</p>
Both by Persian wheel.	4 10 7	...	...	...	<p>Kasbah Bagran, Mitchin, Khales, Chakla Abi, Chakla Chahi, Khals, Bela, Maira, Darmiana, Bolak Nama, Chakla Julba: Koh Daman Khaili, Bela Darya Par, Khatak, Mardan Tahsil, Maira Warpé, Konara Darya, Koh Daman. Chakla Maira, Maira Khales, Konara Darya:</p>
	do. do.	0 4 6	4 2 6	NIL.	
Persian wheel.	No distribution has yet been made.			...	<p><i>Tahsil Kohat.</i> Of the total number of wells there are 79 in Japta Nilab. The revenue rates for these wells were fixed at 3-0-0, single crop, 6-0-0 double crop, barani 5 annas per acre. There are 5 wells in Chakla Kohi to the East of the District. The revenue rate per acre was fixed at 3-0-0, barani 3 annas. There is only one well in Toppé Shukandaru, it is Maafi, and has not yet been assessed. There is one well in Circle Tor I. The revenue rate per acre was fixed at 4-4-0 barani 4 annas. There are 5 wells in Circle Tor II, the revenue rates per acre were fixed @ 1-14-0 single crop, 2-12-0 double crop, barani 2 annas. <i>Tahsil Hanga.</i> In Chakla Chinabala there are 4 Tahsils, the revenue rate for well land was fixed at 5-0-0 per acre, barani 5 annas. In Chakla Koh-i-Daman there are 107 wells. The revenue rate for well land was fixed at 4-4-0. There is nothing to show that the agriculturists have held back from constructing new wells owing to the settlement. No new wells have yet been prepared since the measurement.</p>
Persian wheel.	7	3	6	...	<p>In Ilaka Kot Najibullah the ordinary depth of water is 8 feet In Ilaka Khari, 13 feet. In other places the depths vary from 18 to 20 feet. The average depth is from 8 to 20 feet of water. These wells are all in Parganah Haripur, none in the other two Parganahs of the District. The rate of land revenue varies according to the nature of the soil. Col. 18 shows the average rate per acre charged on land revenue. The rate entered in Column 13 is for land watered by irrigation channels or hill streams.</p>

QUESTION 4, CHAPTER I.

Extract from a Memorandum by R. E. EGERTON, ESQUIRE, Financial Commissioner of the Punjab, dated September 1870.

21. Of the classes of works mentioned in para. 4 of the letter from the Secretary to the Government of India, wells are the most important in the Punjab. The only other works connected with irrigation which have been hitherto constructed by the people are inundation canals, small irrigation channels taken from hill streams, and embankments for storing water. The inundation canals have in nearly all Districts been placed under the management of the Canal Department. No new works of this class are undertaken except under the management of the Officers of the Irrigation Department.

- | | | |
|--------------|--|--|
| Works of—(2) | Drainage. | } Are undertaken by Officers
of the Canal Department. |
| (3) | Reclaiming land from rivers. | |
| (4) | Protection of land from floods. | |
| (5) | Works for reclaiming and clearing waste lands will be noticed further on. | |
| (6) | Clearing land from stones and other obstacles to cultivation. There is not at present any demand for advances to clear such lands, as the amount of waste land unincumbered with such obstacles is sufficient for all demands, and it is evident that the lands which cost least for clearing are likely to be cultivated before those lands which require more outlay to bring them into cultivation. | |

22. The subject of wells should therefore be first considered.

Proposals have been made on several occasions for the extension of irrigation from wells by means of a system of takkavi advances for whole Districts or tracts of country. Mr. Prinsep, in his letter No. dated regarding water advantage rate on lands irrigated from the Khanwah canal, and more fully still in a pamphlet recently published, pages 33-39, proposes to make advances to the extent of 140 lacs to construct 60,000 wells, to irrigate 1,800,000 acres of land in the Amritsar and Lahore Divisions, and in a portion of Rawalpindi Division.

Major Tighe in his letter No. 155, dated 16th June 1870, to Commissioner, Umballa Division, proposes a Government loan to Zamindars at 5 per cent. per annum, repayable with interest in instalments extending over 24 years, on the security of wells and land. He proposes in this way to irrigate 250,000 acres and to advance Rs. 8,000,000 for this purpose.

23. There is no doubt that it would be very profitable to the State to extend irrigation from wells in the manner and to the extent proposed by both Mr. Prinsep and Major Tighe; but it is not practicable to do so, I think, within the time contemplated in either scheme.

24. In neither of the proposals has anything more than the irrigable area and the cost of the masonry shafts of the wells been considered.

It has been assumed that all the other requisites for the extension of irrigation to the enormous extent set forth in the two proposals exist already; but it is not shown that there are cattle or cultivators, or labourers, or artizans, enough for the construction and working of wells on anything like the scale proposed. To take Major Tighe's proposal alone:—He shows that the number of masonry wells now existing in the Umballa District is 4,798. He proposes to add three times that number to the District in a few years.

The returns of stock in Umballa shew that there are 4,95,000 cows and bullocks in the District.		
Bullocks.		Supposing that of this number one-fourth are bullocks fit for working
16,000 x 8 = 128,000		wells—this gives 1,23,750 bullocks—of these, at 4 pair per existing
Deduct available..... 83,826		well, 39,824 are now employed in irrigation, balance of bullocks
Balance... 44,174		available, 83,826. To work 16,000 new wells, 44,174 bullocks are
		required, in addition to the present assumed number available. To
		provide the bullocks (44,174 x 50 Rs.) = Rs. 22,08,700 are required, and these must be purchased.
		Again, the number of artizans employed to provide apparatus for the wells must be very largely
		increased if the number of wells is increased to the extent contemplated. The census returns of the
		Umballa District shew a very large population of tanners, for here the lao and charas are chiefly in
		use. The Siakote returns show a very large number of potters, for in that District there are more
		than double the number of wells which the Umballa District possesses, and these are all worked by
		Persian wheels. It is not practicable to give reliable calculations of the proportion in which the
		number of artizans who provide the well apparatus must be increased to meet the demand caused by
		the immense extension of well irrigation; but there is no question that the number must be increased
		very largely.

25. In the case of Mr. Prinsep's proposal, which extends over the area of several Districts, there will be a similar necessity for investment of capital in cattle, and for increase in the number of artizans to provide the well apparatus.

26. I mention these matters to shew that, in considering the schemes which have been proposed, regard must be had, not only to the cost of the masonry shafts of the wells, but to other conditions essential to the existence of irrigation from wells on the scale contemplated. It is impossible to believe that in a country where the practice of irrigating from wells has existed for ages, where the people are so alive to its advantages, and where the profits of agriculture have so largely increased under the influence of peaceful rule and fixed land revenue demand, irrigation from wells would not have increased more rapidly than it has done, were there not other causes than the difficulty of procuring money sufficient to construct the masonry shafts of wells to retard the increase; and in none of the proposals which have been made for extension of irrigation from wells have these causes been duly weighed. In both Mr. Prinsep's and Major Tighe's proposals, the calculation has been based merely upon the amount of irrigable not unirrigated area, and the cost of the masonry required for wells enough to irrigate this area.

27. It is impossible to say how much of the slowness of the people in constructing wells is due to their appreciation of the causes which have been mentioned above, and how much to difficulty in procuring capital for constructing the wells. Some allowance must no doubt be made for the slowness of the people to understand the advantages which Government holds out to them.

28. The plans proposed by Mr. Prinsep and Major Tighe are both of them admirable in theory, and if they are carried out gradually, the result will be profitable both to the people and to the State. What has been said above, is not said in hostility to the plan, but merely to shew that difficulties which have not been fully considered exist in the way of carrying out the proposals to the extent contemplated by the projectors.

29. The general feasibility of the proposal to extend well-irrigation to a greater extent than heretofore may be tested, if Deputy Commissioners be directed to take up some particular portion of their Districts in which irrigation may be extended with probable advantage to the people, and after explaining to the land-holders the conditions on which Government makes *takkávi* advances, they should enquire if the people have the means to carry on irrigation from a number of new wells; and if satisfied on this point they should be directed to make advances under the rules, modified as now proposed. Much may no doubt be done by judicious encouragement, and after careful enquiry; but it must be remembered that any attempt to force advances upon the people to construct wells or any other works, without some assurance that the subsidiary conditions necessary to make proper use of the improvement which it is desired to effect exist, will end in nothing but disaster. Advances will be recklessly taken and balances will accrue which it will be impossible to realize, and agricultural prosperity will be checked, instead of being advanced.

<i>Census Report.</i>		30. The amount of available waste lands, the property of Government, in the Punjab is very large. Much of this is considered barren; but of the amount so recorded there is a large area which requires water alone to make it fertile. Besides the Government lands, there is an immense extent of culturable land included in village areas. The reclamation of lands of the latter class is going on gradually through the people themselves, who under our system of Settlement for fixed periods enjoy the produce of all lands newly cultivated after the assessment is declared. The process of clearing such lands is going on in numberless places at once. The clearance consists in removing bushes and roots, which are valuable for fuel. No expenditure of money is required to make such clearings, and the wood which is extracted from the ground fetches a good price. For clearing village lands, therefore, advances are not required.
Statement II—Explanation	Statement	
	Acres.	
Culturable	33,28,322	
Barren	60,61,277	
	Total... 93,89,599	

<i>Census Report.</i>	
Statement II—Column 7.	Acres 1,28,52,821

31. Grants of Government waste land to lessees have been made to a considerable extent during late years. As the amount available is so large, it was to be expected that applicants for leases would select the lands which from being good quality and from being situated in places where labour is readily procurable and means of irrigation available, presented the best prospect of being profitably cultivated. Many leases of Government lands have been granted to persons possessed of capital, on easy terms for fixed periods. Advances for clearing these lands have not been given, nor do the existing rules provide for advances being made for such a purpose.

32. Considering the immense area of village lands which is uncultivated, and the impossibility of cultivating more than a small portion of the Government wastes without canal irrigation, it is undesirable to make large grants of Government waste lands at present, and it is not necessary to give facilities for obtaining grants of *takkávi* for clearing such lands. If it is desired to extend cultivation in Government waste lands, a system of leases on easy terms offers quite as much encouragement as a grant of *takkávi*;—such a lease involves no direct expenditure, and is a mode of encouraging cultivation entirely in accordance with native custom.

33. Mr. Prinsep has recently published a paper on the subject of constructing State canals in waste lands the property of the State,

Mr. Prinsep's proposals are not, strictly speaking, connected with the subject of *takkávi* advances. I may remark, however, that according to all the experience hitherto obtained in leasing waste lands it is exceedingly improbable that land will be taken up to the extent of 2,500,000 acres at Rs. 10 per

acre if granted revenue free for ten years, even with the prospect of irrigation from canals being available. In order to bring this amount of land under cultivation, 500,000 adult cultivators will be required, or a cultivating population of at least one and a half million, exclusive of non-agriculturists. The area to be brought under cultivation is equal nearly to the whole cultivated area of the Umballa and Jullundur Divisions, and it is quite out of the question to suppose, even if the money to pay for the land were forthcoming, that a population sufficient to cultivate the whole, or even one-half, of the land, in the time proposed, can be found. A far more gradual extension of irrigation and cultivation must be looked for.

34. If canals are made from the Sutlej, Chenab, Jhelum and Indus, through those parts of the Doabs which are without irrigation, the Government waste lands will rise enormously in value. This is shewn by the increase in the value of waste lands in the Lahore District commanded by the Bari Doab Canal. The increase is so remarkable, that it is very doubtful whether it is advisable to dispose of the waste lands at all until the canals are made.

CHAPTER I, QUESTION 4.

I. Early Irrigation from the Western Jumna Canal.

Year.	Amount of water-rate in rupees.	Area cultivated at average rate of 0-11-2 per acre.	REMARKS.
1819-20	876	1,255	Main Line and Dehli Branch opened.
1820-21	14,646	20,988	
1821-22	24,619	35,279	
1822-23	21,458	30,749	
1823-24	36,015	51,609	Drought.
1824-25	26,647	38,185	} Famine.
1825-26	48,374	69,320	
1826-27	33,975	48,686	Rohtak Branch opened.
1827-28	34,161	48,953	
1828-29	52,953	75,882	
1829-30	53,375	76,486	
1830-31	57,700	82,684	
1831-32	51,016	73,106	
1832-33	65,805	94,299	
1833-34	1,48,783	2,13,206	Famine.
1834-35	1,14,065	1,63,455	
1835-36	1,10,603	1,58,494	
1836-37	1,53,177	2,19,503	
1837-38	2,72,378	3,90,318	Drought.
1838-39	1,89,645	2,71,761	
1839-40	2,24,383	3,21,541	Rains scanty
1840-41	2,55,818	3,66,587	Contract system introduced.
1841-42	2,63,069	3,76,978	
1842-43	2,79,300	4,00,237	

CHAPTER I, QUESTION 4.

Statement showing the progress of Irrigation on the Western Jumna Canal.

Year.	Area Irrigated in acres.			Area in acres of double cropped land.	Percentage of		Duty in acres per cubic foot.		Average water rate in rupees per acre.		Average mean discharge utilized.		REMARKS.
	Kharif.	Rabi.	Total.		Flow.	Lift.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	
1860-61	U n k n o w n .		4,54,292	...	...	...	...	...	...	...	...	...	Famine year.
1861-62	"	"	3,72,680	...	...	...	...	...	...	...	...	...
1862-63	"	"	3,03,361	...	...	...	...	...	...	...	...	...
1863-64	"	"	3,51,537	...	...	...	...	...	...	...	...	...
1864-65	1,97,673	2,37,291	4,34,964	...	...	...	...	...	...	...	...	...
1865-66	1,96,271	2,01,692	3,97,963	...	...	...	120.8	160.6	...	...	1,625	1,256	Enhanced rates from kharif of 1867.
1866-67	2,11,103	2,36,068	4,47,171	...	...	...	108.6	147.1	...	...	1,944	1,604	
1867-68	1,86,887	1,44,150	3,31,037	...	...	...	120.0	100	...	...	1,557	1,445	
1868-69	1,98,670	2,83,208	4,86,878	...	...	...	92*	159*	...	...	2,104	1,755	* Dry year—Revenue Report says that this is a fairer criterion of actual duty as little or no drainage water entered canal.
1869-70	2,34,464	2,62,078	4,96,542	...	88.58	11.42	102	138	2.76	2.11	2,255	1,861	
1870-71	2,18,535	2,44,172	4,62,707	58,888	90.79	9.21	127	126	2.82	2.16	1,697	1,907	
1871-72	1,87,647	2,56,738	4,44,385	60,014	90.73	9.27	102	114	2.46	2.17	1,819	2,220	
1872-73	2,02,371	1,49,450	3,51,821	39,302	88.08	11.92	105	85	2.92	2.09	1,899	1,705	
1873-74	1,71,630	1,40,117	3,11,747	30,935	87.39	12.61	96	71	3.07	2.03	1,747	1,762	Falling off attributed by Superintending Engineer to settlement operations.
1874-75	1,60,118	2,22,729	3,82,847	51,696	93.38	6.62	85	122	3.01	2.08	1,841	1,790	
1875-76	1,89,188	1,21,406	3,09,595	23,309	93.91	6.09	87	92	2.75	2.03	2,125	1,262	Falling off due to rain-fall of Sepr. 1875.
1876-77	1,75,729	1,90,753	3,66,482	39,298	93.19	6.81	85	111	2.94	2.09	2,009	1,684	
1877-78	2,15,135	2,92,839	5,07,974	85,202	90.20	9.80	84†	150†	2.66	2.12	2,505	1,913	† Dry year. These figures are reliable, as there was no drainage to speak of; the duty in kharif was less than in 1868-69, because the hot west winds in 1877 necessitated much more frequent waterings. The figures on total supply in 1877-78 are 81 and 149

Area probably irrigable when present works are completed, say 5,60,000, say about the year 1883 or 84.

† These columns are of no use on Western Jumna Canal, as a rule, because the large amount of drainage entering the Canal along the line vitiates any calculations except in very dry year. But it may be taken that during a dry year, the duty on supply utilized is from 85 to 90 acres per cubic foot in kharif, and 160 to 160 acres in rabi.

J. OTTLEY, CAPTAIN, R. E.,
Assistant Secretary, Irrigation Branch,
D. P. Works, Punjab.

CHAPTER I, QUESTION 4.

Statement showing the progress of Irrigation on the Bári Doáb Canal.

YEAR.	Area irrigated in acres.			Area in acres of double cropped land.	Percentage of		Duty in acres per cubic foot utilised.		Average water-rate in rupees per acre.		Average mean discharge utilised.		REMARKS.
	Kharif.	Rabi.	Total.		Flow.	Lift.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	
1860-61	34,125	55,662	89,787	...	...	...	...	...	...	...	...	...	Dry year.
1861-62	54,517	68,455	1,22,972	...	...	...	...	...	...	...	...	...
1862-63	59,476	66,540	1,26,016	...	...	...	...	...	...	...	...	...
1863-64	64,195	70,167	1,34,362	...	...	...	39.84	90.54	2.57	2.65	1,613	775	
1864-65	66,370	1,26,313	1,92,683	...	...	...	52.30	205.38	...	...	1,269	615	
1865-66	91,378	84,602	1,75,980	...	...	...	57.94	111.76	...	...	1,577	757	
1866-67	92,699	1,35,753	2,28,452	...	...	...	54.25	91.51	...	...	1,700	1,467	
1867-68	1,06,043	1,56,085	2,62,128	...	...	...	56.9	122.0	2.41	2.36	1,880	1,279	
1868-69	85,519	2,14,315	2,99,834	...	...	...	53.6	138.2	2.41	2.33	1,594	1,550	Dry year.
1869-70	1,15,524	1,18,403	2,33,927	...	92.4	7.6	67.4	90.6	2.38	2.33	1,715	1,306	Water advantage rate put on a checked irrigation.
1870-71	88,643	1,90,567	2,79,210	19,293	90.6	9.4	52.39	98.53	2.91	2.26	1,692	1,933	
1871-72	76,412	2,10,658	2,87,070	11,813	89.33	10.67	41.42	111.28	2.64	2.06	1,844	1,893	
1872-73	96,718	1,32,078	2,28,796	14,496	89.92	10.08	79.7	110.43	3.16	2.17	1,220	1,196	
1873-74	1,00,913	1,31,233	2,32,146	24,672	89.98	10.02	46.40	92.87	3.25	2.17	2,175	1,413	
1874-75	87,214	1,92,599	2,79,813	30,818	87.66	12.34	41.59	98.57	3.17	2.15	2,097	1,954	
1875-76	92,335	1,22,264	2,14,599	25,260	89.83	10.17	57.46	87.77	3.13	2.16	1,607	1,393	
1876-77	75,748	1,26,964	2,02,712	26,288	88.21	11.79	50.50	147.29	3.36	2.14	1,500	862	
1877-78	85,664	1,81,331	2,66,995	28,062	87.75	12.25	55.20	186.56	2.86	2.12	1,552	972	Dry year.

Area probably irrigable when irrigation is fully developed will be 4,20,000 acres—say about the year 1885.

The duty cubic foot on Bári Doáb Canal appears to be from :—

Kharif 50 to 55 acres.
Rabi 100 to 110 "

Some of the figures given are evidently wrong, but it is difficult to find out how or why. It would take a long and careful search to settle these points even if it be possible at all.

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Assistant Secretary Irrigation Branch,
D. P. Works, Punjab.

QUESTION 5; CHAPTER I.

What grains form the staple food of your people? When are they sown and harvested, and what are the critical times at which rain is essential to each of them, or at which a failure or excessive fall of rain may be mischievous or ruinous?

The extracts appended are the replies of District Officers to the above question. The table with which they are prefaced has been compiled from those replies; the dates given in the table are those at which it is assumed the majority of the operations of sowing and harvesting take place. The replies which follow give those dates more precisely.

These replies, and the table calculated from them, which is appended to question 3, shows that barley and the kharif millets and maize, with a little rice, form 47 per cent. or nearly half the food consumed in the Province, that wheat contributes thereto 37 per cent. and pulses 15 per cent. In the Gurgáon District and Hissar Division the agriculturists do not consume any wheat; but in the Lahore Districts and in the Ráwalpindi and Mooltan Divisions wheat forms half of the food annually consumed by the population.

On the whole the replies received show that the two harvests contribute equally to the food of the population.

What are the critical times at which rain is essential to each of them, or at which a failure or excessive fall of rain may be mischievous or ruinous?

The rabi harvest being sown in September and October, it is absolutely necessary that there should be rain in one of those two months, or it will not be possible to sow successfully. Similarly, showers are necessary at the end of December or beginning of January, and again in February, and if none fall in these months, the unirrigated crops necessarily fail. These winter rains almost certainly fall in sufficient quantity sooner or later. Heavy rain in March and April, when the crops are ripening, is not uncommon, promoting rust and blight and otherwise injuring the quality of both grain and straw. Though the replies annexed do not clearly show this, the rabi crops in the north of the Province ripen nearly a month or three weeks later than those in the south, where the summer heat sets in perceptibly earlier.

As regards the kharif, owing to the great heat of the summer and autumn, it depends throughout for its success on the repetition of rain at short intervals of, say a fortnight each. If a month's break occurs in the rains, the crop is much jeopardised by its continued exposure to fierce drying heat; though even after such an interval, the crops frequently show a wonderful power of recovering themselves when rain does fall. This crop is rarely materially injured by undue prolongation of the rains beyond their usual season.

I shall not attempt here to indicate the different peculiarities of the several crops. The pulses, especially gram, are more delicate than the cereals, being easily injured by too much rain. And of all the crops, wheat, which occupies the ground the longest, seems to be the sturdiest and least fickle, as it is also the most paying.

Papers appended to reply.

Tabular statement showing dates of sowing and harvesting.

Replies received from each District, stating the same; also the grains which form the staple food of the people.

QUESTION 5, CHAPTER I.

Dates of sowing and harvesting in each District of Punjab, roughly stated from the replies of District Officers appended.

District.	KHARIF.		RABI.		REMARKS.
	Sown.	Reaped.	Sown.	Reaped.	
Delhi ...	June, July ...	October ...	September, October, ...	April, May ...	
Gurgaon ...	July ...	September, October, ...	October ...	April. ...	
Karnal ...	June, July ...	October ...	September ...	Do. ...	
Hissar ...	June, July ...	September, October, ...	October ...	March ...	
Rohtak ...	Do. ...	October ...	Do. ...	April ...	
Sirsa ...	July ...	Do. ...	Do. ...	Do. ...	
Umballa ...	15th June, 15th July, ...	September, October, ...	15th Sep., 15th Nov. ...	April ...	
Ludhiana ...	July ...	November ...	October, November, ...	April, May ...	
Simla ...	April, May ...	September, October, ...	November ...	May, June ...	
Jullundur ...	September, October, ...	April, May ...	1st half of July ...	October, November, ...	
Hoshiarpur ...	...	Not stated.	...	...
Kangra ...	May, June ...	September, October, ...	October, November, ...	April ...	
Amritsar ...	June, July ...	October and Nov. ...	October ...	April ...	
Sialkot ...	Do. ...	Do. ...	September, October, ...	May ...	
Gurdaspur ...	July ...	October ...	Do. ...	April ...	
Lahore ...	Not stated.	...	September, October, ...	April, May ...	
Ferozepore ...	June, July ...	October, November, ...	October, November, ...	Do. ...	
Gujranwala ...	July ...	November ...	October ...	Do. ...	
Rawalpindi ...	June, July ...	October ...	October ...	April ...	
Jhelum ...	Do. ...	Do. ...	October, November, ...	May ...	
Gujrat ...	Do. ...	Do. ...	Do. ...	Do. ...	
Shahpur ...	Do. ...	Do., November ...	September, October, ...	April, May ...	
Mooltan ...	July ...	October ...	November, Dec. ...	April ...	
Jhang ...	July, August ...	Do., November ...	October, November, ...	April, May ...	
Montgomery ...	Do. ...	Do. ...	November, Dec. ...	Do. ...	
Muzaffargarh ...	June, July ...	September, Oct. ...	October, November, ...	Do. ...	
Dera Ismail Khan ...	July, August ...	October, November, ...	September, October, ...	April, May ...	
Dera Ghazi Khan ...	Do. ...	December, January, ...	October, November, ...	Do. ...	
Bannu ...	June, July ...	Not stated.	Do. ...	Not stated.	
Feshawar ...	July ...	October, November, ...	October ...	April, May ...	
Kohat ...	June, August ...	Do. ...	Do. November ...	May, June ...	
Hasdra ...	June, July ...	Do. ...	Do. ...	Do. ...	

Replies of District Officers.

NOTE.—In respect of the food grains which form the staple food of the people, the following instructions were sent to District Officers and they will explain the form which the replies have taken.

Give for your District an estimate of the food grains consumed in a year by an average agriculturist's family consisting of five persons, 1 old person, man and wife and two children; the estimate to be given in the following form:—

Description of grain.	Sera.
Total ...	

Give a similar estimate for the non-agricultural classes and residents in towns.

DELHI DISTRICT.

The staple food of our people consists of the rabi grains, barley, gram and wheat; and of the kharif grains, bajra, maize, jowar, rice and the inferior pulses, mash mung. The

rabi grains are sown in September and October (November is not too late), and cut in CH. I. April and May; for a good crop rain is essential in the preceding August and September to soak the ground for sowing, and a little rain is required in January or February: late rains in October interfere with sowing, and late rains in March and April injure the ripe crop. The kharif grains are sown in June and July, and reaped in October and November; they require good rain in July and August, and are injured when ripe by late rain in October.

Estimate of food grains consumed in a year by an average family of five persons :—

AGRICULTURISTS.				NON-AGRICULTURISTS AND TOWNS-PEOPLE.			
Daily.		Yearly.		Daily.		Yearly.	
Man ...	1½ sers	Grain.	No. of sers.	Man ...	½ sers	Grain.	No. of sers.
Woman ...	1 " "	Wheat ...	320	Woman ...	½ " "	Wheat ...	480
Old person ...	½ " "	Barley ...	320	Old person ...	½ " "	Barley ...	120
2 children ...	1 " "	Gram ...	160	2 children ...	1 " "	Gram ...	160
	4 sers	Bájra ...	280			Bájra ...	80
		Maize ...	160			Maize ...	80
		Jowár ...	120			Jowár ...	40
		Pulses (inferior) ...	40			Pulses ...	80
		Miscellaneous... ..	40			Miscellaneous... ..	40
			1,440=36Mds				1,080 sers =27 Mds.

GURGAON DISTRICT.

The following grains form the staple food of the people. Kharif crops, bájra, jowár, moth, múng, (i. e. millets and pulses); rabi crops, barley and gram. The kharif crops are sown in July, and reaped in September and October; they require rain for the sowing in June or July, and also in August or September to keep them from being burnt up; excessive rain in the end of September or beginning of October injures the ripe crop. The rabi crops are sown in October, and reaped in April; they require heavy rain in August or September to prepare the ground for sowing, and a little rain in January or February to keep them from drying up; too much rain in October interferes with the sowing, and too much in March or April injures the ripe crop.

The following is an estimate of the food grains consumed in an average year by an average family of 5 persons :—

AGRICULTURISTS.				NON-AGRICULTURISTS AND TOWNS-PEOPLE.			
Daily.		Yearly.		Daily.		Yearly.	
Man ...	1½ sers.	Gram ...	200 sers.	Man ...	1 ser.	Wheat ...	200 sers.
Woman ...	1 ser.	Barley ...	400 "	Woman ...	½ "	Gram ...	120 "
Old person ...	½ "	Bájra ...	400 "	Old person ...	½ "	Barley ...	240 "
2 children ...	1½ sers.	Jowár ...	200 "	2 children ...	1 " "	Jowár ...	200 "
	4½ sers.	Moth ...	200 "			Bájra ...	200 "
		Mung ...	200 "			Urd ...	80 "
			1,600 sers = 40 Mds.			Rice ...	10 "
						Mung and Moth ...	80 "
							1,200 sers = 30 Mds.

* Commissioner considers these should be 86 and 27 Maunds as in Delhi and Karnál.—E. WACE.

KARNAL DISTRICT.

The grains which form the staple food of the village population are kharif, jowár, bájra, maize, coarse rice, moth, muhg. Rabi grains: masur, wheat, barley and gram sown, reaped, and eaten mixed.

The approximate sowing and harvest times are given below. These are the ordinary times. In an exceptional season the sowing may be further delayed a fortnight or even more; but to the injury of the produce :—

Staple.	SEED TIME.		HARVEST.	
	From	To	From	To
Coarse rice	20th May	5th July	5th September	15th October
Bájra	1st June	15th July	20th September	20th October
Jowár	10th "	5th August	20th October	20th November
Maize	Do.	20th July	5th September	20th October
Mung	Do.	Do.	20th October	20th November
Moth	Do.	15th August	Do.	Ditto
Grain	1st September	10th October	10th April	30th April
Masur	5th do.	Do.	Do.	Ditto
Mixed wheat, gram, barley	20th do.	30th November	25th March	Ditto

For the kharif crops rain is most needed in June and the first week of July, and it cannot be too plentiful.

They are also greatly dependent upon the rains in the end of July and first half of August. If it is either too plentiful or too scanty, it injures the crops. Too much rain at the end of September also injures the crops, as it washes off the pollen from the flowers.

For the rabi crops rain is most needed in August and beginning of September; and it can hardly be too plentiful; good rain in December and January is also most beneficial. Rain after the first week of March is injurious, as it affects the flower, as above.

In both crops rain at harvest time does infinite damage; as the grain when cut lies in the fields for weeks, and both it and the straw are liable to damage from wet.

The average yearly consumption of a family of 5 souls among the agricultural and labouring classes may be given as follows :—

	Maunds.		Maunds.
Bájra and jowár	8	Wheat, gram and barley mixed	10
Coarse rice or maize	5	Gram	5
Pulses	5	Masúr, randwa &c.	3

In all 36 maunds. Bájra takes the place of part of the jowár in the high light soils where it is grown. Maize is more eaten in the riverain village, and rice elsewhere.

Among the better classes, whether in the city or in the village, the following is a fair estimate :—

	Maunds.
Maize and jowár	3
Fine rice	4
Pulses	3
Wheat	13
Gram	4
Total	27

HISSAR DISTRICT.

Bájra and moth form the staple food of the people in this District. They are sown in June and July, and harvested in September and October.

Rain during the months of June, July and September is essential, and in October is ruinous.

Estimate of food grains consumed in a year by an average agricultural family consisting of 5 persons, 1 old person, man and wife and 2 children :—

Description of grains.	Sers.
Bájra	1,275
Moith	255
Total	1,530

Estimate of food grains consumed by an average non-agricultural family, and residents of towns, consisting of 5 persons, 1 old person, man and wife and 2 children :—

Description of grain.					Sers.
Bájra	...	...	...	...	354
Wheat	...	...	...	...	237
Gram	...	...	...	...	118
Mung	...	...	...	...	159
Urd	...	...	...	...	78
Total					945

ROHTAK DISTRICT.

Staple food.

Grain.	When sown.	When harvested.	Rain when advantageous.	Month in which heavy falls do harm.	Month in which absence of rain proves injurious.
Barley	November, December.	March.	January, February.	March.	January, February.
Gram	September, October.	Do.	November, December.	February, March.	November, December.
Jowár	July, August.	October, November.	July, August, Sept.	September.	July, Augt., Sept.
Bájra	June, July.	September, October.	July, August.	Do.	July, August.

Statement showing estimate of the food grain consumed in a year by an average agriculturist's family of 5 persons.

Description of grain.					Sers.
Barley and gram	...	...	...	...	800
Jowár and bájra	...	...	...	...	680
Múng and mésh	...	...	...	...	71
Total					1,551

Non-agricultural classes in villages much the same as the above.

Residents in towns :—

Description of grain.					Sers.
Wheat	...	...	...	...	800
Gram	...	...	...	...	200
Múng and mésh	...	...	...	...	80
Rice	...	...	...	...	40
Total					1,120

SIRSA DISTRICT.

Bájra, barley and wheat form the staple food of the people in the Sirsa District.

Bájra is sown in July, and harvested in October, and requires rain in each of the months July, August to September.

If there be no rain in July, a crop may still be obtained with rain in August and September. If there be no rain in July and August, there will be no bájra. Excessive rain in September causes blight.

Barley is sown from October to December, and is harvested from 20th April to 15th May. It requires rain in September and between 20th December and 10th January, or in February, according as the sowing has been early or late.

Excessive rain in December or January is ruinous.

Wheat is sown in October and in the first half of November, and is harvested in April.

With the exception that wheat requires more rain, the remarks regarding barley apply.

The estimated consumption of food grains by an average family is :—

For agriculturists.

Description of grain.	Sers.
Bájra	5
Total	5

For non-agriculturists and residents in towns:—

Description of grain.	Sers.
Bájra	1½
Barley	1½
Wheat	1
Rice	½
Total	4

UMBALLA DISTRICT.

The staple food of the people of the Umballa District at rabi is principally wheat and gram. Though in less quantities than wheat, dál is also largely consumed. At kharif the principal food is makki, jowár, bájra and chína; dál also eaten with these.

The rabi grains above mentioned are sown from the 15th September to 15th November, wheat being sown last of all. The rabi harvesting begins from 1st April, and ranges generally up to the 10th April. The kharif grain crops cultivation depends upon rain falling; if rain has fallen, they, i. e., the crop, would be sown by the 15th June, and later, according as the rain may happen to fall.

The kharif harvesting commences from the 1st September (when chína is generally ripe), and goes on till about the end of October.

It is essential for the well-being of the future rabi crop that rain should fall in September, or in the latter portion of Bhadhon and beginning of Assoj; in short, copious rain throughout August, although beneficial enough for the standing kharif crops, will not suffice for a good and ample rabi, unless some rain also fall in September; rain again is most essential during the month of December, and again in February; rain during these months will generally secure a copious crop. Rain is not desirable for a month or so after sowing.

For the "kharif" it is most essential that rain should if possible fall by the 15th June or about the 1st Asárh, and it will be all the better if there be rain more or less once a week until the end of September. If the month of "Asárh" pass entirely without any rain, there will be no cotton crop, and other staples will be limited. Rain is very desirable and beneficial when the grain is just coming into ear, and for want of it then the grain will be

short in quantity. The following is an estimate of the food grains consumed in a year by (an average agriculturist's family of 5 person :—

<i>Description of grain.</i>			Sers.	Chts.		
<i>Rabi.</i>						
Wheat	...	2	4	} 5 sers per diem for 6 months or 182½ days.	} Mds. S. C. =22 32 8	
Gram	...	2	4			
Dál	...	0	8			
<i>Kharif.</i>						
Makki	...	1	8	} 5 sers per diem for 6 months or 182½ days.	} =22 32 8	
Jowár	...	1	8			
Bájra	...	1	8			
China	...	1	8			
Dál	...	0	8			
Total maunds					...	45 25 0

The following is an estimate for non-agricultural classes :—

<i>Description of grain.</i>			Sers.	Chts.		
<i>Rabi.</i>						
Wheat	...	1	12	} 4 sers per diem for 6 months or 182½ days.	} Mds. S. C. =18 10 0	
Gram	...	1	12			
Dál	...	0	8			
<i>Kharif.</i>						
Makki	...	1	8	} 4 sers per diem for 6 months or 182½ days.	} =18 10 0	
Jowár	...	1	8			
Bájra	...	0	8			
Dál	...	0	8			
Total maunds					...	36 20 0

Estimate for city residents :—

<i>Description of grain.</i>			Sers.	Chts.	
<i>Rabi.</i>					
Wheat	...	2	4	} 3-12 per diem for 6 months or 182½ days.	} Mds. S. C. =17 4 6
Gram	...	1	0		
Dál	...	0	8		
<i>Kharif.</i>					
Wheat	...	2	4	} 3-12 for 6 mths. or 182½ days.	} =17 4 6
Makki	...	1	0		
Dál	...	0	8		

LUDHIANA DISTRICT.

Wheat, gram, barley, jowár, Indian corn form the staple food of the people of this District.

They are produced in the seasons rabi or spring and autumn or kharif, as follows :—

Rabi or spring.—Wheat, gram, and barley are sown in October and November and harvested in April and May, and rain is essential from August to September.

Kharif or autumn.—Jowár, Indian corn, sown in July and August, and harvested in November; rain essential in July and August.

Good rain in July and August is advantageous for the operations of both seasons. Excessive rain in August is bad for the kharif and in April for the rabi.

The average consumption of grains per annum by a family of 5 persons, being agriculturists, and of residents of towns, is as follows :—

<i>Agricultural family.</i>		
Wheat, gram, barley	}	45 maunds.
makki, jowár.		
The same grain by	}	33 maunds 30 sers.
residents of towns.		

Agriculturists eat very little wheat, but live on gram, barley, makki, jowár,

In June wheat, barley and gram is consumed, and in November jowár, makki (India corn).

SIMLA DISTRICT.

Staple food of the people in the Simla District is wheat and barley and lentils from the rabi harvest, and from the kharif harvest, Indian corn, red and other millets, dál, rice. The rabi is sown from 15th October to 15th December, and harvested in May and June. The kharif is sown in April, May and June, and harvested in September and October. For the rabi harvest rain is required in September and October, and in March and April; for the kharif in July and August. If the rains are not satisfactory, either scanty or excessive in those months, then the result will be mischievous or ruinous.

Estimate of food consumed in a year by an average agriculturist's family of 5 persons.

Description of grain.	Sers.
Wheat	280
Barley	160
Chúna	120
Indian corn	400
Koda (millet)	80
Babri (millet)	80
Másh and other pulses	160
Buck wheat	40
Rice	80
Lentils	40
Total	1,440

Non agriculturists.	Seers.
Wheat	360
Lentils	40
Indian corn	360
Másh and other pulses	80
Rice	120
Koda (millet)	120
Total	1,080

JULLUNDUR DISTRICT.

The staples of food of the people in the spring crop are, wheat barley, masur, and gram sown in September and October, and harvested in April and May. The first critical time is November, when the young crops have germinated freely and want water to nourish them. December should be a month of showers for a bumper harvest. Excessive rainfall in the winter months is rarely ruinous to *cereals*, though if it falls when the corn is in the ear, it is apt to be mischievous, producing blight and rust. Too much rain, however, at this season utterly destroys masur and gram. We had an example of this last spring, for I do not suppose the entire Doáb gathered $\frac{1}{10}$ th of the pulse crop it sowed, though at one time prospects were most bright.

If no rain falls in December or January, the chances are, the spring crops will be an utter failure.

The autumn staples of food are, makki, másh moth jowár, and múng. These are sown in early July, and harvested in October and November; rain to soften the ground for the plough is required at the end of June—at latest the 15th July. When once the crop is sown, rain is required weekly to extent of 2 or 3 inches. If they fall at regular intervals and in tolerable quantity all through July, August and the first week in September, we may expect a bumper harvest. If however there is a season of dry weather in July when the seed sowing process is over, our prospects are sure to look bad; and if it does not fall by 1st August, partial failure may be expected. If there is no rain till the 15th August, it may be considered that none of the ordinary autumn crops, except sugar-cane,

will yield anything. Perhaps there will also be a modicum of makai (Indian corn) as this is planted when the rain falls, however late that may be.

The following tabular statement shows an estimate of the food grains consumed in a year by a family of agriculturists, non-agriculturists, and residents in towns consisting of 5 persons, 1 old person, a man and his wife and 2 children.

Description of grain.	Family of agriculturists.	Non-agriculturist.	Town residents.
	Seers.	Seers.	Seers.
Wheat	640	720	760
Másh	80	100	120
Masur	20	20	...
Makai	605	280	200
Moth	80	40	40
Mung	20	30	30
Jowár	260	70	...
Rice	40	80	100
Barley	80	40	20
Gram	90	80	80
Total	1,825	1,460	1,360

HOSHIARPUR DISTRICT.

The grains most in use are wheat, barley and gram of the spring harvest; and of the autumn harvest, Indian corn, charri (sorghum) moth (phaseolus). It is very hard to give an answer to the latter part of the question, because the sowing and harvesting and intermediate progress of the crop vary according to the season and according to the heaviness of the previous rains.

For the wheat harvest, however, it may be said that good heavy rain in August or September or October, or the beginning of November, is essential, and also in December or January.

For the rain crop a heavy rain at the end of June or beginning of July, and pretty steady falls of rain in July and August, are required.

The food grain consumed in a year by an average agriculturist's family consisting of 5 persons as described is as follows.

Description of grain.	Seers.
Wheat	} 1600 = 40 Mds. or 8 Mds. per head.
Indian corn	
Rice	
Dál and gram	

This 40 maunds might be divided as follows:—

Description of grain.	Seers.
Makki, Indian corn	720
Wheat	400
Gram	160
Másh, moth	160
Rice	80
Barley	80
Total	1,600 or 40 maunds.

The estimate for the town family is follows :—

Old man	$\frac{5}{8}$	Wheat	$\times \frac{1}{2}$ of dāl	per day.
1 Man	$\frac{1}{2}$	"	" $\frac{1}{2}$ "	do.
1 Women	$\frac{1}{2}$	"	" $\frac{1}{2}$ "	do.
2 Children	$1\frac{1}{2}$	"	" $\frac{1}{2}$ "	do.
5 persons $2\frac{7}{8}$ of wheat $\times \frac{1}{2}$ of dāl.				

Description of grain.	Sers.
Wheat*	1231 $\frac{1}{2}$
Dal, Mung	228 $\frac{1}{2}$
	1,460

or 36 maunds 20 sers, which is at the average rate of 7 maunds 12 sers per head per annum.

I may here mention that 7 maunds was the average adopted by Sir W. Muir in his octroi inquiries in the North Western Provinces.

I am inclined to think that the estimate errs, if anything, on the side of excess, and that the annual consumption of a town family is on the average somewhat less than 7 maunds of grain and pulses per head.

This 7 maunds per head might be apportioned as follows :—

Description of grain	Sers.
Wheat	680
Indian corn	320
Rice	160
Mash, moth	140
Gram	100
Total	1,400

In making a calculation it will be safe to take full 8 maunds per head for the agricultural and 7 maunds for the town population.

KANGRA DISTRICT.

The grains which form the staple food of the people in this District, are, rice, wheat, barley, maize, gram, mash, mung, moth, peas, masur and mandal. Grains of rabi crops are sown in October and November, and those of kharif in May and June; the former is harvested in April, and the latter in September and October. Rain is essential to rabi crops in December and January, otherwise failure; excessive fall of rain in February and March is ruinous, and to kharif crop rain is essential after 15th to 30th June, otherwise failure, and excessive fall of rain is ruinous in September.

The estimate of food grains consumed in a year by an average agriculturist's family consisting of 5 persons, 1 old person, man and wife and 2 children, are :—

Description of grain.	Mds. Srs.	REMARKS.
Rice	2 0	Average 7 maunds and 5 sers.
Wheat	5 13	
Indian corn (chulli) or maize	12 27	
Other grains	12 25	
Dāl	3 0	
Total	35 25	

* If for wheat, Indian corn or millet be substituted, about 4 less will be eaten.

Estimate for non-agricultural classes and residents in towns—

Description of grain.	Mds. Srs.	REMARKS.
Rice	8 0	Average 5 maunds, 19 sers.
Wheat	8 0	
Indian-corn (challi) or maize	5 0	
Other grains	2 15	
Dál	4 0	
Total	27 15	

AMRITSAR DISTRICT.

Wheat and rice chiefly form the staple food of the people in the city and towns, but the following grains are used by the agricultural classes :—

Makki (Indian-corn), jowár (millet), gram, china, kangni, jau (barley), maddal, sawánk and churál.

The following tabulated statement will show when these grains are sown and harvested, and what are the critical times at which rain is essential to each of them, or at which a failure or an excessive fall of rain may be mischievous or ruinous :—

Name of harvest.	Name of grain.	When sown.	when harvested.	The critical times at which rain is essential.	The times at which a failure of rain may be mischievous or ruinous.	The times at which an excessive fall of rain may be mischievous or ruinous.
Kharif	Rice	June	End of Sept. ...	End of July, middle and end of August.	From 14th July to 14th August	In the latter part of September.
	Jowár	July	Ditto	Ditto	Ditto	Ditto.
	Makki	Do.	Octr. and Novr.	Ditto	Ditto	August.
	Kangni	June	Augt. and Sept.	Ditto	Ditto	From 15th August to 15th September.
Rabi	China	Do.	Ditto	Ditto	Ditto	Ditto.
	Máh	Do.	Octr. and Novr.	Ditto	Ditto	None.
	Wheat	October	April and May	15th January to 15th February	November to January.	Any time during cold weather.
	Barley	From 15th Sept. to 7th Decr.	15th March ...	Ditto	Ditto	Ditto
	Gram	From 1st to 15th October	April	15th November	Ditto	Ditto
	Masur	October	Ditto	15th December	Ditto	None.

The following statement will show an estimate of the food-grains consumed in a year by an average agriculturist's family consisting of 5 persons, 1 old person, man and wife and 2 children :—

Description of grain.	Maunds.	Sers.
Wheat	10	32
Millet	7	0
Gram	4	0
Indian corn	3	0
Barley	4	23
China, kangni, sawánk and maddal	3	0
Total	32	15

A similar estimate for the non-agricultural classes and residents in towns is given as follows :—

Description of grain.				Maunds.	Sers.
Wheat	...	...	...	12	0
Rice	...	...	...	4	0
Millet	...	...	...	6	0
Gram	...	...	...	1	35
Barley	...	...	...	2	0
Total ...				25	35

SIALKOT DISTRICT.

The following grains form the staple food of the District :—

Wheat, barley, gram, (chana) bherra (wheat and gram mixed), masur, goji (wheat and barley mixed), china (a kind of millet), maize, rice, jowar (great, millet), bajra (spiked millet), kangni, dhan, mandal, (kind of rice), kangni, mash, mung (pulses), sawank (millet), and moth.

The rabi or spring crops are sown from the end of September up to December, and harvested in May, with the exception of chana and masur, which are reaped in April. The kharif or autumn crops are sown from April to the middle of August, and harvested partly in October, November and December.

The best time for the rain-fall for the rabi crops is from January to the end of March and for the kharif from July to September. If the rain-fall is heavy during the months of April and May, October and November, great damage would be caused to some of the principal crops which are then standing, and which have reached maturity.

The following is an estimate of the food-grains consumed in a year by a family consisting of 5 individuals, an old person, a man, his wife, and 2 children.

For an agriculturist's family :—

Description of grain.				Mds.	Srs.
Wheat	...	...	...	11	3
Jau and goji	...	...	...	12	0
Makai	...	...	...	3	0
Chana	...	...	...	1	0
Massur	...	...	...	1	0
Mash and mung	...	...	...	1	0
Rice	...	...	...	2	0
Jowar	...	...	...	1	0
Mandal	...	...	...	1	0
Total				33	5

For a non-agriculturist's family :—

Description of grain.				Mds.	Srs.
Wheat	...	...	...	12	0
Jau and goji	...	...	...	4	0
Makai	...	...	...	1	0
Chana	...	...	...	0	35
Massur	...	...	...	0	20
Mash and mung	...	...	...	2	0
Rice	...	...	...	2	5
Jowar	...	...	...	0	20
Total				23	0

GURDASPUR DISTRICT.

The following grains form the staple food of the people of this District.

Description of grain.	When sown.	When harvested.	When rain is essential to them.	When failure or excessive rain causes injury.
Wheat	October	April ...	September, October, December, January and February.	September, October, December, January and February
Berra				
Barley				
Masur				
Gram				
Indian corn	15th Sept. to	Do. ...	September, October, December and January.	September, October, December and January.
Mandal	15th Octr.			
Kodra				
Sawank				
Kasgni				
Charri	July	October ...	June, July, August, September and October.	June, July, August, September and October.
Bajra				
Moth				
Mung				
Mah				
Rice	April ...	October ...	April, May, June, July, August, September and October.	April, May June, July, August September and October.

The following is an estimate of the consumption of food-grains in a year by an average family of agriculturists and non-agriculturists consisting of 5 persons, 1 old person, man and wife and 2 children :—

Agriculturist—

Description of grain.	Sers.
Wheat	250
Barley	125
Berra	125
Indian corn	300
Rice and kodra	200
Other inferior grains	460
Pulses	40
Total	1,500

Non-agriculturist—

Description of grain.	Sers.
Wheat	550
Barley	100
Berra (mixed grains)	100
Indian corn	100
Rice and kodra	200
Other inferior grains	50
Pulses	100
Total	1,200

*LAHORE DISTRICT.

The grains which form the staple food of the people of this District are, wheat and gram.

Wheat is sown in October and November, and harvested in April and May.

Gram is sown in September and reaped in May.

The rain is essential in September and October, and also in January and February.

Rain in March and April is mischievous.

Food-grains consumed in a year by an average agriculturist's family consisting of 5 persons, 1 old person, man and wife, and 2 children, are as follows :—

Description of grain.					Sers.
Wheat	...	18 Maunds	...	...	720
Barley	...	4 "	...	...	160
Gram	...	6 "	...	...	240
Jowár and makki	...	6 "	...	...	240
Dál, pulses	...	3 "	...	...	120
Total					1,440

Ditto for a non-agriculturist:—

Description of grain.					Sers.
Wheat and Dál	...	22 Maunds	...	...	880
Gram	...	5 "	...	...	120
Rice	...	1 "	...	...	40
Total					1,040

FEROZEPOR DISTRICT.

(1). Wheat, barley, grain, jowár, bájra, Indian corn; (2) wheat, barley and gram are sown from the end of September to end of November, and harvested from 1st April to middle of June; jowár, bájra and Indian corn are sown from the 15th of June to the end of July. Jowár sometimes even in April and May, should rain fall in these months, and harvested from 15th October to 15th December. (3). For the spring crops rain is required in August and September to moisten the ground for sowing them, and again in January and February to bring them on. The autumn crops require rain in July and August, and a little in September. Heavy rain is injurious to the former in April and May, and to the latter in October and November, but except it be prolonged wet weather, no great harm is done.

(4).

Description of grain.	Sers.
Of all the grains above mentioned, the grain eaten varies with the time of year; wheat is the most consumed	1,825

(5). 1460 Sers.

GUJRANWALA DISTRICT.

Wheat, mung, rice and másh form the staple food of the people of this District, but moth, jowár, makki, barley, gram, goji, kangni and china are also consumed by the people of low classes. They are sown and harvested as follows :—

Fasal.	Name of grain.	When sown.	When harvested.
Kharif,	Moth and jowár	27th June to 27th July	1st November to 15th November.
	Makki, rice, mung and másh.	28th July to 15th August.	1st November to 15th November.
	Kangni and china	13th July to 28th July	29th September to 14th October.
Rabi	Ditto	10th February to 10th March.	29th September to 10th May.
	Gram, goji or wheat and gram.	15th September to 15th October.	10th April to 10th May.
	Wheat, goji or wheat and barley.	15th October to 1st December.	Ditto.

The rains are essential—

Ch. I.

Rabi.
15th October, 13th July, 28th January
and 27th February.

Kharif.
27th June to 15th September, weekly, at the end of September once.

Failure of rain in August and September is detrimental to kharif crops, and in January and March to rabi crops; excessive fall of rain in March, June and November is ruinous to crops. In the end of September excessive rain is a serious injury to rice crops.

Estimate of the food-grains consumed in a year by an agriculturist's petty family, consisting of 5 persons, 1 old person, man and wife and 2 children :—

Agriculturist, 2 men ... 2½ sers. ♀
Woman ... 1 " "
Children ... 1 " "

Description of grain.	Mds.	Sers.	Remarks.
Wheat, ata ... 4 months,	13	20	Though these people consume more than this estimate, but as a known fact they usually consume 1 máni= 8 maunds of wheat annually, as a part of year they pass on vegetables (herbs, turnips and carrots) which are the produce of their own fields. Pulses are included in this, and they eat 3 times a day.
Makki ... 2 "	6	30	
Goji of gram ... 2 "	6	30	
Barley ... 2 "	6	30	
Mung, moth and rice, 2 "	6	30	
Total ...	40	20	Cháhwa at 9 A. M. Batwela at 12 noon. Shám after evening.

Non-agriculturist, 2 men ... 2 sers. 2 chittáka.
Woman ... " 12 "
Children ... 1 ser.

Description.	Mds.	Sers.	Remarks.
Ata wheat ... 4 months,	12	...	In this class usually almost all the non-agriculturists are included as well as village servants, who also eat for some part of the year only vegetables like their masters.
Ata makki ... 2 "	6	...	
Ata goji of gram ... 2 "	6	...	
Ata barley ... 2 "	6	...	
Moth, mung and rice, 2 "	6	...	
Total ...	36	...	

The tradesmen eat less than agriculturists do, and have only 2 meals, at 9 o'clock A. M. and after evening, and do not eat at 12 noon, like the agriculturists.

Towns-people 2 men ... 1 ser 8 chittáka.
Women ... " 10 "
Children ... 1 ser.

Wheat, rice and pulses 28 maunds and 20 sers. Towns-people eat twice a day, and do not work hard like other classes of people; besides gram, sweetmeats and vegetables form a part of their food.

RAWALPINDI DISTRICT.

Wheat, bájra and Indian corn form the staple-food of the people of this District.

Wheat is sown in October, and harvested in April. Bájra is sown in June, and gathered in October, and Indian corn is sown in July, and harvested in October.

For wheat rain is essential in the latter halves of January and March.

For bájra and makai rain is essential in July, August and part of September.

Excessive rain is ruinous to wheat in the end of March, for bájra in the end of September, while Indian corn scarcely suffers from excess of rain.

I. The following is an estimate of the food-grains consumed in a year by an average agricultural family consisting of 5 persons, 1 old person, man and wife and 2 children.

Description of grain.	Sers.	Remarks.
Wheat	1,200	
Barley	50	
Bájra	225	
Indian corn	225	
Jowár	66	
Gram	40	
Dál (pulses of sorts)	120	
Total	1,916	

For a similar family of the non-agricultural class and residents in town—

Description of grain	Sers	Remarks
Wheat	720	
Bájra	320	
Indian corn (makai)	360	
Rice	40	
Jowár	10	
Gram	60	
Dál of sorts	160	
Total	1,670	

JHELM DISTRICT.

The staple food of the people is wheat, barley and bájra. Wheat is sown from 15th September to end of November, and is usually reaped about May. It requires a week's rain at the new year, a few showers in the middle of February, and a few more a month later. A failure of rain in February and March does most harm, and an excess of rain in April and May is most injurious.

The above description applies to barley as well. Bájra is put in the ground between 15th April and 15th July, and reaped in October or 1st half of November. It requires some rain in the end of July, plenty all through August, a good shower before 15th September, and another after that date; short rain in August is most injurious, and the worst time for an excess is the end of September, when the crop is ripening.

The following table gives the food-grains consumed by an average family in a year, agricultural and otherwise.

Description of grain.		Sers.
Agriculturist	{ Wheat	600
	{ Barley	40
	{ Gram	40
	{ Bájra	240
	{ Pulses	130
	Total	1,050
Non-agriculturists and residents in towns	{ Wheat	775
	{ Barley	...
	{ Gram	...
	{ Bájra	175
	{ Pulses	100
Total	1,050	

GUJRAT DISTRICT.

The staple food grains of the people of the District are wheat, barley, jowár, bájra and makki; of the-rabi crops wheat and barley are sown in October and November, and cut in May and June; rain-fall when the seed is germinating is most beneficial for the crops, also

in February and March previous to the formation of grain in the ears. At the following Ch. I. periods injury is sustained by these crops from excessive rain; immediately after sowing, as the seed then becomes dislodged or rotted. Secondly, after the grain has ripened in the ears, at which time heavy rain causes the stalk to break; lastly, after the crop has been reaped, and is being threshed and stored. Of the kharif crops jowár bájra and makki are sown in June and July, and cut in September and October; for these crops rains during June and July and until the formation of grain in the ears is most beneficial, and heavy rain during September and October when the grain is ripening is most injurious to these crops.

Estimate of the food-grains consumed in a year by an average agriculturist's family consisting of 5 persons :—

Description of grain.	Maunds.	Sers.
Wheat	27	...
Bájra	10	...
Jowár	4	30
Jau	5	20
Total	46	50

The following is an estimate of grain consumed by a similar family of non-agriculturists and residents of towns :—

Description of grain.	Maunds.	Sers.
Wheat	30	15

SHAHPUR DISTRICT.

The following are the staple food-grains of this District, with seasons of sowing and harvesting :—

Description of grain.	When sown.	When harvested.	REMARKS.
Wheat and barley ...	October and November	April and May.	
Bájra	June, July and August	November and December	
Makki	June and July	September and October	
Chína	March and April and September.	May and December ...	Chína is sown and harvested in rabi as well as in kharif.
Jowár	June, July and August	November and December	
Gram	September and October	April and May	

Rain is needed at the sowing time for all these crops, but unless there is fall in September, the kharif crops will wither, and the ensuing rabi cannot be sown, the land being too hard for the plough. Excessive rain in March, April or May, and a deficient fall in January and February, causes damage to the rabi, but an excessive fall seldom injures the kharif crops.

The consumption in a year, by an average agriculturist's family, consisting of 5 persons, is estimated to be 34 maunds 11 sers as shewn below :—

Description of grain.	Quantity.	
	Maunds.	Sers.
Wheat for 4 months	12	30½
Barley for 2 do.	2	15
Bájra for 4 do.	12	30
Makki for 1 do.	3	7½
Chána for 1 do.	3	8
Total	34	11

And for non-agricultural classes and residents in towns, the estimated quantity of grains consumed in a year, by a family of 5 persons, *i. e.*, 1 old person, man and wife and 2 children, is 28 maunds and 32½ sers, *viz* :—

Description of grain.	Quantity.	
	Maunds.	Sers.
Wheat for 11 months	23	15
Bájra for 1 do.	2	25
Pulses for 12 do.	2	32½
Total	28	32½

MOOLTAN DISTRICT.

The staple food consists of the kharif grains, the pulses, the wheat and the rice. The proportion of wheat and inferior grains eaten depends entirely on the means of the family; well-to-do people eat only wheat; the very poor never eat it at all. Wheat and pulses are sown in November and December, and harvested in April; the kharif grains are sown in July, and harvested in October. Rain can hardly be said to be essential, but a moderate supply in January and February, and in July and August, greatly improves both harvests. Excessive rain is always bad: if it comes before the ears are formed, it brings blight; if it comes afterwards, it beats down the grain and rots it. Sometimes it comes when the grain is being threshed, it then destroys the whole of the bhusa and a great part of the corn. In the family mentioned, the old person may be estimated to eat ¾ ser of átta, 1 chittak of dál or other pulses a day, the wife the same as the old person; the man 1 ser of átta and 1 chittak of dál; the children would each eat half as much as the man; this seems a large allowance for them, but then they eat much more often than adults; at the above rate the yearly consumption would be as follows :—

Atta ¾ sers a day = 1277 sers or 32 maunds a year.

Dál ¼ chittak a day = 91 sers or 2 maunds 11 sers a year.

The amount of vegetables and green food consumed cannot be definitely estimated. It depends on whether the family has a garden or not.

The consumption of a non-agricultural family would be much the same as the above, but probably the man would eat ¾ instead of a whole ser of atta a day, and this would reduce the yearly consumption by 91 sers or to about 30 maunds.

JHANG DISTRICT.

The grains forming the staple food of the population of Jhang are wheat, gram, jowár, china, barley, dál, Indian corn, peas, masur :—

Wheat	is sown in Oct., Nov., Dec.	and reaped in April and May.
Gram	do. Sept., Oct.	do. April.
Barley	do. Oct., Nov., Dec., Jan.. ..	do. do.
Masur	do. do. Do.	do. do.
Peas	do. Sept., Oct., Nov., Dec.	do. do.
Jowár	do. June, July, Aug.	do. Oct., November.
Mung	} do. Aug., Sept.	do. Nov., December.
Moth		
Másh		
Indian	{ 1st crop in June	do. August.
corn			{ 2nd do. Aug. .. ..	do. October.
China	{ 1st crop in Mar., April	do. May, June.

Indian corn is only grown in the Chiniot tahsil, and even there only in the northern part.

The rain-fall in this District is small, and much rain is not needed, as cultivation is almost entirely either artificially or naturally irrigated. The báriani area is very small, and is usually assisted by surface drainage. For the rabi crops on cháhi and saílába lands rain is urgently needed in July and August, and again during the last week of December and January, and again in March; rain in the latter half of September and the beginning of October is also useful. Rain in the months of April or May after the grain has formed in the ear is most injurious. Rust and blight are produced, and the grain withers up and becomes almost unsaleable.

For the kharif crops rain is absolutely necessary in July and August. Rain in September, October is also beneficial after a break in the rains. Rain in November and December blights the jowár plant, and blackens the grain, is very injurious to the cotton then being picked, and also to the grains of the dál tribe.

Excessive rain is hardly known in this District, and would only be injurious when any rain is more or less injurious. The rain-fall in Jhang during the last 2 moths has been excessive viewed by the past averages of rain-fall, but it has been most beneficial.

I estimate the quantity of food-grains consumed by an average agriculturist's family in this District at 30 maunds, and that consumed by residents in towns at 33 maunds.

The estimate is given below in the prescribed form :—

Description of grain.	Sers.
Wheat	480
Gram	200
Jowár	120
China	160
Barley	120
Dál of various sorts and miscellaneous grains	120
Total	1,200 = 30 Ms.

For a family resident in a town add to the above $6\frac{1}{2}$ maunds of wheat and $\frac{1}{2}$ a maund of dal and miscellaneous grains, and cut out the china.

It must be remembered that in this District the food of a Zamíndár consist largely of milk and butter-milk, and also of different kinds of vegetables, "ság," including carrots, turnips both leaves and bulbs, &c. Non-agriculturist classes consume as compared with the agriculturists but little milk and not much "ság." The cattle graziers who live in the bar may be almost said to live chiefly on milk in its different forms.

MONTGOMERY DISTRICT.

Wheat, rice, great millet, (jowár), Italian millet (kangni), panicum miliaceum (chfna), Indian corn (makki), barley (jau), cicer orientum (gram), phaseolus radiatus (másh), ervum lens (masur), conjamus havus (arhar).

Name of grain.	When sown.	When harvested.	When rain is essential to them.	When rain is mischievous or ruinous.
Rice, Indian corn, great millet, Italian millet, panicum miliaceum, phaseolus radiatus.	Hár and Sáwan equal to July and August.	Assu, Kátik, Maggar, equal to Oct. November, and December.	For kharif Sáwan and Bhádran equal to July and August.	If rain is not enough in the months mentioned in preceding column, the result will be mischievous and ruinous; excessive rains during Besákh, Jéth and ½ of Hár, equal to April, May, and June will damage the rabi crop; during Kátak and Maggar, (Octr. and Novr.) the kharif crop will be destroyed.
Wheat, barley, ervum lens, conjamushavus.	Kátik and Maggar (November and December).	Chét, Besákh, Jéth, (April, May and June).	Forrabi Poh, Mágh, Phag-gan equal to January, February and March.	
Cicer orientum	Assu, Kátak (Oct. and November).	Chét, Besákh (April and May)		

For an agriculturist's family:—

Description of grain.	Maunds.	Sers.
Wheat	20	0
Rice	1	30
Jowár (great millet)	4	0
Kangni and china	2	7½
Makki (Indian corn)	2	0
Jau (barley)	2	0
Total	31	37½
Gram, dál	1	8
Moth (phaseolus radiatus)	1	32
Masur (ervum lens)	0	15
Total	3	15

For a family of a non-agriculturist:—

Description of grain.	Maunds.	Sers.
Wheat	20	0
Rice	3	0
Jowár (great millet)	1	3½
Makki	1	0
Total	25	3½
Dál as above.	1	8

MUZAFFARGARH DISTRICT.

The staple food of this District consists of wheat, barley, gram, peas, mohri (ervum lens, masur in Hindústáni) rice and bájra; jowár is almost entirely grown for fodder. Wheat, barley and peas, gram and mohri are sown from the beginning of October to the end of November. Peas, gram and mohri are reaped during the last 15 days of March. Wheat and barley are reaped from the 15th of April to the 15th of June.

Harvesting is not completed before the 15th of June. Rice and bájra are sown from the middle of April to the middle of July, and are harvested from the 15th September to the 15th October. For wheat, barley, gram, peas and mohri, rain is desired throughout the whole time of their growth, but especially from the 15th January to the end of March.

In this rainless country moderate rain is desired all the year round, the only months in which the farmers object to rain are in Besákh and Jéth, i. e., 15th April to 15th June, because the rabi crops are being harvested, and because it is commonly believed that rain in those months brings a dry Sáwan and Bhádron (15th July to 15th September). An important staple of food not mentioned in the questions in this District is the date crop. Date trees grow spontaneously, and require no care beyond watching and picking the fruit. There are 3,66,221 female date trees in this District. The yield of a single tree sometimes goes as high as 2 maunds. However, taking the low yield of 10 sers a tree, the yearly crop will be 91,555 maunds. The fruit ripens in July and August. The average selling price is from Re. 1 to 2-8 per maund. Dates are largely exported to Mooltan, Lahore and Sindh.

The following is an estimate of the food-grains consumed in a year by an agriculturist's family, consisting of one old person, a man and his wife and two children.

The old person eats	...	...	...	...	1 ser daily.
The man eats	...	...	...	...	1 do.
The wife eats	...	...	...	...	$\frac{1}{2}$ do.
The children eat	...	...	...	...	1 do. between them.
Daily consumption	...	...	...	...	3 $\frac{1}{2}$ sers.
Dál daily	...	...	...	...	$\frac{1}{2}$ do. *

Description of grain.				Maunds.	Sers.
Wheat	$\frac{1}{2}$	...	...	34	9
Bájra		...	...
Rice		...	...
Peas	$\frac{1}{2}$	...	...
Barley		...	...
Gram		...	...	3	15
Dál (Mohri &c) for 9 months		...	...
Total		...	...	37	24

The following is an estimate of the food-grains consumed by a family of town residents consisting of the same number of persons:—

Description of grain.				Maunds.	Sers.
Wheat	...	...	...	34	9
Rice	...	...	...
Dál for 6 months	...	...	...	2	10
Total	...	...	...	36	19

The towns-people eat more vegetables and less dál than the rural population.

DERA ISMAIL KHAN DISTRICT.

The staple food of our people is wheat. In the Cis-Indus tahsils they eat very little else, except in the Thal, where they also eat a little bájra. In the Trans-Indus tahsils the people eat bájra during 2 or 3 months, and wheat for the rest of the year. They eat as little bájra as they can, and sell most of it to the Nassars and other Pawindahs. Bájra and jowár are sown in the spring after the April rains; but to a much greater extent in July and August. A failure of the July and August rains prevent the sowing of the late bájra, and leads to the failure of the crops sown early in the season.

* Dál is eaten for 9 months only; vegetables and ság are eaten for 8 months.

I. The late August and early September rains are very valuable—Trans-Indus—for the wheat cultivation. In the Indus sailába tract, the rain that falls at this period checks the rabi cultivation, and is of no use generally as the ground is already saturated.

Rain is required for sailáb crops in December and January, and again a little later in the season.

Bájra and jowár are mostly harvested in October and November when there is seldom much rains. Wheat and gram are harvested in April and May, and harvest operations are often interfered with by an excess of unseasonable rain at this season. On the whole the rain-fall in these parts is seldom enough to occasion serious mischief, and crops more generally suffer from a lack than from excess of rain.

A family of 5 people in a town generally eat from 3 to 3½ sers of wheat per day. An agricultural family will eat perhaps a ser or a ser and a half more, or from 3½ to 5 sers. This is for people who are in fair circumstances. The poorer people have to do on less, especially when prices are dear. In years of abundant harvest the common people make a great deal at reaping time, and eat a great deal of raw bájra in the fields. At some times of the year agriculturists substitute bájra for wheat in parts of the District, and they also eat gram and dál at odd times, but wheat is their staple food.

DERA GHAZI KHAN DISTRICT.

The grains which form the staple food of the people of this District are wheat, jowár, bájra, and rice.

Wheat is sown from the middle of October to the middle of December, and harvested in April. For wheat rain is required in the months of January, February, and March. Excessive rain in February, *i.e.*, when the ear makes its appearance, is destructive to the crops.

Jowár and bájra are sown in June, July and August, and harvested from December to February. In the Pachád these grains are principally cultivated, and as a rule are both sown and harvested later than similar crops on irrigated lands. Like wheat the jowár and bájra crops are injured by excessive rain when in ear.

Rice is sown in June and July, and harvested in September and October. This crop depends entirely upon canal water, and in some places upon water from hill streams.

The average estimate of food-grains consumed in a year by an agriculturist's family consisting of 5 persons, 1 old person, man and wife, and 2 children, are as follows;—*

Description of grain.	Sers.
Wheat ...	3
Jowár and bájra ..	3
Rice ...	2

Ditto for non-agriculturists.

Description of grain.	Sers.
Wheat ...	2½
Jowár and bájra ...	2½
Rice ...	2

Rice in this District is eaten boiled, as well as ground and made into cakes.

BANNU DISTRICT.

Wheat, barley, gram, bájra, moth, and maize. The first 3 are sown from October 15th to the end of December, the last 3 from the middle of March to end of July. Rain is most wanted in the months of July and August, also some time in the cold weather. To produce average crops the ground requires to be moist about the time of sowing, and thence-forward until the grain begins to ripen; rain is wanted at intervals of not less than a month or so. Excessive rain is very mischievous from end of April to June 10th for all crops, and is so at any time for gram. Cloudy weather long continued is ruinous for gram.

* These estimates are not intelligible. I give them as received. Apparently they indicate what the family will consume per diem, if living on any one of the grains named.—E. WACE.

The average family would consume :—

Members of family.	Name of grain.	Sers at 80 tolas.
Old man ...	Wheat,	100
	Bájra, moth, maize, barley and gram	150
Zamindár and wife	Wheat	250
	Other grains	500
Two children ...	Wheat	100
	Other grains	260
Total annually consumed		1,360

For non-agricultural classes the estimate would be :—

Members of family	Name of grain.	Sers at 80 tolas.
Old man ...	Wheat	150
	Other grains	90
Man and wife ...	Wheat	300
	Other grains	300
Two children ...	Wheat	165
	Other grains	150
Total annually consumed		1,155

I am supposing in the above the year to be an average one, and that other articles of diet, as greens, onions, melons, and even meat at times, are eaten.

PESHAWUR DISTRICT.

The grains which form the staple food of the people of this District are barley, masur, bákila (beans), Indian corn, and jowár.

Barley, masur, and bákila, are sown between the 20th September and end of October, and are reaped between 1st April and end of May.

Indian corn is sown between 1st July and 10th August, and is reaped between 1st October and end of November.

For barley, masur, and bákila, rain is needed in September, January, February, and March.

For Indian corn rain should fall in July, August, and September. The tabular statement required is as follows :—

Description of grain.	Quantity consumed by agriculturists in sers.	Ditto for non-agriculturists.
Wheat	600	540
Barley	240	320
Indian corn	800	600
Masur	80	82
Mung	60	60
Bákila	40	40
Total, ...	1,820	1,642

KOHAT DISTRICT.

The subjoined statement will give the information called for regarding staple food of the District. :—

Name of grains.	Time of sowing.	Time of harvesting	Rain essential.	RAIN MISCHIEVOUS OR RUINOUS.	
				By an excessive fall in	By a fall in
Wheat, ábi ...	1st December to 15th January.	May and June ...	...	...	April and May
Do. bārání ...	October and November.	May and June ...	December ...	April ...	May ...
Barley, ábi ...	November to 15th January.	April and May ...	...	Do. ...	Do. ...
Do. bārání ...	October and November.	April and May ...	December ...	...	April and May
Indian corn, ábi ...	August and September.	October and November.	September ...	...	August ...
Bájra (spiked millet) bārání.	June to August ...	October and November.	August ...	...	November ...
Mung and moth, bārání...	Ditto ...	Ditto. ...	Ditto ...	...	Do. ...
Rice, ábi ...	May and June ...	September ...	June ...	...	September ...

The following statement gives the information called for in No. 5 :—

Proportion allowed for each member.	Description of grain.	Quantity.			Value.			Rate per rupee according to value assumed at present.			REMARKS.
		Mds.	Srs.	Chs.	Rs.	A.	P.	Mds.	Srs.	Ch.	
<i>Agriculturist's family.</i>											
Old man $\frac{1}{2}$ ser ...	Barley for 5 months ...	11	16	...	7	2	...	1	24	...	The staple food of the agriculturist is barley, bájra and Indian corn. The proportion allowed for each member has been fixed after allowing for the green herbs so plentiful here without which no meal is complete.
Man and wife $1\frac{1}{2}$ sers.	Bájra for 3 months ..	6	33	...	5	7	4	1	10	...	
2 children 1 ser	Indian corn for 4 months	9	6	...	7	5	2	1	10	...	
Total 5 sers	Total ...	27	15	...	19	14	6				
<i>Non-agriculturists family.</i>											
Same ...	Wheat $1\frac{1}{2}$ ser per diem	13	27	8	15	10	3	...	35	...	The staple food of the non-agriculturists is wheat, rice and mung, the proportion allowed for each has been fixed at the same as that for agriculturists because they do not eat green herbs in the same quantity.
Same as above	Rice (shali) 1 sr. per diem	9	5	2	6	13	7	1	...	...
	Mung $\frac{1}{2}$ ser per diem	4	22	6	6	1	4	...	30	...	
	Total ...	27	15	...	28	9	2				

HAZARA DISTRICT.

What grains form the staple food of your District ?

Indian corn generally, wheat, barely and rice to a small extent.

When are they sown and harvested ?

Indian corn in May, June and July, harvested in September, October and November ; rice, March, April and May, harvested in August, September and October ; wheat and barley, October, November and December, harvested in April May and June.

What are the critical times at which rain is essential to each of them ?

From 15th June to 15th September for the growth of the kharif and sowing of the rabi crops, and from January to April for the growth of the rabi and showing of the kharif crops.

What are the critical times of failure of rain ?

Failure of rain in February and March results in the failure of the rabi, and July and August the kharif crops.

Excessive fall of rain.

In May, June, October and November is injurious to crops.

Estimate of food-grains consumed in a year by an agriculturist's family of 5 persons.

Description of rain.	Sers.
Indian corn ...	781
Bajra ...	375
Wheat ...	562
Barley ...	562
Total ...	2,280
Dál mung &c. ...	76
Do. moth ...	38
Total ...	2,394

The average is $1\frac{1}{2}$ sers each for 2 meals a day, exclusive of dál, which is used with bread for 6 months during the winter and butter-milk in summer.

Estimate of food-grains consumed in a year by a non-agricultural family and residents of town.

Description of grain.	Sers.
Indian corn ...	912
Wheat ...	913
Total ...	1,825
Dál mash ...	19
Dál mung ...	19
Dál moth ...	19
Total ...	1,882

The average is one seer each for 2 meals a day exclusive of dál, which is used with bread as well as vegetables.

CHAPTER I, QUESTION 6.

What proportion of the cultivated land, and what class of crops is manured yearly, and what is the average weight of manure given to the acre—(1) in land constantly manured; (2) in land occasionally manured. If there is any customary rotation of crops and fallows, state it.

This question was referred to District Officers for report. Their replies are appended; and I have prefaced them with a tabular statement in which their answers concerning manuring are summarised. The information given in this statement concerning the proportion of the cultivated area which is manured, is more valuable than that relating to the amount of manure applied per acre. It is probable that the distinction between occasionally manured, and constantly manured, has not been understood by the various reporting officers in the same sense. And for the purposes of the question under reply, it will be safer to compare the total area manured with the proportion that bears 2 crops annually. No land can steadily bear 2 crops a year which is not thoroughly well manured.

In a Province such as the Punjab, with a hot climate, and a rain-fall in many districts scanty, there is a natural restriction in the general use of manure well known to the native agriculturist, but not sufficiently recognised by those of us who are his critics. Even in England farmyard manure applied in dry summer seasons to light soils is apt to make the land hollow, and liable to be injured by drought.* This fact is well known to the native agriculturist. In most of the tracts where the annual rain-fall is less than 25 inches, (as in the Hissar Division, in the dry parts of Ferozepore, and the western portions of the Jhelum and Rawalpindi Districts) the agriculturists give as a reason for not manuring their unirrigated crops, that manure, when applied, "*burns them up.*" For example, see the entries in the appended statement against the Districts of Karnál, Hissar, Sirsa, Ferozepore, Gujranwála, and the Mooltan and Deraját Divisions, where next to none of the unirrigated cultivation is returned as manured.

But so far as irrigation is available in sufficient abundance, and where the rain-fall exceeds 25 inches per annum, the statement gives conclusive evidence of the great value attached to manuring by the native cultivator.

Another feature of agriculture in the Punjab, which limits the use of manure, is, that in the majority of districts there are considerable areas of land which almost annually receive a valuable deposit of silt. Such are the alluvial (*sailáb*) lands on the banks and in the beds of the great Punjab rivers, annually covered by their summer and autumn floods; and in a less degree the lands irrigated from the same rivers by inundation canals in the lower Punjab; also the extensive areas in the Deraját Division at the mouth of the passes which drain the Sulimán ranges; the lands in the Shahpur and Jhelum Districts, at the foot of the salt range, and other smaller areas in which floods annually deposit a valuable silt on the soil.

The effect of this annual deposit of fertile silt is to make manuring by so much unnecessary. An estimate of the extent to which the soil is periodically renewed by fertilising additions, which did not take these silt deposits into account, would fall far short of the truth. [The extent of *sailáb* land in each district is given in a statement appended to my reply to Question 4.]

The description of manure universally and almost solely used consists of the sweepings of villages and towns, human excrement, and the droppings of the village kine, flocks, and other animals. Cowdung preponderates, mixed up with broken straw and litter swept up from the stalls of the cattle.

The unirrigated lands chosen for manuring are usually those nearest the village site; and in the submontane districts each village or hamlet is surrounded with a belt of such lands. The water which drains out of the village when rain falls, carrying with it human excrement and other fertilising substances, is also usually directed on to these lands.

* Wrightson's Hand-book of Agriculture, page 114.

I. In the manuring of irrigated lands other considerations come into play. The manure must be carried to the lands that are irrigated. In the case of irrigation from wells, these wells are usually dotted about at a greater or less distance from the village; and the fields nearest the well being those most abundantly irrigated, and most easily watched, are always selected for the highest manuring. The cultivators with their families and cattle usually have sheds at their wells where they live in the busiest agricultural seasons.

As regards the amount of manure applied per acre, the weak point in the replies appended is that the varying treatment of the different crops manured is not detailed. Sugarcane, opium, tobacco, turmeric, and vegetables, are very highly manured; while to cereals a smaller quantity of manure is applied. The rate probably usually varies from 8 to 15 tons (200 to 400 maunds. per acre).

If there is any customary rotation of crops and fallows, state it.

This is a question which has been addressed to District Officers more than once in the course of our administration of the Punjab. And the true answer undoubtedly is, that in the agriculture of the Punjab the rotation of crops does not hold that prominent place which it does in that of England. That the principle is understood and applied (with a degree of intelligence which varies with the locality and class of cultivator) will be apparent from a perusal of the papers annexed to this reply; but its practice is confined to a very limited area of the most fertile and best irrigated lands.

This reply being stated, a further question arises; viz., *Is the absence of any such system on the great majority of the cultivated lands injurious; and is its introduction desirable or practicable?*

These are questions which have as yet received little investigation. Accustomed as we are to regard the English agriculture as the best, a system of which the prominent features are such a combination of cattle farming with agriculture as makes heavy manuring and rotations possible, the native agriculture, in which these features are for the most part necessarily absent, in the minds of most of us stands condemned without further hearing.

I believe that this conclusion is erroneous. That that system of agriculture only is scientific, which is practical, is the principle which guides even so enlightened a body as the Royal Agricultural Society of England. And if we duly weigh the climatic difficulties with which the native agriculturist has to contend, and the extremely limited capital which he can command, we shall I think be bound to admit, that *under such circumstances* the prevailing systems are no despicable solution of the problem of, how to get the most out of the soil without reducing its productive powers.

What may be called the normal system of agriculture in the Punjab prevails most widely in the submontane tracts, where the rain-fall exceeds 20 inches per annum. It is a 2 year course, principally of cereals; thus—

		Months.	Crop.
Rabi ...	September to April	8	Wheat.
Kharif ...	May to June	2	Fallow.
	July to October	4	Millet.
Rest ...	November to August	10	Fallow with repeated ploughings.
	Total 2 years	24	

September.—Sow wheat again, and so on. For either harvest, pulses or seed may be substituted instead of cereals, though this is more usually done in the kharif. Mixed crops are very common, especially in the kharif, for if the rain-fall is fickle, the pulse may succeed though the millet fail, and *vice versa*; with the wheat it is very common to sow mustard, which is pulled young and given to the cattle mixed with dry fodder; thereby

supplying them with an early green crop when the frost has killed all the grass. An important feature in the millet crops is that, growing as they do to more than twice the height of wheat, a very sparsely sown crop supplies a very large amount of fodder. The area sown with kharif crops on these lands is usually less than the area of the rabi crop, for various reasons which I cannot here explain at length. In the tracts in which this system prevails, there is usually no good grazing for the cattle; and one of its principal merits is the large amount of fodder which it supplies. Its justification, as a course providing sufficiently for the periodical renovation of the soil, depends on the 10 months' fallows and ploughing which follows the kharif crop. The ploughing during this fallow commences early in January, and between that date and September the land is usually ploughed over 8 or 10 times. So long as this is duly attended to, the productive powers of the soil undoubtedly do not deteriorate. The repeated ploughings also completely clear the soil of weeds. To an observant eye nothing is more remarkable than the complete absence of weeds in September in the fields where wheat is being sown; in strong comparison with the rank growth of crop and weeds in the adjoining millet fields. The ploughings of the past 9 months have killed the old weeds, and prevented the growth of new ones in the fallow lands.*

* NOTE.—I so little understood till lately the real value of this fallow with ploughings, and I believe most of us so little understand it, that I make no apology for subjoining the following extracts from Wrightson's hand-book of English agriculture (1877) for the purpose of explaining this. It is probable that in the Punjab under the combined effects of the winter rain and frosts, the fierce summer heat, and heavy falls of autumn rain, the ten months fallow and ploughings above described, weather the soil to a greater degree than these operations would effect in the same period in more temperate climes.

EXTRACT FROM WRIGHTSON'S HAND-BOOK OF AGRICULTURE.

Active and dormant constituents of soils.

The preceding section will have shown that in every soil the material from which the tissues of plants may eventually be elaborated, exists in two physical conditions. First, there is the mass of earthy matter which has already been seen to consist of sand, clay, lime, vegetable matter, and stones; with the exception of lime none of these substances are taken up by the roots of plants. But associated with them in much smaller quantities are a number of substances which constitute the active ingredients of a soil. Of these last a small portion is already soluble, and available, and a larger quantity is insoluble, and therefore for the present unavailable.

The mass of the soil may be regarded as the hunting ground, in which the roots of plants ramify and search for food; also as a suitable material for preserving proper conditions relating to moisture and to temperature. It is indispensable to the well being of the plant; but at the same time it is not the general mass of the soil which feeds it. The entire mass may be thus divided; first, the part comprising potential or possible (future) plant food, as yet insoluble in water and in acids. The second, the portion soluble in water, or dilute acid, representing the active or available plant food of the soil.

The available plant food is, unless removed, constantly recruited by the gradual decay of insoluble matter. It is acted upon by the forces enumerated in the section upon the origin of soils; and we find that the same forces which produced them are still acting upon them, and further effecting the disintegration of these mineral constituents.

What then is the nature of those changes which are for ever taking place in a soil. By the removal of crops the available plant-food becomes exhausted, and the field ceases to be productive. But after a few years of rest fertility is found to be restored. During the interval of rest the soil has been exposed to changes of temperature, to the action of air and moisture, and it may be to vegetative force in the action of roots of plants which have taken possession of the surface. The consequence is, that under the combined influences of these forces, fragments of quartz, felspar, apatite, phosphorite, gypsum, and other mineral substances become weathered. They part with small quantities of their substance, which pass over into the soluble and available condition, and thus a store of plant food once more accumulates.

This mineral matter rendered soluble will not be suffered to wash through the staples of the soil, but will be only carried a very short distance, before it is seized upon, and appropriated by that singular force of surface attraction already noticed; and hence we see a satisfactory reason why "rest" restores land, and a clear difference between the active and the as yet, dormant constituents of a soil.

Chemical composition of soils.

The following substances occur in all soils and in the ashes of all cultivated plants, and are also found to exist in the crystalline rocks.

<i>Volcanic Rock constituents.</i>	<i>Soil constituents.</i>	<i>Ash constituents.</i>
Potash ...	Potash ...	Potash ...
Soda ...	Soda ...	Soda ...
Magnesia ...	Magnesia ...	Magnesia ...
Lime ...	Lime ...	Lime ...
Phosphorus ...	Phosphorus Pentoxide ...	Phosphorous Pentoxide ...
Sulphur ...	Sulphur Ferroxide ...	Sulphur Ferroxide ...
Silica ...	Silica ...	Silica ...
	Chlorine ...	Chlorine ...
Ferrous Oxide...	Ferrous Oxide ...	Iron ...
Alumina ...	Alumina ...	

Fluorine and manganese are also found to occur in many soils, in very small quantities. The fertility of a soil must depend among other things, upon the presence of every constituent required by plants, and so completely is this the case, that the absence of even what might appear the least important substance, renders a soil unable to ripen crops.

- I. This system prevails from east to west of the Province, wherever a rain-fall exceeding 20 inches can be relied upon, as testified in the annexed replies and extracts. Variations from it arise from one or other of the following causes: (1) the cultivation of special crops; (2) manuring; (3) a smaller average rain-fall than 20 inches; (4) annual flooding by rivers; (5) irrigation.

Cotton is the only important instance of variation due to special crops. It occupies the ground from April to December; and is not unfrequently allowed to stand a 2nd year, and sometimes a 3rd, the plants in such instances being cut down to the roots at the close of each year's pickings in December.

Manuring on the submontane tracts makes it possible for the cultivator to omit the ten month's fallow, and to secure 2 crops each year. In these tracts the lands immediately surrounding each village are, as above noted, those usually selected for cultivation in this way.

In the above list those constituents which occur in least quantities in the soil are generally those which the ash contains in largest proportion, and are therefore most required by plants, and it is for this reason that potash and phosphorus pentoxide are highly valued as applications for land.

The constituents of soils occur in various conditions. It is not enough to know that a soil contains all the requisite materials for supplying ash constituents to plants, but we must know the state in which they exist. Hence a complete analysis of a soil should inform us as to the proportion of substances soluble in water, soluble in acids and insoluble in acids. Taking as examples certain analyses of soils made by the late Dr. Anderson of Glasgow, the relative proportions in which these three divisions occur may be approximately stated as follows:—

	Midlothian.		Perthshire.	
	Soil.	Sub-soil.	Soil.	Sub-soil.
Substances soluble in water	0.2319	0.2630	0.1191	0.2661
„ „ soluble in acids	8.8600	6.6320	9.2156	10.8300
„ „ insoluble in acids	78.2910	87.1210	79.3200	77.3590
Organic matters	12.7340	6.3800	11.1900	11.4020
Sum of all constituents	100.1169	100.2960	99.8447	99.8671

Each of the divisions in this table, with the exception of the last, contains all the mineral constituents of plants, and yet it must be evident that fertility must greatly depend upon there being a supply of substances soluble in water or dilute acids. That from 78 to 87 per cent. of a soil, from which all pebbles and considerable fragments have been sifted, should be insoluble in acids, and therefore unavailable for present use, is itself a striking fact. Equally strange does it appear that 0.1 to 0.3 per cent. should represent the amount we may suppose to be readily available for solution. But although the percentage is small relatively, it is very considerable positively, amounting to from one to three tons per acre of ten inches in depth.

The insoluble portion of soils must not be looked upon as useless. Not only is it the medium by which nourishment finds its way to the roots of plants; but owing to the continued action of the forces already noticed, a further disintegration is constantly taking place, a weathering action whereby fresh portions or particles of insoluble matter pass over into a soluble and available condition. The entire mass of a soil may then be divided into active and dormant constituents; the former class being constantly, although slowly, recruited from the latter. A soil which has borne successive crops of corn becomes exhausted of the active or immediately available ash constituents. A field exhausted in this sense, if allowed a period of rest, will be found to have regained its fertility, simply because fresh portions of mineral matter have been digested and reduced to a soluble condition. These considerations, therefore, show clearly that the large proportion of material in a soil, insoluble in acids may be regarded as a magazine of mineral plant food, which will become available in the distant future.

Tillage operations.

Although tillage operations are of constant recurrence, and can hardly be classed with the durable or permanent improvements already noticed, it must be allowed that they greatly modify the physical character of the soil. They aid the natural forces of heat, moisture, and vegetation, which are ever at work disintegrating the undissolved mineral matter of the soil. No implement is so effective in pulverising the ground as frost; neither can any tillage operation be effective, unless timed with regard to the conditions of moisture in the ground. Considerable attention has already been given to the nature of those changes by which insoluble mineral matter is gradually reduced into a soluble condition available for plant food. These changes are accelerated by tillage, much in the same way as pounding in a mortar facilitates the solution of an intractable substance. Every student who has worked in a laboratory knows that some substances require to be ground to an impalpable powder in an agate mortar before they can be persuaded to dissolve. The process of stirring, by which fresh particles of the solvent are brought into contact with the substance to be dissolved, may also be used to illustrate the advantages of tillage.

Tillage acts in much the same manner. It acts by dividing the soil and exposing fresh surfaces to the air and every other influence which acts upon a soil.

Tull thoroughly appreciated the value of tillage, and attributed the beneficial action of dung to its fermenting and dividing power upon the soil. "Plough it, harrow it, as often as you please; grind dry earth to powder; the longer it is exposed or treated by these or any other method possible, instead of losing it will gain the more fertility." Liebig insisted equally upon the perfect division of the soil by tillage implements, as a means of hastening the processes by which plant ash ingredients are increased from the insoluble store composing the bulk of all soils.

Tillage also acts beneficially by facilitating the passage of water downwards to the drains and upwards to the roots, by capillary action. It is also the means used by farmers for eradicating weeds. We are therefore able to assign three important directions in which good tillage assists the growth of crops.

When a rain-fall of 20 inches cannot be relied on, we commonly find the 2 years system given up, and irrigated and unirrigated lands alike for the most part yielding only one crop a year. Whether that crop will be an autumn (kharif) crop, or a spring (rabi) crop, depends primarily on the average amount of the winter rain-fall. In the Hissar Division, where that is very small, the kharif crop greatly predominates. But in the rest of the Punjab the rabi area is usually as 6 to 4. In the Mooltan Division and in the southern half of the Derajat Division, where the rain-fall is usually less than 10 inches per annum, no cultivation (with insignificant exceptions) is attempted, unless assisted by irrigation from canals or wells, or by flooding from rivers and hill torrents.

The fertile alluvial lands, which line the banks of the great Punjab rivers, are annually submerged or moistened by the floods caused by the summer melting of the Himalayan snows and by the autumn rains; on these it is of course usually impossible to grow a kharif crop; and the rabi crops grown are wheat and barley on the better lands, and peas and pulses on the poorer ones.

Where irrigation is obtainable, a more extensive variation of the usual course comes in. The cultivation dependent on well irrigation in the Amritsar and Jullundur Divisions, and in other districts with a plentiful rain-fall, is exceedingly rich; sugar-cane is largely raised; and where that is not grown, 2 crops and more are grown every year. The cultivation dependent on canal irrigation is equally rich, so far as manure will go. The appended replies of District Officers concerning the course of cultivation on the Bari Doab Canal (Amritsar and Gurdaspur Districts) and Western Jumna Canal (Karnal and Delhi) do not convey to me any clear idea of what system of cropping prevails on lands irrigated by those canals. But of the system prevailing on the inundation canals in the Mooltan Division, a very clear account is given in the replies of the Settlement Officers of Mooltan and Muzaffargarh.

There is no doubt that on the Bari Doab and Western Jumna Canals continuous cropping has been attempted to the temporary injury of the soil. On the Bari Doab canal such irrigation was to a great extent an innovation; and the people had to learn their experience.* On the Western Jumna Canal, the same reason applied in part; and our revenue system was also to blame, for at the previous settlement of 1840, in many instances entire villages were assessed at high irrigated rates on their whole area, which of course left the agriculturists no resource except continuous double cropping, whether they possessed sufficient manure or not.†

In concluding this answer, had the time at my disposal permitted, I would have endeavoured to estimate with some approach to exactness the areas to which each of the above paragraphs apply. But perhaps this is of the less importance, because probably in the whole Punjab less than a sixth of the cultivation is manured. In tracts where the rain-fall is abundant, and where irrigation is plentiful, the cattle are not in sufficient numbers to supply manure to more than a limited area. In the tracts further south, where rain-fall is scanty, manuring is injurious except on irrigated lands.

The system of cultivation is consequently mainly one under which light crops of cereals and pulses are taken in an unbroken succession from the land; either 2 crops in one year followed by a year's fallow; or one crop each year, thereby allowing 6 months interval between each crop; the crops are lighter in the latter case than in the former. It is difficult to condemn this system, because longer fallows would certainly not increase the yield of the land to the extent in which the agriculturists would be losers by the crops given up; and because in the existing circumstances of the peasantry no other resource except increased fallowing is available; on the other hand, the existing systems afford distinct evidence that, so far as irrigation and manure is available, it is intelligently applied to increase the yield of the land.

* See the replies of Raja Sir Sahib Dyal and of Mr. E. C. Palmer, to Question 7 of Chapter I, (on deterioration of soil.)

† See the reply of Mr. Maconachie, Settlement Officer of Delhi to Question 9, Chapter I.

CHAPTER I, QUESTION 6.

List of papers appended to reply.

Statement showing proportion of cultivated lands in the Punjab which is manured, with other data bearing on the subject.

Replies of District Officers concerning the prevailing systems of cultivation and the extent to which manuring is practised.

Extracts from a paper on the agriculture of the Punjab, furnished to the Agricultural Society of Lahore in September 1852, by Lieutenant-Colonel Tremenheere, of the Bengal Engineers.

Extract from the Settlement Report of the Umballa District, by Mr. P. S. Melville, 1854.

Extract from the Settlement Report of the Montgomery District, by Mr. W. E. Purser, c. s., Settlement Officer ; dated 1876.

Extract from the Settlement Report of the Shahpur District by Colonel W. G. Davies, Settlement Officer, 1866.

Extract from Assessment Report of the Jhelum District, dated January 1878.

Statement showing the proportion of cultivated land in the Punjab—continued.

Division.	District.	Average annual rain-fall.	Description of cultivation.	Per cent. irrigated and unirrigated.	PER CENT. OF CULTIVATION MANURED.			Percentage of cultivation which being thus manured bears 2 or more crops annually.	Population per square mile of cultivation.	STOCK PER SQUARE MILE OF CULTIVATION.			AMOUNT OF MANURE APPLIED PER ACRE.			
					Constantly.	Occasionally.	Total.			Horned cattle.	Sheep and goats.	Others.	To land constantly manured.	To land occasionally manured.		
														Amount.	At what intervals.	
Amritsar ...	Gurdáspur...	30.9	Irrigated ...	16	27	9	26	7	549	146	79	10	200	250	3rd year	
			Unirrigated ...	84	8	7	15									...
			Total ...	100	11	7	18									1
Lahore ...	Lahore ...	18.5	Irrigated ...	37	18	10	28	10	411	95	56	10	800	200	Yearly	
			Unirrigated ...	63	...	...	...	...				
			Total ...	100	6	4	10	4								
Ferozepore	Ferozepore	20.0	Irrigated ...	14	20	10	30	20	276	86	33	9	550	750	2nd year	
			Unirrigated ...	86	...	...	...	...				
			Total ...	100	2.84	1.42	4.26	3								
Gujránwála	Gujránwála	26.3	Irrigated ...	70	9	3	12	1	637	180	67	12	200	200	Time of sowing	
			Unirrigated ...	30	...	...	...	...				
			Total ...	100	7½	2½	10	0.70								
Rawalpindi	Rawalpindi	31.5	Irrigated ...	2	86	14	100	100	546	105	116	25	300	155	1st and 2nd year.	
			Unirrigated ...	98	3	3	6	3								
			Total ...	100	5	3	8	5								

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Jhelum ...	18.6	Irrigated ...	3	34	43	77	100	69 per cent. of column 8.	348	182	66	13½	300	120	2nd year
		Unirrigated ...	97	5	5	10	60								
		Total ...	100	5	7	12									
Gujrat ...	29.2	Irrigated ...	13	20	14	34	2	0.26	560	185½	62	13	160	100	Previous to sowing
		Unirrigated ...	87	15	5	20	...								
		Total ...	100	14	8	22									
Shahpur ...	13.0	Irrigated ...	64	2	3	5	2	1	857	238½	278	44	160	160	2nd or 3rd year
		Unirrigated ...	36	...	...	...	1							
		Total ...	100	1	2	3									
Mooltan ...	Mooltan ...	6.1	Irrigated ...	79	}	Can not be stated.	}	582	171	319	28	200	...	Annually.	
			Unirrigated ...	21											
		Total ...	100												
Jhang ...	10.3	Irrigated ...	69	20	7	27	5	681	625½	625	65	160 to 200	120	2nd year	
		Unirrigated ...	31	...	3	3	...								
		Total ...	100	12	7	19	3								
Montgomery	8.7	Irrigated ...	62	9	12	21	1	596	367	413	43	160	160	Ditto	
		Unirrigated ...	38	...	...	...	3							
		Total ...	100	6	7	13	2								
Muzaffargarh	6.1	Irrigated ...	65	89	...	89	Not known	476	230	168	30	1400	...	...
		Unirrigated ...	35	...	...	...	...				
		Total ...	100	46	...	46	...								
Derajat ...	Dera I. Khan	8.0	Irrigated ...	32	53	...	53	Not known	547	186	476	33	...	...
			Unirrigated ...	68	2	...	2								...
		Total ...	100	18	...	18	...								
Dera G. Khan	7.2	Irrigated ...	57	6	2	8	Not known	455	76	60	16	75	40	2nd or 3rd year.	
		Unirrigated ...	43
		Total ...	100	3	1	4	...								

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Statement showing the proportion of cultivated land in the Punjab—concluded.

Division.	District.	Average annual rain-fall.	Description of cultivation.	Per cent. irrigated and unirrigated.	PER CENT. OF CULTIVATION MANURED.			Percentage of cultivation which, being thus manured, bears 2 or more crops annually.	Population per square mile of cultivation.	STOCK PER SQUARE MILE OF CULTIVATION.			AMOUNT OF MANURE APPLIED PER ACRE.			
					Constantly.	Occasionally.	Total.			Horned cattle.	Sheep and goats.	Others.	To land constantly manured.	To land occasionally manured.		
														Amount.	At what intervals.	
Deraját	Bannu	12.0	Irrigated ...	15	15	12	27	15	392	220	73	57	15 to 20 donkey-loads.	Mds.	Mds.	Before sowing.
			Unirrigated ...	85	...	...	...						
			Total ...	100	222	178	4									
Pesháwar	Pesháwar	12.9	Irrigated ...	25	9	15	24	38	369	95	58	7	400	320	15 or 20 days.	15 or 20 days.
			Unirrigated ...	75	...	1	1									
			Total ...	100	2	4	6									
Kohát	Kohát	20.2	Irrigated ...	38	} Can not be	} ...	} ...	4	976	288	337	33	300 to 400	153	1/2 yearly	1/2 yearly
			Unirrigated ...	62												
			Total ...	100												
Hazára	Hazára	46.3	Irrigated ...	10	35	26	61	35	544	319	242	16	250	200	Yearly	Yearly
			Unirrigated ...	90	12	6	18									
			Total ...	100	13	9	22									

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CHAPTER I, QUESTION 6.

Replies of District Officers.

This question was referred for report to District Officers, with the following instructions :—

(a). What proportion of the cultivated land is manured yearly, how much constantly, and how much occasionally ? Give your reply in the following form :—

Percentage of cultivated area which is manured.

	Constantly manured.	Occasionally manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated land ...				100	
Unirrigated land...				100	
Total				100	

(b). What is the average weight of manure given to the acre per annum, on land constantly manured ?

(c). On land occasionally manured, what is the amount of manure per acre so given ; and at what probable intervals ?

(d). Describe the usual course of cropping prevailing in your District ; and explain to what extent unmanured lands are helped by rests, or by repeated ploughings. In answering this question, be careful to note any differences that exist between the treatment of irrigated and unirrigated lands.

The replies are given as received ; though in several instances they do not give a very intelligible account of the systems obtaining. The replies which give the clearest account of the prevailing systems are those received from Hissar, Ludhiána, Jullundur, Hoshiárpur, Amritsar, Ferozepore, Jhelum, Mooltan, Jhang, Muzaffargarh, Bannu, and Hazara.

DELHI DISTRICT.

(a). Percentage of cultivated area which is manured :—

	Constantly manured.	Occasionally manured.	Not manured.	Total.	Dofasi.
Irrigated land ...	27	13	60	100	26
Unirrigated land ...	10	5	85	100	2
Total ...	16	8	76	100	11

(b). On land constantly manured, 250 maunds of manure is given to an acre annually.

(c). On land occasionally manured, 400 maunds of manure are given to an acre every 3rd or 4th year.

(d). There is no regular course of cropping in this District in any kind of soil, irrigated or unirrigated. Except that wheat is never followed by wheat, or jowár by jowár, other crops are sown year after year without a change, that is, no particular attention is paid to varying the crop. Even unmanured lands are seldom helped by rests, or by more ploughing than usual.

GURGAON DISTRICT.

I. Percentage of cultivated area which is manured :—

	Constantly manured.	Occasionally manured.	Not manured.	Total.	
Irrigated land ...	19	26	56	100	Percentage of do-fasi on cultivated, 8 per cent.
Unirrigated land ...	2	2	96	100	
Total ...	5	6	89	100	

The average weight of manure given to the acre per annum on land constantly manured is 200 maunds.

The average weight of manure given to the acre per annum on land occasionally manured 300 maunds every 2nd year.

Little attention is paid to any regular course of cropping. The unmanured land is generally cultivated only for one harvest, and the rest it gets during the other harvest is thought sufficient. Jowár is not sown in the same land 2 years in succession. Cotton is not sown after bájra. In all other cases, in deciding what crop to sow, regard is paid to the kind of soil and amount of rain-fall without any consideration as to what the previous crop was.

KARNAL DISTRICT.

(a). Percentage of cultivated area which is manured :—

	Constantly.	Occasionally.	Never.	Total.	Percentage of do-fasi. *
Irrigated land ...	81	...	69	100	15
Unirrigated land ...	...	...	100	100	13
Total ...	11	...	89	100	12

The above figures are got from the settlement results, applied to the remainder of the District, and are very nearly accurate.

No land but the very small area immediately round cities is constantly manured, if by that is meant *every year*. On the other hand, no land is occasionally manured, if by that is meant at considerable intervals.

In manured land, sugar-cane, cotton, tobacco, or maize is ordinarily sown, to be followed *without* additional manure by wheat, methi, jowár &c., &c.

Unirrigated land is very rarely manured at all.

(b), (c). On such land the amount of manure given varies from 350 to 200 maunds per acre, usually every 2nd year. Besides this, top-dressing is used near the cities to the extent of some 30 maunds.

(d). Very little attention is paid here to rotation of crops. Jowár, cotton, wheat, sugar-cane and mandua are considered the most exhausting crops. Sugar-cane, however, which is grown almost entirely in manured land, is usually followed by cotton or wheat; maize, which is cut early, is generally followed by wheat. Rice is followed by gram or barley, because the same sort of soil is best for them.

Very little fallow is left if the year is a good one ; while in a bad season all the high-lying fields which are without irrigation are left unsown. Irrigated land is seldom, if ever, left fallow. Repeated ploughing is chiefly used for irrigated land, in which wheat, cotton, sugar-cane, or maize is to be sown, and for unirrigated land which is to grow jowar. Ch. I.

HISSAR DISTRICT.

Percentage of cultivated area which is manured :—

	Constantly manured.	Occasionally manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated land ..	2.85	7.06	90.09	100	14.90
Unirrigated land ..	..	..	100	100	1.16
Total ..	0.16	0.38	99.46	100	0.89

(b.) The average weight of manure given to the acre per annum, on land constantly manured, is about 500 maunds.

(c.) On land occasionally manured, the amount of manure per acre given is 200 maunds, and the interval at which it is given is 6 months.

(d.) The usual course of cropping prevailing in this District is as follows :—

1. The land is first ploughed, then harrowed, and after that seed is sown by the aid of the plough and tube.
2. The unmanured lands in this District are the bārāni ; the greater portion of it yields but one crop which is the kharif, and is allowed to remain fallow for 6 months, and is seldom or ever ploughed during that time.
3. There is but a slight difference between the treatment of irrigated and unirrigated lands. The irrigated lands have to be ploughed and harrowed four times and manured as well, before seed is put down, and the greater portion of it yields but one crop (rabi). In some places the irrigated land is not allowed to rest, as vegetables, cotton, tobacco, &c. are always being sown.

ROHTAK DISTRICT.

(a.) Land manured.

Percentage of cultivated area which is manured :—

	Constantly manured.	Occasionally manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated land ...	11	56	33	100	Irrigated. .. 8.5
Unirrigated land ...	15	23	99.62	100	Unirrigated. .9
Total ...	2	7	91	100	*

(b.) Average weight of manure given to the acre per annum, on land constantly manured, 600 maunds.

(c.) On land occasionally manured; 450 maunds, as a rule, every 3rd year.

(d.) Statement describing the usual course of cropping :—

Serial No.	Description of soil.	ROTATION OF CROPS.					
		Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.
1	Cháhi.	Jowár, bájra.	Barley, wheat.	Jowár, bájra.	Barley, wheat.	Jowár, bájra.	Barley, wheat.
2	Do.	Cotton	...	Bájra, mung, másh.	Barley, wheat.	Jowár, bájra.	Barley, wheat.
3	Canal.	Jowár.	Barley, wheat.	Jowár.	Barley, wheat, gram.	Jowár.	Barley, wheat.
4	Do.	Sugar-cane.	...	Suar-cane.	...	...	Barley, wheat.
5	Báráni manured.	Jowár.	Barley, sarson.	Mung, másh, and jowár.	Barley, wheat.	Jowár, bájra.	Gram, sarson.
6	Do.	Cotton.	Gram.	Do.	Do.	Do.	Do.
7	Báráni not manured.	Jowár Bájra.	...	Do.	...	Do.	...
8	Do.	...	*Not dofasli	save in good rainy seasons.	...	...	...
9	Dahri.	Cotton.	...	Jowár, bájra.	...	...	Barley, wheat.
10	Do.	Sugar-cane.	...	..	Barley, wheat.	Jowár, másh.	...

Unmanured báráni lands, save in good rainy seasons, yield one crop only, and therefore have much rest.

Ploughings from one to four times according to the crop intended to be sown.

As a rule, irrigated land receives no rest save in the case of cotton and sugar-cane, when during the rabi the land is at rest. When land has given crops each harvest for 3 years consecutively, it is allowed to remain ek-fasli for a year or two.

SIRSA DISTRICT.

(a). Percentage of cultivated area which is manured.

	Constantly manured.	Occasionally manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated	0.013	0.001	99.987	100	...
Unirrigated	...	...	100	100	...
Total	...	...	...	100	...

(b.) On land constantly manured the average weight of manure given to the acre per annum is 40 maunds.

(c.) On land occasionally manured 30 maunds is the quantity given every 2nd or 3rd year.

(d.) On land devoted to bájra no other crops are sown by way of preventing the deterioration of the land, but when the rain has not fallen at the right time for the cultivation of bájra, crops of til, moth or jowár are sometimes raised. On wheat and rice land, these are the only grains sown, and they are sown as continuously as the rain-fall will allow.

It will thus be seen that rotation of crops is not observed either on irrigated or on unirrigated land. On an average nearly all unirrigated land will be left fallow for want of rain, every 3rd year. Otherwise no rest is given to the land.

Failure of water in the Ghaggar too gives the rice land the only rest that it ever gets.

Repeated ploughing is not practised, doubtless because the enforced rest given to the land in years of drought is sufficient to keep up its crop-bearing powers.

* Do-fasli means that which bears 2 crops, and ek-fasli that which bears one crop, per annum.

UMBALLA DISTRICT.

(a) The following shows the proportion of cultivated land that is manured yearly, Ch. constantly and occasionally.

Percentage of cultivated area manured :—

	Constantly manured.	Occasional-ly manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated land ...	50	24	26	100	1,11,000 acres.
Unirrigated land ...	8	15	77	100	or 11.6 per cent. on 9,58,064 acres.
Total ...	29	19½	51½	100	

(b) On land constantly manured the average weight of manure per acre is 300 maunds.

(c) On land occasionally manured 350 maunds per acre every 4th or sometimes every 5th year.

(d) Land cropped with wheat has generally lain fallow since the last rabi crop; it is ploughed very often, as many as 8 times, and never less than 5 times. In October after ploughing, wheat land is "closed," as it were, with the "sohága," i. e., bushed and rolled, and left till sowing time in November. For gram agriculturists are not nearly so particular; the land is not ploughed often and hard rice land is used. Barley is cultivated like wheat. Wheat and barley land is often cropped with sugar-cane and cotton afterwards, lying fallow after the rabi harvest in April till sowing time; which for cotton would be in "Asár," June, or for sugar-cane, till the following March, in which case the land will have had a rest of nearly a 12-month. After a gram crop the same land is generally cropped with rice, and in the same way gram may follow rice. Where sugar-cane is grown, the land, as explained before, lies fallow all through the kharif; it is ploughed a number of times—more even than wheat land. After ploughing in October the surface soil is closed up and smoothed across with the "sohága" for the entire cold weather, and in March the sugar-cane is sown; after every successive shower of rain it is weeded and earthed up. Among kharif crops cotton land is ploughed in the cold weather, and it is sown in June.

It does not particularly matter when the other kinds of kharif crops, such as makki, jowár, bájra, are sown, and the land does not require much previous ploughing.

As regards rests to unmanured lands, wheat land lies fallow through the following kharif, and rice land and sugar-cane land also are generally left fallow afterwards, or during the cold weather season, though if there is an *early* crop of rice, owing the favorable and seasonable rain, land cropped with rice is not unfrequently cultivated with gram. The only particular difference in treatment of manured and unmanured and irrigated and unirrigated lands is, that irrigated land which has been manured will be ploughed much oftener than unirrigated land which has not been manured, but there will not be any material difference in the rotation or succession of crops.

As a general rule, in all kinds of land, the Zamindárs are but little alive to the benefit of fallows as tending to nurse the soil; on the contrary they "flog" the land (to use an English agriculturist's slang term) to the utmost, and get all they can out of it, and it is only sugar-cane land which gets any moderate amount of rest by lying fallow. Wheat and barley land also enjoying a slight recess for a half year.

LUDHIANA DISTRICT.

(a). Percentage of cultivated area which is manured :—

	Constantly manured.	Occasion-ally manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated land ...	53	47	...	100	Say 33 per cent. of irrigated.
Unirrigated land ...	...	1	99	100	
Total ...					

(b). The average weight of manure given to the acre per annum on land constantly manured is 200 maunds per acre, both before and after sowing.

(c). 100 maunds per acre on land occasionally manured put on once a year after sowing.

(d). On irrigated land, 3 months fallow is allowed in the year. First wheat is sown, and then jowár in the same; wheat is also sown after cotton; sugar-cane is an annual crop, i. e., takes up the year, and there is no other crop sown on the land.

On unirrigated land the custom is to divide the land into 2 parts. One part lies fallow for the whole year, and on the other part wheat, barley and gram are sown in spring, followed by jowár in the autumn. The next year the respective part change places, so the land really lies fallow every other year, but double crops are also taken in the intervening year.

SIMLA DISTRICT.

All land is usually manured in these hills every third year; thus of 100 acres, one-third will be manured in the present year, one-third in next year, and one-third in the following year, and so on over again. The average weight of manure given is 200 maunds per acre.

Irrigated lands always bear 2 crops; likewise 1st class unirrigated 2 crops; all the rest one crop, that is, the kharif; and cultivated land seldom or never lies fallow.

JULLUNDUR DISTRICT.

(a). Percentage of cultivated area which is manured.

	Constantly manured.	Occasion-ally manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated ...	29	30	41	100	36
Unirrigated ...	...	6	94	100	4
Total ...	10	15	75	100	

(b). 225 maunds of manure is given to the acre per annum on land constantly manured.

(c). 112 maunds on land occasionally manured at intervals of 6 months.

(d). On irrigated lands the usual course of cropping in this District is: that land on which at kharif makki is sown, wheat, barley, senja and metha are sown in the rabi following after the usual ploughing and irrigation. Well manured irrigated lands are

given no rest, but are ploughed twice or thrice during the year. Unirrigated lands require Ch. rest for a year and a half after the kharif crop, i. e., if they are sown with kharif crops in one year, say *Sambat* 1935, no crop (rabi or kharif) will be sown on them during *Sambat* 1936 but they will be kept for the rabi and kharif sowings of 1937;* such lands are ploughed repeatedly between 10 and 20 times during the year.

HOSHIARPUR DISTRICT,

(a). The proportion of land manured to total cultivated is given in the table below. This is according to the Tahsildar's returns; but I think $\frac{1}{4}$ instead of $\frac{1}{2}$ of the cultivated area would be nearer the mark judging from other inquiries I have made.

	Constantly manured,	Occasion-ally manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated land ...	31	29	40	100	About 16 per cent.
Unirrigated land ...	5.8	2.8	91.4	100	
Total ...	7	4	89	100	

(b). From 300 to 700 maunds of manure per annum are put on lands regularly manured.

(c). This question hardly admits of a definite reply, the practice varies so much according to locality and opportunity.

(d). A few of the rotations considered advisable are :—

{ Trefoil (senji),
 { Sugar-cane,
 or { Hemp,
 { Sugar-cane or wheat,
 or { Indigo,
 { Sugar-cane, melons or wheat.

On land which bears 2 crops only.

Rabi Wheat
 Kharif Indian corn
 Rabi Wheat, and so on †

The ordinary course of cropping 3-crop lands in the vicinity of the town is as follows

1. Tobacco
2. Indian corn.
3. { Potatoes, or
 { Radish, or
 { Turnip, or
 { Wheat.

Unmanured and irrigated land are ploughed oftener than manured and irrigated lands. For wheat, land will be ploughed 4 to 6 times if it is manured. If it is unmanured, it will be ploughed 6 to 8 times.

For sugar-cane, land is ploughed 10 to 15 times.

After cotton gathered in November the land is often allowed to rest till Indian corn is sown in the kharif.

In the "Kandi" a good deal of land is cultivated only every second year, and lies fallow for a year between each crop.

* The interval between the reaping of the previous kharif and the sowing of the next rabi would appear to be ten months, not a year and a half as stated. The rabi of *Sambat* 1937 is sown in the autumn of *Sambat* 1936. The course described would appear to be the 2 year course common on unirrigated lands on all the submontane tracts of the Punjab, under which half the land is cropped one year, and the other half the next.—E. G. WACH.

† The rotation quoted above is very common in unirrigated land. Bad rains of course interfere with the rotations. If an interval of 10 months elapsed, I should not call it dofasi. The rotation given is the common rotation, I think I may say, on dofasi land. Wheat is sometimes replaced by sarraf, masar, barley, gram &c. The dofasi land has of course generally to be manured, unless the land is subject to inundation and gets a fresh coating of soil. Such land is not common in this District and Jullundur.—W. COLDESTREAN.

KANGRA DISTRICT.

Percentage of cultivated area, which is manured.

	Constantly manured.	Occasion-ally manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated land	61	21	18	100	60 per cent. which bears 2 crops annually. 4 do. do. 3 do 10 do. do. 2 do 90 do. do. 1 do
Unirrigated land	82	13	5	100	
Total ...	71.50	17	11.50	100	

(b). The average weight of manure given to the acre per annum is 150 maunds on land constantly manured.

(c). 55 maunds on land occasionally manured before sowing seed.

(d). As usual in other places, the unmanured lands are helped by repeated ploughing.

AMRITSAR DISTRICT.

(a).—The following statement will show what proportion of the cultivated land is manured yearly, how much constantly and how much occasionally :—

	Constantly manured.	Occasional-ly manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated Land ...	41	20	39	100	27 per cent.
Unirrigated land ...	...	...	100	100	Nil.

(b).—The average weight of manure given to the acre per annum on land constantly manured is from 100 to 450 maunds.

(c).—On land occasionally manured the amount of manure per acre so given is from 20 to 90 maunds. The land is occasionally manured at an interval of 2 or 3 years.

(d).—Some irrigated unmanured land is set apart for rice, which is grown every kharif.

On other irrigated unmanured lands, wheat or barely is grown every rabi, and the land is ploughed repeatedly during kharif.

On unirrigated land, after wheat, barely or gram, an autumn crop of chari, moth, swank or mash is grown, and then the land is allowed a year's rest.

On irrigated manured land, there is a succession of crops, thus :—

Kharif, Indian corn.

Rabi, barley, sarson or senji.

Kharif, Indian corn again, or sugar-cane or cotton.

After sugar-cane the land would rest, and wheat be grown the following year; after cotton, a kharif crop—Indian corn or sugar-cane—would follow.

SIALKOT DISTRICT.

(a).—The following tabular statement shows the percentage of cultivated area Ch. I. manured :—

	Constantly manured.	Occasional-ly manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated land ...	9	29	62	100	10
Unirrigated land ...	4	7	89	100	2
Total ...	7	18	75	100	6

(b).—The average weight of manure per acre given to land constantly manured is 256 maunds.

(c).—The average weight of manure per acre given on land occasionally manured 320 maunds, and after every 3rd year.

(d).—

RABI.

The land is first ploughed up 10 or 12 times from July to September, and then levelled with a "sohága," a flat heavy piece of wood dragged over the surface of the field by bullocks; the ground is then irrigated by well water, and the seed sown, and subsequently watered about 4 times should no rain fall. In April chana and masúr is reaped, and wheat, jau, and goji in May.

KHARIF.

In land intended for cotton and sugar-cane, the ground is ploughed up from about 15 to 20 times, and the "sohága" applied to its surface 8 or 10 times. In April the seed is sown, the land is then watered, and weeding takes place; "dhán" (unhusked rice) is sown in July in nursery beds in low-lying grounds; the seed is sown broad-cast in its natural state, and the seedlings then transplanted to land which has been prepared for them by repeated ploughings and clod crushings. The cotton is gathered every 8th day from October to December. The sugar-cane is cut from December to February.

Irrigated and unirrigated land that has not been manured is allowed to recover its productive power in 2 ways: 1st, by allowing it to rest or lie fallow for 6 months, when only 1 crop is sown within the year; and 2ndly, by the land being repeatedly ploughed and levelled, when 2 crops can be sown and a good yield obtained. It is stated that on such land, when a first crop fails from accidental causes, such as want of rain, on a second crop being sown, a full produce is yielded owing to the nutriment the soil obtained from the failing of the 1st crop. There is no difference in the treatment of irrigated and unirrigated land; the latter receives the same amount of ploughing and levelling as the former, the only difference being in the artificial irrigation applied to the former.

GURDASPUR DISTRICT.

(a).—The following statement will show the extent to which land is manured in this District :—

	Constantly manured.	Occasional-ly manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated land ...	27	9	64	100	7
Unirrigated land ...	8	7	85	100	...
Total ...	11	7	82	100	1

(b).—The average weight of manure given to the acre per annum on land constantly manured is 200 maunds.

(c).—On land occasionally manured 250 maunds at intervals of 3 years.

(d).—With the exception of the inferior unmanured lands, such as those in the Kahnuwán Chamb and the banjri lands (mixture of stone and sand) in the Patháñkot Parganah (about 2,000 acres), no rest is allowed to lands in this District. The Kahnuwán Chamb lands are cultivated for 3 years successively, and then allowed to lie fallow for 3 years, while the banjri lands in the Patháñkot tahsil are allowed rest every 2nd year. The people in this District do not, as a rule, take any measure in the way of rest or ploughing to increase the productive power of their lands. But when lands actually fail to produce any crop, they are allowed to lie fallow, as is the case with the Chamb and banjri lands mentioned above. There does not appear to exist any material difference in the treatment of unirrigated and irrigated land, which needs to be mentioned here.

LAHORE DISTRICT.

(a).—Percentage of cultivated area which is manured :—

	Constantly manured.	Occasional-ly manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated ...	18	10	72	100	10
Unirrigated ...	...	...	100	100	...
Total ...	...	...	...	100	...

(b).—The average weight of manure given to the acre per annum on land constantly manured is 800 maunds.

(c).—The average weight of manure given to the acre per annum on land occasionally manured is 200 maunds once a year.

(d).—The land is prepared for sowing by ploughing and watering ; it is ploughed 8 times for sowing wheat and barley, and only 4 times for gram ; it is watered from 4 to 8 times according to the circumstances of the season.

The unmanured lands, after having been cultivated, are left to remain fallow for 6 months, or a year according to the capacity of the soil. These lands require more ploughing to prepare it for sowing.

FEROZPORE DISTRICT.

(a).—Percentage of cultivated area which is manured :—

	Constantly manured.	Occasional-ly manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated land ...	20	10	70	100	20
Unirrigated land ...	...	...	100	100	...
Total ...	...	...	...	100	...

(b).—550 maunds.

(c).—750 maunds every second year.

(d).—Manure is never used on unirrigated lands. The rabi is the main crop on unirrigated lands. On irrigated also it exceeds the kharif, though on the latter description of land more kharif is grown than where there is no irrigation. Where irrigation prevails,

it is the custom to have a fallow every 4th or 5th year. Where it does not, an autumn crop follows a spring one, and the ground is then left fallow for a year. Practically, however, on unirrigated lands the occasional failure of rain-fall causes as many fallows as are necessary. As long as the rains are favorable, the cultivator goes on taking as many crops out of the land in succession as he can, and for this very reason a failure of rain or an irregularity in its fall every 3rd or 4th year, as generally happens, causing a partial failure of the autumn crops, is not thought much of by the people of this District; and is rather good for the land than otherwise. Crops are generally grown intermixed; gram in the same field with wheat or barely, and moth in the same field with jowár. Thus if one crop is blighted, or fails, the other survives, and becomes a whole instead of a half crop.

In a subsequent communication the Deputy Commissioner explains that there is no real distinction between lands constantly and those occasionally manured. The lands manured are always the same, viz., those immediately adjoining the habited sites. Some of these lands are sometimes left to rest a while, or may not receive manure for 2 or 3 crops; in either case such lands when next manured will receive a heavier dressing than those receive which have not been left unmanured for a time. The usual quantity of manure is 300 to 400 donkey-loads, weighing about $1\frac{1}{2}$ maunds each. The use of manure is confined to parts of the District, where water is near the surface. Few crops are manured. Gram, barley, bájra, jowár, and as a rule wheat, are grown without manure.

GUJRANWALA DISTRICT.

(a). Percentage of cultivated area which is manured :—

	Constantly manured.	Occasionally manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated land...	9	3	88	100	1
Unirrigated land					

(b). Average quantity of manure for an acre per annum 200 maunds.

(c). Usually the same as in (b), but any savings of manure from land constantly manured are also added to lands occasionally manured. They are usually manured at the time the crops are sown, but when any crops are attacked by disease such as "tela" or insects, manure of kallar earth is given, but its amount is not certain, though it is always above fixed rate.

Sugar-cane, cotton, wheat are the principal crops which require to be manured.

(d). Usual course of cropping prevailing in this District :—

Kharif principal crops—sugar and cotton is sown when the land has been ploughed 5 times, and sugar-cane when 12. They are sown in the month of March. Jowár, moth &c., are sown in July, and land is ploughed twice. Makki is also sown in July, and land is ploughed 4 or 5 times.

Special course.—If it rains before or after the usual time, then all the crops except sugar-cane are sown. In some of the Bár and adjoining tracts cotton is produced.

Usual course.—Rabi, time of sowing, October, November and December.

Special course.—If it rains in January, barley can be sown, and if in February, tobacco, onions and melons. Difference that exists between the treatment of irrigated and unirrigated lands: first of all irrigated lands are sown, after that unirrigated lands are sown.

After unseasonable rains unirrigated lands are ploughed, and smoothed (by sohága) and then they are sown. Báráni sowings are carried on thus: lands are ploughed and levelled in July, August and September, and sown in October and November. For kharif crops in July at the time of sowing, and for rabi crops in July, August and September, occasional ploughing is necessary.

RAWALPINDI DISTRICT.

The following statement shows the percentage of cultivated area which is manured:—

	Constantly manured.	Occasionally manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated land...	86	14	...	100	100
Unirrigated land	3	3	94	100	3
Total ...	5	3	92	100	

(b). The average weight of manure given to the acre per annum on land constantly manured is 300 maunds.

(c). The average weight of manure given to the acre per annum on land occasionally manured is 155 maunds. Such land is manured at probable intervals of one and two years.

(d). Irrigated lands are sown with wheat or barley in rabi, and makki in kharif. When the green barley is cut, and the crop not allowed to ripen, a third crop of vegetables or tobacco is sometimes raised. In some places vegetables are substituted for makki. In lands where natural irrigation is procurable, makki and chari are sown, and the area left fallow at rabi. In some parts cotton, wheat and bájra succeed each other; at the foot of hills where water comes from the hills, cotton generally remains on the ground for 3 years; after cotton wheat is sown.

In unirrigated land wheat is sown at rabi, and bájra or jowár in kharif, but if the land be poor, it is allowed to remain fallow at kharif. Every 2nd year the land is allowed to be fallow, and then wheat is sown again; at the time the land lies fallow, it is ploughed as usual but not sown. If the land be very poor, it is allowed to remain for 2 years at a time.

About 7,68,492 acres of unmanured lands are helped by rests or by repeated ploughings. The whole of this last named area is either unirrigated or sailábi.

JHELUM DISTRICT.

(a). Percentage of cultivated area which is manured:—

	Constantly manured.	Occasionally manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated land...	34	43	23	100	
Unirrigated land	5	5	90	100	
Total ...					

(b). 300 maunds of manure is considered a fair dressing for land constantly manured.

(c). 120 maunds average for land occasionally manured. It is often given in alternate years.

(d). The usual course of cropping is to take a crop of bájra after wheat or barley, and then to leave the land for a year. One good ploughing is sufficient after the spring crop is removed, but in the interval of a year between the removal of the kharif crop and the time when a rabi crop is sown, the land is ploughed up several times, varying according to the quality of the land and the inclination and opportunity of the cultivator. Thus light sandy soils require less ploughing than stiff clays. 4 ploughings suffice for the

former, while the latter may be ploughed 10 times to advantage. Rotation of crops is not understood or practised, and there is no difference in this respect between irrigated and unirrigated land. Owing to the peculiar circumstances of the well tract, land which can be constantly manured is not rested.

GUJRAT DISTRICT.

(a). Percentage of cultivated area which is manured :—

	Constantly manured.	Occasionally manured.	Not manured.	Total.	Percentage of previous columns which bears 2 or more crops.
Irrigated land...	20	14	66	100	2
Unirrigated land	15	5	80	100	

(b). 160 maunds of manure to 1 acre.

(c). 100 maunds of manure to 1 acre previous to ploughing for sowing.

(d). The rotation of crops is as follows :—

After wheat and barley cut in a green state for fodder is removed, the land is sown with crops other than food grains, such as sugar-cane, tobacco, melons, &c., but after the above crops, removed in maturity, jowár, bájra, makki and moth are sown. The extent to which unmanured lands are helped by rests or repeated ploughing is that the produce is thus increased by one-half. Irrigated lands are once watered previous to sowing, then manured and ploughed 3 or 4 times, and when the seed germinates, watered and weeded, and the unirrigated land is only ploughed, and the seed sown broad-cast. It is occasionally left fallow, such as every fourth or fifth year.

SHAHPUR DISTRICT.

(a.) The following shows the proportion of the cultivated land manured yearly, constantly and occasionally, and not manured at all.

	Constantly manured.	Occasionally manured.	Not manured.	Total.	Percentage of previous column, which bears 2 or more crops annually
Irrigated land	2	3	95	100	2
Unirrigated land	"	"	100	100	1
Total ...	1	2	97	100	1

(b.) The average weight of manure used per acre per annum on land constantly manured is 160 maunds.

(c.) On land occasionally manured, the manure used per acre is also 160 maunds; such lands require manure yearly, or every 2nd or 3rd year according to the quality of the soil.

(d.) As a rule, unmanured irrigated land is allowed to be fallow for six months, i. e., only one crop is taken from it. It is then ploughed 4 times and sown, but land unirrigated and not manured lies fallow for a year, and sometimes longer, when, if there is a timely rain, it is ploughed up from 4 to 6 times in this District.

MOOLTAN DISTRICT.

The returns of the area manured for the whole District are not yet complete, and it would be very difficult to give them in the tabular form proposed. The general custom regarding manures is this :—

- I. The sailáb land is not manured at all.
- II. Nor is simple canal land, unless very close to the homestead.
- III. In the immediate neighbourhood of large towns, the whole area is constantly and plentifully manured.
- IV. In small towns and scattered wells, the manure of the cattle is used as far as it will go.
- V. For the other lands no regular supply of manure is given. The proprietor invites herdsmen to graze their flocks on it, and allows them in return the croppings and leaves of trees.

(b.) The weight of the manure in the immediate neighbourhood of Mooltan is estimated at 200 maunds an acre a year.

(c.) For other lands occasionally manured I can give no estimate.

(d.) I. *Unirrigated, or sailáb lands.* For the first 2 years after new land is thrown up by the river, it is sown with peas, or some other pulse; after that it is sown with wheat year after year.

II. *Simple well lands.* The main crop is the wheat; this, with enough turnips and jowár for the support of the cattle and the owners' family, and a little cotton for home consumption, forms the whole produce. The area is generally so large that half the well is cultivated one year, and half the next. If it is not large enough for this, the kharif lands of one year will be used for rabi crops.

III. *Canal and well lands.* As a rule, the area of these wells is large, and the kharif crops are grown in one part by the aid of the canal, and the rabi on another by aid of the well, but if the canals flow late, they give the rabi lands one or two waterings. The rabi cultivation is the same as in simple wells. The kharif as simple canal.

IV. *Canal alone.* This contains the greater part of the indigo lands. Indigo remains in the ground for 2 years, sometimes even for 3 years. It is cut in September, and wheat sown for the ensuing rabi; for the indigo is believed to act as a manure.

Repeated ploughings are only used in the highly cultivated lands.

JHANG DISTRICT.

The information required as to the proportion of land under cultivation that is manured annually is given below.

	Constantly manured.	Occasionally manured.	Not manured.	Total.	Percentage bearing 2 crops.
Irrigated, i. e., cháhi and jhallári land	20	7	73	100	5
Unirrigated, i. e., sailábi, baráni, and nashri	"	3	97	100	"
Total				100	

The average weight of manure given to the acre per annum on land constantly manured, varies from 160 to 200 maunds. On land occasionally manured, the manure will be given every other year, and the amount given will be about 120 maunds per acre.

There is no system of rotation of crops in this District. Where land is abundant, as is the case with the wells in the upland circles, fallows are largely made use of. Where land is not abundant, the land has to be reinvigorated by manure. Repeated ploughings are not customary. Land can only be ploughed up after rain or after irrigation. In the case of wells I believe the lands are never irrigated to allow of their being ploughed up, except just before being sown. If there is no rain, the lands remain unploughed. When the seed time arrives, the land which it is intended to sow, is first watered, then the seed is sown broad-cast on the unploughed ground, and is next ploughed in. I speak more especially of the rabi sowings of wheat and barley. If there is rain between July and August, the land intended for wheat will be ploughed about 4 times, if the Zamíndár is an industrious farmer, only twice if he is lazy. This ploughing is not so much to help the productive powers of the soil as to retain the moisture in the ground until seed time, when of course it is of the greatest importance that the well oxen should have as little irrigation work as possible. This year, for instance, I believe the wheat will all germinate without the use of a drop of well water.

In the case of bārání and sailáb lands the case is different. Bārání lands, if it is intended to sow them with wheat, receive repeated ploughings, both to improve the soil and retain the moisture. Sailáb land, subject to inundation, cannot be ploughed for wheat until late in the season. They are too wet until the flood season has spent its force. The higher lands and lighter soils are, if the floods are not too high or too constant, sown with kharif. In either case, whether the crop is a kharif or a rabi one, the ploughing done is but little. The soils sown with inferior grains such as masur, mattar, and gram, usually get only a single ploughing.

I have already said that there is no systematized rotation of crops in this District, but there are a few points that may be noted.

1. *On wells.* Land that has been cropped with wheat either gets a rest or is manured every 3rd year. If there is an abundance of good land available, a large portion of the area under wheat will be fallow every alternate year. Of the land under wheat in any given year, the portion lying nearest the well will often bear jowár, cotton or turnips after wheat, but the more distant will be sown with little else than wheat. Cotton is usually followed by wheat, and often by china. Jowár is usually followed by cotton. In considering the well cultivation of this District, one has to remember that the rain-fall is scanty, the climate hot, and that the khárif crops are always sown close into the well, in order that as little as possible of the water may be lost by evaporation. The kharif cultivated area is to the rabi as 25 to 75; and if we only took the area irrigated from wells, the kharif percentage would be much smaller.

Bārání and sailábi lands only bear one crop—the rabi as a rule. Sometimes sailába land is sown with “ráwan” (beans) or melons after wheat, but the area so treated is small.

MONTGOMERY DISTRICT.

(a). Percentage of cultivated area which is manured :—

	Constantly manured.	Occasion-ally manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated land ...	9	12	79	100	1
Unirrigated land ...	...	...	100	100	3

(b). 160 maunds.

(c). 160 maunds every 2nd year.

(d). Unmanured land irrigated by canals are not helped by rests, but by repeated ploughings. Lands irrigated by wells are helped by rests (sometimes) for one year. Unirrigated lands are never helped by rests; whenever there is rain or river inundation, they are ploughed and cultivated.

MUZAFFARGARH DISTRICT.

The cultivated area of this District is 397,529 acres. The statistics at hand only give 41,639 acres, or rather more than one-tenth, as manured. From what I know of the District, I can say that this area of manured land is much under the mark. It is not customary ever to manure sailába land or land irrigated by canals alone, because the silt acts as manure. The area of land not manured will therefore be—

	Acres.
Sailába	140,995
Irrigated by canals alone	51,696
Total	192,691

Probably to this 22,821 acres may be added on account of wells assisted by sailáb. This gives a total of 215,512 acres not manured, and leaves a balance of 182,017 acres of irrigated land which is manured. This manured balance consists of land irrigated by wells alone, and land irrigated by wells and canals, and is as constantly manured as the number of cattle and the means of agriculturists will admit. The value of manure is thoroughly understood in this District, and considerable labour and money is spent on it, and where the agriculturist has not enough animal manure, he supplements it with indigo refuse,* with clay from the silt clearings of the canals, and with sand, which he mixes with the stiff clay of his fields. He also hires flocks of sheep and goats at † a ser of wheat per night per score, and folds them on his lands.

With reference to the above remarks, the following statement shows the percentages of cultivated area which is manured. There are no statistics to show what land is constantly and what land occasionally manured.

	Constantly manured.	Occasion-ally manured.	Not manured.	Total.
Irrigated land	89	...	11	100
Unirrigated, i. e., sailába land ... ..	...	...	100	100
Total	46	...	54	100

(b.). (c.) The only statistics I have about the weight of manure to the acre relate to sugar-cane and gardens, which are more heavily manured than any other land. The weight is 1,400 maunds to the acre. This seems a good deal, as it is equal to 50 tons per acre, but I have seen 920 maunds put down to the acre in my own garden. So the amount above stated is not excessive.

Rotation of crops.

(d). To describe the usual course of cropping, the District must be divided into 2 parts.

I.—The inland part irrigated by wells and canals.

II.—The river-side part irrigated by the annual rising of the rivers.

The inland part must be subdivided into—

(a). Estates where sugar-cane is grown.

(b). Estates where crops other than sugar-cane are grown.

* Valb. † Pana. ‡ Attil.

In the sugar-cane estates the whole area is under crop every year, and the strength of the soil is maintained by heavy manuring. The rotation of crops is as follows :—

1. *Jowár or turnips, from May 1878 to January 1879.
2. Sugar-cane, from February 1879 to December 1879.
3. Indigo, from April 1880 to September 1880.
4. Wheat, from October 1880 to April 1881.

After which the rotation begins again with a crop of jowár or turnips. The rotation in sugar-cane estates occupies 2½ years, if turnips be sown; and 3 years, if jowár be sown.

Sometimes successive crops of sugar-cane are grown.

The rotation in estates where crops other than sugar-cane is grown is—

1. Wheat and barley, October to April.
2. Indigo, May to September.

If, however, the indigo is left in the ground for a second year, no other crop can be grown. The regular rotation is wheat or barley after indigo, and indigo after wheat or barley. In rice-growing estates rice is usually grown every year; but sometimes after rice, which is reaped in September and October, the land rests during the winter and the following summer, and in the next October (*i. e.*, a year after the rice was reaped) wheat is sown, and after wheat rice again.

Sometimes immediately after rice has been reaped in September—October, peas or gram are sown.

Cotton land grows nothing but cotton in the year, for it remains so long in the ground, *viz.*, from June to December, that no other crop can be grown. Cotton almost always follows cotton.

In the river-side part of the District which is irrigated by the annual rising of the rivers commonly only one crop is grown in the year. What the crop is depends on whether the flood has deposited good silt or bad. If the silt is good, wheat, barley or gram are sown. If it is bad, peas, methra and mohri (*masur*) are sown. If the floods retire early, *i. e.*, before August 15th, til is sown. There is properly speaking no rotation of crops in the river-side lands. If the silt continues good, the superior crops, wheat, barley and gram are sown year after year; if the silt is bad, inferior crops, peas, methra and mohri are sown.

On land that is formed gradually by the river, *samuka* is sown in the first year; peas, methra or mohri in the second; and wheat or barley in the third.

Fallows.—As a rule in the inland part of the District land is cultivated every year when manure is abundant. If manure cannot be obtained, land is cultivated every alternate year. In some parts of the District the soil consists of a very thin layer of clay with sand below it. This soil is locally called "*Maman*." It is easily exhausted, and after being cultivated for one year requires two and sometimes three years rest before it can be cultivated again. Repeated ploughings as a means of restoring exhausted land or as taking the place of manure are unknown. The number of ploughings depends on the crop to be sown.

In the inland part of the District the following number of ploughings is given to the various crops :—

Ploughings, 1—Inland.		the various crops :—			
Sugar-cane	9 to 12 ploughings.
Turnips	7 "
Wheat	}	
Barley		
Cotton		
Jowár		
Bájra					

If the land is soft and can be easily soaked with canal water, no ploughing is done for indigo; the seed is sown broad-cast among the wheat stubbles, and covered by bush-harrowing. If the land is hard or cannot be soaked with canal water, 3 or 4 ploughings are given to land intended for indigo.

* If jowár is sown, the rotation begins in May 1878. If turnips, it begins in October 1878.

In the river-side part of the District, if soft silt has been deposited, only one ploughing is given. If soft silt has not been deposited, 4 ploughings are given to wheat, barley, gram and til; and 2 ploughings to peas, methra and mohri.

DERA ISMAIL KHAN DISTRICT.

Most well lands are more or less manured, also sailába lands immediately round village sites. Lands in the Damán tract, which forms the bulk of the Trans-Indus tahsils, are not manured. The area which is more or less manured is about 86,000 acres, but a portion of this is devoted to crops other than food grains. There are no statistics distinguishing constantly manured from occasionally manured lands.

I should put the proportion of manured to unmanured as follows :—

	Manured.	Not manured.	Total.
Irrigated.	53 per cent.	47 per cent.	100
Unirrigated.	2 per cent.	98 per cent.	100
	18 per cent.	82 per cent.	100

(b), (c) I cannot say what the average amount of manure employed may be.

(d) Hill torrent lands are cultivated year after year, provided they get watered. There is no necessity for fallows. Similarly, there is no custom for fallows or rotation of crops on bārání lands, except that in some cases gram and wheat are planted alternately. In the nasheb * the greater part of the area is cropped with wheat year after year, fallows only being allowed when land has grown weak after long cultivation. In the Thal, the portion of the land of a well planted with kharif crops is generally left fallow for a year, but on the other hand kharif crops are often sown immediately the rabi crop has been cut. In the case of lands irrigated by perennial streams from the hills, (kálápani) 2 years fallow generally succeeds one years cultivation. These lands cannot be cultivated continuously.

DERA GHAZI KHAN DISTRICT.

About $\frac{1}{4}$ th land for vegetables and tobacco has to be manured regularly, for cotton occasionally, for wheat every 2nd year.

Percentage of cultivated area which is manured. :—

	Constantly manured.	Occasionally manured.	Not manured.	Total.	Percentage of previous cols. which bears 2 or more crops annually.
Irrigated land.	6	3	92	100	
Unirrigated land.	...	...	100	100	
Total.	...	...	...	...

(b). The average weight of manure given to the acre per annum on land constantly manured is about 75 maunds.

(c). The average weight on land occasionally manured about 40 maunds per acre every 2nd or 3rd year.

(b).

Irrigated lands.

Rabi	...	Wheat
Kharif	...	Jowár, bájra and cotton

* Nasheb are alluvial lands annually flooded by the Indus.

2nd year fallow, then again wheat, jowár and bájra, and so on in continuation.

Unirrigated lands.

Kharif... .. Jowár, bájra and cotton.
Rabbi, assun and mustard (oil-seeds) and occasionally wheat.

In the Pachad the land is not allowed any rests. The silt deposited by hill streams gives annually fresh vigour to the land irrigated by such streams. Rests consequently are not necessary.

BANNU DISTRICT.

	Constantly manured.	Occasion-ally manured.	Not manured.	Total.	Percentage of previous column which bears 2 or more crops annually.
Irrigated ...	15	12	73	100	15
Unirrigated ...	...	...	100	100	...
Total ...					

(b). On an average about 112 maunds per acre; but turmeric fields get 342 maunds, and sugar-cane 300 maunds per acre.

(c). About half the above, at or rather before sowing time generally.

(d). I answer this with a copy of portions of 3 paragraphs written lately on the subject for final report of Settlement, viz.—

On báriani soils, in which naladár or hill torrent lands are included, the amount and timeliness of crop; rotation on *báráni* and *sailába* lands otherwise of the rain-fall generally determine what crop shall be sown, or whether an enforced fallow is to be endured. In the sandy parts of Marwat, if there be sufficient moisture, wheat is grown for two consecutive years, and gram in the third year. Little barley is produced. In years when moisture is deficient, the areas under wheat and gram are about equal, otherwise the proportion is two acres of wheat to one of gram. On *saladár* lands all over the District the same land or banked field is generally sown for two or three succeeding years with wheat and then with cotton or *bájra*. * * * Barley is not much sown on the Thal, except by poor men who have no seed wheat in hand. * * * On Thal lands which get the drainage from upper lying waste, cropping of the same plot is continued for from three to five years, after which a long fallow ensues, an adjoining plot at the lower end of the field being brought under the plough. The first year's crop on this new land is generally *bájra*, as its roots loosen and soften the soil, and enable it to retain moisture, when next year wheat is grown. On *sailába* lands wheat is raised year after year on the same plot until the increase of weeds, and the smallness of the out-turn compel a fallow. A good *sailába* soil well replenished with silt and water will yield wheat for 8 or even 9 consecutive years, before exhaustion takes place. When water remains standing on land in September, the sowing of wheat that year is impossible. In such a case either *bájra* is sown in the following spring for the next Kharif, or the land lies at rest for a year. No regular system of rotation is practised in the District, except in Bannu proper. Elsewhere the variety of crops is so small, and so much depends on the season, that beyond the substitution of gram and *bájra* for wheat any other change is almost impossible. But in Bannu proper with water at command and with manure always obtainable, a constant succession of crops is possible, and indeed imperative for the maintenance of a super-abundant population. Although the Bannuchi farmer knows nothing about agricultural chemistry; experience has taught him, what succession is best to get the most out of his land, at the minimum expenditure of labour. He classifies all plants as either "heating" or "cooling" to the soil; when one of the former class has imported too much heat, he substitutes one of the latter, and so renovates the soil. The order of the more important "heating" or exhausting crop, is (1) turmeric, (2) tobacco, (3) cotton and (4) wheat. That of the cooling or non-exhausting crops is (1) clover, (2) maize, and (3) barley. Sugar-cane and rice, though both taking much out of the soil, are hardly included in either category, and for the following reasons. The former requires repeated waterings and quantities of manure, and is only grown on good land which receives plenty of Kurram river silt, hence on the final removal of the cane after it has been cut for three or even 4 years in succession, the soil is nearly as productive as it was before the setting of the cane in it. On removal either cotton or maize, is sown; if the latter, wheat very likely follows, and the cane is again set on it whilst it is young. As to rice, it is supposed rather to enrich than to impoverish the soil, because in the course of the perpetual floodings which go on, an enormous quantity of river silt is deposited. Rice is rather sown in poor and lowlying than good land, unless the object be to raise the level of a plot or fill up inequalities in the ground, in both of which cases it is freely grown. It is generally followed by wheat or clovers.

I shall now run through the 4 "heating" crops named above, and the "cooling" crops by which they are followed.

(1). *Turmeric*.—Is sometimes succeeded by itself, but never grown for 3 consecutive years in the same ground; is generally followed by maize or clovers and then by wheat.

(2). *Tobacco*.—Is little grown except in the Mirian and Shamshi Khel tappas, where it seems to thrive best on land slightly impregnated with reh, and is almost invariably followed by maize.

(3). *Cotton*.—Is little grown on the best soils; is supposed to be exhausting perhaps because its roots strike so deep; is generally followed by clover, and sometimes follows sugar-cane or the soil is left fallow for a year.

(4). *Wheat*.—Is generally sown after barley or sugar-cane or even cotton, and on good land is sometimes continued for 3 years. On poor land 2 crops are seldom raised in succession. It is succeeded by clover or barley, or a fallow.

The richest *dofasli* lands can bear a succession of wheat and maize for 3 years.

Fallows.—In the canal irrigated part of Isa Khel the rule is no rotations, but a fallow for from one to three years after each fairly good crop. Sometimes, however, the same land will produce wheat or barley for three or four consecutive year, before fallowing is allowed; a wheat crop is often followed by cotten.

In Bannu proper fallowing is not customary, except on lands which get little of the Kurram river's silt and no manure. Most villages comprising over 200 acres have some remote or high lying plots which are alternately cropped and fallowed. In Isa Khel the general rule is one, two or at most three crops in succession, and then a one or two years rest. Whilst lying idle, the soil is neither turned over nor watered, unless a grass crop is wanted for the cattle; hence much of the gain derivable from fallowing is lost. For unirrigated fields the practice is to continue cropping until soil exhaustion compels a fallow, and when that occurs, the field is kept untouched for three or four years. The occasional failure of rain at seed time is not always a loss to the cultivator; as in consequence he saves his seed, and his land gets a rest. In Marwat this spring the wheat crop on the *old light* soils yielded only two or three-fold. The people ascribed the scant return to the excessive rain-fall; but I think it was more due to the over-cropping, as a series of good years had given them a succession of fair or fine crops since 1872. In the case of *bunds* fed from hill torrents, cultivation can and does continue year after year until a break in the supply of mud and water occurs.

PESHAWAR DISTRICT.

(a.) Percentage of cultivated area which is manured.

	Constantly manured.	Occasionally manured.	Not manured.	Total.	Percentage of previous columns which bear 2 or more crops annually.
Irrigated land ...	9	15	76	100	38 p. c.
Unirrigated land ...	Nil.	1	99	100	Nil.
Total ...				100	

(b.) On land constantly manured, the average weight of manure given to the acre per annum is about 400 maunds.

(c.) On land occasionally manured, it is 320 maunds. If the crop is vegetable and garden produce, or sugar-cane, manure is given at intervals of 15 or 20 days; if it is wheat, barley, cotton, or jowár, it is generally given only once.

(d.) On "do-fasli" land of very good quality, the rule is to sow wheat after cotton; but if the land is somewhat inferior, it is allowed to be fallow for one season after cotton, and then jowár or rice is sown on it.

If sugar-cane has been sown, the land is left fallow one season, and after that is sown with Indian corn or rice. After rice or Indian corn no fallow is allowed, but barley or wheat is sown in alternate seasons.

On *ek-fasli* land wheat is sown one year, and barley the next. If cotton is raised on it one year masur is sown the next year; kangni, bájra, sugar-cane, and cotton, are considered to be crops very exhausting to the soil: after them the land is generally allowed to lie fallow one season. If land is limited, bákila masur and mung are sown in the belief that they strengthen the soil, and are as good as a fallow.

Irrigated land is ploughed twice during one season; if the soil is hard, a 3rd ploughing is given. Unirrigated land, if soft and sandy, gets 2 ploughings; if hard, 4 ploughings are given. The rules about rotation of crops apply to irrigated (*do fash*), and unirrigated (*ek-fash*) land equally. CH. I.

KOHAT DISTRICT.

(a.) The proportion is very small. I am unable to give figures, as no separate heading for manured land was recorded at the measurement stage. The land generally manured is generally that close to the village, and known as *bári*, of which there is a very small proportion in each village.

(b.) About Kohát the average weight of manure given to the acre per annum, on land constantly manured, is said to be 80 borás or sacks, weighing 1 Kohát maund each, i. e., 80 maunds* per acre. This is given 3 or 4 times during the year.

(c.) On land occasionally manured, 120 Kohát maunds† per acre, are said to be given twice during the year.

(d.) The chief crops, and their order of sowing are as follows :—

Rabi ;—Barley and wheat.

Kharíf ;—Rice, cotton, jowár, bájra and Indian corn.

In *single crop ábi lands* every kind of crop is sown, and it is usual to allow the land a rest for 1 or sometimes 2 harvests after a crop.

In manured land yielding 2 crops the usual rotation is wheat and barley after jowár, (great millet); cotton follows barley and wheat, when they are not intended to ripen, and are used for green fodder. This rotation continues for 3 years where manure is constantly used. After a course of these crops the land is helped by a rest of 2 harvests.

The productive powers are helped by rests, and not by repeated ploughings.

HAZARA DISTRICT.

Percentage of cultivated area which is manured :—

	Constantly manured.	Occasionally manured.	Not manured.	Total.	Percentage of previous columns which bear 2 or more crops annually.
	Acres.	Acres.	Acres.		
Irrigated land	35	26	39	100	35
Unirrigated land	12	6	72	100	12
Total ...					

Average weight of manure given to the acre.—About 250 maunds per acre.

Average weight of manure given to the acre on land occasionally manured.—About 200 maunds per acre, once a year.

Usual course of cropping—rests to land, and ploughing.—From good unirrigated land, manured as usual, 2 crops are obtained, and 1 from unmanured; the latter land is allowed is allowed rest every alternate year; the more it is ploughed, the better is the crop.

* English weight—102 maunds.
† English weight—158 maunds.

I. CHAPTER I, QUESTION 6.

Extracts from a paper on the Agriculture of the Punjab, furnished to the Agri-Horticultural Society of Lahore, in September 1852, by Lieutenant-Colonel Tremeneere, of the Bengal Engineers.

Except Rawalpindi, the countries Trans-Indus, and the hill Districts of Kot Kangra and Simla, the face of the country may be said to be one uniformly level plain, varied only by depressions several miles in breadth forming the valleys of the five rivers which flow through the plain and unite in Sindh. These low lands are full of fine alluvial deposit, and are enriched by partial inundations every year. They are tracts of great natural fertility, and abundance of the best water for irrigation is obtained a very few feet from the surface. The ground intermediate between one basin and the other of adjoining rivers is higher, by several feet, and comparatively dry and unproductive. Portions towards the south, are either not cultivated at all, or are barren, and covered with jungle and sandy wastes; yet the soil is friable, and has, for the most part, a fair admixture of loam and sand, requiring the command of water only to fit it for the highest cultivation. Scarcely a stone is to be found, and the land, when turned, resembles the finest garden soil. If schemes for the supply of water, which are understood to be in contemplation, and partially commenced, should be carried out, these parts of the Punjab may be made, in time, as productive as any other.

Nearing the hills, and eastward of a line drawn from the point of junction of the Sutlej and Beas rivers through Amritsar, Wazirabad and Jhelum, the whole surface is a scene of uninterrupted fertility and richness, to the base of the lowest range of hills which bound the plains to the north and east. A glance at the map will show that villages and towns are much more thickly clustered on this upper portion of the Punjab, and along the lines of rivers, than in other parts of the country.

Although these differences exist in the general aspect and natural capabilities of various parts of the Punjab, the cultivated products are much the same in all, wheat, barley, sugar-cane, maize and millet being the staples of the whole country, with some cotton, hemp, tobacco, and vegetables of several sorts. These are grown at two distinct periods of the year, and are divided between the spring and the autumn crops, so named from the time at which they are reaped. The spring, or rabi crop, is sown in November, and reaped in May; the autumn or kharif, sown in July, and cut at the end of October. In the first, the cultivation is principally wheat and barley. In the autumn are reared sugar-cane, maize, millet, and moth, with cotton and other substances above mentioned. The native methods of cultivation exhibit a good deal of industry at some periods, of which perhaps, the best example is their mode of preparing the land. As many as six or seven ploughings are given before wheat or barley is sown, and for some other crops considerable pains are taken; the ground is completely pulverized. Many a disparaging remark has been made on the native plough, its simplicity and lightness, and its merely "scratching the ground;" but a little reflection will show that, under the peculiar circumstances of climate and soil, it is probably the best. In England, the object is to break up hard masses of mould or stiff clay, and to get rid of superfluous moisture, while here, in light and tractable soil, scarcely a clod can be seen, and to preserve, in the sub-soil, the rain and moisture it imbibes at certain periods, is the cultivator's greatest care. It is evident, therefore, that deep ploughing would be unsuited to such conditions. If the surface is loosened so as to allow the delicate fibres of the roots to penetrate and to secure the free access of air, it will be sufficient; to turn up the moist soil from below, and expose it to a hot sun and drying wind, would be most injurious. When the ground is in a dry open state, the drill is used in sowing, with the object of delivering the seed deep into the soil. A piece of flat, heavy wood is then drawn over the furrows to smooth them and "keep in" the moisture. After rain, or in wet seasons, the seed is sown broad-cast.

A good deal of trouble is also taken in hand-hoeing and weeding some of the crops, as sugar-cane, maize, and the larger kind of millet; but only in the early stages of growth. Cultivation, of nearly every sort, is so crowded that it would be impossible to pursue this practice so long as it would be beneficial to do so, and great improvements might be made in the system, both in this and many other respects, which will be adverted to as we proceed.

The principal objects to which our inquiries were directed, were to ascertain whether any regular rotation of crops is practised, and the principle on which it might be based. To what extent manure is used, in what state applied to the land, and the different substances resorted to; as well as an elucidation, generally, of the existing system of farm management in the Punjab. It is believed that this species of information, in a collective form, has never been before procured, and it may be considered interesting to publish an abstract of the replies, in an appendix, under the head of each question to which the information refers. They have been, therefore arranged in this manner, so that a judgment may be formed of the correctness of the inference deduced in this report, as well as on the value of the suggestions offered.

The point of first importance relates to the succession of crops, and it has been clearly elicited that no regular rotation, nor any system whatever of changes, for the relief or improvement of the soil, exists. The same crops succeed each other, year after year, on the same ground, and generally both of grain within

twelve months. The rabi is no sooner removed than the kharif is sown; one or the other is occasionally omitted, and the ground left fallow for half, sometimes for all the year, but if no manure has been used, the same crops are annually grown; wheat and millet, wheat or barley and moth, alternately, within the same twelve months, and this invariably where the land is not artificially irrigated.

Near wells, a certain system of changes is followed, but this is owing principally to the use of manure, which is almost exclusively confined to irrigated lands, and it is more to give the following crop some advantage from the dressing which has been applied to the preceding one, than from any acknowledged principle of varying the products taken from the land.

Thus maize, the larger kind of millet, and sugar-cane are both irrigated and manured, and it is customary to take a crop of wheat or barley in succession to those, which always proves a good one. On irrigated lands, which comprise probably not more than one-fifth of the area of the country, a crop of Indian corn is taken when first brought under cultivation; after which the ground is prepared for sugar-cane, frequently ploughed, and well manured. The cuttings are generally planted in March, and the crop is not cleared till February. Indian corn again succeeds at the next kharif, after which wheat, or if desired, a second crop of sugar-cane can be again laid down. This, however, does not succeed wheat, but is always after maize. Again, cotton is sown in April, and cleared in December, when it is succeeded by "maithee" for fodder; then maize at the succeeding kharif, after which ground will be fit for sugar-cane, and lastly wheat. The last three are manured, but cotton not so. But the absence of any definite rotation on true principles, is fully established.

The cultivation, near villages and wells, consists of sugar-cane, maize, jowár, cotton and tobacco, valuable products, which cannot be brought to any perfection without manure. It is not available in sufficient quantities to fertilize the general face of the country: so that for wheat and barley it is very sparingly used and generally not at all for these, and other crops, over any considerable extent of land. The substances collected are cow-dung and other animal excrement, litter, vegetable refuse, ashes, rubbish, sweepings of houses and of yards. These are kept in heaps outside the villages, and exposed to the weather for a considerable time, before being applied as manure to the land. After one or two years, but without any definite rule, it is spread on the field at the time of ploughing. It is not thought fit for use, till it has been allowed to ferment a year; but on the other hand, it is often carried out before the straw and other substances have had time to decay. In either case it is unfit for the land, and on examination of some has shown that not more than 40 per cent. of its bulk is calculated to afford any nourishment to the growing crop. After a twelve months' exposure to a tropical sun and rains, little of its fertilizing properties remain; the nitrogen and ammonia from animal substances, most essential to vegetation, must have been long before expelled. To sugar-cane, maize and jowár, a top-dressing is given, when the plants are young, which is advantageous, but the principle of saving or economizing manure, and applying it in the best state, is most imperfectly appreciated, if at all. Many substances, as bone-dust, lime and others, might be pointed out as available, and within the native cultivator's means and reach, to add to the exuberance of his crops; but this belongs more to a system of high farming than to a general review of the state of agriculture of this country as it now exists.

We consider it better, for the present, to abstain from such details, and to endeavour to point out the radical defects of general management. It appears that the scanty supply of ordinary manure is one of the foremost of these, and this is so intimately connected with a proper rotation of crops, that the two considerations can scarcely be separated. A further supply can only be derived, first from the land; secondarily, from the cattle which feed on and elaborate the vegetable substances which the land has produced. No increase can occur unless land is set apart for its production. Green substances must be grown and cut continually, or roots reared for the food of cattle, which will yield manure, for it is only such substances as are consumed by them which return to and enrich the soil. Lands in the rabi, as well as the kharif, should be devoted to this purpose, and the "racking" system of wheat every year from the same ground, should be abandoned. It is certain that land treated in that manner must be greatly impoverished, and it is extraordinary that blight and famine have not been produced. If turnips, mangold-wurzel, lucerne, or other suitable crops, are allowed to take their turn in cultivation, the increase of wheat, barley or other grains, in any single harvest, would be soon apparent; the produce of one season would probably exceed what it now is for two years from the same land, under the present exhausting system.

But to grow more green crops and other fodder will not be sufficient so long as the careless practice remains of keeping the cattle without any economy of the manure they yield, which is a necessary consequence.

They stand, for the most part, under trees which surround the wells at which they work, instead of being kept under sheds, where litter could be usefully mixed with their dung and nothing lost. With an increase of the means of subsisting them, their numbers would increase, more land could be ploughed, and a system pursued which would be advantageous in every respect.

The point which seems next to demand attention is the excessively crowded state of all the crops. As they advance to maturity, the plants are as thick as they can possibly grow, and much too close to one another to arrive at any perfection. It is impossible to observe the tangled mass of sugar-cane, the thick and scarcely penetrable fields of maize and millet, without being satisfied that each plant can neither derive sufficient nourishment from the soil, nor its proper share of light and air from above. The natural results are everywhere evident; the cane is thin and attenuated. Some of the heads of millet rise up and expand to their full size; but by far the greater number are small, low and stunted.

With maize, it is much the same. The sure and only remedy for this error is to plant in rows, sufficiently far apart to allow of hoeing and weeding by the use of the plough; this method of cleaning the ground is simple, efficacious and saves a great amount of manual labour; turning the soil near the roots, during several periods of growth, is most beneficial to the crops: weeds are readily and effectively removed, and every plant has room to attain its full development. This is no new suggestion. In the cultivation of maize especially, it is practised in America, in France, and other countries, where land is very valuable, and has been found to answer well. There can be little doubt that it would be successful here.

These, then, are the leading characteristics and defects, in the practice of farming in the Punjab. A system, let us remember which, independent of these, has derived no aid from chemistry: from an acquaintance with the composition and properties of earths, from mineral and artificial manures, or from correct physiological principles. If, by such advantages, certain quantities of land in other countries have been made to support twice as many inhabitants as they did eighty years ago; and if, within the present century, sixty-four millions sterling a year have been added in value to the agricultural produce of Great Britain alone, may we not expect that wherever the same means are tried, they will be followed by similar results? With a climate in which the seasons of rain and fair weather alternate with great regularity, with a fertile and highly improveable soil, and rivers for the export of surplus produce, the capabilities of the Punjab are unquestionable, and might be turned to better account than the discovery of the richest mines. There are springs of wealth at our feet, which require but well-directed skill to bring them to the light of day. The prosperity of the people and the interests of Government are alike concerned, in this country, in the progress of agriculture, at once the greatest, the simplest, and most obvious of its resources.

Abstract of Replies received by the AGRICULTURAL SOCIETY from all Districts of the PUNJAB to the Questions stated in the margin.

	CEREALS.	PULSE.	OTHER PRODUCTS.
What are the rabi or spring crops	Wheat.	Gram.	Tobacco.
	Barley.	Peas.	Linseed.
		Lentiles.	Safflower.
		(Musur.)	Mustard.
The kharif crops?	Jowár, } Bájra. } Maize.	Dál. Moth. (Mung.) Dál.	Sugar-cane. Cotton.
	Rice (not general.)		

The cereal grains and pulses are grown over the general face of the country, the rest near villages and towns where facilities for irrigation and manure exist, the only difference observable in the management of two crops is that for the rabi the land is more carefully prepared, and much more frequently ploughed, before the seed is sown, six or seven times, and sometimes more being necessary, whereas in the kharif once or twice is thought sufficient. In the latter, owing to the greater moisture of the season, weeding operations are more frequent, but except for sugar-cane, maize, cotton and tobacco, they are very imperfectly effected. In the Ludhiána District, Major Goldney saw, in February, "a field of gram in which it was difficult to say whether there was most gram or most weeds."

The same crops succeed each other, year after year, on the same ground: there is no system of changes for the renovation of the soil. Where manure is abundant the same crops are grown yearly. Land, which has long been under cultivation, is manured, and again cultivated as before.

"After the rabi is off the ground, it is allowed to be fallow for some months; when, after being ploughed, another rabi crop is again put in and the next year in July the same ground will be sown for the kharif." Fallows for a whole year are common.

"In the iláka of Háfizabad, after cutting Indian corn, barley is sometimes sown, because the Indian corn has been manured, but the produce is inferior in quantity." In Gujrat, "the custom, with reference to irrigated land is, to take half the area for one year for the rabi and the other half for the kharif. The next year, that used for the kharif is turned up for the rabi of the following year, being allowed to lie fallow for a season, and the usual system of rotation is

- " 1st—Wheat.
- " 2nd—Indian corn.
- " 3rd—Barley.
- " 4th—Jowár

These being all grain crops afford little or no relief to the land. They differ only in the degree in which they exhaust the powers of the soil. During a year of abundant rain, some of the poorer lands are made to yield two crops, but generally one only is obtainable. The practice may be said to be to take advantage of the rains as they fall. There is no regular system, with the exception of one District. In Mooltan, turnips are grown after jowár and wheat. They are reared, chiefly, for the support of cattle, and are used both fresh and dried. Notwithstanding this practice, Mr. Edgeworth states that no definite rule exists for changing the crops; but on the contrary, on lands that are subject to inundation, the same kind of produce is taken off the same ground during two similar and successive harvests. Mr. Carnac states that at Rawalpindi, the "irrigated and best lands are called 'dofusli,' or two harvest lands, and yield two crops a year. They are sown with wheat, which is reaped in May, then ploughed up and sown with millet in August. This is cut in October, and followed again by wheat in December, if rain fall."

In Leiah, Captain Hollings informs us that wheat is almost universally sown on the same ground every year. In the Ludhiána District, common millet is sown as often as four times, in one year, in the same field. In February, Major Goldney observed a good deal of barley, methee, linseed, dál, and mustard, all grown together, and their being cut green for cattle to be mixed with chaff. "Jowár also is sown in April, and cut in June for the same purpose. They have no grazing, and cattle will not work wholly on dry fodder. In October, green sugar-cane was given to them."

In the Cis-Sutlej states, Mr. Wynyard informs us, that after rice, barley or gram are generally sown; tobacco generally follows cotton: after Indian corn sugar is sometimes grown, after hemp, all spring crops are sown. This is the general rotation of crops, and that which, from experience, has been found to answer best. There is also one general rule:—after sugar-cane, wheat is sown; after wheat, cotton: thus the manure expended on the sugar lasts for three years.

In the District of Kángra, Mr. E. C. Bayley states, "that the only crop, and it is a staple product of that District, regarding which any rules of succession are very carefully observed, is that of the best kind of rice. It is only sown after linseed and wheat, and on the best irrigated fields, and in the finest soil." Indeed to such an extent is the care bestowed on rice carried, that though rice is grown every year on some lands, yet it is said that, strictly speaking, the same variety of rice is never sown annually on the same ground, and as there are innumerable different sorts, there is ample room for succession. With respect to other grains there is less strictness, but usually after *sarson*, safflower and barley, there is sown millet, *mundal*, *sawdnk* (a pasture grass,) pulse and *kachálu* (*ARUM colocasia*). The latter is preferred, if it is intended to sow any valuable crop, the following "rabi," as it requires much manure, and leaves the land rich, but not rank. What little oil-seed is sown is usually sown after gram. Beyond these there are no regular rules of succession. A practice exists with some of the "kharif" crops, as cotton, millet, rice and sugar, of ploughing up the field just as the crop begins to make its appearance. This second ploughing is said to make the plant strong and healthy.

The advantages of any particular succession of crops, do not appear to be at all understood. In the Umballa District Mr. Bowring states that Indian corn is sown in the kharif, because it is ready to cut sooner than the other autumn crop. It is followed by any of the spring crops for which the land is suited, and the same course is pursued year after year.

Nothing generally. In the Simla lower hills, green millet is mentioned. In Ludhiána and Umballa, *shamakh* (a species of pasture grass) is thus treated before sugar-cane, is any thing grown for the purpose of being ploughed green into the soil? is planted, and jowár and dál, in a young state, for other crops; but the practice is by no means general.

Sugar-cane, Indian corn, and tobacco must have manure to thrive in any soil. Lands, which are periodically inundated, are seldom or never manured, but those artificially irrigated are always so. Manure would be made use of to a greater extent, if procurable; but no village furnishes a sufficient quantity for the whole of the cultivated area. It is, therefore, applied more particularly to the lands irrigated from wells and other sources. There never is sufficient for unirrigated lands. Those prepared for wheat and barley are manured whenever there is any thing available for them, but the supply is very limited.

They do, so far as their imperfect system of farming permits, and their present knowledge of other sources from which it may be derived. No land is set apart expressly for the production of manure; that is, to grow food for cattle which will be returned to the land. Near towns and villages it is collected, "but when the distance it has to be carried is anything more than short, the people do not exert themselves; and in the Bángar, or high unirrigated tracts manure is not made use of at all in any shape." Much depends on the class of cultivators employed. Gujars and Rájputs, Sayds, Moguls a Patháns, are indolent in this respect. Every village has its stock, and disputes about it are not uncommon.

From scarcity of wood and absence of any other fuel for cooking, a vast deal of cow-dung, a most valuable manure, is burnt. "In the Kángra District, the droppings of the flocks of the hill shepherds who bring their sheep and goats to feed in the low lands, during the winter, are much sought after." Mr. Bayley remembers a case in which a civil action was brought against a Gaddi, by the owner of a certain field in the which the Gaddi had been in the habit of folding his sheep for many years, in order to compel him to continue to do so. He has seen people too "laboriously bring leaves from a distance for the same purpose."

Mr. Melvill states, with reference to the Hoshiarpur District (and the remark is generally applicable) that, "a place just outside the hamlet exists in every village where the accumulations of each day are thrown. The heap is commenced in June, and goes on increasing till October, when it is expended, and again, from November to May. But if there is no great demand for the manure, it is allowed to remain for one or two years. Manure is never used fresh. For the rabi crops it is laid down in October : for kharif crops in May."

Animal manure, vegetable refuse, sweepings of the town, of dwellings, and drains; ashes and rubbish of all sorts; earth from old mounds and dykes; the urine of camels is prized in the Leiah District. The heaps collected are distributed amongst the village community, according to custom. From some towns moist soil is carried to the land.

In Kángra, the dung of all domestic animals and the leaves of certain trees are the chief substances used; stubble, also, which is left purposely long on this account, is burned and its ashes ploughed in as manure; ashes and lime are also occasionally applied to the soil, but rather to destroy insects than as manure; and this only on which there are strictly speaking "garden crops." In the Cis-Sutlej states, the earth, which crumbles from old mud walls, besides the foregoing substances, is mentioned as a manure.

After six, sometimes twelve months exposure to the weather. If kept beyond two years, it is said to be unfit for use; but in Cis-Sutlej states and in Kángra the older it is the better it is esteemed. 'It is often applied in a fermented state to the crop when partially grown, and some will press down manure to the roots, with the hand, after the crop has sprouted, and to sugar-cane a dressing is applied when the shoots are one span high, the ground being first manured four months before cane is planted.'

Manure is sometime used first previous to sowing, but in poor soils frequently two or three times after the crop has appeared above ground.

Some cultivators spread the manure prior to ploughing the land; others, after the ploughing has been effected. Farmers, who can afford it, manure when the young shoots have been ten to fifteen days above ground. The early part of the rains and in October are common periods for the distribution of manure. It is always ploughed in before Indian corn and the same for wheat when available.

In the Shekhupura District, a practice prevails of laying ashes from brick-kilns on the floors of the cattle sheds, which, when mixed with the litter, is esteemed very fertilizing. The ashes protect the cattle from the cold ground; and next morning they are carried out to the yard, and replaced by clean ashes. A description of manure is also obtained in the District from the sweeping of brick walls, which is spread on the fields much as bone-dust in England. This is probably a carbonate of soda locally known as "kallar" which in certain quantities, appears to be a stimulant to vegetation. Worm-eaten wheat is considered the best manure. The twigs of the Indigo plant, after coming out of the vats, are in the Muzaffargarh District, placed in the water-course; the water passing over them extracts any remaining properties, and conveys them to the young wheat. These twigs are also strewed over young wheat, which is watered, and the properties of the Indigo filter through and strengthen the wheat. Rabi lands manured in October and November, kharif lands in May and June, sugar fields in February, and vegetables when sown.

The whole of the cultivation, except the small portion artificially irrigated, is dependent on the regularity of the rains. All suffer equally by failure. The cold weather rains, from January to March, secure the spring crops, and what are called the periodical rains, those of the autumn.

Gram is especially dependent on rain, and is sometimes entirely lost for want of it; as was the case this year. Rice of the sort sown without irrigation, maize, sugar-cane, and cotton are also dependent on rain. In the Cis-Sutlej, Mr. Wynyard says, with regard to this question, that all crops sown on lands, which it is impossible to irrigate by artificial means, are entirely dependent on the regularity of falls of rain. The following are the principal crops most commonly sown on such lands:—Rice of all kinds, maize, bajra, jowar, cotton, moth, dal, oil-seed, hemp, gram, other pulses, sugar and wheat. In short, crops of all sorts, except poppies, tobacco, vegetables and generally sugar-cane; but in the Umballa District this grows without artificial irrigation.

The above crops are sometimes lost altogether for want of timely rain; such was the case in the spring harvest of 1852, when field after field of wheat totally failed. The crops most subject to this contingency are rice, maize, jowar, dal, hemp, and moth.

The produce of the land depends chiefly on facilities for irrigation, the qualities of the soil, and the industry of the people. Lands irrigated from canals or rivers are said to be more productive than by wells, as more fertilizing matter is deposited by the former. The waters of the Chenab are said to be superior, in this respect, to those of the Sutlej.

Great differences are seen in the degrees of industry exhibited in different classes of the population. Captain Goldney observes that—"The well-fenced field and well dressed land of the Ráin and Ját stand out in strong contrast with the slovenly management of the Gujar and Rájput. After Ráins, Mális and Játs, rank Sayads, Patháns, Banjaras, Brahmans, Gujars, Rangars, and last of all in painstaking habits, the Rájputs. The difference is observable in every village, where the holdings belong to different classes." Captain Larking states that "in the same village under similar circumstances a hard-working Ját or Málí will get a fair return for his labour, whilst a lazy, indolent Rangar gets nothing.

because the Ját works hard and ploughs and prepares the soil to the utmost of his means before putting in the seed; whilst the Rangar hastily puts the plough loosely through the soil and sows it. It is not to be expected then that his lands will yield the same return as the former." Mr. Brandreth observes "that Ráins are good cultivators; almost all others, either Dogars or Nyháls, though possessing the finest lands in the District of Ferozepore, have no success in cultivating them. The energy of the cultivator has much more to do with success than the possession of the best soils and the easiest modes of irrigation." The Belochees are very wanting in industry; "they cast the seed on the ground and take little further trouble about it." Mr. Carnac states that in the Rawalpindi District, "the agriculturists trust almost entirely to providence and very little to their own exertions; so long as the land yields them sufficient to live on, they take no further trouble. The people of the plain of Chuch, bordering on the Indus, are perhaps an exception."

The following interesting description of the process of husbandry in the Cis-Sutlej states is given by Mr. Wynyard, Settlement Officer:—"The kharif crop is always sown broad-cast; but in the rabi, wheat is sometimes sown through a funnel tied to the plough's tail; although in this part of the country this crop is generally sown broad-cast too. Land of the kharif is only ploughed two or three times, and much attention is required to weeding. Land prepared for the rabi sowings is ploughed from 10 to 15 times; for sugar-cane, the land is ploughed from October to February, about 20 or 25 times. It is then levelled by the wooden instrument 'sohága,' which is used instead of a roller. The land is again ploughed, and into the furrows thus made, cuttings of the seed sugar-cane, about 6 or 9 inches long, are laid horizontally. They are covered over by the ridge caused by the next passage of the plough. After the field is sown the sohága is again used to level the whole surface. When the shoots come above ground, the earth is loosened with a kusee or phowrah. Land for cotton is ploughed 8 or 10 times. For maize, 6 or 8 times. Rice is sown in two ways. The first plan is this: they either plough the land which is almost always well flooded and under water; and after harrowing it with a gahun, (a piece of timber stuck full of wooden pegs) they sow the rice broad-cast. The other plan is to drive a herd of cattle into the land to be sown, and move them about until all the ground is well worked up, then they sow. The seed is thus prepared for sowing. They soak the seed rice for one day and night; then they strain off the water and put the seed on the ground in a heap and cover it with a cloth; in a day, or at the most two days, the seed germinates: it is then sown broad-cast. The seed, thus prepared, at once settles down through the water into the soil; and the earth, in solution in the muddy water, is sufficient covering for it. Rice and tobacco are frequently transplanted."

"Great differences are observable in the degrees of success of farmers. The differences are attributable: 1st—to the productive power of the land; 2nd—to the stock of the agriculturist, as cattle, carts; 3rd—to his property, as wells; 4th—to his habits, industry, &c.; 5th—to his religious persuasion, or the customs of his clan; for instance, a Ját who delights in working in his field, and who has a wife who is as fond of it as himself, who will help him to plough and sow, to manure and to reap; who will assist him, in short, in all his agricultural pursuits, will of course get more out of his land than a Rájput, whose wife will do nothing but cook his dinner, use a spindle, and, if she is a good house-wife, make up his winter fuel from the cow-dung; more especially when the Rájput himself will not put his hand to the plough when he can entice or hire a Chamár to do it for him. Such a man's field will, of course, be badly ploughed, badly weeded, badly watched, never watered, if there is any, the least, difficulty in getting water. In short, there is all the difference between a good agriculturist and a bad one. The difference is the same all over the world, and can be seen in any part of the world, and in any part of these Districts. The success of farmers depends a great deal upon the moderation or severity of the Government land tax. The Zamindárs of the Umballa District have been for years suffering from most severe and cruel over-assessment: the consequence has been that they are poverty-stricken and in debt: many of them in rags, and some of them often at a loss for the necessaries of life. It is a miracle to me how the people have gone on paying their revenue; the consequences have been that industrious Játs have neglected the culture of their fields and taken to the carrying trade, which, bad as it confessedly is, when a man who has to keep himself and family, two bullocks and cart, only gets for a hard day's work, 15 miles over a bad road, the same sum, 10 annas, or five-eighths of a rupee, that two palankeen bearers get, who, in three hours, assist 6 other men in carrying a dák traveller one stage." Mr. Wynyard's duty in the North West Provinces was to revise the Settlement of a District, Fatehgarh, where it was confessedly too high; and where the Zamindárs would not pay the whole rents of their land and allowed them to be sold away from them; but he never saw those cases of over-assessment so heavy as he has seen in the Umballa District. "The revenue ministerial officers were obliged to collect those according to law. This has not been the case in Umballa, and Zamindárs, who are supposed to pay only a tax on their rents, have, with very few exceptions, been for years paying to the British Officers more than their full rents, and are in a body in a more wretched state of poverty than Zamindárs under the Sikh rule, who profess to take the whole rent, and certain cesses besides, and who do it."

From Mr. Melvill, of the Hushiárpur District, the following information is obtained:—"The rabi crop is reared after great labour; the kharif, with but little trouble; because the latter invariably follows the former, and the ploughings of the rabi are almost sufficient for the kharif. Thus, a man wanting to sow wheat, will plough his field from 10 to 14 times between the month of June and October: when he has cut his wheat he will wait till rain falls in June, run the plough once or twice over the field, and then sow the kharif crop. It never happens that the kharif is the first crop sown on fallow land. The kharif invariably succeeds the rabi."

"Great differences are observable in success of agriculturists. The reason is two-fold: caste and the possession of an ample agricultural stock. Rájputs Brahmins and Gújars, are lazy and improvident,

cultivators; they will not get as much out of their estates as Játs, Sanís and Ráíns will from theirs, although these be inferior to the ones held by the first named castes. If the number of ploughs in a village be comparatively small, delay takes place in preparing and sowing some of the lands. Where the number of the ploughs is sufficient for all the lands to be sown in one season, that is sufficient to prepare them nearly at the same time, so that the seed might be thrown in simultaneously, the crops would yield probably a larger out-turn than if some were sown a few days after the others, because we suppose the weather has been watched, and the best time chosen for sowing the first seed. It is most probable that a few days after the first seeds have been sown, the unsown soil will not be in such a fit state for the reception of the seed as it was before. These differences can be seen in almost any two contiguous villages; also in any one village where lazy and industrious castes co-exist.

"Major Edwardes, c. B., gives the following abstract of replies received in the vernacular, from some of the Zamíndárs of the Jullundur Doáb:—"The land called Necáhf, when near villages, healthy land dug up and manured and well watered by wells, will produce any thing after one crop is removed, with the exception of suagr-cane. The class of agriculturists called Ráíns, managed often to get three or four crops of vegetables off land that is called, 'do fashí,' two crop soil."

"In báráni, or unirrigated soil, distant from villages, after reaping the spring crop, if the land is well watered, it yields an autumn crop of bájra, jowár, cotton, dál, oil-seed, &c. But after this, báráni land seems to be exhausted, and is to be left fallow for one year; after having remained barren one year, it is again ready for use. But the following is the general mode of farming:—A man has one hundred bigáhs of land, divides it into two portions of 50 each, and off one takes his two crops, leaving the other half fallow for one year; and this one is in its turn brought into cultivation, and this is considered the most profitable arrangement."

"If the unirrigated land, which is dependent on rain, is not left thus fallow for one year after the removal of two crops, and is not well turned over by the plough, it would bear a crop, but the produce would be good for nothing, and if the farm was cropped twice one year, it would all have to lie fallow the next."

"In the profits of Zamíndárs the difference varies according to trouble and expenditure; whoever manures, waters, digs, and ploughs most, is of course most successful. Wherever the Zamíndárs are of the castes, Ráin, Sani, Ját, and Gujar, there is more produced by them than by the Rájputs, Patháns, or Khattris. One remark applies to all classes, that if the Zamíndárs are rich enough to farm without the aid of money-lenders, they realize much more than a poor man can expect who has to farm on borrowed capital. At the time of sowing, most of the Zamíndárs are greatly dependent on these money-lenders, and if at this period any delay in getting a loan occurs, the proper time passes and a poor crop ensues. Too often the Mahájan then takes all the crop for payment of principal and interest; and there is no other profit to the Zamíndár than getting his daily bread. In short, the profit of farming goes to whoever lays out the capital."

This is a picture of the lot of an improvident cultivator; for their circumstances generally, in the Jullundur Doáb especially, are far better. I have heard it stated by an officer, very conversant with these matters, and who had once charge of this fertile Province, that the proceeds of the sugar crop were sufficient to pay the Government demand for the year; so that the whole produce of the rabi, and great part of the kharif, was clear profit to the Zamíndár.

Wheat and barley are sown by the drill, which is a wooden tube fixed to the plough, so that the last ploughing and sowing are simultaneous.

Maize is sown very carefully by hand, each seed about six inches apart; jowár, bájra, moth and oil seed are sown broad-cast. The distinction, however, with regard to the use of the drill, as reported by Mr. Davidson, "does not turn altogether upon the grain, but upon the soil, whether light or sandy, when drill husbandry is resorted to, or whether heavy and thick, when the seed is scattered by the hand. Jowár in the kharif, and the irrigated crops in the rabi, are generally sown by scattering the seed; whereas the other kharif crops and the unirrigated rabi crops, are sown by drill husbandry, which is of two sorts, one by the "por," a hollow bamboo attached to the plough, or by the hand (generally a woman's) dropping the seed into the furrow immediately after the plough, as it proceeds along. Maize is thus sown."

In the the kharif on an average five times. For jowár and dál only once; cotton, sugar-cane and maize, four or five times, or more. Tobacco is frequently weeded. These particulars refer principally to the Cis-Sutlej states. In Thánesar, sugar-cane is said to be weeded as many as "ten times, the poppy seven, tobacco five, cotton four, maize three, jowár and bájra twice. In the more extensive crops, as wheat, &c., the ground is not cleaned."

CHAPTER I, QUESTION 6.

Extract from the Settlement Report of the Umballa District, by MR. P. S. MELVILL, Settlement Officer, dated 1855.

91. The rainy season is the foundation of all agricultural operations. Common sense, as well as existing facts, point out the time when the soil has been softened by rain, as the period of commencing to plough. Were the hot season to be taken for ploughing, man and beast would suffer, and the yield of land would be comparatively nothing. The cold season is that alone, in which wheat, the staple food of man, will grow. The rainy season usually commences in "Asár" (about the middle of June).
92. Wheat is the staple commodity, and can be sown only in October, or at the beginning of the cold season. But land must be ploughed, at least, from eight to twelve times, before it is fit for the reception of wheat seed. Therefore it is manifest, that to rear a crop of wheat, the cultivator must commence his ploughing when the first shower of rain falls in Asár (June). This is the early rain of Scripture, as distinguished from the latter rain, which brought the sown wheat to maturity.
93. I have taken for my example wheat, as this is the grain, the price of which regulates, more or less directly, the general tariff of a country. But what has been said, with regard to wheat, applies equally to other products of the rabi harvest. In short, the rabi is the primary harvest. But, as I said before, to cultivate the rabi, the agriculturist must have had possession of the soil, from the month of Asár preceding.
94. Certainly nine-tenths of the land, in this part of India, is capable of bearing only one crop in twelve months. The soil, which can produce a succession of harvest every six months, is but a fraction of the whole. Therefore we must regard the first named kind of land alone in our discussion.
95. The land which has been relieved of its rabi, has not lost the chemical properties, deduced by the labour bestowed in the former rains. It is consequently capable of producing a kharif crop after the rabi, with but almost nominal labour. But when this kharif has been cut, the land will lie unsown for twelve months more; and it will not be till after the lapse of a year, that ploughing will again commence for another rabi.
96. *Thus, it appears, that in two years of 24 months, only two crops are grown. I state this as a fact. The universal custom of Upper India is, as I have mentioned it to be.
- CH.

QUESTION 6, CHAPTER I.

CH. I. Extract from the Settlement Report of the Montgomery District, by Mr. W. E. PURSER, C. S., Settlement Officer; Dated 1876.

The greater portion of the cultivated land of the District is watered from wells. The use of the "láo" and "charsa" is not known. Water is raised by the Persian wheel.

WELLS. GENERAL.

Area irrigable from a well in a year.

Wells are lined with brickwork, in which case they are called pakka; or they have no such lining and are known as kacha. The depth of the well to the water varies from a few feet in the "Kunds" and "Donás" along the rivers to about 60 feet in the Ganji Bár and the Sandal Bár. In map No. 6 the depth of wells in different parts of the District may be seen. The cost of a well and the area it can irrigate annually depend very much on the depth to the water. Map No. 4 shows the cost of and the area irrigable by a single-wheeled well in each of the circles in to which the District has been divided for assessment purposes. The area a well can water depends so much on the nature of the soil, the character of the season, the quality of the cattle employed, and the industry of the cultivators, that it is not possible to say the area irrigated is so much, neither more nor less. I measured a good many wells myself, and found the average area irrigated in the spring was just 3½ acres per yoke, in fair average soil, with water 25 feet from the surface. This would give about 25 acres as the area irrigated from a well, per annum. Lieut. Elphinstone gives 30 acres (para. 73); but he makes no allowance for double-wheeled wells, and there is no doubt some bārání cultivation was recorded at last settlement as cháhi; and pure well-land is not distinguished from cháhi-nahri and cháhi-sailába land. Including these last two classes, no doubt more than 30 acres might be irrigated from a well. Calculating as he did, the area watered by each well at this settlement was found to be 28½ acres, ranging from 15½ in Montgomery to 36½ in Dipálpur. The cost of constructing a single wheeled pakka well varies from Rs. 250 to Rs 550. In sinking a well a whole rather larger than the proposed brick cylinder is dug down to the sand. This is called "pár." Then a circular frame is laid down in the "pár,"

and the cylinder of brick and mud, or in rare cases of brick and lime, is built on it. When this has got a few feet above the surface, the sand and earth inside and under the "chak" are dug out, and hoisted up and thrown aside. As the cylinder sinks, it is built up at the top. The excavation, after laying down the "chak" till the water is reached, is called "tor." It is made by a class of men called "tobas" or "thobas." The "toba" is armed with a broad heavy pick-shovel like an exaggerated "kahi" or "kassi." This he strikes into the sand or earth, and when it has got a good grip it is pulled up with its load by those above. When the water is reached, the excavation is called "tobáie." On the water becoming deep the toba has to dive. The work is very hard, and he is fed in the most sumptuous way. As soon as the cylinder has been sunk deep enough, the parapet is completed and the wood-work put in its place. There is no fixed depth to which a cylinder should be sunk below the water level. If the chak rests on firm soil, a smaller depth will suffice than when the foundation is shaky. In a single-wheeled well the diameter of the interior of the cylinder will be ten to twelve feet, and the thickness of the brick-work from eighteen inches to two feet. Sometimes in sinking a well hard sticky clay occasionally mixed with kankar, called "jillhan," is met with. If there is much of this, it is found impossible to sink the large cylinder or "kothi," and a smaller one has to be sunk inside it. Similar smaller cylinders are sunk, when the water level in a well has fallen, or the bottom has given way. They are known as bachcha. The cost of sinking a well may be seen from the following statement, which is an abstract of entries in an account book. The well is 26 háths, or about 40 feet deep, and I presume of average breadth. It is one mile from the brick-kiln.

Cost of sinking a well. ment, which is an abstract of entries in an account book. The well is 26 háths, or about 40 feet deep, and I presume of average breadth. It is one mile from the brick-kiln.

	Rs.	As.	P.
Chak	11	2	0
Carriage of chak for 3 kos	0	13	0
Digging pár, seven háths	7	2	0
81,000 bricks, @ Re., per thousand... ..	81	0	0
Carriage of bricks to well	30	0	0
Tobás for digging to water, 5 háths	5	0	0
" " sinking well below water 12 háths	12	0	0
Masons for building 26 háths @ 1-8 per háth	39	0	0
Water carrier (brings water for mud, &c.) ...	9	8	6
Labourers' wages, @ 2 as. p. d. generally ...	43	14	0
Food of men employed on work	34	14	3
Tools	0	9	0
Leather rope, 1-12-0; another rope, 0-8-3 ...	2	4	3
Reed screens	1	10	0
Munj	1	4	6
Kuppa for carrying bricks	1	0	0
Charity: goat Re. 1; other items Rs. 2-12 ...	3	12	0
Gur, distributed for luck	3	4	0
Lungi and turban, given to tobás on completion of work	6	8	0
Another turban (not known who got it) ...	1	5	6
Miscellaneous	4	8	6
Total	300	7	6

The account begins with an item of Rs. 1-4-0 for gur for good luck, and ends with Rs. 2 given in charity. A toba will be fed in this way: flour, one ser four chittáks; dál; two chittáks ghi, two chittáks, sugar, three chittáks; and tobacco two chittáks; The labourers get some parched gram in the afternoon to encourage them. Wells are built sometimes large enough to allow of two Persian wheels working at the same time. Such a well is called "wári."

Double-wheeled wells
or "wáris."

Its cylinder has an interior diameter of about 15 feet. It costs about one quarter, or as much as one-third more, than a single well of the same depth. When water is near the surface, and the supply is good, such double wells are common. But where the water-level is deep, tenants dislike working at "wáris;" for the men working one wheel may be put to much inconvenience by those at the second wheel driving on their bullocks at an extraordinary pace, and so reducing the water-level below the limit reached by the buckets of the first wheel. In this District wells have no springs. They are filled by percolation. In some wells the water level is never much reduced—the

Water supply in wells.

water is then said to be pakka páni. In some the water-level is reduced by ordinary working of the well; the water in this case is called "ubkás." If a well is not subject to much influx of sand it is cleaned out once in 10 or 12 years, but otherwise in 5 or 6. The cost is only a couple of rupees. As long as the water is shallow, the cultivator does the clearance himself, when it becomes deep, tobas are employed. Kacha wells are not common. They are found only near the rivers. Sometimes they last very well—four or five years; but two years would be a high average. They are very uncertain, and may tumble in at any moment; and sometimes do just when they are wanted to mature the crops. From the bottom to a few feet above the water they are lined with a cylinder made of wood, or branches of pilchi or kána. They cost about 20 Rs., of which a little more than half is the cost of excavation. Such wells are the only ones found in tracts subject to serious inundations, as it matters little whether they are knocked in or not. The irrigating capacity of a kacha well is but little inferior to that of a pakka well.

Cleaning wells

Kacha wells.

Kacha wells.

The wood-work of a well is called "harat." This is the ordinary Persian wheel. It consists of many parts, the names of which are given in the accompanying glossary. The number of "kubbás," or cogs on the horizontal driving wheel, or, what is much the same thing, the size of the wheel, depends upon the depth of the well. It is always a multiple of 4; the usual number is 28; but where the water is deep, it rises to 32, and where water is very near the surface, it falls to 24. The more kubbás the easier work for the bullocks. The "jora" or horizontal and vertical wheels are made of kikar, but on the Ravi ukhán is sometimes used when there are only 28 kubbás. A jora of ukhán costs Rs. 20; of kikar about Rs. 30. The "máhal" or rope frame to which the buckets are fastened is made of múnj. Ropes made of dab grass are sometimes used. I saw them at Sayadwála. They last nearly a month. On an average 5 máhals are required in a year, and cost about Rs. 2 each. In kacha wells the máhal is subjected to rougher treatment than in a pakka well; and so 7 or 8 máhals are used up in a year. The size of the water-pots depends on the depth of the well,—the deeper the well the smaller the pots. Where wells are deep there will be 11 or 12 to the háth of depth; where shallow, 9 to 10. The usual number is 10 or 11. There seems to be some relation between the number of pots to each "háth" and the radius of the "báir," expressed in "muths" or the breadth of the fist across the lowest knuckles. Parts of the harat are commonly oiled. These are the cogs of the vertical and horizontal wheels, where they touch, the end of the axles of both wheels touching the bharunní and the makra. Concerning "jhallárs," Lieutenant Elphinstone says, (para. 77) :—

The harat or Persian wheel.

A jhallár is merely the Persian wheel of a common well transferred to the bank of a canal, the margin of a jhil, or the high bank of a river. A small pool is excavated immediately below the jhallár to collect the water, and afford the wheels a sufficient surface to work upon. As almost the whole expense consists in the wood-work, jhallárs are constructed in great numbers and abandoned again without materially affecting the prosperity of the Zamindárs. On the banks of the Deg river, which are high and narrow, they are in universal use. They are also frequently met with in favorable situations on the Ravi and Sutlej, but the cultivation depending on them in these situations is very precarious. They are very generally employed on the Khánwah canal, but they can only be used there for kharif crops, as the canal contains no water from October to April. Compared with wells, their irrigating capabilities may be estimated at about one-half, their situation on a bank naturally depriving them of about one-half of the circle which would surround a well; to which may be added, that the supply of water on which they depend can never be compared, as regards permanency, with that of a well.

This comparison of a jhallár with a well is not correct. A man will not work a jhallár if he cannot depend with tolerable certainty on the supply of water he requires. And as to the irrigating capability of a jhallár being only one-half that of a well, because its situation deprives it of one-half the circle surrounding a well; on the same principle, a double-wheeled well, with 12 yokes of bullocks, would irrigate only as much as a single-wheeled well with six yokes. In the case of an ordinary jhallár, the water is much nearer the surface than in an average well, and so the jhallár will irrigate much more than the well; at least half as much more. But perhaps all that is meant is that, for assessment purposes, the value of a jhallár is half that of a well. If so, in the absence of any reliable information on the subject, the estimate may be accepted.

A "kámil," or thoroughly found well, has six yokes of two bullocks each. In some cases there are as many as eight yokes, but the average is under six. If the well is fully yoked there are, as a rule, more, than one set of cultivators. In this case they take turns at irrigating. These turns are called "váris" or báris. The length of each "bári" depends on the number of yokes and the aridity of the soil. The more yokes the longer each "bári," the drier the soil the shorter each turn. The length of the bári is generally six hours in Montgomery, 12 hours in Pákpattan and Gugera, and 24 hours in Dipálpur. If there are eight yokes at a well, each will work one pahar or three hours; if there are six, three will work during the day, the

Váris—method of working a well.

I-6

others during the night. If there are four yokes each works one pahar and a quarter; and when the fourth yoke has done its work the first begins again. Four yokes can keep the well going day and night, less than four cannot. A well with six yokes will irrigate about 5 kanals, or $\frac{1}{3}$ of an acre of fair gasra

land in 24 hours, when the water is 25 feet from the surface. The deeper the water and the more sandy the soil, the less the area irrigable. About one acre of sikand could be irrigated by the same well in the same time. During the hot months, irrigation is carried on only during the night. In the cold weather, each well is a small village in itself. The cultivators with their families, cattle and goats, reside at it. Sheds are put up for the cattle, and feeding troughs prepared; fodder is collected in circular stacks made of cotton-stalks (called "palla"); the oratory or "tharha" is put in order and strewed with straw; and every one settles down to five months' hard work. And, standing out in a slushy field in one's bare legs, a couple of hours before sunrise on a January morning, with the thermometer marking 10 degrees of frost, opening and closing the water-courses leading into the little beds into which the fields are divided, is not the work those people would choose for themselves who are so fond of calling the natives lazy.

The overflow of the rivers is called "sailáb." The flooded land is "sailába" land. The area flooded varies greatly. Since last settlement, a permanent decrease has taken place in the area inundated. Formerly it was 156,585 acres; the present measurements showed only 82,412 acres. The cause of this decrease is not clear. There may be less water in the river than there used to be; and there certainly has been a series of dry years. The Sutlej has set towards the west, covering what was once cultivated land with sand; but this has occurred in very few places. Something is due to the silting up of nullahs like the Bakhilwáh and Dhing. Changes in the course of the rivers are probably as much the cause as anything. In 1852, the Ravi changed its course, going to the west; and a serious decrease in the sailáb took place in consequence, in Gugera. In 1853 the Sutlej carried away a projection of stiff clay soil on the Baháwalpur side of the stream which had acted as a sort of dam, and the result was an immediate diminution in the sailába lands of Pákpattan. Similar changes may have occurred since last settlement, though there is no record of them. Whatever the cause may be, the result has been most disastrous. In many instances, what Lieut. Elphinstone anticipated, has followed on the failure of the sailáb; the abandonment of the greater portion of the well-lands in the sailába regions. If there is one thing a Ját likes nearly as much as his buffaloes, it is a fine fat piece of sailába cultivation. The flood saturates the land and leaves a deposit of rich mud. When the river goes down and the sowing season comes, he ploughs up the land and puts in the seed, and then can rest himself till the crop is ripe. If the saturation has not been thorough and the winter rains are not good, the out-turn will be poor; and it may be needful to work the well (if one happens to be near by) to bring the crop to maturity. The principal sailába crop is wheat. Very few kharif crops are, from the nature of things, grown on sailába land. Sometimes the land remains under water so long that it cannot be cultivated in time for the next spring harvest. This occurs only in very low-lying spots. The floods of the Ravi are more beneficial than those of the Sutlej as stated in para. 5 Chapter I. In some instances land is found along the rivers sufficiently moistened by absorption, though not flooded, to "produce crops, without any further watering." This absorption or percolation is called "ugáj." It is "ugáj" that causes "kallar."

Result of the failure of sailáb
Sailába cultivation.
Ugáj.

There is, properly speaking, no bārání or rain cultivation. In a few villages on the Lahore border there may be a little in good seasons. But there are numerous depressions in the ground into which the drainage water of the neighbouring high-lands pours, and in these depressions crops are grown without further irrigation. The area thus cultivated, and the quality of the produce, vary with the season. In autumn "til" and moth are usually sown; in spring, wheat and gram. The total rain cultivation within village limits was found to be only 24,898 acres, or $6\frac{1}{2}$ per cent. of the cultivated area. But though the rain cultivation may be scanty and of no great value, it is an entire mistake to say that "drought, which, in regions that depend much on rain, forms the chief cause of distress, is not likely to affect materially the resources of this District" (Gugera Settlement Report, para. 124). There are few Districts in which drought is more mischievous. Cattle die of starvation; the survivors give scarcely any milk, or are unable to do any hard work. "Dhagge turde nahín"—the bullocks cannot get along—is the complaint of every cultivator. The result is that the cultivated area is about half what it is in a good year. Then the white ants commit serious ravages when there is no rain; and the yield of the crop is poor. Besides, the unfortunate agriculturist, instead of growing food for himself, has to grow an extra quantity of fodder for his cattle, and support himself and family on what he can borrow or steal. Again, cultivation is so expensive and requires such large means that, if once beaten down, the cultivating classes find it much harder to recover themselves than in purely bārání districts. The remarks made by Mr. Morris, in the Gujranwála Settlement Report, para. 16, apply equally to this District, and are undoubtedly correct.

If possible in ploughing, several ploughs are brought together in the same field, as bullocks work better in company. The furrows are straight. It is quite an unknown thing to plough in curves. The ploughman should make his turrows as long as possible, according to the saying:—

Lamí usri haliyán, chhotí laví hár.

Long "tacks" for ploughmen, short for reapers. A plough will break up 4 kanals of sikand or 5 kanals of gasra in a day. On the 5th, 7th, 9th, 10th, 21st, and 24th of each month, the ground is

supposed to be sleeping, and it is not considered lucky to commence any agricultural operations on these days; but, once began on another day, there is no objection to going on, whether the ground is asleep or not. Sunday, Monday and Thursday are the best days on which to commence sowing. Most crops

are sown at once in the field in which they are to grow. They are sown either broad-cast, or with the drill. In unirrigated lands such as *sailába* and *báráni* lands, and where there is much "kallar," the drill is used. In "kallar" soil, the object is to get the seed below the mass of the "kallar," which is found usually at the surface; in *sailába* and *báráni* lands the object is to get the seed into a stratum that will not soon dry up, and to shield it from the influences of the weather, which would often prove fatal to it in unharrowed and unrolled fields. Some crops are, however, always sown broad-cast. When the seed is very small, like that of poppy and til, it is mixed with earth before being sown, as otherwise it would be difficult to distribute it equally. Cotton seeds are smeared with cow-dung to keep them from sticking together. Some crops are grown from seedlings (*pantri*) raised in nurseries: such are tobacco and pepper, and rice on the Deg. Sugar-cane is grown from cuttings. In broad-cast sowing the seed is held in one end of a sheet coming over the left shoulder; the other end, after passing under the right shoulder, is tucked in under the end on the left shoulder. Seed is not changed and is said not to deteriorate. But I was told once on the Ravi that deterioration has been noticed. A drill will sow nearly one acre in the day. After ploughing, fields that are to be artificially irrigated are harrowed. The clods are broken and pulverized and the surface smoothed down, at the same time that the seed is covered by means of the *sohága*. This is drawn backwards and forwards by a couple or four pairs of bullocks, and answers its purpose very well.

Harrowing—clod-crushing. The man guiding the bullocks stands on the *sohága* to increase the weight brought to bear on the clods. Weeding is admitted to be a good thing, but is very rarely practised. Any thing more disgraceful than some cotton fields can hardly be imagined; here and there a melancholy bush in a jungle of weeds. Weeding is done either with the *kahi* or *ramba*. In the former case the ground is dug up as well as weeded. When the *ramba* is used it is not uncommon to manure the roots of the plants at the same time. The former operation, which may be called hoeing, is known as "godikarna," the latter as "choki karna." Fields are not usually fenced near the village; and along roads where cattle are constantly passing, fences are made of branches of *kikar*, *karil* bushes, thorns, in fact of any thing that comes handy. In river villages fences of *pilchi* are not rare, where wild pigs are about. They are made by sticking stout *pilchi* branches into the ground and weaving smaller branches in among them. When young some crops have to be protected against deer and other animals. For this purpose scare-crows, called "daráwa," are put up. Bones, heaps of stones, strings fastened to sticks, are the usual

scare-crows. But plastic art occasionally shows itself in the form of a straw man with one leg, and arms stretched out at right angles to it; gram, poppy, melons, *charri*, and wheat have thus to be protected. When the crop is ripening, birds have to be kept away from it. In the case of *jowár*, *makki*, and *báira*, a platform called *manna*, is raised on stakes or fixed on the top of a tree; about 10 or 12 feet from the ground, or a mud pillar ("burji") is raised to that height, and on it a watchman stands, armed with a "khabáni" with which he slings mud pellets made by himself at the birds. Each time the sling is discharged it causes a crack, and the watchman yells. One person can watch about 2 acres this way. Poppy is watched with the *khabáni*, but the watcher does not use any platform. Wheat, gram, barley and moth are also watched, but not with the *khabáni*, nor is the *manna* in use. The watchman is provided with a long hempen rope, called "títála," with which he goes wandering about the field. Every now and then he whirls it round his head and brings it down with a crack. One man can watch about 10 acres this way. The fields are watched only at night in *Asu* and *Kátik*; *Phágan* and *Chert*. The watchmen are mostly *machhis* and *meahs*. They are paid 3 *mans* (tops), or about 2 *pakka mans* for each harvest. Reapers are called *láwa*. They belong chiefly to the class of village servants. But they do not confine themselves to their own village. They go wherever they can get work. The usual pay is one *pái* (7 sers *pakka*) of grain, or 4 *annas* in cash, per diem, with five sheaves.

Reaping. An ordinary reaper will cut down one *kanál* and a half in the day; a strong and practiced hand will do as much as 2 *kanáls*. The *kanál* is half a rood. On an average, 5 men will cut down an acre in a day. Reaping is carried on during moonlight nights in the last few hours before day if the straw is very dry, as the moisture of the night air is supposed to strengthen the stalk and prevent the ears falling off. If clouds gather, great efforts are made to get in the crops, as hail is much feared at this season; but hail is very uncommon in this District. Sunday and Wednesday are lucky days to commence reaping. As soon as the grain is cut it is stacked. The reaper gets his share when the crop has been threshed and is divided. He is paid from the "dheri" *shámilat* or common heap. There are several ways of threshing. The most common is to yoke a number of bullocks together, fasten the one at the left hand of the line to a post, round which the straw to be threshed is piled, and drive them round and round from right to left. This is known as "khurgah ná gáhna," to thresh by the trampling of hoofs. Wheat and barley are first threshed with the *phalha*. A pair of bullocks are yoked to the *phalha* and driven round the stake about which the straw is heaped; there may be several *phalhas* at work on after the other, but there are never more than four. One man is required with each, and a couple more with *tringals* to throw the scattered straw back into the heap. One pair of bullocks with the *phalha* will thresh the produce of a quarter of an acre in a day. They will work 8 hours at a stretch from 8 a. m. to 4 p. m. in the sun. Buffaloes are never used for threshing (see para. 9, Chapter III.). When the wheat or barley has been threshed with the *phalha*, the straw is shaken up with the *tringal*, and is blown on one side, while the

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grain falls to the bottom. Many unthreshed ears are found, and these and the grain are called "send." They are again threshed "khurgáh náI" without the phalha. Generally there are four bullocks in a row, and two rows may work at the same time. Each row is called "merh." Only wheat and barley are threshed with the phalha. Rice, jowár, china, kangni, masar, churál and zira are threshed by bullocks. The straw is then shaken and the grain winnowed. Moth, mung, máh, and rahwán are treated at first as wheat is after the preliminary threshing, and after being well shaken are threshed by bullocks; gram is treated as wheat, but both threshings are by bullocks. Til is not threshed at all; the pods open and the grain is shaken out; makki, sonf, and dhanía are threshed with sticks. China is often threshed in this way. A hole about 5 feet wide and 2½ deep is carefully plastered. The thresher takes a bundle of china straw by the side where the roots were, and beats the ears against the side of the hole. Or else a piece of ground is swept and a log of wood put on it, against which the ears are beaten. One man is required with each merh, and there should be one man with a pitchfork for each heap. Eight bullocks will thresh 2 acres of gram, jowár, churál or masar, or one acre of rice, china, or kangni in one day.

Winnowing.

"Khurgáh náI" threshing and winnowing should be carried on, if possible, when there is a hot wind blowing and a fiery sun blazing overhead, as the thorough breaking up of the straw and separation of the grain are facilitated by these circumstances. There should properly be three persons winnowing. One fills the chajj and gives it to another, who shakes out the contents to the wind; the third sweeps down from the heap forming below all the bits of sticks, earth, straw, and unthreshed ears, which are found in the heap after threshing. From the

Goblins.

time the grain is cut till it is finally weighed, the agriculturist has to be on his guard against "bhúts," or demons and goblins. Fortunately they are of but middling intelligence, and their principal habits are well known, and so a "goblin" can be "done" with a little care. Till winnowing all that need be done is to get the "mulwána" of the village to write a charm on a piece of paper, which is then stuck in a cleft piece of kána and put on the heap of grain and straw. This is paid for by a fixed fee called rasulwáhi. Híndús are said to neglect this precaution, unless there is a "mulwána" in their village. Greater care has to be taken when winnowing commences. Friday is the regular weekly holiday of the goblins, and if any cultivator commences to winnow on that day he may expect to have his grain vanish. When a fit time has come to winnow the grain, the cultivators and a couple of chuhras proceed in silence to the heap, and a couple of other men stay at a little distance to prevent any living thing approaching. Their winnowing is carried on vigorously but no one speaks. In the evening if the operation is not complete, the charm remains on one heap and the other is carefully pressed down with the chajj. Goblins are always asleep at night, but any somnambulist is unable to do harm if this plan is adopted. When all the grain has been winnowed and the time comes to divide the produce, the same precautions are adopted. As the goblins are always asleep, or engaged on household duties at noon and the evening, one of these hours should be selected for weighing the grain; this is done with the topa; or, if there is any hurry, the amount of a chhajjfull is ascertained, and the number of chhajjes in the heap is found. The weighman is provided with pieces of straw, one of which he puts down for each topa, or chhajj. He must carefully avoid counting the number aloud. As soon as the quantity of grain has been ascertained, the goblins are powerless. It is not clear how far the people really believe in these matters, or how far they act up to their belief. But there are very few who do not believe most thoroughly in goblins being abroad, though they sometimes seem shy about admitting it.

Manured land has been recorded as "gorha." This term is commonly used, but the proper name is said to be "niáin." Some crops are always manured, such as tobacco and most vegetables; some are never manured, and some only occasionally. The total manured area is only 16,158 acres or 4¼ per cent of the total cultivated land. Most of the manured area is under wheat. Manure is supposed to force the straw at the expense of the ear; and as plough-cattle have to be fed on green wheat, it is an advantage to have a thick crop of stalks. Manure consists of the excrement of cattle, horses, sheep, goats and human beings, and all sorts of refuse thrown on the village or well dung-heap, or of ashes; or of kallar, obtained by scraping up the earth on the sites of old villages or brick kilns, or where saline matter appears in streets and lanes. Buffalo's dung is considered the best of all manures especially for tobacco, as it increases the size of the leaves. Droppings of sheep and goats are usually put in tobacco trenches. The tobacco acquires an acrid and pungent taste from this manure. The quantity of stable manure used depends much on a man's means. I think about 10 tons an acre a fair average. From one to two "borás," weighing about one maund and a half each, are applied to each marla; that gives from 240 to 480 maunds per acre. The dung-heap is removed twice a year; the cold weather heap in Phagan and Chetr, for tobacco, cotton &c.; and the hot weather heap in Asu and Kátik for wheat. Such manure is called "áhal." A fire of cow dung is always burning at each well. The ashes are used as a top dressing for poppy, zira, methra and ság. Four borás go to the kanál. A bora of ashes is reckoned at quarter of a maund less than that of áhal. So nearly a ton and a half of ashes go to the acre. Ashes are called "suhá." "Kallar" is applied to tobacco, pepper and cotton; and to wheat, barley and onions. It is put to the roots of the first three, and scattered over the others; as regards wheat and barley, when they are about 18 inches high, about 24 hours before they are irrigated, generally in Mágh. Seven or eight borás are put on one kanál. The people collect the kallar themselves, and do not buy it. No attention is paid to the difference in soils in choosing what manure to apply. No manure is used but those kinds mentioned above.

There is no regular system of fallows or rotation of crops. No attempt is made by alternating the crops to refresh the powers of the soil. Land set apart for spring crops will be cultivated with the same crop year after year; similarly land

Fallows. Rotation of crops.

appropriated for autumn crops. The only attempt at a rotation of crops occurs in the case of rice and gram. In rice cultivation the ground gets very little air, in gram cultivation a great deal, so gram succeeds rice, and rice gram, and the soil is benefited. The leaves and roots of gram are said to be good for rice; and then, as the ricelands are moist, they can be ploughed up for gram without any further trouble as regards irrigation. Manured lands may be cropped harvest after harvest till the effect of the manure is exhausted, but most land is cropped only once in the year; after some time the land gets an extra fallow. Forced fallows, owing to want of cultivators to till the land, are in most places only too common. Owing to some crops not being off the ground, when the time for sowing others arrives, the latter cannot immediately follow the former. For this reason, excepting cotton, kangni, rice, sawánk and makki, none of the kharif crops are followed by rabi crops; and the same remark applies, *mutatis mutandis*, to china, as a rabi crop. Cotton may be followed by methra and sinji; rice, and sawánk by gram, chupál, masar and coriander; and makki by all the rabi crops. Kangni is held to exhaust the soil so no rabi crop follows it. As regards the spring crops, sarhon, poppy, tobacco, onions, melons, methra, and sinji may be followed by any autumn crop; wheat and barley by cotton, jowár, moth and til; gram and coriander by rice, sawánk and máh; zria by moth; churál by sawánk, máh and mung; and masar by almost all the autumn crops.

I have said nothing hitherto concerning the yield of the different crops. Indeed, there are very few of them the yield of which is known even approximately. It is utterly useless enquiring from the people. They reply with the most bare-faced and self-evident falsehoods. Now and then a man may be entrapped into a damaging confession, or a simple-minded cultivator may blurt out the truth; but such cases are rare. One may make experiments, and cut down crops and thus get at the truth; but unless one does so one's self, the results are untrustworthy. No native has the least idea of the necessity of minute accuracy; so that if he really does cut down the crop, and does not make simply a paper experiment, the result is sure to be vitiated by his inaccuracy. It is, however, impossible for a European officer to do much in the way of making experiments, especially for a Settlement Officer, who is constantly on the move and cannot drag his crop about with him. He may be obliged to go to an inland tract just when the river crops are fit to cut. As regards some crops, such as cotton, sugar-cane, hemp and pepper, it is impossible to ascertain, by actual experiment, what the out-turn is, unless one can give up weeks to the task. And at the best, only a small portion of the field can be reaped; and it is very unsafe to assume that the out-turn of the whole field will be in proportion to that of the small portion, let alone the out-turn of a tahsil for a series of years. Concerning a few crops, I have been able to form an opinion; partly from actual experiment, and partly from enquiry; and I will state what I think the out-turn on an acre of average soil, when the crop has been fairly cultivated, and has not suffered from, or benefitted by an unusual season. Irrigated wheat produces 16 maunds, or about 1,300 lbs. per acre. Barley, by all accounts, produces one-quarter more than wheat; so it ought to yield 20 maunds, but it does not get as good treatment, and may not produce so much. Rice gives 17 or 18 maunds of cleaned grain. Kangni produces 14 maunds per acre; but the out-turn varies very much. I would put the yield of china at 12 maunds. Cotton produces 6 maunds or, roughly speaking, 120 lbs. of cleaned fibre. Lieutenant Elphinstone puts the yield at 12 maunds, or 240 lbs. of cleaned fibre. I believe that new land on the Ravi will produce that much, and 10 maunds on the Sutlej; but in a couple of years, the out-turn falls off by at least one half. Poppy produces six sers of opium, or 3 maunds of *post* and 3 maunds of seed. Tobacco produces 25 maunds of green plants, which will dry down to about 6 maunds. An acre of turnips sells for Rs. 24. Lieut Elphinstone says they sold at 1,600 to 3,200 lbs. per rupee. Assuming the highest price now, the yield would be nearly 17 tons, about one-half less than the English average, including tops in both cases. But I doubt if three maunds are produced in the marla. As regards other crops, I can give no opinion that would be of much value.

At a well, fully yoked, irrigating about 25 acres in the year, the land will be laid out somewhat in the following fashion. Three-quarters of an acre of early china or charri at a well will be sown to bring the cattle over the end of the hot weather and commencement of the rains. Half a kanál will be put down under vegetables of sorts. The regular autumn crops will be an acre, or an acre and a half of cotton; the same of charri; one acre of china or kangni; half a kanál of pepper; and 2½ to 3½ acres of jowár. The regular spring crops will be 2½ acres of turnips or sarhon; 15 acres of wheat; and one kanál of tobacco. This scheme gives 6½ kanáls of intermediate crops; 6 ghomáos (or acres) 4½ kanáls of autumn crops; and 17 ghomáos 5 kanáls of spring crops. Often no china or kangni is sown in the autumn, and sometimes a couple of acres of barley may be put down in place of as much wheat. The crops invariably cultivated are cotton and jowár in the autumn; and turnips and wheat in the spring. On canal-irrigated lands there is no custom as to what crops should be sown, or as to the proportion of each to the others; and cultivation on sailába lands depends on the character of the inundation.

QUESTION 6, CHAPTER I.

Extract from the Settlement Report of the Shahpur District by COL. W. G. DAVIES, Settlement Officer, dated 1866.

The subject of rotation of crops and other means of increasing the productiveness of land have lately attracted attention; I shall therefore add here the results of my observations on these interesting topics. It is almost needless to remark, that nothing approaching scientific farming can be looked for in a country where the people are both ignorant and firmly wedded to traditional rules and customs, and where (from the fact that while for centuries the population has not sensibly increased, land has been available in quantities more than sufficient to supply the wants of all), the same stimulus to exertion has not existed as in our own country, with its limited extent of arable land, and rapidly increasing population. But it must not therefore be assumed that the people are ignorant of the ordinary processes of husbandry. The fact is that experience here, as elsewhere, has taught them all that is perhaps needful for them to know in their present circumstances. That such is true as regards this District, and that the practice of the agricultural population has modified itself everywhere throughout this tract, to suit particular conditions of each portion, I will now endeavour to show.

The ordinary means by which the productive powers of land are economized, increased, and renewed, are (1) rotation of crops, (2) manuring, and (3) fallows. Let us now see how far the conditions under which agriculture is carried on in this District, compel a resort to any of these aids. And first, as regards the sailáb cultivation along the rivers. Here nature allows of no interference, but makes and mars as she wills. As soon as the crop is cut, the river rising inundates the land, and when she retires, it is found that a deposit of sand, or one of alluvium, of more or less richness, has been left. If fit for cultivation at all, the land is practically new, and as such requires no extraneous help to increase its fertility, and the crop that is most valuable (wheat) is grown year after year without intermission.

But on passing out of the range of the river floods, and entering the tract where tillage depends on artificial irrigation, the case becomes altogether altered. Here we have a number of fixed circles (with wells as their centres,) beyond the circumference of which cultivation cannot ordinarily pass, and the area being limited, each of the aids to agriculture enumerated above is successively brought into play to obtain from the soil as large a return as possible. It will perhaps not be uninteresting to describe briefly the system generally pursued to effect this; suppose for example that fifty acres of land are attached to a well, of this twenty acres will be sown with spring crops, the same extent of land is lying fallow, prepared for cultivation, together with ten acres sown during the preceding kharif. After the spring crop is cut, half of the same land will be sown with autumn crops, and for the next rabi there will be the twenty acres which have been lying fallow. This will leave half the land lately under spring crops, and ten acres of the previous kharif to form the fallow, which will receive repeated ploughings and manurings, till its turn comes round to be cultivated again. By this means each plot of land receives rest alternately once for three, and the next time for four harvests. On a well of this size the proportions in which the ordinary crops are grown would be as nearly as follows:—

Rabi	{	Wheat	...	...	...	14	Acres.
		Barley	...	...	...	2	"
		Poppy	...	...	...	1	"
		Turnips for feeding bullocks	...	...	...	3	"
				Total	...	20	"
Kharif	{	Cotton	...	...	...	3	Acres.
		China	...	...	...	1	"
		Bájra	...	...	...	1	"
		Chari for bullocks	...	...	...	5	"
				Total	...	10	"

The above exhibits the internal economy of a well in regard to the matters under discussion, and one general rule may be deduced from it that, an autumn crop may, and often does, follow a spring crop in the same land, but the converse of this is never seen.

I pass on to the salt range, and the tract at its base. In the former the soil is ordinarily too rich to require a lengthened repose; that within the immediate influence of the hill torrents, called Háil, like the alluvial tracts bordering the rivers, is fertilized at short intervals by the deposits brought down by the streams, and yields double crops in never ending succession; and for the remainder experience has shown, that a fallow extending over twelve months, during which the surface is repeatedly turned up by the plough, is amply sufficient to restore it to full vigour. The invariable rule in these lands is that an autumn follows a spring crop, and then the land is allowed to lie fallow for a whole year. The Zamindárs say, that the bájra which

usually follows wheat here, restores the productive powers of the soil, but this must not be understood too literally; they mean probably that bájra is the one crop of all others which least unfits the land to produce wheat; and here experience has doubtless taught them aright. It may be added, that the use of manure is little known throughout this part of the District. In the plains along the base of this range, land is so plentiful, that the site of cultivation is shifted very often; three years fallow succeed three years cultivation, but the crops are nearly always the same; wheat and gram for the spring, and bájra with, perhaps a little cotton and pulses, for the autumn crop. The only exception to this rule is in the "naládár" land the "háil" of the plains, which from being twice in the year covered with a rich deposit of alluvium, brought down by the torrents after rain, is enabled to produce annually two crops without requiring any rest. Here also the use of manure is ignored, nature having provided a better substitute.

Ch. I.

**AGRICULTURE OF THE JHELM DISTRICT, AS DESCRIBED IN THE
ASSESSMENT REPORT DATED 10TH JANUARY 1878.**

33. The system of agriculture differs according as the land is Chahi, Sailab or Barani. Chahi is land irrigated by wells; Sailab is alluvial land annually inundated by the river floods; Barani is land which gets no water besides the rain.

System of Agriculture different on Chahi, Sailab and Barani Lands.

34. The Sailab lands of which I am speaking now are the alluvial lands on the immediate banks and in the bed of the River Jhelum, included in Tehsils Jhelum and Pind Dadan Khan. Sailab lands are almost entirely cultivated with wheat, year after year. A little Barley is grown on the poorer lands; and on those least exposed to the action of the autumn floods some Bajra and Chari. But on the real Sailab lands nothing but a Rabi crop is possible owing to the summer inundations. On half formed land coarse rice and Sawak is sown, but the area so treated is scarcely worth notice. Also on such lands, if Barley and Rice are sown together in October, the rice will not germinate till the river rises again the following summer, but this also is mere catch cropping, and the rice so grown is coarse and poor. In short the system on these sailab lands is to take one Rabi crop each year; which crop is usually wheat. Some of the wheat crops thus grown are very fine; but others especially in rainy seasons are poor and short. And I have seen a great deal of such land much choked with thistles and other weeds. Sailab land is not usually manured, and owing to its situation between branches of the river and liability to floods it cannot receive the frequent ploughings by which the condition of the Barani land is so much improved; nor indeed does it need such ploughings except to clear the land of weeds.

That on Sailab Lands.

35. With a few exceptions noted below the irrigation is entirely from wells. The system of cultivation followed on these lands in the Pind Dadan Khan Tehsil and in the rest of the district differs.

System of Agriculture on Chahi land.

36. That Tehsil excepted, the wells of the district irrigate very small areas. On the banks of the ravines which drain the Jhelum, Chakwal and Talagang Tehsils are commonly found lowlying strips of alluvial land, in which wells, can be sunk at little cost; similar wells are also sunk on the frontage of the Jhelum river between the bed of the Bunhar and the Jhelum town; and there are a few in the plain round Jhelum. Some of the best are at Domail and at Rohtas on the Kahán, in the Kulian, Kas, and near Badshahanj; round Dullá (T Chakwal) and Jabbi (T Talagang) on the banks of the Sohán; and on the Ankar at Tamman (T Talagang). Though these wells are small and poorly equipped in cattle as compared with the wells of the Panjab; the lands irrigated by them yield steadily 2 crops a year; except in the River bank and plain circles of Tehsil Jhelum, where the double cropping is not so steady, but even here it extends to more than two-thirds of the irrigated land. The principal crops are (as shown in above statement) wheat, barley, vegetables and tobacco in the Rabi; and Bajra, Maize, Cotton and Vegetables in the Kharif. These lands are all well manured; and they are for the most part in the hands of Malliars, the

Chahi system of the district, the Pind Dadan Khan Tehsil excepted.

most industrious agriculturists in the district. On the other hand, some of the wells especially those in Tehsil Talagang are poor; and those of later construction are not (like the old ones) always in the hands of Malliars, but have in many instances, been sunk by agriculturists who are less able to make them profitable.

37. In the Pind Dadan Khan hills 876 acres are irrigated: viz 178 acres by wells, principally at Wagh, of the same character as those above described; and 698 acres by springs.

About $\frac{1}{3}$ of the land irrigated from springs is returned as bearing 2 crops a year. Some of the cultivation is rich; as at Choa Saidan Shah and at Kallar Kahar (now in the Chakwal Tehsil); but its value varies with the supply of water and the character of the cultivators. The cropping is very similar to that on the well lands previously described.

38. The well irrigation in the Pind Dadan Khan plain area, 18117 acres, is for the most part in the vicinity of the river.

The average area irrigated per well is 16 acres; depth to water 15 feet; cost per well 200 Rs. 31 per cent. of the cultivated area of the River bank circle is thus irrigated. All the available manure is given to the well land, and about $\frac{1}{3}$ of the irrigated area is manured. The land so treated is usually that nearest the well. The system of cultivation is to reserve a small plot for sugarcane; an acre or so for turnips; one or two acres for cotton; and to sow the rest with wheat. After the wheat has been harvested, a limited area (a third of the whole), is re-sown with Maize bajra and Charf. Thus the whole area bears one good crop; and about a third which is manured bears a 2nd crop. The cultivators look for their profits principally to the wheat crop. Some of the sugarcane is pressed, and some given to the cattle; it is of poor quality. The turnips are grown for cattle fodder; and the bajra Maize and Charf for the most part serve the same purpose.

39. It remains to describe the system of agriculture on the barani lands, which are 94 per cent of the area of the district.

The prevailing systems of cultivation are two:

(1.) A 2 year course, which rests each acre for a year and then takes 2 crops the year following. This prevails in Tehsil Jhelum and nearly all Tehsils Chakwal and Pind Dadan Khan.

(2.) A system under which the Rabi and Kharif lands are separate and are each cropped once a year. This prevails in Tehsil Talagang, and in a few villages at the North West corner of Tehsil Chakwal.

40. The 2 year course on the barani lands of Tehsils Jhelum, Chakwal and Pind Dadan Khan is as follows: The Kharif crop having been harvested at the beginning of November, the land lies over for 2 months until the Loi holiday (1st Magh—12th January), shortly before which the land has usually received a good fall of rain. From this date the cultivator ploughs and reploughs the

land, as often as he has leisure inclination and opportunity, for nearly 9 months to the end of September. Land under this treatment is spoken of as "*Warihal*". In the Jhelum and Pind Dadan Khan Tehsils and in the Lundi Patti of Tehsil Chakwal, land is usually ploughed over 8 or 10 times during this period and in Dhanni about 4 or 5 times. The process completely clears the land of weeds; and in the better cultivated tracts brings it to a fine condition of tilth. From the end of September Rabi sowings commence. When the Rabi crops have been cleared in May (the land is then termed "*Narka*") the first opportunity is taken to plough the land over 2 or 3 times and then a Kharif crop is sown. Under this course if regularly carried out, an agriculturist will in each year take a Rabi and Kharif crop from half his cultivated land, the other half being at rest under ploughing; that is to say he gets one crop per annum per acre cultivated but the course of cultivation is so arranged that each acre rests every other year. The system is extremely well suited both to the climate and to the circumstances of the people; and the 9 months' rest and ploughing which each acre should get every other year must go very far towards supplying the place of manure; for the ploughings besides completely clearing the land of weeds, by pulverising the soil and by exposing it freely to the action of damp and of the atmosphere, accelerate the decay of insoluble matter and its conversion into plant food; so that land treated in this way for 9 months probably gains as much good, as if it were left for twice the time in unploughed fallow.

41. I have described the system as it is followed by the best cultivators.

Variation from this course. Speaking roughly in Jhelum the full agricultural course is well carried out, but in the Pind Dadan Khan Tehsil a third of the land cropped each year yields no Kharif crop, and in Chakwal a half. The main reason of this is the shorter rainfall of these 2 Tehsils. The shorter the rainfall, the greater the difficulty in raising Kharif crops on the lighter soils. In the Chakwal Tehsil, especially there is a great deal of light soil. And Zemindars contending annually with difficulties of this sort learn to limit or expand the Kharif sowings of each year according to the opening promise of the season. On the other hand there is of course a certain amount of carelessness and bad cultivation; and occasionally attempts to grow the more valuable wheat crops year after year, by omitting the Kharif, (as is commonly done on the barani lands of the River Bank Circle of Tehsil Pind Dadan Khan.) But these are minor points. The main point is, that in proportion as the Kharif rainfall is short, the lands suited for Kharif crops will be limited by the exclusion of the lighter soils and by the selection of those of a more loamy character and which receive drainage, from lands lying above them. This is the same lesson as is indicated by the agricultural system of the Tallagang Tehsil, which I proceed to describe.

42. The other system, under which the Rabi and Kharif lands are

System of barani cultivation in Tehsil Tallagang and a few villages in the west of Chakwal. separate and are usually each cropped once a year prevails in Tehsil Tallagang and in a few villages of the Babial and Chach Ilakas in the west of the Chakwal Tehsil. In these tracts the higher and sandy lands are reserved for the Rabi and the lower more loamy lands for the Kharif. The country between Lawá Tamman and Tallagang lies in broad gentle undulations, the crests of which are light sandy soil, and the hollows more or less loamy. I presume that in long course of time much of the clay in the higher lands has been washed down into the lower. On the sandier soils the autumn rains are not sufficient for the growth of Kharif crops; but they are sufficient on the loamy soils, which are richer in

clay and therefore more retentive of moisture, and which also receive the drainage of the higher fields. The people therefore cultivate the latter with Kharif crops and succeed in getting very fair Rabi crops off the higher and sandier soils by aid of the winter rains. The Rabi lands are 4 or five times the extent of the Kharif lands. Neither Rabi nor Kharif lands get more than 3 or 4 ploughings before being sown; sometimes less.

43. Where the holdings of the cultivators, are large, as in the Babial villages of Tehsil Chakwaal and in Lawá and other parts of Talagang, it is a common thing to find that a part of the Kharif lands has been thrown out of cultivation as "*budhi*" or old. In these places the Kharif cultivation is rough, the land is not sufficiently ploughed, and so after 3 successive Kharif crops becomes a good deal choked with weeds. The cultivator under such circumstances will keep only half his kharif land under cultivation, and the other half fallow; changing the 2 halves after every three years. The drainage of the half left fallow is carefully conducted by little surface channels on to the portion under cultivation. It is I think doubtful how far this practice is really necessary; it certainly has the advantage of giving to such crops as are grown a larger share of the rainfall than they would otherwise receive; and it seems to me to be principally resorted to where the holdings are large and the cultivation rough. It is not practised in the better cultivated villages of the Tallagang Tehsil; though as regards soil and rainfall these are similarly circumstanced to those in which the budhi system prevails. The highest proportion of Budhi lands is found in Babial and Lawá. In the majority of the villages of the Tehsil where the custom exists, the Budhi land does not exceed one third of the Kharif area.

44. Cotton cultivation owing to the length of time during which this crop occupies the ground, necessarily where it occurs creates a diversion from the ordinary course of husbandry. It is sown in March and the pickings last from October to the end of December, so that a Rabi crop can neither immediately precede it nor immediately follow it. On the Barani lands of Tehsil Jhelum and Lundí Patá, the plants after the first year's pickings are cut off short close to the ground, and they sprout again in the spring following, yielding a 2nd crop generally better than that of the 1st year. In Dhanni, Tallagang and the Pind Dadan Khan plain the plants are similarly cut back a 2nd time and a 3rd year's crop is taken, but this is always poor. In the Pind Dadan Khan hills, very little cotton is grown, as their more temperate climate does not suit this crop; so much as is grown is ploughed up after the 1st year's pickings.

Cotton cultivated on well lands stands for 2 years in Tehsils Jhelum and Pind Dadan Khan, but for only one year in the rest of district.

It is not usual to take any special care to sow cotton on superior land.

45. In Tehsil Tallagang manure is not usually applied to the barani lands. The people say manure burns up their crops. This experience agrees with that of other countries. Professor Wrightson in his Hand-book of Agriculture recently published remarks (page 114) that there is "an objection to the use of dung upon light soils in dry seasons, the dung often doing harm by leaving the land hollow and liable to be injured by drought." If this is so in wet England, a fortiori must it be the case in the light soils of a dry country like Tallagang. In the Thall and Phaprá circles of Tehsil Pind Dadan Khan manure is little used in the barani.

land for similar reasons, the climate is too hot and dry. In the River Bank circle of Pind Dadan Khan the manure is all used up in the well lands, and there is none to spare for the Barani. In the hill circle of that Tehsil and throughout Tehsils Jhelum and Chakwal the manure produced is principally applied to the best barani lands.

Some of the barani lands thus manured are cropped twice annually, usually 3 or 4 per cent of their area. The system of giving occasional dressings of manure to fields is on the increase.

46 A more widely applied method of improving the produce of land is the system of banking up the lower edges of fields described in paras 34-36 of the Settlement Report. It is practised in the Khadar and Pabbi circles of Tehsil Jhelum; throughout Tehsil Chakwal; in parts of Tehsil Talagang; and in the Pind Dadan Khan hills; in fact wherever the cultivated fields lie on the sloping sides of plateau or in raviny ground. The larger style of embankment, specially described in the Settlement report is not much attempted, they are too expensive and frequently break during the heavier falls of rain. But instead thereof there is an almost universal system of small banks at the lower edges of those fields, of which the surface was originally sloping, or which have been made in raviny land. Though these little banks do not cost much money, constant attention and much labor is spent on them by the cultivators. They are made sufficiently high to enable the cultivator to level the surface of the field, with one or two feet extra to retain the rainfall and drainage from higher lands. By their aid a very great improvement in the character of the barani cultivation has taken place, since annexation and since the Regular Settlement was made; an improvement which is still progressing. Similarly in the Thal and Phapra circles of the Pind Dadan Khan plain all the best fields are surrounded by small banks of about 2 feet high; but these banks are made, not to level the field surface, but in order to retain in sufficient quantity in each field the fertilising floods which come down from the Salt range after any considerable rainfall. Without such banks the floods would run off.

47 I have reserved till now my remarks on the nature of the crops cultivated on the barani lands, but there is little to say on the subject. The crops are almost identical all over the district; in the Rabi principally wheat, with a little mustard, tarámirá and gram; in the Kharif principally bajra with a little moth, Chari and cotton. Chari is the term locally applied to Jawar sown thickly; the effect of sowing it thickly is that it grows a finer and more tender stalk, and therefore better suited for cattle fodder, which is the sole purpose for which this crop is grown. In ordinary years a great deal of gram is grown on the sandy soils of Tehsil Talagang and in the South West corner of Tehsil Chakwal. But in a good year, the zemindars prefer to cultivate wheat, because gram is a delicate crop easily spoiled by plentiful rain in January and February.

48 Before leaving this part of my subject one other feature in the agriculture of the district deserves notice, viz the custom of sowing mixed crops. All over the district it is a general practice to sow a little mustard mixed up with the wheat. The mustard this sown is cut green; and given to the cattle mixed up with bhusa. The result is to supply the cattle with a limited amount of green food of good quality in the later winter months, at a time when there is hardly any grass or

other green food of any sort (the young wheat excepted.) The presence of the mustard plants among the wheat does not interfere in any degree with the growth of the wheat crop. In the same way mixed crops of bajrá and moth are very common. Moth is sown later than bajrá ; and if the cultivator thinks he will not get a good bajrá crop, he adds moth to fill up the field. As the season advances he commonly allows the crop which promises best to come to maturity, and feeds his cattle with the other. In the same way taramírá and mustard are not unfrequently sown into a poor bajrá crop, when the young plants are ploughed over (Seel) in August. Moth is added to a poor cotton field for a like reason.

An equally thrifty practice is the sowing of taramírá and mustard on the field banks, which prevails all over the district especially in the Chakwál Tehsil, thereby securing a crop return even from the land occupied by these banks.

49 To conclude—rough and simple as the agriculture of the district may appear at first sight—neither its skill nor its thrift are to be despised ; and my observations, so far as they go lead me to believe that both are steadily increasing ; and are now at a considerably higher standard than that of 25 years ago. The general standard of cultivation is highest in the Jhelum and Pind Dadan Khan Tehsils, Chakwál follows next and Tallagang comes last.

General skill and thrift displayed in the agriculture of the district.

QUESTION 7 OF CHAPTER I.

CH. I.
Have any attempts been made by the Government or private persons to improve agriculture in your Province, either in the way of introducing new or improved implements, or new staples, or improved seed, or better methods of cultivation, or better breeds of cattle and so forth, and with what result? Have you any suggestion to make for such improvement? Is there any Government model farm in your Province? Or have any estates under the management of Government or of the Court of Wards been used for the object of making experiments or setting examples of improved agriculture? If so, state the system of management, whom they were placed under, and what the results, financial and agricultural, have been? Have any improvements been made in the breed of cattle, in the forms of ploughs, carts, sugar-mills, or any other agricultural instruments, or in the mode of drawing water from wells? Have any agricultural exhibitions been held in your Province, and have you observed that any good result has been obtained from them? Was anything exhibited the imitation or adoption of which would have been useful to, and practicable by the ordinary cultivator? And, if so, was there any willingness to imitate or adopt such improvements? Have you observed that there has been any deterioration of the soil, or that crops are worse than they used to be within your own experience? Does any such question specially arise in case of irrigated land? State specifically on what facts you base your replies. Where there is any popular belief in such deterioration, state what facts are adduced in support of it.

REPLY.

THE INTRODUCTION OF NEW STAPLES.

Immediately after the annexation of the Punjab in 1849, the attention of District Officers was directed to this subject. Small quantities of various seeds were distributed to them on some occasions by Government, and on others by the Agri-Horticultural Society of Lahore.

It was hoped that such new crops, if successfully grown in small quantities at the head-quarters of each District, would spread from these centres. In the majority of instances this expectation has been disappointed. I notice the principal staples so experimented with, and the result to date in each case.

SORGHO SUCRE' OR IMPHIL.

Experimental sowings of small quantities of this crop have been continued at the head-quarters of a number of Districts with more or less persistency for now 20 years past. It is an autumn crop with conditions of growth similar to those of joár (*Sorghum vulgare*). At the same time it grows more luxuriantly, and contains much more saccharine matter. For both reasons it would presumably be a valuable addition to the autumn fodder crops. In several Districts, especially Rawalpindi, Stálkot and Kángra, the agriculturists were induced to sow it experimentally; but they gave it up after trial. It is now seldom or never seen outside the gardens of the District and Municipal Committees. I do not find anywhere an exact account of the reasons for the agriculturists' disinclination to cultivate the crop.

OATS.

Oats have been continuously sown at the head-quarters and tahsils of several Districts for 25 years past, with very fair success. They thrive well on such land as is ordinarily sown with wheat and barley. But except at the Government studs, and to a very limited degree in our Military Cantonments, there is no market for the produce. The people will not eat the grain and in their judgment the straw is not much better fodder for their oxen and milch cattle than that of wheat and barley. The crop consequently does not establish itself.

NEW VARIETIES OF MAIZE.

A little has been done lately, as in the case of *sorgho sucre* above, with a view of introducing new varieties of maize, but as yet with no outcome worth notice.

CAROLINA RICE.

- I. From 1870 attempts have been made in selected Districts to introduce Carolina rice. In one or two places (as for instance in Chamba) the crop grew well; but the rice produced was not liked, and the husking machine in common use broke the grain. The experiment consequently fell through.

FLAX.

In 1854, experiments, the success of which at first appeared not improbable, were commenced with a view to extending and improving the cultivation of flax in the Lahore and Amritsar Divisions. The District Officers under Government instructions urged the agriculturists to extend their flax cultivation; Government offering rewards and undertaking to purchase the produce, which was actually done to the value of Rs. 50,000; the produce being resold without loss at Kurrachi. The crops grown produced abundant linseed, but little or no marketable fibre. The conclusion being arrived at, that the production of fibre needed more skill than the agriculturists could give to it, the Government ceased to urge the cultivation of the crop. But subsequently, from 1860 to 1865, some merchants of Belfast kept an agent at Siálkot, who imported seed, advanced it to cultivators, looked after their crops, and tried to teach them proper methods of steeping the stalks with a view to the production of good fibre. These efforts resulted in the production of a limited amount of good fibre. But they also ultimately demonstrated to the agriculturists that the crop was not, at its best, much more remunerative than wheat. And at the death of the agent in 1865-66, the Belfast merchants, seeing that its cultivation was not likely to grow to any very large proportions, withdrew from their venture. About 22,000 acres of flax are cultivated in the Punjab. The local product is much poorer in fibre, but richer in oil, than the flax of Europe.

COTTON.

The attempts to improve and develop the cultivation of cotton in the Province have been most numerous and persistent. From the earliest years of the administration, foreign seed was imported and distributed to District Officers. The native cotton is of shorter and coarser fibre than Egyptian and American cotton; and the object aimed at in the distribution of foreign seed has been mainly the local production of a cotton of larger yield and longer fibre. The annual reports from the earliest period contain notices of the efforts thus made to develop the growth of foreign descriptions of cotton.

When the war in the United States cut off the supply of cotton from America, on which the English manufacturers had till then relied, and the price of cotton was consequently greatly enhanced in India, every effort was made by District Officers, under instructions from Government, to encourage the agriculturists to pay more attention to the cultivation of cotton, and the previous efforts to introduce good foreign descriptions were redoubled. Various gentlemen (officials and others) proved by experimental cultivation that foreign cotton could be successfully grown; and in 1870 a Canal Engineer (Mr. Login) demonstrated that by adopting the Egyptian system of sowing on raised furrows 8 inches high and 3 feet apart, in irrigated fields, an unprecedented yield could be obtained even with the native variety of cotton.* But the ultimate outcome of all our efforts as yet is, that the agriculturists adhere both to the native cotton plant and to their own methods of cultivating it.

The area of cotton cultivation in the Punjab has been carefully observed for 12 years past. It does not usually exceed 700,000 acres; about $\frac{4}{7}$ of the crop is irrigated, and the rest is dependent on rain only. The average yield of cleaned cotton per acre is believed to be something less than 80 lbs. The produce may be taken at 400,000 cwts. in an average year; of which usually one-third is exported, partly by boats down the Indus, and partly by rail eastwards. There is a small export of Indian cotton cloth westward into Afghanistan, from 50,000 to 60,000 cwts. The average wholesale price of cleaned cotton in 1876-77 was Rs. 20 per cwt.

* The late Mr. Login's experiments were made at his own expense on very small areas. They were subsequently successfully continued at Government expense for 2 or 3 years on 50 acres of land at Chandí near Umballa. Among the papers appended will be found a report in which he gave an account of the principles on which his experiments were based, and of the manner in which he applied them.

POTATOES.

This crop was unknown in the Punjab before annexation. Its introduction in the vicinity of all our hill stations followed immediately on annexation. It is principally grown in the hill tracts of the Rawalpindi, Hazára and Kángra Districts, and in the Hill States round Simla, and to a very small extent near our larger plain stations. The extensive consumption of this vegetable in our Military and Civil stations has been the stimulus under which its cultivation has established itself. But to a very limited extent it is gradually becoming an article of native diet. The estimated area cultivated with this crop, and its yield is said to be as follows :—

District	Acres.	Yield per acre. Mannds of 40 Sers each.
Near Simla	Not known.	25
Kángra	448	11½
Near Dalhousie	125	60
Rawalpindi	458	50
Hazára	600	50

OTHER EUROPEAN VEGETABLES.

Have been sedulously cultivated by the local Committees at the head-quarters of each District, but except in a small degree near our larger towns, they are little cultivated outside the gardens of the local Committees and English officers.

TEA.

This has been the most successful of all our attempts to introduce new staples. In the Punjab Record 1861-63, year 1848 two small tea plantations were established in the Kángra hills by Dr. Jamieson, the Superintendent of the Botanical Gardens of Saháranpore. The experiment proving a promising one, the Government of India in 1852 directed its extension, and in consequence the Holta plain (then waste) was taken up for the purpose.

By the year 1859 the success of the cultivation was so well established, that Government deputed an officer to assist capitalists desirous of forming tea estates in buying suitable land from the native landowners. This same officer, Major E. Paske, returning to the District in 1867, found a thriving tea plantation on almost every piece of waste land secured in 1859 for the purpose. The Hon'ble the Lieutenant Governor (Sir R. Montgomery) writing in a memorandum dated 13th December 1864, recorded that, when he previously visited the Kángra District in 1860 there was hardly an acre of tea cultivation outside the Government plantations, but that between then and his second visit in 1864, 17 estates with an area of 15 square miles had been created by European capitalists; and that the natives themselves were growing tea in 47 villages.

Major Paske, writing again at the end of 1872, reported the existence of 13 estates owned by Europeans and 15 owned by natives, the largest being 1190 acres with 190 acres under tea plants, and the smallest 13 acres with 11 under plants. Some of the estates of intermediate size had from 400 to 500 acres under plants. In addition there were small plots of tea cultivation aggregating 681 acres. The entire acreage devoted to tea cultivation in 1872 was 7732 acres, of which 3292 were under plant; ($\frac{2}{3}$ mature, $\frac{1}{3}$ immature). The total annual yield had risen from 2,41,332 lbs in 1868 to 4,28,665 lbs in 1872. A return furnished to the Government of India in October 1877 shows that the area *under plant* had then increased to 4611 acres (besides 1773 acres under preparation for planting), and the annual yield to 7,23,088 lbs. The following statement supplied to me by the Deputy

Commissioner of Kángra shows the extent to which Europeans and natives respectively share in this industry :—

Years.	Plantations.		Area under-Tea cultivation.	Approximate annual yield.	
	Number.	Owned by.		lbs.	Value Rs.
1878	35 1,099	Europeans. Natives.	4,787 3,146	5,60,483 2,26,611	4,16,669 1,13,305
Total ...	1,134	...	*7,933	7,87,094	5,29,974

The Government withdrew from its experimental cultivation, selling its Holta estate to a European capitalist in 1865. The cost of cultivation (picking included) averages Rs. 60 per acre, and the yield of mature, *i. e.*, over 3 years old plants, 200 lbs. The cost of manufacture subsequent to picking is 6 annas per lb. The best fields yield from 300 to 400 lbs per acre. The tea is largely exported to the London market. The cultivation is increasing both by Europeans and natives, and great advance has been made in ascertaining the conditions best suited to its culture. Situate as the industry is in a populous agricultural District, there is abundance of labour available. And the relations between the European planters and the local native population have hitherto been of the best.

Tea cultivation has also been commenced in the Simla District, 120 acres being under plant. It was tried in the Hazára and Rawalpindi hills, but has hitherto failed there.

It may be remarked in conclusion that this industry, though originally started by the Government, is entirely dependent for its development and promineney on the European enterprise engaged in it. If that enterprise were withdrawn, the native cultivators would probably fail both in the preparation of the tea and in its exploitation in the European markets.

CINCHONA.

A very earnest attempt was commenced in 1864 by Major Nassau Lees, one of the gentlemen interested in tea cultivation in Kángra, to introduce the cultivation of cinchona; and one of the Kángra planters is still giving his attention to it, but hitherto the cultivation has not succeeded; the apparent cause of failure being that the climate is too dry, and in the winter too cold.

Punjab Revenue Report
1871-72, Manual of Cinchona
Cultivation 1876.

CHINA GRASS.

Attempts to cultivate China grass have hitherto led to no results, for a different reason, *viz.*, the difficulty of inventing suitable machinery for cleaning the fibre. The Government of India have twice offered a large prize for the invention of such machinery, but this will no doubt be noticed in the replies submitted by the North West Provinces in connection with the Saháranpore gardens

SILK.

Small experiments having for their object the introduction of sericulture in the Punjab have been tried at different times during the past 30 years in nearly all the submontane Districts of the Province; the experimentors being in nearly every instance the Civil and Medical Officers of the Province. For a summary of these experiments, I would refer to Mr. Baden Powell's Punjab Products p. p. 161 to 177. I should serve no practical purpose by recounting them here, for they have all the same history. The result in nearly every case showed that silk cocoons could be easily raised at a great profit; but beyond this stage the experiments never proceeded, except in one instance. The subject was taken up 4 or 5 years ago in the Gurdáspur District by Mr. F. Halsey, an independent gentleman, who had settled in the north of that District. Following up successful efforts to introduce the growing

*This probably includes land taken up for planting and not yet planted out.

of silk cocoons made by the Civil Officers of the District, he established a small silk filature, Ch. I. and was working it very successfully up to his death, a few weeks ago. For 3 years past the District Committee at Gurdáspur, with Mr. Halsey's assistance, has held exhibitions of silk cocoons. For the best cocoons exhibited, prizes are given annually by the Committee, aggregating Rs. 1,000 in value, to which Mr. Halsey usually added. This gentleman had also offered 3 prizes aggregating Rs. 1,000 for the best plantations of Chinese and Philippine Island mulberries in the Gurdáspur District, and the same sum for the Kángra District; and he purchased for his filature the cocoons of all those who did not wish to reel their own silk. The Deputy Commissioner of Gurdáspur reports that the cultivation of the cocoons is now a well established source of profit among the agriculturists. It was at first confined to Kashmír, but has lately been taken up by many among the agriculturists. The death of Mr. Halsey is no doubt a severe blow to it, but there are grounds for hoping that some one may be found to take over and maintain the filature, and thus keep up the newly awakened interest of the agriculturists in sericulture.

Silk goods are manufactured in all parts of the Punjab, and especially at Amritsar and Mooltan. The raw silk thus consumed is imported principally from Afghánistán, Bokhára and Kashmír, and the gross imports were estimated 15 years ago to be worth Rs. 20,00,000 per annum. Of this a portion passes on to other Provinces. But it is evident that sericulture and silk filatures might be developed into most profitable industries. I annex a few remarks on the subject furnished by Colonel F. Millar, the Deputy Commissioner.

I believe the cultivation of cocoons is now independent of prizes; it has established itself, and would not, I think, suffer if the prizes were withdrawn, although I think prizes should continue for some time to come.

At first Kashmír took up the cultivation of cocoons, but now agriculturists and their families have done so, as well as Brahmans, Sayads, Fakirs, and other classes; outsiders are not apparently attracted by the prizes; none have as yet competed; all having been taken by persons residing in the District, and this year the first prize was awarded to a Lambardár of Gurdáspur.

I am of opinion that this industry has now become thoroughly established, and is likely to flourish, although it has sustained a blow by the death of Mr. Halsey, who took much interest in it, distributing young plants of the exotic mulberry gratis to all wishing to plant them. He also purchased the cocoons of all parties who did not wish to reel their own silk.

One Zamindár of this District purchased eggs for 1 rupee, and made a clear profit of Rs. 22 after paying all expenses; and this has induced many others of the same class to commence operations.

The men work in the fields, while the women employ themselves in taking care of the silk worms.

AGRICULTURAL IMPLEMENTS.

Our attempts to improve the aids to agriculture (leaving the improvement of cattle to subsequent notice) have been confined to artificial manures, improved sugar mills and ploughs.

In 1874 patent iron sugar-cane mills (Thomson and Myles) were supplied experimentally to several Districts. But trials showed that they were not fitted for the small cane of the Punjab, and failed to crush it sufficiently.

More recently in the present year a suggestion was made for the importation of light ploughs manufactured by Messrs. Ransomes of Ipswich. It was shown by the late Mr. Halsey of the Gurdáspur District that the ploughs were sufficiently light for the cattle of the country; and that they could be delivered at Lahore at a cost of Rs. 24 each. But the suggestion was abandoned, because the shares could not have been renewed by native workmen; in fact supplies of them could only have been obtained from England, or from Government workshops. But the late Mr. Halsey cultivated 250 acres of land at Sujánpur in the Gurdáspur District with English ploughs drawn by cattle, which, though no doubt superior to the ordinary plough cattle of the country, were yet bred by their owner from selected country stock; and he obtained crops from the land far superior to any ordinarily raised in the neighbourhood.

For a not dissimilar reason attempts made shortly after annexation to improve the Persian wheel used all over the Punjab for raising well water for irrigation have failed of accomplishing any practical results. It is easy to indicate how the well gear could be improved, and made to do a larger duty with the same draught power now employed, but all the improvements yet suggested require more skill for their construction and maintenance

Ch. I. than the rural artizans possess. Well gear which cannot be made and repaired by the ordinary village artizan is useless to the ordinary agriculturist.

SUGAR FACTORY AT SUJANPUR.

The enterprise of the late Mr. Halsey also succeeded in starting at Sujánpur sugar mills for manufacturing sugar. The capital (Rs. 4,00,000) was subscribed principally by eighty-eight European gentlemen, many of them officers in the Punjab, and about Rs. 32,000 by native merchants. The mills are only in their first year ; but there is little doubt that they will yield large profits. They are worked by water power, supplied from the Bári Doáb Canal ; and the machinery was imported from England. The objects aimed at by the company are the manufacture of sugar suitable for native consumption, and the manufacture of rum.

If the profitable character of these mills is established, there is reason to believe that they will be extended, so that other similar companies will be started.

Cotton and woollen mills have not yet been started in the Punjab. But if European enterprise and capital is once attracted to the richer Districts of the Punjab, there is little doubt that in sugar, cotton, wool, silk and other products, it will find abundant field for profitable employment. The bearing of such enterprises on the prosperity of the agriculturists who supply the mills with raw products is patent. And it is in the development of such enterprise, whenever practicable, rather than in legislative schemes and systems of local Government, that the true remedy is to be found for the indebtedness, the poverty, and the unskilfulness of the native agriculturist.*

MODEL FARMS.

There is no model farm in the Punjab, the only attempt yet made to establish one came to end at the close of 1876. Its history was as follows :—

In 1873 the Government of India offered to assign to the Punjab the services of a trained gardener, and Rs. 4,000 towards the expenses of an experimental farm. The offer being accepted, the gardener, Mr. Lloyd, was first employed on a small area of land near Umballa, on which experimental cotton cultivation had been attempted ; but in 1874 he was placed in charge of 176 acres of Government land near Amritsar. The land was of varying quality, some decidedly bad, but it was conveniently situated near a large town.

After 3 years' trial it appeared that the farm had been steadily cultivated at a loss (not reckoning the Superintendent's salary), and it was therefore broken up at the commencement of 1877.

If the farm had really served the purposes of a model farm, an effort to keep it up in spite of the expense would probably have been made. But it was on too small a scale to furnish any useful results ; and it was not in the hands of a man who by his antecedents could have any real knowledge of the agriculture of the country. The proper scope and aim of a model farm was thus described by the Hon'ble Mr. Egerton, when Financial Commissioner, at para. 33 of the Revenue Report for 1873-74 :—

The progress of the experiment of a model farm depends much upon the plan of operations adopted. It is to no purpose that superior staples are grown before the eyes of the people, if the mode of cultivation is totally foreign to them. The only means by which any real aid towards the development of the resources of the country can be afforded is by a study of the system of tillage which is in ordinary use, and by applying to it such improvements as the people are competent to appreciate. Any movement towards improvement in agricultural produce must therefore initiate with a full appreciation of the mode of agriculture to which the people are addicted, and in which they have confidence ; and only those innovations will be accepted by them which tend gradually to ameliorate this method, and not those which involve a total abandonment of their time-honored habits.

* The following extract from a report by the late Mr. F. Halsey, on the local exhibition of silk cocoons in Gardáspur, dated 1st of May 1876, is worth quoting :—

" If cocoon growing is to become a staple product of this District, it is to the Zamindárs we must look for their production. There is little doubt in my mind that the whole of the Government revenue could be paid by the villagers from the proceeds of their cocoons, which would leave the whole produce of their lands for the village consumption and export ; and as it is chiefly in these villages which now are most suffering from debt that the mulberry tree exists in the greatest numbers, we may really hope that with an increase of silk worm farming, the difficulties of these suffering villages may diminish."

On the same subject I append a memorandum dated 10th January 1872, written by C the late Mr. F. Halsey, an independent gentleman, who at that time and up to his decease a few weeks ago, had paid much attention to agriculture in the Amritsar Division.

FARM IN THE DERA GHÁZI KHAN DISTRICT.

The Deputy Commissioner of Dera Gházi Khan has a farm of 19,000 acres (1,100 cultivated on the local system by tenants) in his District, and another considerable area in the Biloch hills near Fort Monro. The objects of the farm are to induce hill Bilochis (hitherto strangers to agriculture) to settle there and learn agriculture, to introduce certain improvements in the breeding of Biloch horses, to improve the cattle and sheep of the District, and to distribute fruit and shade trees. The farm pays its own expenses.

ESTATES UNDER THE COURT OF WARDS.

In the Punjab it has not as yet been found practicable to use any estates under the Court of Wards for the object of making experiments or setting examples of improved agriculture.

IMPROVEMENT OF SHEEP.

Rams have been imported from England in small numbers, and sent to the Hazára and Shahpur Districts. Up to a late date the report of the results was not encouraging. It was stated that the fine fleeces were much torn and spoilt by the thorny bushes common on the lower grazing grounds; but the last report from Hazára states that the breed is liked for its size. A number of other superior rams have been, for some years past, distributed to the Districts where there are most sheep, but it is only quite lately that any exact accounts have been taken of the result. In 1877 it was ascertained that, of 100 rams distributed, 50 had died. As regards the progeny, the reports do not show any material progress as yet in the improvement of the breed. On the other hand, the leading agriculturists in each District are by no means indifferent to the matter: and they willingly accept the charge of the rams, and comply with instructions concerning their keep and use. 64 rams are now made available each year at the Hissár cattle farm for distribution to Punjab Districts free of charge.

IMPROVEMENT OF CATTLE.

Similar means have been adopted for the improvement of the horned cattle. Bulls have been distributed from the Hissár cattle farm to as many Districts as applied for them. The first distribution of 30 bulls took place immediately after the annexation of the Punjab. But the subject was lost sight of for some years; and it was only in 1876 that attempts to ascertain and watch the results were revived. The reports received were of varying character; but on the whole they showed, that in those cases in which the selections were judicious, the bulls were appreciated by the breeders, and rendered valuable service in improving the breed of draught cattle. 32 bulls are now made available each year at the Hissár cattle farm* for supply to Punjab Districts free of charge. The keep of the bulls costs the agriculturists little or nothing. It is usual to make over a bull to some large central village, and he is allowed to roam free with the village cattle. The aggregate progeny of the bulls is as yet insignificant in numbers.

CATTLE FAIRS.

On this subject I subjoin an extract from the Revenue Report for 1876-77. The return quoted therein is also appended. Since this extract was written, prizes for cattle have been offered at the Rawalpindi horse fair, and a large cattle fair is likely to be developed at that place:—

Page 182. The most important fairs are those held in the Districts of Hissar, Rohtak, Sirsa and Amritsar. Of the total of 183,027 cattle attending all the fairs in the Province, all but 10,000 were at the fairs in these 4 Districts. The minor fairs were held in the Districts of Jullundur, Hoshiárpur, Gurdáspur, Siálkot, Gujránwála, Ferozepore, Jhang and Montgomery.

184. The general result shows a large increase in the number of cattle attending fairs, and this increase is almost entirely in the more important fairs, particularly those in the Hissár Division, where

* This is an institution kept up by the Military Commissariat Department. It consists of 43,000 acres of waste land near Hissar, and it is devoted principally to the production of horned cattle. The stock on the farm numbered 10,521 on the 31st May 1877. It is in charge of Lieut.-Colonel Robinson.

the number increased from 78,804 in 1875-76 to 1,02,357. The important and well managed fairs in that Division are well appreciated, because they supply a real want. The cattle of that locality are of good quality, and traders from a distance are always pretty sure of finding the kind of animal they require, and cannot elsewhere procure, while the breeders who send cattle for sale are pretty sure of finding customers. The same may be said of the fairs held at Amritsar in spring and autumn, where some 50,000 or 60,000 animals are exhibited, of which a considerable proportion change hands. On recent occasions, horses have also been sent to this fair, and find ready sale.

185. The amount of prizes given varies considerably. At the Amritsar fairs, where 68,857 cattle attended, Rs. 2,990 were distributed in prizes, being an average of 8 pies for every animal that attended; whereas, in the Hissar Division, the average is under 3 pies. In the latter, moreover, only 144 animals were entered for prizes at all; whereas at the Amritsar fairs 414 were entered. The Amritsar prize scheme has been carefully revised from time to time, and the increasing success of the fairs held there may be due in part to this, but the increasing popularity in the Hissar fairs seems to show that where there is a good market for cattle, periodical fairs will flourish, whether prizes be liberally distributed or not. The number of cattle, however, is not the only test of the usefulness of a fair. The quality of the animals is a very important point, and it is chiefly to effect a gradual improvement in this respect that a liberal prize list adjusted with discrimination is valuable. There is reason to believe that this improvement is really taking place. The demand for bulls of good breed from the Hissar cattle farm shows that the improvement of stock is felt to be an object capable of attainment, and well worth attaining.

186. In the Sirsa District 40 Hissar bulls were utilized, and produced 1,117 head of stock, some of which are very fine specimens. The people appreciate the bulls and their progeny highly. The statement shows that the cattle fairs generally are not only self-supporting, but yield a considerable surplus, which, under present arrangements, is credited to the provincial revenues. The income was Rs. 26,778, and the expenditure Rs. 12,666, leaving a surplus of Rs. 14,112. The minor fairs are not, as a rule, self-supporting, their first starting, and their maintenance for some time, being dependent on the existence of a surplus derived from other fairs. These small fairs, however, serve many useful purposes, and need not be hastily abandoned merely because they cannot at first be taxed in proportion to the expenditure incurred on them. Independently of their value as cattle markets, and as a means of supplying an improved breed of cattle, they are popular as local gatherings. At Hoshiarpur a local industrial exhibition was held in conjunction with the cattle fair, and was thought to be a great success. But where the results continue year after year to be incommensurate with the efforts made, and the expense entailed, fairs are sometimes discontinued, as was found necessary recently in the case of the fairs in the Jhang and Montgomery Districts.

187. The income is raised by means of fees, which are levied in some cases on all animals attending the fair, and in others on all sales effected. In the Hissar and Sirsa Districts the latter system is adopted, in Rohtak the former. In Amritsar there is an admission fee for all animals attending, and a separate fee for animals entered for prizes. In almost all cases the fees are collected by direct agency, the employment of contractors having been found disadvantageous.

188. Of the Rs. 12,666 expended on cattle fairs, Rs. 6,446 was for prizes, and Rs. 6,220 for expenses of management.

Statement showing the result of Cattle Fairs held in the Punjab during 1876-77.

Districts in which fairs were held.	Number of fairs held in the year.	Number of cattle that attended.	Number of cattle entered for prizes.	Amount given in prizes.	Amount of fees collected.			Amount of expenditure other than for prizes.	Total expenditure.	REMARKS.
					On total number.	On animals competing for prizes.	On animals competing for prizes.			
Hissar	2	28,806	81	819	7,811	...	655	1,484		
Rohtak	2	47,417	54	476	2,970	3	432	908		
Sirsa	1	26,134	9	234	6,346	...	232	466		
Jullundur	1	799	17	325	96	...	152	477		
Hoshiarpur	1	245	93	499	...	14	849	* 1,348		
Amritsar	2	68,857 and 2,015 horses.	414	2,990	8,552	414	3,703	6,693	* Rs. 512 were expended on the local exhibition held at the same time as the cattle fair. The District Fund contributed largely to the expenditure.	
Gurdaspur	1	569	18	16	36	6	6	22		
Gujranwala	1	6,393	31	220	485	...	27	247		
Ferozepore	1	1,026	31	387	45	...	84	471		
Jhang	1	69	6	90	...	...	...	90	
Montgomery	1	2,712	27	390	...	...	70	460	
Total.	14	1,83,027	781	6,446	26,341	437	6,220	12,666		

HORSE FAIRS.

Besides the 2 Amritsar fairs above noticed, where horses are brought for sale to the Ch. I. number of about 2,000 each year, 3 large horse fairs are held in the Punjab, at Rawalpindi, at Jhang, and at Sakhi Sarwar in the Dera Gházi Khan District. Attempts are being made to start fairs at other places, but these 3 are the most important. The number of horses which attended these fairs, and the amount of prizes distributed on the last occasion when they were held, was :—

Fair.	No. of horses attending.	Aggregate value of prizes distributed.	Aggregate value of sales.
Rawalpindi	2,250	8,000	78,500
Jhang	500	2,000	...
Sakhi Sarwar in Dera Gházi Khan	• 1,200	2,000	13,500

The Rawalpindi fair has been held from a very early period of our rule ; the others are of later origin. The object of these fairs is to encourage horse-breeding among the agriculturists of the neighbouring Districts. Our native cavalry have always been mainly mounted by horses indigenous to the country ; and it is hoped that eventually a still larger and more powerful breed of horses may be thus obtained. In aid of this object, a number of stallions (English, Arab, Stud-bred, and Walers) are kept up by Government, and distributed each winter for service in the Districts where the best breeds of horses exist ; and all mares previously shown to a veterinary surgeon and branded by him as sound and fit, are served by these stallions without charge. The number of mares so branded is 2,000. In 1864 the number of stallions thus distributed in the principal horse-breeding Districts of the Province was 43 ; the present number is 130, viz :—

English thorough-bred	19
Half bred and Norfolk trotters	25
Walers	5
Cape	1
Arabs	45
Stud-bred	35

Among a limited number of agriculturists in the portion of the Punjab west of Lahore, the horse-breeding thus encouraged is of a highly remunerative character, and adds much to their prosperity.

AGRICULTURAL EXHIBITIONS.

In the year 1864 an exhibition was held at Lahore, in which specimens of the raw products, manufactures, and machinery of the Punjab were collected from every District and political dependency of the Punjab. The exhibition has produced 2 permanent results of great value.

The exhibition building, and a very large portion of the articles exhibited, have been formed into a permanent museum. The charge of the museum (for which Government have granted a small allowance) is usually held by some Civil Officer, selected from those stationed at Lahore for his special qualifications.

The number of visitors has increased from 50,000 per annum 6 years ago to 130,000 in 1876-77. Nine-tenths of the visitors are natives, most of them being country people (agriculturists and traders). The contents of the museum are being added to year by year, and are of great interest and value.

The other permanent result was the preparation by Mr. Baden Powell, c. s., of 2 volumes, describing the Punjab products and Punjab manufactures shown at the exhibition.

Both subjects are dealt with very completely ; and the administration and the public have at their command in these volumes a complete account of the products and manufactures of the Punjab, such as, but for the Exhibition, there would have been little prospect of our obtaining.

AGRI-HORTICULTURAL SOCIETY OF LAHORE.

I have described, one by one, the different items, in respect of which attempts have been made to improve the agricultural resources of the Province. It remains to state how far those attempts have been assisted by private efforts or societies. Immediately after the annexation of the Punjab, the Agri-Horticultural society was formed at Lahore. The society consists of gentlemen (European and native) residing in the Province; who are nearly all of them members of the various Government services. It is nominally independent of Government, and its formation arose out of the interest felt in the development of the country by the officers employed in it. In the first years of its existence, the inquiries of the society resulted in producing some of the best accounts of agriculture in the Punjab which have yet been written. Horticulture, arboriculture, wool, silk, sugar, and other important products, also formed subjects of inquiry by the leading members of the society, the results being recorded in the society's proceedings.

Its gardens at Lahore, the seeds of flowers, vegetables and trees, which it distributes to the head quarters of each District in the Province, and its efforts to introduce and distribute new varieties of agricultural and horticultural produce, are of great value, and in these respects the society supplies a want which could not be met in any other way.

Nearly three-fourths of the funds, however, by which it is supported, are supplied by Government: thus the society's Budget for 1877-78 shows the following estimated income:

				Rs.
Contributions from	{	Imperial Revenues	5,400	
		Provincial Revenues	3,600	
		Local and Municipal rates (each District of the Province contributing)	6,150	
		Subscriptions of members...	1,100	
		Sale of garden produce &c.	4,740	
Total Rs.				20,990

The society's permanent establishments at Lahore cost Rs. 11,750; and it expends in the purchase and import of seeds from Rs. 4000 to Rs. 5000 per annum.

EFFORTS OF EUROPEAN ENTERPRISE.

I have already noticed under the head of flax, the efforts made by certain merchants of Belfast to develop the growth of flax; and also under the head of tea the success of the European planters in Kángra. Two other English merchants, Mr. Cope and Mr. Coates, of Amritsar and Ferozepore, made valuable efforts a few years ago to develop the trade of the Province with Europe, especially in cotton. Similarly, the late Mr. Halsey's enterprise in silk in the Gurdáspur District, the sugar factory which he started in 1877, and his successful use of English ploughs on the small farm which he cultivated, are noteworthy instances of the value of intelligent European enterprise, and of the results it would effect if it could be attracted to the Province.

But the Kángra tea industry and a few other instances such as those above noticed being excepted, the Government is as yet entirely dependent on its own exertions and on those of the officers in its employ for the improvement of the agriculture of the country.

In respect of some forms of industry, such as cloth mills (cotton and woollen) and sugar factories, it is probable that their multiplication by independent European enterprise is not far distant. And such industries, if successful, have an obvious and almost certain tendency to promote the agricultural prosperity of the tracts in which they are established. The promoters of them may possibly be led themselves to take a share in the agriculture of the country. But we shall certainly be more than sanguine if we rely entirely on such speculative projects for the improvement of the agriculture of the country. And it does not seem too much to say, that until Government makes some earnest and systematic provision for the study and observation of the native agriculture, we shall neither adequately appreciate its existing methods, nor succeed in pointing out the directions in which it is practicable for the mass of the agriculturists, circumstanced as they are, to improve those methods.

DETERIORATION OF SOILS.

On the question whether the cultivated soil and the crops have deteriorated or not, the replies of 13 officers employed in various parts of the Province, and of 1 native gentleman, are annexed.

I give a short summary of these replies. :—

3. *Colonel Davies, Commissioner of Delhi*, has been employed in the Punjab since 1854, principally in the Rawalpindi, Amritsar and Delhi Divisions; states that there has been no deterioration of soil, except on irrigated lands. Ch. I.

The lands irrigated by the Bári Doáb Canal and by the Western Jumna Canal have alike deteriorated. The cause is over-cropping, over-watering and defective drainage.

Alimulla, Honorary Extra Assistant Commissioner of the Rohtak Settlement, Hissar Division, states that in the Rohtak District for 5 years past he has observed no deterioration either in canal irrigated or in unirrigated land.

Mr. J. B. Lyall, Settlement Commissioner, whose experience has been gained during 14 years past in settlement operations in the Amritsar, Jullundur, Lahore, Mooltan and Derajat Divisions, has not observed any deterioration of the soil or falling off of the crops within his experience. He states that there is a popular belief that the yield has decreased, the cause assigned being increasing irreligion, but that the true reason probably is that the land gets less rest than before. He believes that it would be very difficult for any official to observe a decrease of this kind. As to irrigated land, without doubt constant cultivation and application of canal water takes the strength out of it, and in the country round Amritsar a decrease in the yield of irrigated land is commonly asserted to have taken place. Over-saturation combined with insufficient drainage has also spoilt some land near the head of the Bári Doáb Canal in the Gurdaspur District.

Mr. E. C. Palmer, Superintending Engineer of the Bári Doáb Canal, has been employed on that canal for 15 years past; and states that the value of canal irrigation varies with the quality of the soil. Light sandy loam, he writes, is improved by the clayey silt deposited by the canal water, and by the humus left by the crop continuously raised. A stiff clay soil is not similarly improved; but yields less than it would under well cultivation. Clay soils with a substratum of reh are usually injured by canal irrigation; the steady supply of water bringing the reh salts to the surface in great quantity, and rendering it proportionately unfruitful; but there are exceptions to this: for instance, turnips and rice yield well on some reh lands. When land is first aided by irrigation, the crops for 4 or 5 years are very luxuriant; thereafter a marked deterioration takes place, but is not progressive. If cultivation without irrigation is attempted on land usually irrigated, a fair crop will not be yielded for some years. A bushel of wheat raised from canal irrigated land will not weigh so much as a bushel raised on well irrigation by $\frac{1}{4}$ th. But in the market there is no distinction of price (presumably, I would suggest, because in India grain is always sold in the markets by weight).

Raja Sir Sahib Dyal, K. C. S. I., a *jágrdár* magistrate of the Amritsar District, who is a considerable landowner, states that the people commonly assert that canal water has impoverished the soil; but that the truth is the impoverishment is due not to the canal water, but to over-cropping. The old custom was to take a spring crop from half the land and an autumn crop from the other half. They now try to take 2 crops from every field. States that the canal irrigation removes reh salts from the soil; instances a village of his own which has been cured of reh or kallar in this way. Recommends a rule whereby no village would get more water than will irrigate half its land. Complains that villages near the head of the canal get more water than is good for their lands; and that villages further down the canal are consequently stinted of a sufficient supply.

Mr. Palmer, the officer whose report is above quoted, being asked to state whether his experience confirms the complaint last mentioned; replies that the facts are entirely otherwise. He says that great care has been bestowed on the distribution of the water, and that as a rule no village gets more than will irrigate one-fifth of its area. The figures of the 3 years ending 1875-6 show, that in Gurdáspur (near the head of the canal) villages to which water was supplied irrigated each year only 13 per cent. of their area; whereas in Amritsar and Lahore, lower down the canal, such villages irrigated 24 and 21 per cent. of their area. He considers it wasteful to give canal water in tracts where the spring level is within 25 feet of the surface. Both for this reason and owing to the abundant rainfall, the use of canal water has latterly been discouraged in the Gurdaspur District, and of course the villages lower down the canal benefit proportionately.

Muhammad Hayat Khan, C. S. I., *Judicial Assistant Commissioner of Gurdáspur*, states that the land and the crops are worse than they were, because the land gets fewer fallows, and is more steadily cropped. The increase in the population has caused the sub-division of many holdings. By stress of circumstances the cultivators are driven to take 2 crops a year off the land. Canal irrigation facilitates their attempts. When land is first irrigated, it yields very richly, but after 3 years it deteriorates. The irrigation leaves a sandy deposit which is injurious. The remedies suggested by the Zamindárs are, manuring, rests and constant ploughings. But they cannot afford to rest the land, and have only as much manure as is sufficient for the very best lands. He recommends that the Zamindárs be taught the rudiments of agricultural science. This officer has been employed for 12 years past, principally in the Lahore and Amritsar Divisions.

Mirza Asim Beg, Honorary Assistant Commissioner of the Jhelum Settlement, has been employed principally in settlement work in the Gujrat, Házára and Jhelum Districts for 22 years past; states that the yield of land is less than it was before British rule, for obvious reasons. Then the cultivated area was much smaller; and therefore the best lands were selected for cultivation. For the same reason more pains could be spent on them. And the large waste areas enabled the agriculturist to keep more cattle; though cultivation has now doubled in extent, population has not increased in the same

ratio; consequently the agriculturist's labour is divided over a larger area than before. At the same time the cropping is more steady than it was in less peaceful days. States that the universal conversion of the wood and grass-bearing area is seriously injuring the agriculturists by reducing the number of their cattle and their ability to keep cattle, and that every village ought to be obliged to keep 1-10th of its area under grass and copse; or such preserves should be provided in some other way. Their non-existence is an evil hardly less important than the indebtedness of the agriculturists, and will as certainly shortly claim Government's earnest attention.

Mr. P. O'Brien, who has been Engineer of the canals in the Mooltan District since 1850; *Mr. Roe*, who has been Settlement Officer of the same District for 5½ years; and his native Assistant *Hukm Chand (Extra Assistant Commissioner)*, who has been in the District for the same period; all state that no deterioration of soil or crops is taking place; and that irrigation does not injure the soil. In this District the canal irrigation usually enriches the land with alluvial deposits; the lands on the river banks are similarly enriched by autumn floods; and where land is irrigated by wells only, and is so abundant that yearly fallows are always observed. This is an almost rainless District; and, speaking broadly, cultivation unless aided by river floods or irrigation is impossible.

Mr. E. O'Brien, the Settlement Officer of the *Muzaffargarh District*, which adjoins Mooltan and is similar to it, on a 5½ years' acquaintance with the District has arrived at the same conclusion. Native memory looks back with gratitude to the last of the Sikh Governors, *Sawan Mal*, and says everything was best in his time. But native opinion does not assert that land and crops are deteriorating. *Mr. O'Brien* has compared his own estimates of produce with similar estimates made in the early years of our rule, and the comparison shows no falling off in yield. Canal irrigation improves the land, no matter how often repeated, and where noxious salts have accumulated on the surface, washes them away.

Mr. H. St. G. Tucker, who has served for the past 10 years in the *Dera Ismail Khan District*, principally as Settlement Officer, has noticed no general deterioration of the soil. There is no canal irrigation to speak of in this District.

The alluvial lands in the *Indus* yield more richly when first cultivated than they do subsequently, and when old, get poor and weedy. Ten years ago a great deal of such land had only been lately reclaimed. Nearly all the rest of the cultivation in this District is annually enriched by floods from the hills.

Mr. S. S. Thorburn, who has served for 10 years in the adjoining District of *Bannu*, principally as Settlement Officer, gives a similar opinion; there has been no deterioration, speaking generally. In *Marwat*, a sandy unirrigated tract, dependent on a scanty rain-fall, occasional dry seasons create enforced fallows; on the canal lands of the *Kurram* the irrigation enriches the soil with silt.

Major E. G. Hastings, who has served in the *Pesháwar District* for the 12 years ending 1875, and subsequently in the *Kohát District*, principally as Settlement Officer of these 2 Districts, states that on irrigated lands he has observed no deterioration; but that on lands dependent on rain he has observed that the crops on such lands when newly cultivated are richer than on similar adjacent lands which have been longer under the plough. Native opinion asserts that the soil has deteriorated, and gives the following reasons for it: increased population, and consequently more frequent cropping with fewer rests; increased uncertainty and unseasonableness of rain-fall; less careful cultivation consequent on increased employment of tenants and go-betweens. They admit, however, that the land will yield as well as ever with fair treatment.

I have myself served over 6 years (1868-74) in the *Hazára District* as Settlement Officer, and subsequently as Settlement Officer and Deputy Commissioner in the *Jhelum District*; and I do not think it can be stated broadly that land has deteriorated in productive power. There is much force in what is above stated by *Mirza Azim Beg*, who has worked in the same Districts as myself, but I think he generalises too much. Under the Sikh rule, the cultivation in some tracts was good; in others, especially the more unsettled tracts, it was rough in the extreme. Under our rule all parts of the country are equally peaceful, and tracts before roughly cultivated are now vastly improved. Similarly, though it is of course the case that land when first brought under the plough yields more richly than it will after 3 or 4 crops have been taken-off it; I think it is scarcely correct to describe this difference as deterioration of soil. The practical question appears to be this: after the super-abundant richness of the first 3 years has been worked out of new lands, do such lands under the existing system of cultivation continue to *deteriorate progressively*, or do they give a steady fair yield proportionate to their natural quality? I have not observed any progressive deterioration of this nature. Similarly, it is quite true that the average yield reckoned on the total area cultivated is lower than it was; or as an agriculturist would perhaps put the statement, after the division of his heritage between himself and 6 other brothers, much of the land he holds is such, as his father 30 years ago would have thought poor stuff. But the obvious explanation is, that it is profitable to cultivate now poorer soils and more distant fields than before our rule. On the other hand, during the past 30 years, a large proportion of the cultivated fields have been much improved, as I proceed to explain. Some open valleys excepted, *Hazára* is a purely mountainous District, consequently nearly

all the fields when in their natural state are sloping; and I have no hesitation in saying that a vast improvement has taken place during the last 30 years in the character of the Hazára cultivation, by the conversion of these sloping fields into fields level and well terraced. This is not done by the expenditure of money; but by quiet industry, little by little, year after year. Jhelum is not so mountainous a District; it has hilly tracts, but its main features are high undulating plateaux much cut up by ravines. Here also the fields in their natural state are usually more or less sloping; the banking up and levelling of the fields was consequently always a prominent feature in the agriculture of the District, but the fields are much more universally banked up and well levelled now than they were at annexation 30 years ago.

In purely hill tracts, and in level tracts at the base of hills, the cultivator has facilities for renovating his lands which are peculiar to land so situated; that is to say, he can flood his land with the drainage of the adjacent hills; and as a matter of fact such a natural advantage where it exists is never neglected.

DETERIORATION OF LAND BY REH OR KÁLLAR.

There is one wide-spread form of deterioration in the lands of the Punjab plains which deserves special notice. Reh or kallar consists mainly of a mixture of sulphate and carbonate of soda with chloride of sodium in various proportions. The reh crops out on the surface of soil affected with it in a white efflorescence. Its first action is to absorb moisture and keep the ground dry. But when water is added in sufficient amount it dissolves; and the solution, unless greatly diluted, prevents the absorption of liquid by plants, stunts their growth and eventually kills them.

Large tracts of land in the Punjab are thus injured. Speaking roughly the evil is most wide-spread in the lands irrigated by the Western Jumna Canals* and in the clayey soils of the southern portion of the Punjab. Where it occurs in any appreciable degree, it makes the land barren for the reasons above given. It has consequently been the subject of much investigation. It is now well established, that it is not usually conveyed to the soil by canal water, or other sources of irrigation. It exists in the soil originally in a diffused and harmless proportion. It is collected on the surface to a harmful extent usually in one or two ways.

(1). When land is over-irrigated, or otherwise becomes swampy, the reh collects on the surface of the soil and in its upper layer; on such land it can be cured by plentiful irrigation accompanied with really efficient drainage. The water liquifies and dilutes it; and, if there is proper drainage, washes it off the land.

(2). In the clayey soils of the southern plains of the Punjab, which are almost rainless, the occasional showers or limited irrigation are sufficient to bring the reh to the surface, but not sufficient to wash it away; and the evil is in such instances incurable, except by irrigation and good drainage as above described.

In 1865 specimens of soil impregnated with reh, and of adjacent water and subsoil were forwarded to England for Chemical analysis. The Analyst (of the Royal School of Mines) came to the conclusion, that the only practical remedy was irrigation accompanied by efficient drainage. This was practically the same conclusion as was arrived at by the Canal Engineers of the Punjab, Major Fulton and Mr. Garbett, whose reports accompanied the reference to the Analyst. The same view is held by Doctor Burton Brown, an officer whose opinion was based both on scientific analysis and on practical experience in the reclamation of such land in the gardens of the Agri-Horticultural Society Lahore. It will be found expressed by Rájá Sir Sáhib Dyál of Amritsar, as his experience on his own lands, and by the Settlement Officer of Muzaffargarh, in their replies to the question under consideration. Also, if the replies to Chapter IV. (Irrigation works) be referred to, it will be seen that the Settlement Officer of Mooltan, the Canal Officer of the same District, Major Grey, whose experience extends both to Ferozepore and to Baháwalpur, and the Deputy Commissioner of Shahpur, all hold the same opinion. *Mr. Palmer*, the Superintending Engineer of the Bári Doáb Canal, in his replies appended, Nos. 6 and 8, dissents from this conclusion, believing canal irrigation to be necessarily injurious to land affected by kallar.

* For a graphic description of this, see appended extract from a late report by Mr. Ibbetson, Settlement Officer of Karnál, (No 18 of papers appended).

- I. I note in the margin * the best papers on the subject, not filed with this report; on the whole evidence there seems little doubt that plentiful irrigation aided by good drainage will usually cure land affected by reh; as certainly as the reckless irrigation of clayey soils and simultaneous neglect of all provision for efficient drainage will develop it in most parts of the Punjab plains.
1. *Circular Government of India Department Public Works No. 23 dated 24th March 1869, and Proceedings Punjab Government dated 26th April 1869, being papers forwarding for analysis specimen soils from Western Jumna Canal with Analyst's report.
 2. Selections from records Financial Commissioner Punjab No. 15 (1874) concerning reclamation of reh land (which includes Doctor Brown's opinion).
 3. Proceedings Punjab Government December 1873, containing a report on reh efflorescence by Civil Surgeon of Karnál.
 4. Report of Settlement Officer Karnál June 1877, on reassessment of Tahsil Pánipat, paras. 111 to 124.

GENERAL CONCLUSIONS.

The general conclusions to be drawn from the opinions above summarised appear to be as follows:—

Irrigated land.—In the Delhi and Karnál Districts such land has greatly deteriorated by excessive irrigation, and by the absence of efficient drainage. The Western Jumna Canal, which irrigates these Districts, was constructed by native rulers, and was greatly developed by us subsequently to the famine of 1833. But neither in its original construction, nor in its subsequent development was any regard paid to the drainage of the country irrigated. The natural lines of drainage were dammed up by the canal and its cuts, the soil became a swamp, and the whole population were disease-stricken. These evils are now after many years being gradually remedied by the re-alignment of the canal and its distributaries, and by making proper provision for the drainage of the country.

Limited and exceptional instances of similar deterioration occur in the upper part of the Bári Doáb Canal. But with these exceptions, irrigation from this canal has not deteriorated the soil except so far as it has been combined with over-cropping. Such over-cropping is common at the first introduction of canal irrigation in tracts where it has not before existed. The deterioration is mainly of the nature of exhaustion; and is not progressive after a certain point has been reached. Arrived at that point the land continues to yield fair and assured crops at a cost much cheaper than is possible without canal irrigation. The deterioration occurs principally on clayey soils.

On the inundation canals of the Mooltan Division and of the Shahpur District no deterioration has yet been caused by irrigation.

Unirrigated lands.—There is no evidence of general deterioration of soil. A greater proportion of inferior land can now be cultivated with profit, than was formerly the case, and so the average yield of land reckoned on the total area cultivated is probably lower than it was. The old wastes which have been brought under cultivation from time to time since annexation, do not yield now so richly as when first broken up, and land generally gets fewer rests than it used to do. Also neither the population nor their cattle have increased in the same proportion as the extension of cultivation. All these causes tend to lower the average yield of cultivated land. But there is no evidence that the natural powers of the soil are becoming exhausted; or that the yield of the crops cultivated have decreased out of proportion to the greater frequency with which the land is cropped. In tracts where the rain-fall is small and uncertain, the consequent occasional failure of crops dependent solely thereon acts as a natural protection against over-cropping.

REPLY to QUESTION 7, CHAPTER I.

Note by MR. F. HALSEY, of Amritsar, on a proposal to establish Model Farms, dated 10th January 1872.

Mr. Hume's proposition is one that I have long advocated, and is well deserving the attention of Government.

I am so confident that large profits could be derived from farming in India, that, had I the money, I would have no hesitation in laying out £10,000 on it.

We have never yet seen in India (at least as far as my knowledge of the country goes), farming operations carried on by capitalists, and until we do see them carried on by such we shall never know what the country can produce.

All over the world but in this country we see fortunes being made by the intelligent operations of European capitalists: for instance in Egypt, in the southern of the United States of America, and in the Confederations on the River Plate; also in many other countries with climates very similar to that we find here. And if the only capitalist in India, the Government, would once show that there were similar fortunes to be made in this country, we may be sure that many would be found ready to invest their capital in it.

There is no doubt, as Mr. Hume remarks, that:—

“The people have eyes as well as we have, and can appreciate good crops and better methods of tillage just as well as we can, when they see them.”

But who is to show them these things unless it be Government? I farm some 50 acres in the neighbourhood of Amritsar, and am constantly applied to for the loan of my English ploughs, and all the seed I gather from my own crops is eagerly accepted by those who have seen it growing.

In the late debates in the Council of the Governor General on the Irrigation Bill for this Province, it appears as an axiom that Government is giving the country an unmixed blessing by supplying water so plentifully for irrigation purposes. If people ever wanted instruction in any things, it is in the use of this water. As it is now, in the neighbourhood of this place (Amritsar), there are many fields simply destroyed from the abuse of this water, and if the people are allowed to go on using it for many years in the reckless manner they now do, we must expect to see large tracts of land return to their original state of jungle. At present it is the same crop every season; and with the exception of land immediately in the vicinity of large cities or villages, no manure is ever applied to replace what these ever-repeated crops are taking away.

Notwithstanding that the people are always crying out against the still increasing encroachments on their ancient grazing lands, I have never yet seen within the canal irrigated zone a field, however small, allowed to be fallow for two or three years; and yet I do not believe any loss would be suffered in the process; on the contrary, much would be gained. Except to those who have witnessed it, no Englishman who only knows our one hay crop a year at home, has any conception what can be produced in the way of grass in the Punjab (if only water is available), and the great profit attending it; and I can discover no chance of native agriculturists trying it, or any other new system, unless it is first shown to him by some one, and that some one must be Government; and the only way Government can bring it home to him must be by the establishment of farms such as Mr. Hume advocates. That scientific, I may say common-sense, farming will produce good results in this country proportionately as great if not greater than those produced in England, I am perfectly satisfied of from my own experience. I will mention one or two instances.

Mangel-wurzel brought me Rs. 50 a bigah net $\frac{1}{2}$ acre profit, even taking into account many hindrances, such as having to find my market 30 miles off (the market Meean Meer, and purpose employed for, feed of Government elephants). Growing oats gave me grain for my horses at a maund per rupee; at the time the crop was reaped, grain was selling

at 15 seers per rupee, and I had all the straw besides. In this case, both in money and in produce, I was the gainer ; in grain I had a better article at less than half the market rate, and, thrown in, I had the straw (a very important thing in this country where it is all eaten) containing more nutritious matter than is found in the wheat and barley straw of the country. I rented this year the right of cutting grass for 5 miles along the banks of the Bári Doáb Canal. It cost in rent, cutting and carriage, Rs. 390. I have 3,600 maunds of good hay at 9 maunds per rupee ; worse hay is selling in Amritsar now at 32 seers per rupee. The purpose, however, for which I made hay was not to sell, but to feed during the winter months a herd of over 50 heads of cattle I possess.

To prove the financial success of such an undertaking, I agree with Mr. Hume in thinking a considerable area should be operated on at once, because, I take it, Government will charge the farm with the whole cost of the European superintendence, and unless the area of the farm was large, it would never be able to bear the expense of the superintendence. Personally I find the 50 acres I farm pay me well, and without it I should be unable, with my small means, to follow my favorite amusement of breeding animals, had I to buy all their food ; but I pay nothing for superintendence, I do my own.

The greatest proof, however, that can be brought forward, is the fact that the native cultivator is able to pay 36 per cent. per annum interest on the money he borrows, and yet live ; on the contrary, he thrives.

No doubt the success of an undertaking of this sort very much depends on the superintendence. There *must* be *many* Englishmen who, if they have not the required knowledge, would soon find it, and quickly become capable of managing large farms in India. However, I must own that all the failures I have seen in the so-called Model Farms of India, have been in this *very superintendence*, which has generally been ignorant of the improved system it wished to introduce ; or, where practical European sub-management has been available, the class of men employed has been too stupid or unobservant to change the European practice so as to suit the seasons and altered circumstances of this country. As an illustration of what I refer to, I remember once seeing a practical English ploughman plough up a piece of land on the English system, that is, throwing the soil in lands ; the operation was beautifully performed, the crop germinated well, but when the time came for it to be watered, the water would not flow over the field, it naturally preferred to remain in the furrows between the lands ; the result was the crop came to nothing. The ploughman saw there was some mistake, but was helpless to change it, because he had never seen the plough used in any other way before, and was too stupid to alter his system ; the consequence was the English plough was declared unsuited to the country. This system of ploughing in lands in England is employed on purpose to cause a surface drainage ; in the Punjab we do all we can to keep moisture in the soil.

The amount of capital required to start a farm need not be so very great if Government could farm its own land, which in most places it would.

Beyond a house for the manager, no *permanent* building of any sort is required in such a climate as this, and it would be a great mistake to *commence operations* on an expensive scale with all the manifold agricultural implements now in use in England : to employ any but the very simplest, in fact, would be to ensure certain failure.

REPLY TO QUESTION 7, CHAPTER I.

By Mr. W. COLDSTREAM, Deputy-Commissioner of the Hoshiarpur District.

(a). There is a very general wish on the part of the educated and influential Zamindárs to improve agriculture. They wish to learn, and would, I feel convinced, eagerly profit by any good example set before them. A scheme to establish a small model farm in connection with the District Committee here is now being matured. Some machines suited to the country were ordered from England through the kind offices of the lamented Mr. Halsey.

The Government have established a School of Forestry: it might with advantage establish a School of Agriculture where selected native youths could be trained in correct principles, to be afterwards applied in model farms on Wards' Estates, &c., under Government direction.

Small model farms in contiguous Districts might be formed, and trained agriculturist procured from England or elsewhere (if special Indian training could be got, it would be so much the better), who might supervise 2 or 3 such farms, and draw a salary of Rs. 300 or 400 per mensem, jointly contributed by the District Funds of the Districts benefited.

It is quite certain that a great many matters are not properly understood, notably the proper composition and use of manures of kinds, and various effective methods of cultivation, such as, in certain cases, deep ploughing.

Government being the real landlord and depending in fact to such a very large extent on the land revenue, no pains should be spared to develop agriculture by improving the produce and extending cultivation; the result, it might well be hoped, would be increased security against famine, and a growing revenue. There is no apparent reason why wheat if cultivated with the same care and efficiency should not yield as large a return in India as in English soil; as a fact however it does not do so.

The average return for Great Britain is given as 25 bushels per acre, which is 18 maunds 30 seers paka. In this District the average is not more than 2 maunds kucha per kanal, which is 8½ maunds paka per acre, or less than ½ the English rate.*

The yield might be no doubt doubled by proper manuring and tillage.

A stimulus is wanted, and that stimulus is European encouragement and example. How efficient these may be in increasing the agricultural prosperity of a District, the progress of the tea industry in Kangra shows.

(b). The Agri-Horticultural Society of the Punjab might well be affiliated to the Financial Commissioner's office, and discharge, as in the early years of its existence it was wont to do, the valuable functions of an acclimatization and experimental Society for the Province.

(c). Much benefit has been derived from the introduction into the District some 8 or 10 years ago of Hissar bulls. The old ones have nearly all died; new ones were indented for; only 2 rather inferior animals have lately been supplied. The people like them much; their progeny is very valuable; I should think 8 or 10 might with great advantage be introduced into every District. They cost nothing to keep, as they roam free in villages.

(d). It is constantly to be observed that the village communities have little or no power of corporate action for the common benefit or profit. Petty jealousies on the one hand, and utter apathy on the other, prevent their making so much out of their estates as they might. I have specially noted this in the matter of tree planting. In many

* Recent inquiries in the North Western Provinces yielded nearly the same result:—

Average of wheat crop.		Rs per acre.
Cis-Jumna	...	750
Trans-Jumna	...	800
Average for Great Britain	...	1,500
Hoshiarpur	...	682

villages there are hundreds and sometimes thousands of acres of common, which, if planted out with trees, would be an immense source of profit to the village, and a benefit to the country generally. This vacant area is often greatly in excess of their grazing requirements, and lies absolutely unproductive, while it might be made in this way to bring in a large profit with almost no expenditure.

I think it is much to be regretted that the Forest Act did not arm Government with the power of compelling villagers to plant trees, when they have got land in excess of their requirements for tillage and grazing. Such a measure would not be unpopular ; on the contrary, I believe, it would be welcomed by the majority of villages. All that is wanted, is to supply authoritatively their want of corporate action and energy. Were an order to plant common given, it would I believe be obeyed with alacrity. The benefits of a general increase in the area under trees would be direct increase of the villagers' wealth : an increase of moisture, and probably a somewhat lower and more equable temperance in the region where such planting was carried on. Had a clause been inserted in the Act empowering the District Officer, specially or generally authorized in that behalf by the Local Government, to call on the villagers to show cause why an order to plant should not be passed, there need have been no fear of interference distasteful to the people in the great majority of instances.

I discussed the matter in my No 695 and 696 dated 17th December 1877, to address of Commissioner, but I need not enter on further details here. The subject seems to me of the greatest importance to the interests of the country.

(e). I think it is worth while mentioning that for more than a year past a periodical Vernacular journal of Agriculture, devoted exclusively to agricultural subjects has been published "Atáliq Zamíndáran." at Hoshiárpur. It is entitled "Atáliq Zamíndáran." As far as I am aware, it is the only periodical of the kind published in vernacular. As I feel that such an enterprise, especially when indigenous, deserves encouragement, I venture to submit a few copies of the numbers for the past year bound together in one volume.

ANSWERS TO QUESTION 7, CHAPTER I.

ON DETERIORATION OF SOIL AND CROPS.

The last part of this question, as stated below, was circulated to selected officers, and the replies received are given consecutively. CH.

Have you observed that there has been any deterioration of the soil, or that crops are worse than they used to be within your experience? Does any such question specially arise in case of irrigated land? State specifically on what facts you base your replies. Where there is any popular belief in such deterioration, state what facts are adduced in support of it.

REPLIES.

By COLONEL W. G. DAVIES, C. S. I., Commissioner and Superintendent, Delhi Division.

My experience of agriculture has been obtained during my service in the Punjab commission since 1854, and specially in the Shahpur and Gurdáspur Districts. In the former I served 5 years, during which I completed the settlement commenced by Mr. Ouseley, the present Financial Commissioner, and in the latter rather more than 2 years as Deputy Commissioner; I have also seen something of the condition of agriculture in the Districts of this Division.

2. I have observed deterioration of soil, but this has only been in the case of irrigated land in the Gurdáspur and Karnál Districts. It was due in both places to the same causes, over-cropping, over-watering, and defective drainage combined. The way in which these causes work to cause deterioration of soil will be found very fully described in Mr. Ibbetson's Revenue Rate Report of the Pánipat Tahsil, and my review of it, and it would only waste my time and yours if I were to attempt to repeat the description there given. There also will be found the facts in support of the well ascertained results, which do not, I may add, rest on popular belief alone. So far as my experience has gone, there has been no deterioration of the soil where it is not affected by the special deteriorating influences stated above.

By ALIMULLA, Honorary Extra Assistant Commissioner, Tahsil Rohtak, in which he has been employed for 5 years.

In reply I have to say that since I came here I have seen no deterioration of soil in canal irrigated land, nor in land, dependent on rain; nor have the crops deteriorated. Up to this, so long as the seasons are propitious, the crops are as good as they can be expected to be.

2. The reason of this is, that every 2nd or 3rd year there are no crops owing to drought, and so land is rested and regains its strength.

By J. B. LYALL, Esq., Settlement Commissioner, Mooltan and Deraját Divisions.

I have served in all 7 Districts of the Mooltan and Deraját Divisions, and in Lahore, Gurdáspur, Ferozepore, Hoshiárpur and Kángra. I have not observed any deterioration of the soil, or falling off in the quality of the crops within my own experience. Such changes must be very marked to be recognized by an official, and as they must ordinarily occur gradually, it is difficult for him to perceive them in the few years he spends in any one District.

2. There is a popular belief in the Punjab generally that the yield has decreased; the people often say that the virtue or blessing has gone out of the lands, and attribute the

Ch. I. fact to the want of faith, irreligion, and lying spirit of the age. They also, however, admit in argument that it may be partly due to the fact that the land gets less rest than formerly. This is I think the true explanation of the diminution of yield which has occurred.

3. In countries like the Mánjha, which formerly depended on the rain-fall, and have since got canal water, it is commonly said that the rate of yield has fallen off.

Without doubt constant cultivation and application of canal water tend to take the strength out of the land. In former years the yield of such crops as were grown in the Mánjha was very heavy, when a year of good rain-fall occurred.

4. I have observed within my own experience certain cases of deterioration of soil and crops, but they are hardly, I think, cases of the nature referred to in the question under reply. In the Gurdáspur District, on the neighbourhood of the Bári Doáb Canal, I have seen land of a lower level than the canal deteriorate greatly by the growth of springs fed by the canal, or by the water rising too near to the surface. I am thinking of the Káhnwán Chamb tract, and of other villages near Patháńkot, Dínanagar and elsewhere.

By Mr. E. C. PALMER, Officiating Superintending Engineer Bári Doáb Circle.

During the last 15 years during which I have had some experience in irrigation and its effect on agriculture, my observations have led me to conclude that irrigation from canals has a very different effect on various soils.

2. Dividing the soil commonly met with between the Sutlej and Ravi into (1) light sandy loam; (2) stiff clay; (3) stiff clay impregnated with the salts locally known as "reh" or "kallar."

3. I have observed that canal irrigation on the first has a marked effect in improving and fertilizing it.

4. The clayey silt the canal water brings with it, render it more productive, and the regular culture rendered possible by canal water causes a deposit of humus from each crop grown, which has gradually but entirely changed the nature of the surface soil.

5. On the second (stiff clay), although the use of canal water doubtless ensures an average crop, yet the same soil under well irrigation, as a rule, will yield more per acre.

6. I must not be misunderstood to mean that therefore such soil should be avoided in distributing canal water; there is not the slightest doubt that a bushel of grain can be brought to market cheaper from canal irrigated land than from similar soil well irrigated; but the latter, all other circumstances being similar, will yield a heavier and a better quality of grain per acre.

7. After the first 4 or 5 years of canal irrigation, during which the crops are usually very luxuriant, a marked deterioration takes place, but, having arrived at that state, I have failed in observing any further injury by continuous irrigation.

8. I have satisfied myself of the fact that lands canal irrigated for some time take some years to recover, if deprived of canal water, and irrigation by well be resumed.

9. With the 3rd class of land, "reh," the use of canal water is undoubtedly prejudicial, intensifying and hastening the tendency the salts have to rise to the surface.

10. I would always refuse canal water to lands on which "reh" is known to exist in a substratum, *as a rule*.

11. There are, however, exceptions; some of the best crops of rice and of turnips are grown on land, that when dry is white as snow on the surface.

12. I am desired to state specifically on what facts my opinion is based.

I would refer you for an instance of light sandy soil, rendered fertile by canal water, to the tract irrigated by the Chupbal distributary in the neighbourhood of Dharmkot, Tam Taran tahsil, Amritsar District.

13. For the effect on clay soil to the irrigation from the Bári Doáb Canal on the Ch. I. Mánjha generally.

14. For the present state of the irrigated reh lands to the villages of Saurián, Dhulipgarh, Pasrúr, Neázbeg in the Lahore District, Dipálpur and Haveli in Montgomery.

15. I find a difficulty in replying to the last clause of the question.

16. That there is a popular belief in the inferiority of grain (not rice) grown by canal water, is well known to all Canal Officers, but I am not in a position to prove specifically that canal wheat is less nutritious than wheat grown by well or by rain.

17. I do know that of 2 equally good samples of wheat in the Amritsar or Lahore grain market, whether canal wheat or other, there is not one farthing difference in the price per maund.

18. I have heard from the late Mr. Francis Halsey, for whose opinion on agricultural matters I have the very highest respect, that on weighing a bushel of canal grown wheat, average sample, against a similar sample of well irrigated wheat, the latter weighed fully 11 lbs. heavier than the canal wheat.

By RAJA SIR SAHIB DYAL, K. C. S. I., of Amritsar.

It is commonly believed in the Amritsar Parganna that the canal water has made the soil poor. But as no more than half the land can be irrigated, the other half is yet uninjured; and so the Zamíndárs say little of the subject. Certainly *kallar* is removed from land by irrigating it from the canal, and such land afterwards yields well. In a village owned by me (Kot Sáhíab Dyál) the lands were much injured by *kallar*; but since they have been irrigated by canal water they have yielded good crops.

2. In the canal irrigated villages of Gurdáspur, the people say that the canal water has injured their soil. But the truth is that they have given up the old custom of the country, under which only one crop a year was taken from the soil; viz., a rabi crop from half the land, and a kharíf crop from the other half. Instead of this they try to take 2 crops a year, (both rabi and kharíf) from the same lands; and of course the yield under such circumstances is small.

3. Another thing is, that while the villages near the head of the canal are weakened by an excessive supply of canal water, those in the south of the District frequently do not get enough; which also causes short crops. For instance, in the south of the District, at ploughing time the Zamíndárs usually obtain one good watering for their land, but from that date to the ripening of their crops it is a chance whether they get any more.

4. In my opinion, an assembly of the Canal Officers and Civil Officers ought to be held; and if they so decide, then for the future no village should receive more water than can irrigate half its land in the rabi season and half in the kharíf season. Under such a rule, no village would receive an excessive supply, and there would be enough water to spare for those who now receive only a short supply.

By MR. E. C. PALMER, the Superintending Engineer of the Bári Doáb Canal.

(Whose reply has already been given above) being asked with reference to the above reply of Rája Sir Sáhíab Dyál to state whether, as a matter of fact—

i.—Villages near the head of the canal receive an excessive supply of water to the injury of their soil and crops, the villages in the south of the Amritsar District being consequently stunted? and whether—

- Ch. I. ii.—The villages in the south of the Amritsar District cannot reckon for certain on more than one watering for their crops, viz., at ploughing time before sowing ?

REPLIES AS FOLLOWS:—

I do not agree with the opinions expressed by Rájá Sir Sáhíab Dyál of Amritsar.

2. In his 1st para. the Rájá states—

- i.—That it is commonly believed in Amritsar that canal irrigation impoverishes the soil ;
ii.— That it renders soil impregnated with salts fertile.

To the first I am inclined to agree, but with some qualification.

3. An acre of land of a given quality irrigated by a well will produce a heavier out-turn of, say wheat, and of better quality than an acre of precisely similar land irrigated by canal, or that has for some years been so irrigated. The effect of canal water apparently is to reduce the fertility of the land to a certain extent, after which no further deterioration is observable, and this is true of loamy soils only ; on clay and on sand the effect is different. A stiff clay soil cannot be worked profitably without canal water.

4. A poor sandy soil is rendered coherent and fertile by the silt deposited by canal water.

5. The second statement, that canal water is beneficial to "kallar" soils, I entirely disagree with ; for a few years the application of canal water is followed by better crops ; the ultimate condition in which kallar lands are left by canal water applied without drainage is sufficiently exemplified by the wide-spread ruin that has overtaken the villages on parts of the Western Jumna Canal.

6. There is one crop, and one only, that thrives if amply supplied with water on kallar soils, that is rice, and I imagine it is to this crop the Rájá alludes.

7. In the 2nd para. of the Rájá's report, he states that the people say that the canal water has injured the soil in the Gurdáspur District, but gives it as his opinion that the objectionable custom of "do fasti" cultivation is the cause of the injury.

So far as my observations go, I have not the slightest doubt canal water has injured certain lands in the Gurdáspur District, i. e., it will be some years before they recover from a glut of water and become fit for well irrigation ; and generally I am of opinion that to grant water when the spring level is less than 25 feet below the surface, is a waste of water, and an injury to the land.

8. The Rájá in his 3rd para. is of opinion that while an excessive supply has been and is allowed near the head of the canal, the villages at the extremity have had but a scant allowance.

The reverse of this is the fact :—In the whole of the Gurdáspur District irrigation has been discouraged for some years ; and in my opinion rightly so. Over nearly the whole of this District a good rabi harvest may be reckoned on in average years dependent on rain alone. And during the last two such rabi seasons the bári crops have been superior to those canal irrigated.

9. It seems needless to refute the error the Rájá has made in his statement as to the quantity of water received by irrigation in the lower reaches of the canals. Save in exceptional seasons when abundant and seasonable rain-fall renders the crops independent of canal water, no descriptions of crop can be matured with less than 6 waterings.

10. The last para. of the Rájá's note exemplifies how little is known by even well informed native gentlemen of the amount of care and thought Government has bestowed in distributing the canal water so as to benefit the greatest number.

He proposes that the limit of the amount of water to be given to each village should be the volume that can irrigate the whole of its land once in the year.

If this were done, of the 1,200 villages now participating in the advantage of irrigation from the Bári Doáb Canal, about four-fifths or 960 village would be deprived of it.

11. The fact is one-fifth of the gross area is the proportion roughly aimed at as the CH. I. limit to which canal irrigation is allowed to extend.

12. The following statement gives the statistics on the subject; from these figures it will be seen how wide of the truth is the assertion that the villages near the head of the canal, i. e., in the Gurdáspur District, are more profusely irrigated than those lower down the canal.

	Gross area of villages irrigated by canal water acres.	AREA IRRIGATED BY CANAL.				
		1873-74.	1874-75.	1875-76.	Mean of three years.	Mean percentage on gross area.
Gurdáspur	215,224	30,276	32,290	19,810	27,668	12.8
Amritsar	415,954	95,385	117,624	91,180	101,389	24.3
Lahore	510,934	104,726	119,269	103,688	109,201	21.3

Answer by MUHAMMAD HAYAT KHAN, C. S. I., Judicial Assistant Commissioner, Gurdáspur.

It is the belief of the people in general, and also my belief, founded on experience gained during my residence in this and the Lahore District, that a decrease in the produce of land is the result of deterioration of the soil. It cannot be said that crops are now generally worse than they used to be; but in several instances land has actually lost its productive power from the following causes:—

- Owing to increase in the population of the Punjab, the old custom of growing only one crop, or allowing land to lie fallow for one or more years, and of cultivating Banjar land has been lost sight of, or rather it has now become impossible to act up to it. Nearly all Banjar land has been brought under cultivation, and the old fields, divided and sub-divided into several parts, have passed into the hands of the succeeding generation, who, having only a small patrimony to depend upon, cannot but help cultivating the land every year, and growing more than one crop on it.
 - It is an undisputed fact that a good crop entirely depends upon the natural heat and moisture of the soil, and that if any of these two properties is exhausted, the land loses its productive power; hence the land which is properly manured and watered produces a good crop, while the land which is constantly watered but not manured, does not do so. The reason of this is that the moisture is increased by constant watering, but in the absence of manure the natural heat is soon absorbed. The latter remark applies to canal irrigated land.
 - Irrigation from canal leaves a sandy deposit on the surface of the soil and weakens it.
 - Owing to the looseness of the earth caused by canal irrigation, it easily yields to the plough, and the Zamíndárs, as a rule, therefore take less pains in cultivating such land; the consequence is that in time it becomes less productive.
 - No rest is allowed to the canal irrigated land; it is generally made to grow more than one crop a year, which soon exhausts its strength. It is an acknowledged fact that for the first 3 years the báráni land which is watered from the canal produces a rich harvest, but it soon loses its productive power by constant irrigation, from want of manure, and rest, and the deposit of sand.
2. The Zamíndárs suggest the following methods for improving and preserving the natural vigor of the soil: 1. occasional rest; 2. constant ploughing; 3. manuring.
3. None of these suggestions can be acted upon. As already stated, owing to the smallness of the estate owned by each individual person, it is not possible to give any material rest to the land. In regard to the 3rd suggestion, it must be said that manure is not procurable in sufficient quantity. Only the lands adjoining to the village, and those

CH. I. irrigated from wells, are manured, and the rest not. With the decrease of pasture grounds there has been a gradual falling off in the breed of cattle, and consequently a scarcity of manure.

4. The great drawback to improvement is the ignorance of the people, and when the little knowledge they possess of improving the soil cannot be adopted for want of means, it is no wonder that the condition of their land should be so deplorable as we find it. I would therefore strongly advocate the necessity of teaching the Zamindárs the rudiments of the science of cultivation. An effort should also be made to effect an improvement in their ploughs, and in the breed of draught cattle. This can best be done through the agency of the District Committee. A certain sum may be allotted annually for this purpose from District Funds.

Answer by MIRZA AZIM BEG, Honorary Assistant Commissioner, Jhelum Settlement.

The people are perfectly aware that continuous cropping can be successful only when the land receives some external aid.

2. The aids thus recognized are :—

- (1). *Manuring.* This is most useful, when the climate is temperate; but in places subject to great heat it does harm.
- (2). *Irrigation,* if possible from canals or wells, but also by conducting on to land the rain drainage of adjacent lands: or by flooding from hill torrents.
- (3). *Repeated ploughing.*
- (4). *Change of crops.*

3. The reasons why the yield of land should be less now than in former days are obvious.

4. Before British rule large areas were lying waste. Only the best land was cultivated; and the agriculturist could spend all his labour on it. The existence of large adjacent areas of waste helped him in various ways, especially in supporting his cattle. After annexation in 1849, an enormous expansion of cultivation took place. Speaking only of the period between 1857 and 1878, we know by comparison of the records of the 1st and revised settlements that cultivation has increased from 600,000 acres to 1,000,000 acres. Population has not increased in nearly the same ratio. And the new land is decidedly inferior in quality to the old. The agriculturist's labour is divided over a larger area than before. At the same time, owing to the peaceful state of the country, cropping is more frequent. It is obvious that under such circumstances the rate of produce must fall off.

5. I remember one piece of land (in the Haripur plain of the Hazára District) some 10,000 acres in extent, which had been waste for years; but which the agriculturists brought under cultivation a few years after annexation. The first crop it yielded was so rich that they dubbed the land "The silver plain;" but in 3 or 4 years time repeated cropping reduced the yield of this land to a very low rate.

6. The great increase in cultivation has restricted the agriculturist's ability to keep cattle; it has also compelled him to burn their droppings as manure. If every agriculturist was compelled to keep one-tenth of his land under grass and copse, there would be many more cattle in the country, and the agriculturists would in consequence be much better off. If Government at the same time as it enforced this measure, were to remit 5 per cent. of its revenue, the agriculturists could not complain of the compulsory introduction of such an arrangement.

7. The paucity of milch cattle in the country is a great evil. The average in the Jhelum District is only one milch buffalo or cow for every 5 souls. In one tahsil, Chakwál, the average is so low as one to 7 souls.

8. Unless active measures are taken to increase the wood and grass-bearing area, great trouble will eventually be felt. This deficiency and the indebtedness of the

agriculturists are alike evils, which will go on increasing until Government will be CH. I. compelled to remedy them actively.

*Answer by MR. P. O'BRIEN, Executive Engineer Lower Sutlej and Chenab Division
Inundation Canals.*

I have been employed in the Mooltan District since the year 1850, and all the time in the Canal Department. I have had no opportunities for observing famines, none having occurred here since I have been in the District, nor have I ever been in a famine-smitten District.

2. In reply to your questions, I beg to state that in my experience of 28 years in this District, I have not observed any deterioration of soil or crops, nor has any complaint been made about it by the people.

3. In the District generally there is a larger area attached to villages than they cultivate in any one year, and consequently the same land is not brought under the plough every year; but there are other parts where the same conditions do not exist, but in these no deterioration has occurred. Care is taken by the people not to sow the same kind of crop on the same ground during 2 consecutive years, but the land is never left fallow. It bears crops in both the kharif and rabi. The only precaution taken is to manure the land for the rabi crop with the refuse of indigo after manufacture of the dye.

4. No manure is used for the kharif crop, with the exception of sugar-cane, which requires high manuring. All other crops depend entirely on the fertilizing property of the river water to mature them, and the yield is as good one year as another, provided the irrigation does not fail.

5. Water lodging for any length of time destroys the fertility of the soil. This occurs from river spills and from breakages in the canal banks. If there is no outlet for this water, the land in which it lodges becomes unfit for cultivation till it has been thoroughly dried, and then irrigated; such an occurrence is exceptional, for it requires the water to remain a good long time on the ground to destroy its fertility.

6. Too close proximity to the surface of the sub-soil spring is also detrimental to cultivation. This occurs in lands adjoining the river. Crops grow on this, but are always poor and unremunerative.

7. In all other respects irrigation has been highly beneficial.

Answer by MR. C. A. ROE, Settlement Officer, Mooltan.

I have observed no deterioration of the soil or crops in this District, nor have I heard any expression of popular belief in such deterioration. There is no injury caused by irrigation unless combined with excessive inundation from the river. In such a case the water level is unduly raised; small natural springs begin to appear, and a coarse rank grass is produced; in fact the land turns into a swamp. Such cases are, however, rare, and occur only in the Shujabad tahsil.

Answer by HUKM CHAND, Extra Assistant Settlement Officer, Mooltan.

The strength of the soil has not decreased so as to reduce the yield. As a rule in this District there is more land than cultivators. In such backward tracts cultivators usually cultivate one field one year, and another the next, leaving the previous field fallow; and besides a great deal of waste land is being newly reclaimed. Near the towns, where the lands are continuously cultivated, and yield 2 or 3 crops a year, they are generally manured.

- I. 2. The lands near the rivers are frequently enriched by alluvial deposits left behind by the annual floods. In the same way no decrease in the strength of the soil nor in the rate of yield has taken place on the lands irrigated by canals.
3. As to well irrigated lands, in the tracts of this District where wells are principally used, land is very abundant, and the fields under irrigation are frequently changed; so no deterioration of soil takes place.
4. There are a few exceptional cases in the south of the District in which irrigated land has become water-logged, but this is exceptional and due to special circumstances.
5. The average rate of produce is increasing rather than diminishing, nor do the people pretend that any deterioration is taking place.

Answer by MR. E. O'BRIEN, c. s., Settlement Officer, Muzaffargarh.

This answer relates to the Muzaffargarh District of the Mooltan Division; I have been Settlement Officer of that District for 5 years and 5 months.

I have not personally observed any deterioration of the soil or crops of late years. I have examined the reports and correspondence of the years immediately following the annexation in 1849, which contain statements of the out-turn of crops, and I do not find that the amounts given are greater than we find them to be at present. Native officials and Zamindárs who remember the District before British rule, say that no deterioration of soil or crop has taken place.

2. No general deterioration has been observed in the case of irrigated land. The District is long and narrow, lying between the rivers Indus and Chenab.

3. There is a slope from the Indus to the Chenab, and no dorsal ridge between the rivers. The level of the Indus is higher than the greater part of the District. The soil of the District is alluvial, pulverises very fine, and contains a good deal of salt. Irrigation is effected by wells, inundation canals and by the rising of the rivers. Excessive floods and over-irrigation from the canals cause the natural springs in the land *beyond the reach of the flow or canal water* to rise to the surface of the ground. They bring up all the salt in the soil with them, and come bubbling up with a good deal of force.

4. The water thus forced up kills all the vegetation near it, and renders the land unculturable. It is locally known as Soma. It only occurs in the land beyond the reach of canal and flood water. The injury done is local and temporary, and is entirely cured by a surface flood passing over the land affected. I have never seen or heard it stated that canal water weakens the soil which it irrigates, no matter how constantly the land may have been cultivated, and irrigated. On the contrary, canal irrigation is supposed to be the best cure for the salt efflorescence called here *kallar*.

5. I do not think that there is any popular belief in a deterioration of soil. From 1833 to 1844, the Mooltan Province, of which this District was a part, was governed by Diwán Sáwan Mal, whose administration was much better than anything that had preceded it. He especially encouraged agriculture. Enough time has elapsed since his rule for the merits of it to be exaggerated and the defects forgotten, and people certainly do say that there never were such crops as in his time, but then they attribute all that is good to Sáwan Mal. The canals never ran so well, and the rivers never rose so seasonably, and there never was such justice as in Sáwan Mal's rule.

6. I think that Sáwan Mal's rule threw a halo over native rule because it was better than all that had preceded it, and that his fostering of agriculture, which was much neglected when he succeeded, has made people think that the land was more productive under former governments. The praise of the crops in his time is little more than praise of the good old times.

7. I have never heard any facts adduced in support of the statement that crops have become worse, although a comparison of native and English rule has formed a constant subject of conversation with Zamindárs. I have heard it stated, and it is quite true, that the

canals were well looked after in this District under Sáwan Mal, and that they have been neglected under our Government; this is alleged as a proof of deterioration of crops. CH. I.

Answer by MR. H. ST. GEORGE TUCKER, *Settlement Officer, Dera Ismail Khan.*

I have served nearly continuously in the Dera Ismail Khan District for the last 10 years. During this period there has been no famine, nor any serious scarcity. Prices have occasionally however been very high owing to exportation of grain to Mooltan and Sukkur.

2. I have noticed no general deterioration of the soil, except in the case of alluvial lands along the Indus. Such lands when first broken up are richer than when they have been long cultivated. Ten years ago much of the cultivation consisted of newly broken up lands, and the average yield was higher than it is now, when the proportion of new to old cultivation is much smaller. Old lands get weedy and poor, and are not as a rule allowed sufficient fallows to enable them to recover. The fluctuating system of assessment, however, offers every encouragement to the Zamíndárs to throw impoverished lands out of cultivation. In the case of perennial streams, the irrigation from these impoverishes and hardens the soil, but as 2 years' fallow is allowed to one year's cultivation there is no deterioration of soil. Hill stream flood irrigation enriches the soil, and it is impossible almost for such lands to deteriorate though kept continuously under crop. In the Thal the quality of well lands must be kept up by the use of manure. There is no canal irrigation in the District to speak of.

Answer by MR. S. S. THORBURN, C. S., *Settlement Officer, Bannu.*

I shall write about the Bannu District, in which I have served as Settlement Officer since 1872, and for the 4 preceding years as Assistant Commissioner.

I have observed no deterioration in the productive capacity of the soil generally (except on some *reh* lands) in the last 10 years. In the sandy parts of Marwat, where there have been 2 or 3 fair or good crops in succession, the following year's return, as might be expected, is worse even though the rain-fall be seasonable and efficient. I have noted this particularly during the last 2 years in certain localities. As to canal irrigated land, the Kúrm carries such a quantity of suspended silt in its water that it serves to perpetually renovate the soil. Below a certain point the Kúrm water is brackish, from the discharge of the brackish water of a hill torrent called the Kashu into it; all canals taken off below that point in a few years cause land to which their water is applied to be impregnated with *reh*. I know several cases. But as a fact such *reh*-affected but now-irrigated land bears better crops than it did before, when unirrigated. The people understand what causes the out-crop of *reh*. The Marwat villages of the sandy and fully cultivated tracts often complain that their soil has become "old" or "worn-out," but as dry seasons cause enforced fallows, the soil seems to recover its productive powers. The Marwats believe that soil deterioration is retarded by the deposit of dust from dust storms. A long rest is acknowledged to be the best remedy for over-cropping on *dáránt* lands.

Answer by MAJOR E. G. HASTINGS, *Settlement Officer, Kohát.*

My replies are for the Pesháwar and Kohát Districts. In the former I served as Assistant Commissioner and Settlement Officer for 12 years, and in the latter I have served for the last 3 years. I have had no opportunities for observing famines or any experience in carrying out measures of famine relief.

2. I have observed in the Yusafzai and Hashtnagar Mairás that the rain land crops on lately broken up waste are very much better and more plentiful than on adjoining lands

28. I. which have been for some years under regular cultivation. In irrigated lands I cannot say that I have noticed the deterioration of the soil, or that the crops were as a rule worse than when I first joined the District. I have made no course of experiments for either description of lands.

3. The popular belief is that there has been a deterioration of the soil; the reasons given for this having come about are :—

I. Owing to *increased population* the land is more worked than it used to be, and does not get the rest that is necessary.

II. The rain-fall is also said to be not so certain and appropriate as it used to be.

III. The land is not sown so carefully as it used to be in days gone by when the proprietary body themselves were the chief cultivators. The go-between or cultivator is careless compared to the proprietor.

4. It is however allowed that the land with thorough rest and manure gives as good crops as it ever used to.

QUESTION 7, CHAPTER I.

Extract from a report by T. Login, Esquire, Executive Engineer, on the experimental CH. I.
cultivation of cotton carried out under his superintendence; dated 21st October 1870:—

3. I should begin by stating that Bahalgurh is situated in the "khadir" (valley) of the Jumna, that the surface soil at the place where the experiment is under trial is neither very good nor very bad, and is known by the name of "dhakur," a dirty grayish brown colour, and has been under grass for several years, being within the compound of the road chowkee. The thickness of this upper stratum is 2½ feet, below which there is 5½ feet of stiff clay, where it is succeeded by very fine sand, and water is reached at this season at a little less than 20 feet below the surface.

4. The area under cultivation is 5880 square feet, or very nearly one-eighth of an acre; and on the 23rd May last operations began by flooding the field with water to a depth of three or four inches, when it was twice ploughed two days later. On the following day it had "khát" (stable refuse) spread over it, on an average about three-fourths of an inch thick, and on the 27th it was again twice ploughed, if scratching to a depth of four inches or so can be called ploughing; after which the ground was smoothed over by having a "mirah" (a plank) dragged side-ways over it.

5. Next day furrows, eight inches high, and three feet apart, were thrown up by the "jindrah," an instrument in common use throughout the Punjab; it is simply a board, a little over two feet broad, some seven inches deep, and 1¼ to 1½ inches thick, with the lower edge reduced to about half an inch. To this board is attached a handle, four feet long, so that it is simply a broad shovel requiring two people to work it, one holding the handle and directing it, while the assistant by a rope attached to the board at both ends, like a punkha rope to a punkha, pulls this otherwise unwieldy shovel. The furrows by this rude instrument are soon made, so that the cost of making such furrows should not exceed one rupee eight annas per acre, and it is simply in making them that there is any extra outlay on the present system of growing cotton in India, which is more than compensated afterwards by the reduction of labour and saving in seed.

6. After this the field should have been watered a second time by filling the spaces between the furrows or drills to a depth of four or five inches, and two days after that the seed should be sown; but owing to a mistake the seed was put into the ground the following day, May the 29th, and on 1st June, or two days after, the field was watered.

7. The manner in which the seed is sown was first to rub it in fresh cow dung, and then dry it in the sun, as is always the practice here; after this small holes are made near the top of the drills at every two feet, and four or five seed are dropped into each of these holes, covering them over with earth; but when the plants have grown up a few inches, they should be thinned, and only one, the most healthy, permitted to remain.

8. In the simple process above described consists all the difference between the Egyptian system of drills and the Indian broad-cast method of growing cotton, which in Egypt gives a yield averaging 500 lbs. an acre, and here in India only about one-sixth that quantity, and that of a much inferior quality.

9. On the 6th and 7th June the young plants began to show, and on the latter date the first clearing of grass took place. Water was again given on the 9th and 17th as before described, care being always taken that the depth between the drills did not exceed five inches, so as not to come too near the young plants, and on the latter date the second weeding took place also.

10. At Bahalgurh, on the 21st June, there were a few drops of rain, but on the 26th it came down in torrents, and continued with little intermission for four days. By this time the young plants were from four to six inches above the ground; but this heavy rain quite submerged the field, and out of 730 groups of plants (they had not been thinned by this time) only 422 survived, that is, two-fifths of them were killed.

11. It was not till the 17th July I could visit this place on my tour of inspection, when I found those plants that survived averaged about eight inches high, one as much as 16 inches; when each group of plants was thinned, only one plant left remaining, I tried to transplant those now pulled up at the spots where the former ones had been killed, but failed in every instance. As a precaution against this, however, fresh seeds were put in also, which have sprung up; but, being so late in the season, the yield of the latter will not be one-tenth of those which survived the flooding by the heavy rain-fall at the end of June. With the exception of a few light showers on the 9th of July, from the 2nd of the month till the 17th there was no rain at Bahalgurh, where on this latter date there was a smart fall, and the land being low, the water stood in some places from two to three inches above the top of the drills, but this was soon drained off, and the following day all was absorbed, so no injury was done; on this subject I propose making some remarks further on.

12. I again visited Bahalgurh on the 12th September, when I found a great change, some of the plants being over 6½ feet high, one covering an area of nearly 15 square feet, of which I informed you in a private note; and I am happy on this my present inspection to find that several have attained a height of 7½ feet, and two or three covering over 20 square feet, while by the weight of the pods many of the branches are bent downwards, some nearly reaching the ground.

13. Along with this report I send by rail one of the plants entire, that you may see how cotton grown from *native* seed can flourish if sown according to the Egyptian plan. This plant is by no means an exceptional one, for there are several much better, but it is rather above than below the average, and was selected as being easily removed without much disturbing those near it. This plant now sent measured six feet three inches above ground, and the "tap" root was 8 inches, but evidently interrupted (by its crooked appearance) in its downward course by the ploughing not being deep enough. The main stem has given off 18 branches, large and small, and on these branches were counted 226 seed pods and blossoms in various states of advance, but probably the average will be about 150 (one even exceeds 300), so the sample is rather above than below the average, as before said.

14. By post I also send you some cotton, uncleaned, which is the yield of 100 pods, which in all weighed equal to the weight of 15 rupees or six ounces; and by a trial made yesterday I found that on cleaning 313 rupees weight of cotton, the result was 101 of clean cotton, and 217 of seed, or 31½ per cent., very nearly one-third, to two thirds so the sample now sent should yield nearly two ounces of clean cotton.

15. It may be observed that the seed is mixed, such as it came from the bazar, and out of these 100 pods, 40 of them bore four lobes, and 60 of them only three to each pod. I also counted how many were affected by the grub worm, and I found 20 of them had been attacked, the larger proportion among the four-lobed pods. The natives say that an easterly wind brings these insects, and that if there be a few days of westerly wind they die, and do not appear in the pods that begin to ripen with westerly winds, but again make their appearance when the wind is from the east. I mention these little matters as they may be of after use in discovering not only the cause, but also the remedy against this at some future time.

16. To continue. On the 12th July there was a third clearance of grass, and in August twice, again once in September, or in all six times; while there was one more watering on the 25th September, and a last on the 2nd October; so that in all there have been four ploughings, six weed clearances, and six waterings.

The expenditure on this experiment up to the present has been—

					Rs.	A.	P.
On ploughing	...	...	...	...	2	0	0
" manure	...	...	...	...	1	0	0
" watering	...	...	...	...	5	0	0
" clearing grass	...	...	...	...	1	8	0
Total					9	8	0

and this on only one-eighth of an acre, or nearly Rs. 80 an acre, free from land-rent or supervision charges. Had the experiment been on a larger scale, the rate would have been very much reduced, and to the cultivator probably one-fourth would have covered all; but in an experiment of this nature I consider the expenditure very moderate, as in this case one pays not for the work done, but for the *time* the labourers are kept away from other work. The funds paid out being private, I gave orders that the payments should be liberal, so there might be no complaint of short payment made to me.

17. In practice the grass clearances cost the farmers little or nothing, as all goes as green fodder to the cattle; again, the water-rate about equals ten times the charge for canal water, so the above must on no account be taken as an indication of the cost of cultivating by the Egyptian system. Even taking it thus, I believe if the produce were sold in the market, it would meet all the expenditure; for if the yield equals 30 sers, as expected, it would now sell for over Rs. 12.

18. Before closing this branch of the subject, it should be stated that in addition to the ravages of the grub worm, there are also birds and animals to guard against. What between sparrows and parrots, squirrels and rats, the "chaunkidár" (watchman) has enough to do. Up to the present some 10 rats, and over twice that number of squirrels, have been killed, but as other fields ripen, the temptation to come to mine, which was in advance of the neighbouring ones, will become less it is hoped.

19. Having now gone fully into all that has been done and the results, so far as we can yet see I may here state that my reason for submitting this report now, before we know the actual yield, is that in a few days I shall have to officiate for the Superintending Engineer of the Circle, and may not again have an opportunity to prepare so full and detailed a report. For the present, therefore, I can only speak of the estimated yield, which the natives expect to be 30 sers of clean cotton, and, judging from the small experiment before referred to, is not probably far out, for if each plant only produces 100 ripe pods, and they produce two ounces of clean cotton, we have—

420 plants yielding 840 ounces, and

300 " yielding one-tenth or 60 ounces.

or in all 900 ounces, which equals over 56 lbs., or very near 30 sers; so the native estimate is not far out, I believe, which, if correct, gives an out-turn of little short of 500 lbs. an acre. But even half this result for a first trial, where *no particular care has been taken*, nor the soil particularly good, holds out encouraging prospects for the future. But what do the natives think of it?

20. All who have come to see the field admit that having the plant growing in drills is a great advantage, as it enables them the more easily to water the land and clear away the grass and weeds, as

well as facilitating the picking of the ripe cotton without much disturbing the plants. In addition to this it enables them to sow a cold weather crop, wheat or barley, with greater facility between the drills, so the labour expended in forming the drills is more than compensated by the above advantages, not to speak of the quantity of seed saved. On the above points all appear to agree, but as to the seed used, the majority say that the whole thing is an imposition, for native seed could never produce such plants, and that I brought the seed from the "wilayat." Only the people in the neighbourhood, who know that it was purchased in the bazar, admit that the seed used was native, and they say that they will try this drill system themselves next year. The shortness of the fibre, however, at once proves this fact, and I used native seed on purpose so that the poorest cultivator may be able to try this plan himself. The question to establish at present is not *quality* but *quantity*; once convince the cultivators that with a little care they can double or quadruple the yield, and they will then be all the more ready to listen to advice about improving the quality; for with the agricultural community in all countries, and in India in particular, "we must creep before we attempt to walk."

21. I confess myself I was not prepared for such a favorable result as this experiment promises, and the Sub-Overseer, as well as the coolies, thought I had ruined all when I ordered every plant to be pulled up, only leaving one at every two feet. The yield, I think, would have been improved, had I ordered none of the plants to be allowed to exceed five feet in height, for this has been tried with several plants with good results; so I would suggest that in future experiments an order should be given that the plants should be cropped, not allowing any plant to grow higher than a man's chin which is a simple order that the most ignorant can understand. The furrows also, I think, should not be less than nine inches, and the ploughing as deep as possible. Had I ordered this field to have been dug by the "phorah" to a depth of eight inches or so, no doubt the yield would have been still greater, and the expense very little more than ploughing such a small area; but this would have vitiated the experiment, as digging could not be carried out by cultivators in general, so I had to content myself with the present mode of scratching the ground, as it can hardly be called ploughing. The heaping up of the soil in furrows in a measure assists to meet this difficulty, for in Egypt, so far as I could observe, they are not much in advance of us out here in this respect, for in passing through Egypt one may see donkeys and dromedaries, buffaloes and bullocks, yoked promiscuously, all dragging the plough, a camel with a bullock, or a bullock with a buffalo.

22. I now venture to make a few general remarks, and will try to give some reasons *why* such favorable results are obtained from the Egyptian drill system in comparison with the broad-cast system in force out here, where we have the same light, heat, moisture, and also, I believe, soil, for the plains of Upper India are formed from alluvial deposits as well as the land of Egypt.

23. First, the cotton plant is a sun flower and requires *light*, which necessitates plenty of space, and that it should not be in the shade. This is evident in the present experiment; for in the compound there is a large Peepul tree, and the plants in its vicinity do not thrive so well as the others; also the few plants behind the out-offices do not get the afternoon sun so well as the others, and are not so vigorous as these which have the sun all day.

24. Second, space for the roots to spread. This is evident by observing the roots of the plant now sent and before referred to; for it will be observed that the strongest shoots are given off very near the surface to the depth that the soil had been turned up by ploughing, while those which did force their way lower down through the stiff soil are twisted and contorted. With shallow ploughing, therefore, all the more space for the roots is requisite, to enable them to spread out and convey away nourishment to the plant.

25. Lastly, and most important of all, is the improved system of irrigation combined with drainage. This opens some interesting points which I shall attempt to discuss at some length.

26. First of all it is evident that it is an easy matter with a little care to run water between the drills, and to regulate the depth so as not to be less than three inches or more than five inches; thus the water can never come in contact with the stem of the plant. Again, in the case of heavy rain, though during the fall, and perhaps for a few hours longer, the water may inundate the field, yet it is *fresh*, and probably in motion, in which case it is supposed water cannot do injury to vegetation unless at excessive velocities. In fact it is to the overflow of many of our rivers that the fertility of the land in many localities is attributed, as for example, the tahsil lands of Daska, in the Sialkot District—it is to the overflow of the "Aik," which brings down very little sand, but chiefly fine soil, that the richness of the crops is chiefly due. Flowing water, therefore, even though it comes from the neighbourhood and scarcely contains any matter held in suspension, is a different substance to water that is stagnant in its chemical properties, as well as its mechanical ones. Ask any Zamindar, and he will tell you that fresh rainwater, so long as it does not submerge the plant, and thus drown it, does no harm *so long as the sky is cloudy, but let once the clouds clear away, and the direct rays of the sun descend on the water which is not flowing, and it at once becomes injurious to almost all plants*,—rice probably being an exception.

27. This opens the interesting question—What is the effect of light on water in combination with heat, and how are the chemical properties of the water thus changed, which it could not effect when partially deprived of the light, though the temperature was all along very hot? Be it what it may, there remains this important and well established fact, that the water does undergo some change that makes it injurious to vegetation, except that which is rank; and is not this the reason why, even at home, in a comparatively cool climate, garden flowers and the like are watered in the afternoon rather than in the morning or mid-day?

If such be the deleterious effect of light on water which comes in direct contact with some plants, does it not show a wise provision of nature that the light of the sun is always impaired when she waters the ground, and does not this teach us a lesson that we out here in India should try to irrigate our fields in the afternoon and at night rather than during mid-day? And may not this be the reason why, in the case of crops irrigated by canal water, the grain, though equal in every other respect, is considered by the natives not so nourishing? This subject opens a field for extended inquiries, but I must pass on to another very important law of nature.

28. Earth at all times has been known as the great absorber and decomposer of that which otherwise would become prejudicial to animal or vegetable life, so does not the whole secret lie in this little fact why the Egyptian mode of cultivating cotton is so superior to ours in India, namely, that no stagnant water that has been decomposed by the light of the sun can come in *direct contact with the plant*, but *must first pass through the universal chemical agent earth*, and thus be converted into a fit state for the plant to drink up the purified water. In this I believe lies the whole germ of the question, and to my mind explains why we should find such great differences in the out-turn of cotton in Egypt and India.

29. I have perhaps dwelt at too great length on these questions; but considering the great interests they affect, both here and at home, I trust my remarks will not be considered without some value in assisting to further the great object in view, namely, improved agriculture in India.

CHAPTER I, QUESTION 7.

WESTERN JUMNA CANAL

Extracts from a report by MR. D. IBBETSON, Settlement Officer of Karnál, on the reassessment of the Land Revenue of the Pánipat Tehsil of the Karnál District; showing the manner in which the tract irrigated by the Western Jumna Canal deteriorated.

The Delhi branch was opened in 1820, but the small supply of water carried by it may be estimated from the fact that till 1826 *at least*, no bridges were needed, as a loaded village cart could be driven through it without inconvenience. In 1826 the Rohtak branch was opened as far as Gohána; but the irrigation from both these canals, though steadily increasing up to 1833, was still very limited, and in 1831 the small use made of the water is attributed to the uncertainty of the supply, the insufficiency of the outlets permitted for each village, and the high rates charged (annas 11-2 per acre). But the terrible famine of 1833-34 gave a new turn to the irrigation question. The canal officers had no longer to complain that the water they proffered was not appreciated; irrigating villages enlarged and multiplied their channels; numerous other villages which had never before irrigated dug cuts for themselves, often many miles in length; and the area irrigated was limited only by the means of supply, instead of, as heretofore, by the demand. Strenuous efforts were made to increase that supply, and the irrigation of 1833-34 was 2½ times that of 1832-33, while the construction of the Butána branch extended the water to a part of the tract which it had previously been unable to reach. The means of irrigation, once called into existence by the pressure of a water-famine, were still available when the urgent necessity had passed away; and the irrigation never again fell to its former level. The failure of the rains in 1836-37 raised it above the figures of 1833-34, and the continuance of the drought caused the irrigation in 1837-38 to rise to what Captain Baker, the superintendent of canals, declared in 1841 to be the maximum capacity of the channels as they then stood. But the supply was still uncertain, and apt to fail when most needed. The whole system of canals and their subsidiary channels had been called on to perform a task far in excess of that for which they had been designed; the call had been urgent and the necessary adaptations had had to be made as best they could, and on the spur of the moment. The arrangements at the heads for supplying the water from the river were also very imperfect; and too often the canal broke down just when there was the greatest need for its services.

The famine of 1833 fell with perhaps even greater severity upon the *bángar* than upon the *khadír*, for the canal utterly failed, while the people of the latter had at least their wells, so long as the cattle had strength to work them. The distress feebly described in para. 30 paralysed for a whole year the agriculture of the tract. But this very distress was the means of securing at one bound an advance in prosperity which might have taken without it many years to attain. The canal presented at least a possibility of salvation, and every village that could in any way be reached by the water, hastened to dig a cut to its fields. The supply broke down in the autumn of 1833, but it was plentiful in the spring; and from that time the general use of canal water in the *bángar* may be said to date.

In the drought of 1837 the canal again failed, and half the autumn demand was remitted; but in 1838 an irrigation more extensive than in any preceding year enabled the villagers to reap an ample harvest, which they sold at famine prices. In 1839 the remaining balances were remitted. In 1840 the failure of the rains again much profited the villages which received canal water. The epidemic of 1841 assumed a special severity in the canal-watered tracts, and inaugurated for them a reign of malaria, the succession of which has never since been broken. Meanwhile, as leases expired, they were revised for the period remaining till the regular settlement should be completed, with the general result that the demand in 1841 stood at Rs. 1,98,324 against Rs. 2,02,783 in 1836.

As in the *khadír*, the chief value of the new assessment lay in the fact that it equalised the distribution of the burden. Thus, while 35 out of my 64 villages obtained a reduction, the total was raised; and generally it may be said that in the finest and oldest villages a reduction was made, and the increase was obtained from those estates which had been developed more recently. The assessment was very moderate, and the *bángar* should have enjoyed unbroken prosperity during its currency. In each of the first three years of settlement extraordinary floods in the river washed away the dam at the heads, and stopped the canal; and the failure occurred just when water was most needed; but as the canal engineer remarked, the sickness was so great that the canal was better empty than full. In 1845-46 improved arrangements were made to secure a copious and permanent supply, the main banks were raised and strengthened, and since 1864 the canal has seldom if ever really broken down. In the famine of 1860 the *bángar* was "flourishing," and in that of 1870 the only drawback to their prosperity was the cattle epidemic, from which they did not escape. For the last four years they have suffered much from excessive rainfall. But the vicissitudes of season are quite overshadowed in the *bángar* by the terrible evils which interference with the natural drainage of the country has produced; evils under the pressure of which the assessment has gradually been reduced from Rs. 2,47,939 in 1842, to Rs. 2,33,778 in 1876—a reduction wholly inadequate to the distress which it was intended to relieve. I shall describe these evils and their causes as briefly as possible.

When the canal was reopened, every facility was offered to such villages as would make use of the water. In most cases an old imperial water-cut still existed, which they were allowed to clear out and use; and when there was none, they simply made themselves a channel straight from the nearest point on the canal from which water would flow to their fields. As the demand for water has extended, certain large distributaries have been constructed which have absorbed many of these channels, while others have been deepened, enlarged and extended. The main canals, too, have been deepened, and their banks raised, till the water touches the crown of the arches in the bridges. Most of these extensions were made under pressure of urgent need, and therefore, without interrupting the supply, and too hurriedly to admit of due consideration being given to them or of the best possible scheme being selected. Thus, while the faulty alignment of the old canal and channels is still followed, their carrying capacity has been so increased that in most parts the surface level of the water, and in some places the bed of the canal, is above the surrounding country, and the water is thus forced into the subsoil by hydraulic pressure. A great deal of the canal is, of course, in embankment; and in many of the secondary channels, silt clearances, often dating from the time of the *moghuls*, have raised the banks to a height of twelve and fifteen feet; and this system of embankments has been constructed with so little reference to the natural drainage that it intersects all the drainage lines of the tract, and throws back the surface water over the surrounding country.

But if the defects of the means of supply have given rise to evils, the pernicious system of excessive irrigation practised irrigation pursued by the people, coupled with its rapid extension, have increased those evils an hundred-fold. Excluding twenty-five villages which are either too far from or too high above the canal to irrigate from it to any great extent, the following figures show for the canal tract proper, per-centages to total area at three different periods:—

	Irrigation.	Total cultivation.	Pasture.	Barren.
1828 ...	Unknown	44	51	5
1842 ...	45*	55	* 21	24
1876 ...	46*	52	13	35

Of the thirty-five per cent. now barren, six per cent. is occupied by water channels, ponds, and swamps; and one per cent. is permanently moist. Thus seven per cent. of the whole area may be said to be always more or less under water, and forty-six per cent. to be irrigated—much of it twice in the year, much of it for rice cultivation, and almost all of it every year without intermission. Now canal irrigation is not like well irrigation. When every drop of water used is represented by additional labour to man and beast, the greatest economy is exercised: not so when a stroke of the spade is sufficient to set flowing an unlimited supply. In the former case the cultivator divides his fields into small beds which are irrigated successively, and practically answer the purpose of terraces, economising the water, not only by reducing the depth needed, but also by confining the area of already watered ground over which the water has to pass. On the canal, on the other hand, if a field is six inches lower at one end than at the other, a seven inch bank is made round it, and the whole field put under an average of four inches of water in order to get one inch at the top; each spot in the field, after receiving its water, is still passed over by all the water which goes to spots beyond it; and if a leak occurs in the channel, or if a bullock breaks down the side, the water is allowed to run to waste for hours before any trouble is taken to remedy the evil. The banks of the main canal, too, break in some place or other almost every year, and it takes some days before the news can be conveyed to the heads and the supply cut off, during which time the canal is simply flowing on to the country, the escape arrangements being quite inadequate. The duty of the canal water for 1874-75 was 74 acres in the autumn, and 89 in the spring per cubic foot of supply. Supposing that the loss by evaporation and waste is counterbalanced by the fact that much of this land is watered in both seasons, this represents a supply of 62 inches in the year. A well working 13 hours a day for 150 days in the spring and 80 days in the autumn, and watering 15 acres, would have to supply at this rate 6,067 gallons per hour.

The result is that the whole country is water-logged by the canal water being forced into it from below, while the cultivator drenches it from above. And when the rain comes in tropical abundance, instead of finding a thirsty soil ready to drink up the greater part, it falls upon a country already saturated with water, and the whole volume is thrown into shallow drainage lines with an almost imperceptible slope. These again, being barred at intervals by high banks crossing them at right angles, silt up, and the water is thrown back and covers the country for miles. Thus, when, as now, the rain-fall has been unusually heavy for several years in succession, there are hundreds of acres in which the autumn crop, if it can be sown at all, is almost or altogether drowned; while such little land as appears above the water soon enough to plough for the spring crop, is so moist that the yield is barely worth the trouble of gathering. And there is a still larger area on which, after a heavy rain the water stands some inches deep for three or four days at a time, to the great injury of the crop. No means exist of carrying off the water, for, as the Chief

* Note.—These figures would show that the increase in irrigation has been merely nominal. I would invite attention to my remarks on this point in para. 35. It must be remembered, too, that the increase of canal irrigation has been by no means commensurate with its extension, as the large area which has been thrown out of cultivation was almost all irrigated, while the land which has taken its place in these figures is high-lying and naturally dry.

Engineer reported in 1867:—"The level of the water in the canal can very seldom be reduced in the rainy season, just when the drainage of the swamps is most needed; as, even if the supply at the heads be shut off, the quantity of water draining into the channel above Karnál is sufficient, and sometimes more than sufficient, to fill the channel at and below that point." The water, held up by the banks of some channel, does, it is true, constantly break through and pass the obstacle; but this only intensifies the evil, for the flood is presently brought up by another bank, and what might have been comparatively harmless had it happened gradually, assumed the form of a destructive rush caused by the bursting of a dam.

CH. I.

Nor is it only swampland that results from the causes above mentioned; for if it were, the higher land might be cultivated as the lower, became unculturable. For countless ages the rain, falling upon the soil, has washed down with it more or less of its saline constituents into the spring water below. The water has now been raised to within such a short distance of the surface that it can rise to it by capillary attraction, carrying with it the salts which have been thus accumulated. As fast as it reaches the surface, wherever the cultivation or the shade of a thick tree does not interfere with radiation and evaporation, the fierce heat of an Indian sun concentrates the solution. Where the water is so near the surface, and the surface moisture so great, that the water thus made heavier can return by the way it came, no great harm is done. But over most of the area this is not the case, and the water evaporating leaves the salt deposited; and this process, repeated year after year, eventually covers the soil with a flocculent layer of alkaline salts lying like fresh fallen snow, often three or four inches thick. The periodical rains do not mitigate the evil, for it would appear that a very small quantity of the salts saturates cold water, and there is no flow of drainage which could remove the salt mechanically.* The hollows, already half silted up, once filled, the water simply lies where it falls, and soaks into the soil, only to be brought up again by the next sunny day to restore the salts it had dissolved.

The salts lie thick round the edges of the cultivation, and notwithstanding the bank made to keep them out, are carried over the boundary by the rain water, and deposited in the hollows of the out-lying fields. When once cultivation is thus destroyed, the capillary process immediately begins, and thus the evil is gradually eating its way from outside into the still fertile fields, every inch gained being made the stepping stone for further inroads. The saline water, and such grass as is able to spring up in the salt-impregnated land, give the cattle diarrhoea and glandular affections, enfeeble, and eventually kill them; while the large area which is each year covered with water and aquatic plants in the rainy season, and dried up by the sun during the remainder of the year, exhales from its putrefying vegetation a malaria which poisons the blood of the villagers, renders them impotent, and kills them by fever and spleen disease.

The injury to the soil had begun before the settlement; for the unculturable area had increased from five per cent. in 1828 to twenty-four per cent. in 1842.† Some of this increase was no doubt owing to extension of village sites, roads, canals &c., but Mr. Edmonstone points out (see page 90 Delhi settlement report) that in heavy rain the lands near the canal were not only inundated, but often permanently injured by saline efflorescence. No apprehension, however, of any great extension of the evil seems to have been felt; and in only one village was the action of the canal given as a reason for lightness of assessment. The effect upon the population, on the other hand, was probably greatest when the swamps first began to be formed; for the fluctuations must then have been widest, and the amount of decomposing matter in the soil greatest.‡ The epidemic of 1841 was but the first of a series of seasons marked by unusual mortality along the Western Jumna canal, the worst of which was that of 1843, and which eventually led to the removal of the troops from Karnál in 1844. In 1845 the Supreme Government appointed a Committee to investigate the matter, which reported § in 1847, that the sickness was due to interference with the natural drainage of the country, and the saturation with water of stiff and retentive soil especially under rice cultivation. The result of their medical observations, made in the unusually healthy season of 1846-7, is shown in supplementary statement VI.

No sooner was inquiry into the health of the people finished than the deterioration of the soil forced itself upon the attention of Government. In 1850 the Lieutenant Governor visited some of the affected villages, and decided that the terms of settlement must be adhered to, and that the people had "no right to any consideration;" and upon the Collector's reporting that the inhabitants of some of the canal villages "express an intention of abandoning them and settling in the neighbouring territory of Jind if they are called upon to continue paying for land they derive no income from," it was decided that they and all estates similarly situated

* NOTE.—Mr. Buck, Director of the Department of Agriculture and Commerce North West provinces, has just sent me a note on *reñ*, in which he gives what is obviously the true explanation of the fact that the *reñ* is not all washed away by the autumn rains. He points out that the first rain that falls dissolves the *reñ*; and that this water, being in small quantity, is absorbed either where it falls, or in the local hollows, and does not run away into the main drainage lines. Thus the *reñ* is carried down under ground at the commencement of the rains; the cloudiness of the sky and humidity of the air prevent its being brought up again by evaporation, and thus by a species of occlusion, it escapes the action of the main body of rain, which would otherwise carry it off with the surface drainage of the country.

† NOTE.—Judging from analogy in the *Madhár*, I should say that the barren was considerably underestimated in the survey of 1828.

‡ NOTE.—Similarly, if the swamps are ever effectually got rid of, I fear the advantage will be purchased at the cost of some years of terrible sickness.

§ NOTE.—Report of a Committee, &c., Agra 1847.

should be taken into direct management. Even then balances continued to accrue year by year, except in 1853, which was a year of drought. In 1852 a cut (*the Ganda nala*) was constructed to drain some of the worst swamps at the junction of the Delhi branch with the main line: it reduced the swamp somewhat, but in no way diminished the efflorescence; while it poured its collected drainage *vid* the *Báhrí nali* upon the town of Pánipat, where it was by no means welcome. Meanwhile the Board of Revenue declined to deal with individual cases, and directed that a general report should be made when, and not till when, the Government revenue could no longer be realized. As pointed out by Mr. Sherer, "the *Játs* of this District will pay up as long as it is possible for them to raise money by any device, or at any immediate sacrifice; and when they find default inevitable, they consider the worst come, and leave their villages." Thus the break up was "sudden and complete." In 1856 a large proportion of the inhabitants of several villages deserted them and fled to Jind, and the villages utterly broke down. The Government then censured the "lamentable apathy" of the collector; two villages which were entirely deserted, which had lost 941 out of 2,728 acres of cultivation since 1842, were summarily settled; and a general survey of the canal tract was ordered, Mr. Sherer, Collector of Aligarh, being deputed for the purpose.

His report, which was submitted in 1857, and appears to have been printed as No. XLII of Mr. Sherer's report. Selections from the records of the Government of India, Public Works Department, is a most admirable one, and well worth reading. He showed that the water level had been raised from sixty feet to, in many places, two or three feet below the surface; that the fertility of the soil had very generally diminished; that in Pánipat *bángar* seven villages were severely, ten greatly, and five partially injured; and that the evil had not nearly reached its limits, but must necessarily continue to spread almost indefinitely. He says:—

"The possible resources of the *biwahdárs* of several estates are now exhausted. They have borrowed money at extravagant interest; they have become the mere farm slaves of some *panyá* residing in their village; they have sold the trees on their estates; they have sold their daughters; they have sold their silver ornaments and brass utensils, and as many of their cattle as it was possible to spare; and no conceivable source of income is any longer available."

From a sanitary point of view he found a state of things existing "very much worse than that described by the Committee of 1847."

He speaks of the miserable disease engendered by the tainted water and malarious exhalations of the soil; of the spectacle of sick women and diseased children crouching among the ruins of their houses (for in many cases the rafters have been sold) of haggard cultivators wading in the swamps, or watching their sickly crops, or attempting to pasture their bony cattle on the unwholesome grass. The outbreak of the rebellion suspended operations, but temporary relief was given by a reduction of Rs. 5,033 on Rs. 20,216, the assessment of eleven of the worst villages in which 4,777 acres of cultivation had been destroyed.

Between 1859 and 1861 the whole question was elaborately reported on, and twenty-one villages in Pánipat *bán-gar*, which had lost nearly $\frac{1}{2}$ of their cultivation and more than 2-5th of their pasture land, were resettled by Mr. C. P. Elliott. Acting under directions from the Commissioner, he settled the villages upon existing assets, setting off the demand calculated at settlement rates upon land broken up since settlement, against the reduction similarly calculated upon land thrown out of cultivation during the same period. He also declined to recommend any reduction where the deterioration affected less than ten per cent. of the culturable area, or the loss represented less than ten per cent. of the assessment. The reductions were welcomed with enthusiasm, and Mr. Elliott "found the people happy and contented and rejoicing in their improved condition." But the principles upon which the reduction had been made were disapproved of by the Financial Commissioner and Lieutenant Governor, as operating too harshly in restricting the measure of relief afforded, and it was finally laid down, (1) that a review of the tract affected was to be made half-yearly by an experienced revenue officer; (2) that annual returns of the quantity of land thrown out of cultivation should be prepared; (3) that where, on consideration of the condition of the village, the appearance of the crops, and the complaints of the people, the assets of the village appeared to have been materially reduced, immediate relief should be afforded; (4) in calculating which it would be right to take into consideration any land which might have been newly brought into cultivation; (5) but especial care was to be taken that the error of omitting to lighten the land-tax when the deterioration of the soil first diminished its productive powers be not repeated; (6) and that the high rates fixed at settlement be not continued upon land which, though it might not have become absolutely barren, had so deteriorated that they were quite inapplicable to its altered state. Since then a yearly examination into the effects of swamp and efflorescence has been made, and the results tabulated and submitted in exactly the same manner as those of river action in the villages bordering on the Jumna. An abstract of the results is given in appendix II D. It will be seen that land which has recovered, and land which has been newly broken up, have been assessed whenever they reached the ten per cent. limit. In 1861-62 after the famine, the area so recovered was considerable. After setting off these enhancements, the loss of revenue which the remission on this account represents up to date is about Rs. 2,32,000. The history of one of the worst of the villages, *mowzáh Bahókí*, is also given as a specimen (II E).

I have no hesitation in saying that the relief thus afforded has been utterly inadequate. In the first place Mr. Elliot's action, welcome as it was to the sufferers, does not seem to me to have accurately measured the degree of mischief. The demand on the land which had become absolutely and obviously unculturable was remitted; but little if any allowance was made for the deterioration of the remaining cultivation, for the impoverishment due to an

ever-increasing burden borne for so many years, for the sickness of the people and cattle, or for the almost total absence of pasture. The ten per cent limit, too, acts most perniciously where, as here, all the land is owned in severalty; individuals and sub-divisions of villages failing to obtain relief merely because the loss is less than one-tenth of the revenue-paying area of the whole estate. As for the subsequent yearly action, it is difficult to characterise it too strongly. The directions of Government would appear to have been entirely over-looked, and no intelligent review of the whole circumstances of a village ever attempted. No remissions have ever been made, so far as I can discover, on account of general deterioration apart from decrease of cultivation. That it became merely a matter of arithmetic,—so many acres rendered barren at so much an acre: find the reduction in assessment—was perhaps only to be expected in what had become a part of the yearly routine of the tahsil. But what rendered the whole thing little more than playing at relief was the limitation* of the yearly inspection to those parts of the villages which the Extra Assistant Settlement Officer, Rai Munna Lal, had marked off as injuriously affected in 1860. The remainder of the area might have since deteriorated to any extent; but so long as the block then fixed upon did not show a loss up to the ten per cent limit, no reduction was made; while if it improved up to that limit, the demand was at once enhanced.

In 1867 Surgeon-Major Adam Taylor was appointed to inquire into and report upon the sanitary condition of the villages watered from the Western Jumna canal. The Doctor Taylor's report on sanitary condition. figures are given in supplementary statement VI. His report shows that 60 to 80 per cent. of the inhabitants in many of the *bāngar* villages were suffering from enlarged spleen and yearly attacks of fever. He speaks of the "languor and depression of manner and stunted and shrivelled forms of the inhabitants of the villages in close proximity" to the swamp; and of the absence of "the strength and the spirit to repair damage or to preserve comfort."

In the famine of 1860 the irrigation was very largely extended, and the rain-fall of 1862 and 1863 was inordinately heavy. The famine of 1868-69 raised the irrigation to its maximum, and ever since the rain-fall has been much in excess of the average. The people say that, though local swamps are of long standing, much of the general excessive moisture and soakage (*ghūrki*) dates from some eight or ten years back, and there is no doubt that the heavy rains of the last five years have largely extended this evil. The depths of water in the canal are given in appendix II C, and it must be remembered that the bed from which the Karnál depths are measured has been raised by silt deposits since the first opening. The straightening of the course of the canal, which was intended to, and did no doubt, reduce the general level, has left the loops thus cut off from the old bed to act as breeding beds for malaria and alligators.

Supplementary statement VIII B shows well the effects of canal action upon the villages. For the purpose of classification I have assumed that all land covered with effluence would otherwise be pasture land, and, adding it to the existing pasture land, have put all villages in which less than twenty-five per cent. of the total is actually culturable in the first class; all in which from twenty-five to fifty per cent. is culturable in the second class, and all in which from fifty to seventy-five per cent. is culturable in the third class; while the remainder in which more than seventy-five per cent. is culturable form the fourth class. The gradation in prosperity and in advance or retrogression since 1842 is very marked, and perhaps the population figures are the most striking of all, especially when compared with those for the khadir. Out of 87 villages the cultivation has decreased since settlement in 47, in 16 of which it has lost more than one quarter. In only 91 has the increase reached ten per cent. In the twenty-nine villages included in class I, and in many of the others, it may be said that there is practically no culturable pasture land, the small area so entered being, though perhaps technically *capable* of cultivation, and certainly bearing grass of a sickly sort, so affected by salts and swamp, and so scattered about the barren plains, as to be really not worth cultivating.

General Strachey's remarks. Such is a brief and feeble sketch of the history of an evil which in 1867 called forth the following words from General Strachey.

"The portion of the canal near Karnál is a disgrace to our administration, and has been for years past. It creates most pestilential swamps, which must be got rid of, unless we are content to perpetuate this abominable nuisance, which had been talked about for the last twenty-five years, during which period no serious attempt has been made to abate it. For my own part, I distinctly reject all share in any counsels which tend to delay in meeting this most crying evil. I most fully admit the great importance of doing what has to be done with the most scrupulous regard to economy, and I am ready to sacrifice all thought of elegance or congruity for the purpose of avoiding any considerable outlay which is really not needed to secure efficiency. But it is impossible for me to affirm with too great positiveness the moral obligation which rests on our Government to put an end with all possible speed to the discreditable condition of the large tracts of land along the Western Jumna canal, which are converted into swamps of the most pestilential nature, not only destructive to the health and life of the population, but occupying, in a manner far worse than uselessly, some of what might be the very best lands. It will be necessary to do something; and what is necessary should not be delayed till other works, which have no relation to this part of the scheme, are completed."

Ten years must now be added to the twenty-five here spoken of.

* NOTE.—Perhaps based upon a misunderstanding or mistranslation of an expression in the Government orders.

QUESTION 8, CHAPTER I.

What proportion of your population is agricultural, that is, either directly engaged in the cultivation of the soil solely, or in combination with some other occupation, or deriving their chief income from the land? And of this class, what proportion live entirely by the profits of the cultivation of their own land, and what proportion support themselves wholly or in part by field labour for others. Ch. I.

There are 3 main points in this question,

- (a). The proportion of the population which lives chiefly by agriculture.
- (b). The extent to which that portion of the population combine other operations with agriculture.
- (c). The extent to which agriculturists supplement the profits of cultivation of their own holdings with wages earned in field labour for others.

Division.	Per cent. of total population who are agriculturists.	Number of Agriculturists.	
		Total.	Adult males above 18 years of age.
Delhi	51	9,76,787	8,57,167
Hissar	56	8,13,288	2,59,819
Uchhala	61	8,85,155	3,22,393
Jullundur	61	15,94,555	4,46,468
Amritsar	45	12,37,265	4,48,943
Lahore	54	10,26,686	8,94,542
Rawalpindi	60	18,17,640	3,45,889
Mooltan	60	7,40,031	2,09,882
Derajat	60	5,38,662	2,32,214
Peshawar	62	6,58,372	1,75,942
Grand Total ...	55	95,63,680	31,04,549

To enable me to answer this question and question 15, I have compiled from the census papers of 1868, a statement of population according to occupation, which is appended to the reply to question 15.

The per-centage of the population therein returned as agriculturists is for the whole Province 55 per cent., of whom one in three are shown as adult males above 18 years of age (a proportion certainly too large).

The statement in the margin shows the number for each Division.

As regards the next point, the extent to which the agriculturists combine other occupations with their principal livelihood, there are absolutely no statistics available. It is only possible to make a general statement on the subject.

The agricultural classes proper rarely combine agriculture with any other callings, except service in the army or police, and the calling of carriers. A large proportion of the bullock hackeries and camels of the Punjab belong to agriculturists; and so far as this is the case, they use these resources with no little spirit to help themselves over bad years. Similarly, in the northern parts of the Sind Sagar Doab and adjacent tracts Trans-Indus, many of the agriculturists turn carriers in the months when agricultural work is slack, carrying salt and grain for the local traders, and sometimes making ventures on their own account; and thus they add materially to their means. They are equally ready to leave their homes and take work on road and canals in order to tide over bad years. The great majority of the agriculturists, under such circumstances, show very great enterprise; and are not at all the kind of men to sit starving at their homes when they can work as carriers or as labourers. But all the callings of the artisan they regard as beneath them, and rarely, if ever, adopt them.

As regards the 3rd point also, the extent to which agriculturists supplement the profits of their own holdings by wages earned in field labour for others, there are no statistics available; and a general answer must be given. When partial failures of crops occur, such failures as most affect the drier tracts, and leave fair crops in adjacent more favoured tracts, the poorer agriculturists of the former usually go to seek harvesting work in the more fortunate districts. Such work is universally paid for by a share of the crop, usually about a twentieth. But saving such exceptional instances, the ordinary condition of agricultural villages is such as to give few opportunities for an agriculturist to supplement the income of his own holding by working for others. All the holdings are small, with few exceptions no larger than the actual cultivators can themselves look after; and for the same reason the cultivators have not the funds to pay for hired labour. Moreover, there is ordinarily so much neighbourly feeling among the cultivators of each village that, when a man does need help for some special work, his neighbours assemble and do it for him, asking no return except a good meal. The help one man needs to-day, his neighbour will need before long; so as occasion arises they all help each other. In villages thus constituted it will be readily understood that there is little opportunity for a poor agriculturist to add to his livelihood by wages earned from others, excepting only at harvest time.

CHAPTER I, QUES

I.

Population of the Punjab according to occupation,

Division.	District.	AGRICULTURISTS.					NON-AGRI				
		Proprietors.	Tenants.	Laborers, shepherds, graziers and herdsmen.	Total agriculturists.	Total male agriculturists above 15 years.	Public servants, soldiers, priests, pandits and other professions. Pensioners, jagirdars, house proprietors and persons living on private means.	Merchants, shopkeepers, bankers and money dealers, agents, brokers, contractors and sail merchants.	Grain and flour dealers, grain parchers, millers, bakers, confectioners and dealers in sugar, grocers and sellers of wine, pan, drugs, tobacco and spices.	Sellers of vegetables, fruits and flowers, milkmen, butchers, posticers and fish-sellers.	
Delhi ...	Delhi ...	164,511	98,737	6,937	270,285	185,121	33,321	26,250	29,430	9,715	
	Gurgaon ...	201,586	196,906	2,040	399,532	116,881	32,277	7,247	35,997	6,513	
	Karnal ...	226,429	77,868	2,688	306,965	106,165	34,642	12,894	28,062	3,480	
Hissar ...	Hissar ...	169,670	180,237	1,488	351,395	118,345	21,524	13,627	11,119	1,514	
	Rohtak ...	173,865	116,319	22,240	312,424	96,284	20,803	24,112	12,517	4,021	
	Sirsa ...	17,462	131,394	618	149,469	45,220	9,780	7,494	4,335	258	
Umballa ...	Umballa ...	334,276	135,663	31,128	501,066	160,376	82,218	29,982	30,746	7,272	
	Ludhiana ...	257,646	46,305	16,682	320,633	167,264	34,783	25,915	3,108	2,275	
	Simla ...	12,390	961	115	13,466	4,122	3,789	1,168	1,781	710	
Jullundur ...	Jullundur ...	320,285	83,668	4,016	407,970	135,272	41,698	25,416	18,799	4,893	
	Hoshiarpur ...	310,280	202,042	53,661	565,983	160,776	40,001	45,189	6,654	2,865	
	Kangra ...	412,829	114,257	8,646	530,732	160,421	34,275	18,232	5,085	2,367	
Amritsar ...	Amritsar ...	280,475	88,872	48,400	417,747	103,742	86,422	29,852	27,323	7,653	
	Siakot ...	269,398	149,306	4,008	423,312	142,819	100,761	44,815	17,246	7,722	
	Gurdaspur ...	200,988	120,312	74,897	396,197	202,382	85,134	26,583	9,784	2,126	
Lahore ...	Lahore ...	185,952	131,679	36,381	353,012	127,541	61,551	28,774	29,144	8,736	
	Ferozepore ...	195,993	143,849	38,692	378,534	104,568	29,242	20,688	8,992	1,212	
	Gujranwala ...	146,294	78,484	69,362	294,140	72,443	40,867	31,127	24,644	3,789	
Rawalpindi ...	Rawalpindi ...	282,698	191,080	2,198	475,976	104,113	39,211	31,683	11,664	1,986	
	Jhelum ...	216,798	85,796	280	302,874	89,366	26,226	19,168	8,931	1,222	
	Gujrat ...	267,682	87,470	4,242	359,394	109,368	30,979	22,840	12,016	1,402	
Mooltan ...	Shahpur ...	116,960	49,414	14,032	179,396	46,137	18,553	30,563	6,681	405	
	Mooltan ...	61,646	124,873	9,870	196,389	69,006	23,385	38,995	4,425	3,939	
	Jhang ...	38,056	119,619	6,975	164,649	30,842	19,691	22,961	4,227	943	
Derajat ...	Montgomery ...	46,686	104,841	20,987	172,514	52,124	19,492	5,187	15,264	1,315	
	Muzaffargarh ...	131,449	41,993	33,057	206,499	57,910	10,684	15,249	1,624	1,064	
	Dera Ismail Khan ...	113,997	73,099	28,837	215,933	75,033	22,249	49,365	1,425	1,006	
Peshawar ...	Dera Ghási Khan ...	100,107	64,622	8,589	173,318	49,126	16,244	16,602	9,640	1,151	
	Bannu ...	148,080	44,924	11,407	204,411	108,055	15,974	10,688	1,290	418	
	Peshawar ...	168,098	99,171	3,417	270,681	71,595	54,699	24,309	9,939	6,605	
Peshawar ...	Kohat ...	99,188	77	1,042	100,267	28,426	16,978	4,691	560	428	
	Hasrat ...	205,259	62,175	...	267,434	73,921	9,515	13,869	230	280	
	Total ...	5,876,067	3,245,588	561,925	9,683,580	3,104,849	1,065,869	724,560	387,572	99,938	

TOTALS

Delhi ...	592,626	372,496	11,663	976,785	357,167	100,240	46,391	93,469	19,708
Hissar ...	360,997	427,960	24,341	813,288	269,849	52,107	45,233	28,071	5,793
Umballa ...	604,311	182,919	47,925	835,155	322,252	120,790	67,065	35,635	10,257
Jullundur ...	1,043,395	399,967	61,323	1,504,685	446,469	115,974	88,837	30,438	10,715
Amritsar ...	750,861	359,090	127,305	1,237,256	448,943	222,317	101,250	54,358	17,501
Lahore ...	628,239	354,012	144,435	1,026,686	304,542	131,660	80,584	57,780	13,737
Rawalpindi ...	883,128	413,760	20,752	1,317,640	349,589	113,970	104,274	39,292	5,085
Mooltan ...	277,836	391,326	70,889	740,051	209,882	73,152	82,392	25,530	7,254
Derajat ...	362,184	182,645	48,883	593,662	232,214	54,467	75,666	12,255	2,575
Peshawar ...	472,490	161,423	4,459	638,372	173,942	88,192	42,869	10,729	7,313
Total ...	5,876,067	3,245,588	561,925	9,683,580	3,104,849	1,065,869	724,560	387,572	99,938

CTIONS 8 AND 15.

compiled from the Census Papers of 1868.

CULTURISTS.

Wood and charcoal sellers, lime burners and sellers and saltpetre makers.	Painters, jewellers, scut makers, watch makers saddlers and leather dealers, printers, book sellers and book binders.	Calico printers, weavers, dyers, threaders and spinners. Embroiderers, woolen manufacturers, workers in bone and ivory, tailors, shoemakers and cotton cleaners.	Tanners, oil makers, workers in cane and matting. Rope and string makers. Paper makers, lac workers.	Turners, carpenters, masons, stone-masons, blacksmiths and cutlers, copper smiths, wire workers, tinmen and tinkers and brass workers and dealers. Hooks makers, gold and silver smiths, glass workers, potters and brick-makers.	Iron-forgers, sawyers, water-carriers, barbers, washermen and sweepers.	Carriers, letters out of conveyances and boatmen.	Labourers, coolies, beggars, prostitutes, travellers and others.	Total non-agriculturists.	GRAND TOTAL
1,586	5,869	65,379	12,021	37,188	66,191	7,121	47,489	388,665	608,850
482	1,638	54,524	20,345	28,817	45,252	1,632	68,110	397,809	637,341
779	642	43,831	39,151	33,509	24,728	7,742	44,499	308,959	610,927
394	1,365	23,880	4,325	9,214	14,162	1,616	31,546	133,286	484,681
235	1,038	38,182	33,472	26,660	83,420	2,458	28,602	224,490	536,914
6	326	11,205	1,785	6,017	3,424	2,800	14,396	61,326	210,795
2,423	4,150	95,291	40,526	53,382	92,989	9,508	86,045	534,432	1,035,488
212	1,167	42,689	59,009	30,714	41,862	2,639	38,839	262,612	588,245
66	45	2,265	57	1,090	5,974	81	3,514	20,529	38,995*
510	1,981	78,902	42,305	44,008	73,489	7,473	47,319	386,794	794,764
768	2,135	95,387	43,873	25,181	53,656	7,392	40,056	372,947	938,930
262	608	41,120	20,186	20,332	18,206	4,164	47,738	218,150	743,882
1,068	2,202	139,411	1,174	66,708	162,053	18,002	123,981	665,844	1,083,591
1,214	4,598	112,605	4,954	67,920	154,985	11,170	63,708	581,693	1,005,005
670	1,288	59,041	7,382	8,810	38,024	15,222	55,001	269,065	655,262
1,355	2,882	72,952	5,730	37,435	95,988	9,205	31,402	435,654	799,066
223	379	35,838	4,852	11,340	16,853	3,024	42,473	170,717	549,251
1,540	4,098	88,162	1,946	38,567	82,083	8,834	30,959	256,536	650,676
273	560	63,136	455	26,641	26,855	4,222	29,533	235,280	711,266
131	257	51,340	5,092	25,098	20,576	16,071	26,932	198,114	500,883
1,395	1,493	77,355	251	30,638	47,168	8,889	24,220	256,353	616,347
1,395	778	44,291	1,126	20,187	18,147	6,687	47,237	189,370	368,766
1,950	698	54,643	8,591	22,739	29,066	13,985	77,758	275,184	471,873
289	212	47,231	2,747	20,653	19,277	6,700	38,542	133,378	348,027
440	211	35,568	1,543	22,187	31,508	7,465	46,580	186,918	559,432
271	328	19,731	3,529	2,174	3,059	7,178	24,167	89,048	295,547
236	249	29,633	1,456	13,491	13,978	14,622	31,171	178,981	394,864
593	127	26,018	3,946	11,232	10,500	10,179	30,681	135,613	308,831
308	89	15,682	240	11,917	5,243	2,208	19,179	89,236	287,647
712	1,194	42,975	954	22,708	25,717	4,082	58,577	252,471	523,152
112	90	5,290	872	3,960	3,548	2,046	6,560	45,135	145,392
76	84	25,104	738	16,878	14,486	483	18,069	99,802	367,236
20,664	41,672	1,586,721	849,454	803,845	1,266,267	223,860	1,369,889	7,928,741	17,612,321

OF DIVISIONS.

2,337	8,144	161,734	71,517	99,509	166,171	16,495	155,098	940,333	1,917,118
635	2,729	72,237	39,682	40,891	81,006	6,374	74,444	419,102	1,282,390
2,700	5,362	140,235	79,592	84,536	140,775	12,228	128,398	817,573	1,652,728
1,530	4,724	215,409	106,365	99,521	145,251	19,029	135,098	972,891	2,477,576
2,952	8,088	311,057	13,510	143,438	355,062	44,394	232,685	1,506,602	2,743,858
3,118	6,849	146,952	12,523	87,942	145,874	21,055	154,820	862,907	1,889,593
1,895	2,494	236,152	6,944	100,024	106,746	34,369	127,972	879,717	2,197,357
2,960	1,449	157,193	11,510	67,803	82,910	35,272	137,097	734,528	1,474,579
1,137	465	71,383	5,342	36,640	29,721	27,009	81,031	397,680	931,342
900	1,368	73,369	2,564	43,546	43,751	6,511	83,196	397,408	1,335,780
20,664	41,672	1,586,721	849,454	803,845	1,266,267	223,860	1,369,889	6,528,741	17,612,321

I.

Population of the

Division.	District.	AGRICULTURISTS.					NON-AGRI				
		Proprietors.	Tenants.	Laborers, shepherds, graziers and herdsmen.	Total agriculturists.	Total male agriculturists above 15 years.	Public servants, soldiers, priests, pandits and other professions. Pensioners, jagirdars, house proprietors and persons living on private means.	Merchants, shopkeepers, bankers and money dealers, agents, brokers, contractors and salt merchants.	Grain and flour dealers, grain purchasers, millers, bakers, confectioners, and dealers in sugar, grocers and sellers of wine, pan, drugs, tobacco and spices.	Sellers of vegetables, fruits and flowers, milkmen, butchers, poulterers and fishmongers.	

PERCENTAGES

Delhi	81	19	1	61	6	3	6	1
Hissar	29	85	2	66	4	4	2	1
Umballa	37	11	3	51	7	3	1	1
Jullundur	42	16	3	61	5	3	2	...
Amritsar	27	13	5	45	5	4	4	1
Lahore	28	19	7	54	2	4	2	...
Rawalpindi	40	19	1	50	5	5	2	...
Mooltan	19	26	5	50	5	5	2	...
Derajat	37	18	5	60	5	5	1	...
Peshawar	46	16	...	62	8	4	1	1
Total	33	19	3	55	6	4	2	1

PERCENTAGES

Delhi	Delhi	27	16	1	44	5	4	5	2
	Gurgaon	29	28	...	67	...	...	5	1
	Karnal	37	18	...	50	6	2	5	1
Hissar	Hissar	85	87	...	72	5	3	2	...
	Rohtak	32	22	4	58	4	5	3	1
	Sirsa	9	62	...	70	5	4	2	...
Umballa	Umballa	32	13	3	48	8	3	3	1
	Ludhiana	44	8	3	55	6	5	1	2
	Simla	37	3	...	40	11	4	5	2
Jullundur	Jullundur	40	10	1	51	5	3	3	1
	Hoshiarpur	38	21	6	60	4	5	1	...
	Kangra	56	15	...	71	5	2	1	...
Amritsar	Amritsar	26	8	5	39	8	3	2	1
	Sialkot	27	15	...	42	10	4	2	1
	Gurdaspur	32	18	11	61	6	4	2	...
Lahore	Lahore	23	17	5	45	8	4	4	1
	Ferozepur	35	25	7	69	5	4	1	...
	Gujranwala	27	14	12	53	7	6	4	1
Rawalpindi	Rawalpindi	40	27	...	67	5	4	2	...
	Jhelum	44	17	...	61	5	4	2	...
	Gujrat	44	14	1	59	5	4	1	...
Mooltan	Shahpur	32	13	4	49	5	3	2	...
	Mooltan	13	26	2	41	5	3	1	1
	Jhang	11	34	2	47	6	7	1	...
Derajat	Montgomery	13	29	5	48	6	2	4	...
	Muzaffargarh	45	14	11	70	4	5	1	...
	Dera Ismail Khan	29	19	7	55	6	13	...	...
Peshawar	Dera Ghazi Khan	32	21	3	56	...	5	4	...
	Banna	51	16	4	71	6	4	...	...
	Peshawar	32	19	1	52	11	5	2	1
Total	Kohat	68	...	1	69	12	3	...	...
	Hazara	56	17	...	73	2	4	...	...
	Total	33	19	3	55	6	4	2	1

CHAPTER I, QUESTION 9.

C

Replies received from District Officers and others.

Division.	District.	Officers replying.
Delhi ...	Delhi ...	Mr. Maconachie, Settlement Officer.
" ...	Gurgaon ...	Mr. Wilson, Assistant Settlement Officer.
Hissar ...	Rohtak ...	Alimulla, Honry, Extra Asst. Commr., Rohtak Settlement,
" ...	Hissar ...	Mr. A. W. Stogdon, Deputy Commissioner.
Umballa ...	Ludhiána ...	Mr. Walker, Settlement Officer.
Jullundur ...	Hoshiárpur ...	Mr. Coldstream, Deputy Commissioner.
Amritsar ...	Amritsar ...	Mr. Hawkins, Deputy Commissioner.
" ...	" ...	Rája Sir Séhib Dyal, K.C.S.I., Jágirdár and Honry. Magistrate.
" ...	Gurdáspur ...	Muhammad Hayat Khan, C.A.I., Judicial Asst. Commissioner.
Lahore ...	Gujránwála ...	Mr. Tolbort, Deputy Commissioner.
Rawalpindi ...	Jhelum ...	Mirza Azira Beg, Honry. Asstt. Commissioner, Jhelum Sett.
Mooltan ...	Mooltaa ...	Hukam Chund, Extra Assistant Settlement Officer.
" ...	Jharg ...	Mr. Steedman, Settlement Officer.
" ...	Muzaffargarh ...	Mr. E. O'Brien, Settlement Officer.
Deraját ...	D. I. Khan ...	Mr. St. G. Tucker, Settlement Officer.
" ...	D. G. Khan ...	Chiman Lall, Extra Assistant Commissioner.
" ...	Banna ...	Mr. S. S. Thorburn, Settlement Officer.
Pesháwar ...	Kohát ...	Major Hastings, Settlement Officer.

Note to preface Replies to QUESTION 9, CHAPTER I.

In referring this question to selected officers, British and Native, for report, the question was re-written as shown below; and a form was furnished to them in which they were directed to embody their replies to its 3rd paragraph. Accordingly, all the typical cases appended to the replies received will be found to be reported in tables of uniform frame.

QUESTION.

1. State precisely the districts, of which you are about to write in answering the 2nd and 3rd divisions of this question; the nature of your connection with and knowledge of those districts, and over what length of time it has extended?

2. What is the ordinary economic condition of the portion of the agricultural population directly engaged in the cultivation of the land; whether as *owners*, as *occupancy tenants*, or as *tenants-at-will*.

In the term *economic condition* are included all the ordinary incidents of their life, referred to in the 3rd division of this question.

What proportion of each of the 3 classes above mentioned do you believe to be in debt, and to what are their debts commonly due, and what proportion does their average indebtedness in each class bear to their average yearly income?

3. Illustrate your reply to the above questions by giving the *actual facts* as to a few typical instances of agriculturists taken from 4 or 5 different villages in the districts of which you are writing. State with regard to each, what area of land he holds for tillage or grazing, what his family consists of, what amount of food-grain and what value of other produce he raises on an average off his land in a year, what rent or revenue or cesses he pays for his land, what expenses he incurs in hired labour (other than his own labour and that of his family), what amount he spends in a year in purchase of necessaries which he cannot produce on his land, what kind of house he lives in, how many rooms it possesses, what other property, and what stock of grain. How does he dispose of any surplus income, whether by hoarding or lending his money, or investing it in ornaments, or spending it in marriage ceremonies or otherwise?

What are his debts and to what are they commonly due?

Note.—In answering the 2nd and 3rd divisions of this inquiry, please distinguish carefully between the several classes mentioned in the 2nd division, so far as in your experience any material difference of welfare actually exists between them.

Answer by MR. R. MACONACHIE, C. S. Settlement Officer, Delhi.

1. The remarks made below, and the typical instances submitted herewith, deal with the condition of agriculturists in the Delhi District.

2. I have been Settlement Officer in the District since 10th January 1878. During this short time I have been much in camp. Of Delhi tahsil I know very little, Ballabgarh I know fairly, and Sonepat, which I have just finished inspecting for assessment, well. In the remarks made herein, I base the figures and calculations on the instances gathered under my immediate direction by:—

- (i). The Extra Assistant Commissioner Ajudhia Parshád for Ballabgarh.
- (ii). The Superintendents of Delhi and Sonepat for their respective tahsils.

3. The reports of these officers differ in some minute particulars as to the way in which they are drawn up, but such differences appear immaterial. I rely with confidence on the facts related as being substantially true, for in such a work these officers are quite trustworthy. So far too as my experience goes, the statements appear inherently probable.

4. The instances given are nineteen in number, as follows:—

Proprietors	7
Tenants with occupancy right	7
Tenants-at-will	5

5. The proprietors are men of different parts of the District, chosen as living in different assessment circles, and thus as being as regards soil and irrigation at least in different circumstances. The first in style of living probably, though not really the best off, is the proprietor of land in a canal village. The instance given (No. 6) is that of a man somewhat below the average, the fact being that the village where he lives has suffered from "shor." Twenty years ago the canal villages were in the height of prosperity, pakka houses were built, the common funds of the proprietors often raised a substantial travellers' house used as a village assembly room (the chaupár or chaupál). The oxen, fed on sugar-cane stalks, gur, and the abundant fodder of canal irrigated fields, increased in size and strength; the people themselves adopted a more luxurious style of living and dress. But this prosperity has waned; the crops are not what they were, the soil is enfeebled, and in many places destroyed; at least for the time. The people, however, do not easily come back to their primitive simplicity, and the consequence is that there is in the canal irrigated District a far greater amount of indebtedness than there would have been, had the old circumstances of expenditure been unaltered. Still, where the canal has been used, and not abused, there is yet even a prosperity not equalled anywhere in the District. The realignment of the Jumna canal will probably keep this prosperity for many villages, but a safer and simpler means of abating the evil lies in the restriction of canal irrigation and by keeping the main channel dry for some months in the year to allow the spring level to sink again. Much has been written, and something is now being done about the improvement of the drainage, but it were well to prevent as well as to cure. The holding of the canal proprietor is not generally larger than the ordinary size throughout the District, 12 to 15 acres, but he gets richer crops, especially sugar-cane, off the ground. In a large canal village it is not uncommon to find a mass of cultivation of this crop, sometimes 50, 75 or 100 acres standing together, with regularly marked narrow lanes well fenced in leading from one end to the other. Sugar-cane is expensive alike for seed, planting, care while growing, and expressing when ripe. But it well repays the cost, and is in fact the great stand-by in those villages where it is grown. Sugar-cane is grown rarely in the khádir chak and in some villages in the bángar, but nowhere does it come to such a size as in the canal villages.

The other chaks have proprietors for the most part in moderate circumstances. The Kohi chak probably (see No. 14) is the poorest, and there the people are sometimes very low in their standard of living. The houses are mere "chappars" of thatch; sometimes mud walls support the thatch; the food consists mainly of the inferior grains, and the dress often is only a piece of dirty coarse cotton cloth in the form of a "chádar." The general average however is better than this. No. 1, it is true, is in debt, but his style of living is something like comfort, and it is because he has a large family for his moderate holding that he becomes embarrassed. Had he fewer mouths to feed, he might be as well off as the shrewd Ját No. 4, who, in a holding of only seven acres, has managed to save money, and knows how to use it when saved. No. 9, though under a temporary cloud, may perhaps get right

again, in an ordinary year he probably pays his way. His house is not much certainly, but it is better than the Kohi Gujar. If it were not for the cows of the latter, he would hardly manage to live. Ch. I.

The general condition then of the proprietor may be described as moderately prosperous; there is little margin for him to fall back on in bad times, and his style of living is somewhat low, but in ordinary years, and with ordinary expenses he generally pays his way. A marriage, a funeral, or bad luck with his cattle, may bring him into difficulties, but these too he may extricate himself from in many cases. There is reason to believe that legal fees are in a few instances the cause of embarrassment, if not of ruin.

The tenants with occupancy rights, and still more the tenants-at-will, might perhaps be supposed as, being inferior in station, to be inferior in circumstances also to the proprietor. This, however, is not always the case. The tenant with occupancy has sometimes (as in case No. 2) an auxiliary income from "parohitai," priestly dues, which enables him not only to pay his way but save money. In the case in question this auxiliary income becomes most important. The number of such privileged persons is necessarily limited, but without such adventitious aid the tenant is often a man of substance. Whether he will remain so is a matter of doubt. Up to the present time he generally pays only the revenue-rate of the village on his land, i.e., he pays no rent, so that, provided his holding is of a fair size, he may be as well off as the proprietor of other land in the same village. There seems little doubt, however, that when the new assessments shall be announced, a general attempt will be made on the part of the proprietors to obtain rent, or an enhancement of rent, and this must lessen the profits of the tenant.

The position of the tenant-at-will is very unequal. He too at present often pays only the revenue-rate, but on the other hand he sometimes has to give a competition rent. The pressure of population is felt more directly here than in any other class. A family of strong men, or having active women, may do well, but whenever the non-producing part of the house becomes large, distress is sure to follow. The mali of Rathdhaneh (instance No. 3) gets together in one way or another a pretty large income, but the large quantity of food requisite to keep his seventeen people going, makes it a hard matter to keep out of debt. Probably by the time the boys come to working age, they will find their earnings embarrassed with considerable debt. The limit, however, is not far off; when the money-lender ceases to give credit, the house breaks up, and the men scatter to earn their living by hiring themselves out. The difference in status arising from advantages of irrigation is shown in instance No. 8, where a tenant-at-will on 17 acres contrives to pay a 'revenue' of Rs. 62 odd, and Rs. 40 more 'water-rent.' The 'revenue' of course includes rent paid to the proprietor. With this heavy charge on him, he yet pays his way, and is on the whole in comfortable circumstances. This being so, it is no wonder that the proprietors expect to be well off, and are disappointed when they find their former prosperity gone.

I forbear to dwell on details at any length, for I am sure that my experience is not sufficient to give exact estimates, and these I imagine are the only useful things of their kind. The instances I have collected speak for themselves, and are, I believe, as valuable and trustworthy as they are interesting. I would draw attention to the various ways in which the income from direct cultivation of the land is eked out by auxiliary means.

- (1.) The proprietor in Rathdhaneh (No. 1.) makes Rs. 54 by *ghat sold*; the tenant-at-will in the same village (No. 3) Rs. 24; (No. 4) a proprietor, makes Rs. 36; the same amount comes to the Gujar proprietor (No. 14).
- (2.) *Brahmani dues* are great helps to No. 2 and No. 7, who are both tenants with occupancy, while for No. 16, the Brahman tenant-at-will in the Kohi chak, they constitute half his income.
- (3.) *Money-lending* is possible only in the case of profitable farming, but this is not uncommon. It obtains only where the men are shrewd and thrifty. In fact, seeing how some Jats amass capital, and prosper as usurers, one is inclined to think that differences of soil are less important than differences in mental and moral habits.
- (4.) *Lambardar's dues* are a help, but a small one, and the social habits engendered by possession of the dignity are more than a counterbalance to the income thus obtained.

- (5.) *Selling cow-dung* is a help in some parts, especially near towns, in the case of the khadir tenant-at-will (No. 19); this with grass sold brings in Rs. 2, a month.
- (6.) *Letting out gáris* on hire brings in something—Rs. 12 to No. 1—and often there is more than this, chiefly however near towns.
- (7.) The last item is *hire for labour*, which of course, when regularly pursued is fairly lucrative for an able-bodied man. The earnings of boys in the Kohi chak as herdsmen seem noticeable.

I pass on to the last matter on which report is required. The causes of indebtedness are not generally obscure; in order of importance they may generally be put as follows:—

- 1.—Expenses of marriages and funerals.
- 2.—Vicissitudes of season, as regards crops.
- 3.—Ill-luck with cattle, or personal illness.
- 4.—Severity of Government revenue.

All these matters have often been dwelt on, and I am not likely to strike out any thing new. The question of sumptuary laws will probably be considered, perhaps too the idea of a rough assurance association to afford compensation in cases of death of cattle is not original. Both matters seem to me worthy of consideration. But I think it better to pass on to the last point—indebtedness caused by the severity of Government revenue. I think this uncommon, but I believe it exists, and more than anywhere else in the canal villages. Some of these have been paying Rs. 3 on every cultivated acre for the last thirty years. Now this may be borne in fair years, though it is a great burden, and forces on a system of cultivation which cannot but injure the land. But in bad years, or when water is scarce or not given at the right time, the canal village is worse off than any. The canal irrigation, at the style in which it has been going on here for many years past, would I believe ruin any land in time. It is of no use to say that the people are to blame for flooding their land so; their reply is cogent; we must do so to sustain the heavy Government demand. The inelasticity too of the canal water rent is against them: so that as a matter of fact, canal irrigation, which should be the most certain protection of a high average, and of that average from wide variations, often introduces an element of speculation into the matter, which would at first sight seem astonishing. The inference to be drawn seems to be that Government has not properly discharged its duties as joint trustee of the land with the Zamíndárs. If they have not discretion sufficient to prevent a far distant but surely coming destruction of the powers of the soil by a moderate use of the immense power of irrigation from canals, that duty and that responsibility, nevertheless, remain with Government. The remedy is simple,—allow only moderate irrigation, and assess accordingly. Severity of revenue in other than canal villages is rare. The Government demand is inelastic, and we have failed to teach the people, as yet, to prevent the strain in bad years by forethought and thrift in good seasons. But the adjustment is generally accomplished, though in a clumsy and costly manner. The money-lender gives help in bad seasons, and is repaid in good; the greater cost is found in his exorbitant interest. If we push this further, we find that the "middleman" class is numerous; that it is favoured by superior intelligence and social custom. And this brings us to what perhaps is not the greatest cause of indebtedness, strictly speaking; but the greatest cause of *increase* of indebtedness, viz., the power of the bania and money-lender over the Zamíndár. The subject is a well worn one, and it seems unnecessary to do more than, having noted the distinction above, to record my assent to the general opinion.

This reply is of course not exhaustive. It has been written rapidly, but as it deals with matters which must form in a great measure the intellectual pabulum of officers whose work lies chiefly among Zamíndárs, the substance of it has been formed and corrected by daily experience.

Typical instances of the economic condition of the agricultural population of the Punjab

I.—FAMILY AND THEIR HOLDING.									
No. of case.	Status.	No. of persons comprising the family.				Area of holding in acres.			
		Adults.		Children.	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.
		Male.	Female.						
1	2	3	4	5	6	7	8	9	10
One	Proprietor, Sobhat son of Antí, Ját of Rathdhaneh, Sonapat Tahsil, edge of Bangar and Khadir	Four; Sobhat, Santok, Sohaa, Maha Rám.	Three; Mussummatán Níbo, Nankaur, Samarkaur	Two; Mussummatán Nánki, Muttri	Nine	Cultivated by proprietors	12 acres	...	12 acres
Two	Tenant with right of occupancy; Majlis son of Swrata, Brahmin of Rathdhaneh (see example No. 1)	Four; Majlis, Keshor, Net Rám, Rámji Lál	Four; Mussummatán Badámo, Sarmau, Narauli, Nand Kaur	Four; Mulhar (boy), Ghisá " Shival " Albe Rám,,	Twelve	Cultivated by tenants themselves	4 acres	No. 2—None	Tenant with 4 acres
Three	Tenant-at-will; Budh Rám son of Rámdit caste Málí of Rathdhaneh (see example No. 1)	Four; Budh Rám, Sheo Rám, Dalú, Bhupá	Four; Mussummatán Dhapo Nanni Jiwani Dhánó	Nine; Rámji Lál (boy) Hau Rám (boy) Moín (boy) Ghisá (boy) Sing Rám (boy) Mussummatán Bhágo, Mánkaur, Samarkore, Láli	Seventeen	Cultivated by tenants	8 acres	No. 3—...	Tenant-at- 8 acres

II.—INCOME.						III.—EXPENDITURE.				
One year's produce of the land.			Other miscellaneous income.		Total income.	Revenue, cesses, sign- orage charges and for tenants, rent.		By grain used as food and used as seed or otherwise expended.		
Kind of pro- duce.	Amount, maunds.	Value.	Detail.	Value.	Amount rupees.	Detail.	Amount.	Detail.	Maunds.	Value.
11	12	13	14	15	16	17	18	19	20	21
	M. S. C.	Rs. A. P.		Rs. A. P.	Rs. A. P.		Rs. A. P.		M. S. C.	Rs. A. P.
<i>Kharif.</i> Sugar-cane 3 acres;	42 0 0	126 10 6	Share of shámlát produce	0 6 0		Land Reve- nue	27 11 0	Food ...	78 0 0	99 6 0
Jowár 2 acres	24 0 0	34 4 0	Hire of gári	12 0 0		Cesses and Malba	3 2 3	Seed ...	17 6 9	
Báira 1 acre	3 30 0	4 10 3	Ghi sold ...	54 0 0				Jowár ...	0 19 0	0 11 0
3 roods								Báira ...	0 4 4	0 2 9
Gwar 1 acre	7 30 0	9 7 9						Gwar ...	0 25 0	0 2 6
1 rood								Wheat ...	0 25 0	1 0 0
<i>Rabi.</i> Wheat 2 acres	24 0 0	30 6 0						Chana ...	0 23 0	0 10 3
Gram 1 acre	12 0 0	13 1 0						Wheatchana	0 23 0	0 12 3
Wheat, Gram	12 0 0	16 6 0						Sugar-cane	84 stick	14 0 0
1 acre									M. S. C.	
Chaff ...	48 0 0	13 10 0							315 0 0	90 0 0
Straw-wiaps	250	5 0 0							33 0 0	38 7 0
		253 7 6		66 6 0	319 13 6		3013 3			245 3 9
<i>occupancy see No. 1.</i> <i>Kharif.</i> Sugar-cane 1 acre	14 0 0	42 3 6	Brahmins' dnes	15 0 0		Revenue ...	7 15 6	Food ...	90 0 0	123 13 0
Cotton 1 acre	4 32 0	19 3 0	Produce of mortgaged land	150 12 6		Cesses ...	0 14 6	Seed, <i>Kharif.</i>		
Jowár 2 roods	6 0 0	8 9 0				Revenue on mortgaged land	14 7 9	Sugar-cane	28 bun- dles	4 12 0
Gwar 2 roods	3 0 0	3 12 9						Cotton ...	0 9 0	0 6 0
<i>Rabi.</i> Wheat 1 acre	12 0 0	19 2 9						Jowár ...	0 2 12	0 2 9
Straw bun- dles	100	2 0 0						Gwar ...	0 2 4	0 1 6
Chaff ...	12 0 0	3 6 0						<i>Rabi.</i> Wheat ...	0 12 8	0 8 0
		98 5 0		165 12 6	264 1 6		23 5 9	Stalk, straw	135 0 0	33 12 0
								Grain for cattle	27 0 0	18 3 0
								Seed for mortgaged land		10 14 9
										191 14 0
<i>Will—see No. 1.</i> <i>Kharif.</i> Sugar-cane 3 acres	42 0 0	126 9 0	By cultivat- ing land in other vil- lages	75 0 0		Land revenue	15 15 1	Food ...	112 20 0	146 7 0
Jowár 2 acres	24 0 0	34 3 0	Ghi ...	24 0 0		Cesses ...	1 7 2	Seed, <i>Kharif.</i>		
Gwar 1 acre	6 0 0	7 9 6	Vegetables sold	88 0 0				Sugar-cane	54 bun- dles	9 0 0
<i>Rabi.</i> Wheat 1 acre	18 0 0	22 12 9						M. S. C.		
2 roods								Jowár ...	0 19 0	0 11 0
Chana 2 rds	6 0 0	6 0 6						Gwar ...	0 4 8	0 2 3
Chaff ...	24 0 0	6 14 0						<i>Rabi.</i> Wheat ...	0 18 12	0 12 0
Straw bun- dles	200	4 0 0						Gram ...	0 11 8	0 5 0
		218 14 6		185 0 0	348 14 9		17 3 6	Chaff ...	315 0 0	98 0 0
								Gram for cat- tle	45 0 0	61 9 0
										308 14 3

Typical

No. of case.	Status.	III.—EXPENDITURE—concluded.				IV.—SURPLUS.		V.—DESCRIPTION		
		Customary charges of village menials and hired labour.		Necessaries not produced on the land or by family labour.		Total expenditure.	Surplus income over expenditure.	Surplus how disposed of.	No. of rooms in house.	
		Detail.	Amount.	Detail.	Amount.				Used as dwelling rooms.	Used for sheltering cattle.
		22	23	24	25	26	27	28	29	30
One—concluded	Proprietor, Sobbat son of Anti Ját of Rathdhaneh, Sonepat Tahsil, edge of Bangar and Khadir.	Chura ... Chumár ... Carpenter ... Lohár ... Potter ...	M. S. C. 0 5 0 2 3 4 1 0 0 1 0 0 1 0 0 5 8 4 =Rs. 6 14 6+ Rs.32 8 9	Salt ... Clothes...	Rs. A. P. 5 0 0 20 0 0	Rs. A. P.	None: in- deed deficit of Rs. A. P. 20 10 9	...	Two rooms kacha-built, with two covered en- trance rooms.	A separate enclosure uncovered
					Rs.39 7 3	25 0 0	340 8 3			
Two—concluded	Tenant with right of occupancy; Majlis son of Swata Brahmin of Rathdhaneh (see example No. 1).	Chura ... Chamár ... Carpenter... Lohár ... Potter ...	0 5 0 0 20 0 1 0 0 1 0 0 1 0 0 8 25 0 =Rs. 4 14 6+ 13 0 3	Salt ... Clothes...	5 0 0 22 0 0		4 1 0	Is invested in acquir- ing land in mortgage	One 'kacha' built room, with four- rooms(dalan)	No. 2—Tenant One 'kacha' built room, also with a fore-room (dálán)
					17 14 9	27 0 0	260 0 6			
Three—concluded	Tenant-at-will Budh Rám son of Rámdit east Mái of Rathdhaneh (see example No. 1)	Chura ... Chamár ... Carpenter... Lohár ... Potter ...	5 0 0 1 15 0 1 0 0 1 0 0 1 0 0 4 20 0 =Rs. 6 2 3+ 32 8 9	Salt ... Clothes...	5 0 0 25 0 0		None	...	No. 3—Tenant-at- Two 'kacha' built rooms with one fore-room	Cattle are kept in the yard of the dwelling house
					38 11 0	80 0 0	894 15 6			

Instances—continued.—DELHI DISTRICT.

OF RESIDENCE, CATTLE AND CHATTELS.				VI.—DEBTS.			REMARKS.
Cattle.		Chattels, stock of grain and cash.		How incurred.	Amount.	Percentage on total income.	
Details.	Number.	Detail.	Value rupees.				
31	32	33	34	35	36	37	38
		<i>Ornaments.</i>	Ra. A. P.		Ra. A. P.		
Oxen ...	3	Nose rings 3 (gold) ...	15 0 0	1 Marriage expenses	868 9 0	-270 36	This is a large struggling family, the mouths to feed many, the property in land a small holding; though the soil is of fair productive power. The debts are of old standing. Sobbat was in debt before 1925, and the load has been gradually increasing. Bathdhaneh is a large Jât village fully assessed in Sonapat. Sobbat is a typical instance of a man with a large family of kinmen, dependent (by custom being limited thereto) on their small holding of 12 acres for subsistence.
Cow ...	1	Anklets 2 (silver) ...	10 0 0	3 Daily food			
Bull-calf ...	1	Rings 2 (silver) ...	1 0 0	3 Paying Government Revenue			
Buffalo ...	1	Clothes 4 suits ...	8 0 0				
Cow-buffalo-calf	1	<i>Household vessels.</i>					
		Large plates 2 (kansi)	2 0 0				
		Cups 2	2 0 0				
		Small cup 1	0 8 0				
		Cauldron 1	2 0 0				
		Spoon 1	0 5 0				
		Saucepan 2	2 0 0				
		Pan 1	1 0 0				
		Bedsteads 5	3 0 0				
		Balance	0 6 0				
		Spinning-wheel 2	0 14 0				
		Iron pot 1	0 4 0				
		Grindstone 1	1 4 0				
		Wheat 20 sérs	1 4 0				
		Ox 1	40 0 0				
	7		90 13 0				
		<i>with occupancy—see No. 1—continued</i>					
		<i>Ornaments.</i>					This is a typical example of a family well-to-do by means of an auxiliary income. The "Parohitai" of the Brahmin Majhis brings him in enough to enable him to pay his way, and set by a little every year. This hides surplus, probably more than is given here, is prudently invested in acquiring land in mortgage. It is curious to find the very money obtained from the piety or superstition of the zamindár, lent him again to carry on his work with. The amount of capital represented by the produce (which is of course the interest) of the mortgaged land is very considerable, certainly not less than Rs. 600.
Oxen ...	2	Nose rings 3 (gold) ...	21 0 0				
Cow ...	1	Anklets 6 (silver) ...	18 0 0				
		Rings 2	2 0 0				
		Clothes 8 suits	18 0 0				
		<i>Household vessels.</i>					
		Large plates 3	3 8 0				
		Pots 2	3 12 0				
		Cup 1	1 0 0				
		Small cup 1	0 3 0				
		Saucepans 2	2 0 0				
		Cauldron 1	4 0 0				
		Spoon 1	0 4 0				
		Iron pot 1	0 4 0				
		Bedsteads 8	4 0 0				
		Low seats 3	1 0 0				
		Spinning-wheels 3	1 5 0				
		Grindstone 1	1 4 0				
		Grain 15 maunds	37 8 0				
	3		119 0 0				
		<i>will—see No. 1—concluded</i>					
		<i>Ornaments.</i>					Another instance of a large struggling family; but having no property in the land, they obtain little credit, and their debts are therefore comparatively small. The standard of living is very low.
Oxen ...	4	Anklets 6 (silver) ...	18 0 0	1 Expense of marriage	115 0 0	36 93	
Cow ...	1	Necklace 1	8 0 0	2 Daily food			
Bull-calf ...	2	Clothes 8 suits	17 0 0				
		Coarse cloth (gára) 40 yards	2 8 0				
		<i>Household vessels.</i>					
		Large plates 2	2 4 0				
		Saucepans 3	2 8 0				
		Cup 1	0 8 0				
		Pot 1	3 0 0				
		Iron pot 1	0 5 0				
		Spoon 1	0 4 0				
		Spinning wheels 3	1 5 0				
		Grindstone 1	1 4 0				
		Grain 1 mound	1 5 10				
	7		58 3 10				

I.—FAMILY AND THEIR HOLDING.									
No. of case.	Status.	No. of persons comprising the family.				Area of holdings in acres.			
		Adults.		Children.	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.
		Male.	Female.						
1	2	3	4	5	6	7	8	9	10
Four	Proprietor ; Rám Lál son of Sada Rám Ját of Udest- púr, Sonapat Tahsil.	Two ; Rám Lál, Máhiá	Two : Mussum- matán Mahri and Lachmi	Two ; Tej Singh (boy), Mussummat Nandkaur.	Six	Cultivated by proprietors	A. R. P. 7 2 1	...	A. R. P. 7 2 1
Five	Tenant with right of oc- cupancy ; Nahchal son of Majlas Ját of Udestpúr (see No. 4)	One ; Nahchal	One ; Mussummat Dhawa	Three ; Haría (boy), Mussummaté Dhápo and Ratan Kour	Five	Cultivated by tenants themselves.	12 acres	...	12 acres
One of Delhi Tahsil.	Proprietor, Nánik Ját of Uchandi Delhi Tahsil, Chak Nahri	One ; Nánik	Two ; Musammate Cháoli and Samakaur	...	Three	Cultivated by proprietor himself	13 acres	...	13 acres

Bangar, Chak Sonapat.—DELHI DISTRICT.

II.—INCOME.						III.—EXPENDITURE.				
One year's produce of the land.			Other miscellaneous income.		Total income.	Revenue, cesses, sign- orags charges and for- tenants' rent.		By grain used as food and used as seed or otherwise expended.		
Kind of pro- duce.	Amount, maunds.	Value.	Detail.	Value.	Amount, rupees.	Detail.	Amount.	Detail.	Maunds.	Value.
11	13	13	14	15	16	17	18	19	20	21
	M. S. C.	Rs. A. P.		Rs. A. P.	Rs. A. P.		Rs. A. P.		M. S. C.	Rs. A. P.
<i>Kharif</i> Sugar-cane 1 acre 2 roods, Jowar 6 acres, Straw bun- dles	21 0 0 72 0 0 600	63 5 8 102 12 0 12 0 0	Ghi ... Grain sold Manure ...	86 0 0 160 0 0 0 8 0		Land Reve- hue Cesses ...	15 15 6 1 7 0	Food ... Seeds, <i>Kharif</i> Sugar-cane Jowar ... Chaff ... Gram for cattle	45 0 0 45 bun- dles 117 0 37 0 0 45 0 0	61 6 6 7 8 0 1 15 10 103 14 0 48 14 9
		178 1 8		186 8 0	364 9 8		17 6 4			226 11 1
<i>Bangar, Chak Sonapat.</i> <i>Kharif</i> Sugar-cane 1 acre Jowar 5 acres, Bajra 2 acres <i>Rabi</i> Wheat 4 acres Chaff ... Straw bun- dles	14 0 0 60 0 0 6 0 0 48 0 0 48 0 0 500	42 3 6 85 10 0 8 6 6 76 12 0 12 14 0 10 0 0	Manure ...	0 9 0		Land revenue Cesses ...	25 2 0 2 4 9	Food ... Seeds, sugar- cane Jowar ... Bajra ... Wheat ... Chaff ... Grain for cattle	91 20 0 28 bun- dles 1 7 8 0 4 8 1 10 0 185 0 0 27 0 0	42 8 6 4 12 0 1 12 8 0 2 8 2 0 0 88 10 0 29 6 3
		236 14 0			286 7 0					418 15 8
<i>panai village.</i> <i>Kharif</i> Cotton 1 acre Jowar 4 acres Sugar-cane 2 acres <i>Rabi</i> Wheat, gram 6 acres Straw bun- dles 4 acres Chaff 6 acres	5 0 0 82 0 0 26 0 0 78 0 0 1,200 97 20 0	15 0 0 40 0 0 65 0 0 117 0 0 88 0 0 19 8 0	Ghi ...	5 0 0		Land revenue and cesses Water rate cess	49 10 2 32 12 0	Food ... Jowar ... Wheat and gram Jaggery ... Seeds ... Sugar-cane dies Cotton seed Jowar ... Wheat and gram Cattle food Straw bun- dles Chaff ...	8 20 0 14 0 0 2 0 0 56 bun- dles 0 5 0 1 8 0 6 0 0 1,200 97 20 0	10 10 0 21 0 0 5 0 0 15 0 0 0 2 0 1 8 0 9 0 0 36 0 0 19 8 0
		292 8 0			297 8 0		82 6 2			117 13 0

No. of case.	Status.	III.—EXPENDITURE—concluded.				IV.—SURPLUS.		V.—DESCRIPTION		
		Customary charges of village menials and hired labour.		Necessaries not produced on the land or by family labour.		Total expenditure.	Surplus income over expenditure.	Surplus how disposed of.	No. of rooms in house.	
		Detail.	Amount.	Detail.	Amount.				Used as dwelling rooms.	Used for sheltering cattle.
22	23	24	25	26	27	28	29	30		
Four—concluded.	Proprietor Rām Lāl son of Sada Rām Jāt of Udesi- pur, Sonepat Tahsil.	Chura ...	M. S. C. 5 0 0	Salt ...	Rs. A. P. 3 0 0	Rs. A. P. 69 0 2	After provid- ing for mar- riages in the family the surplus is used as capital for lending on, and for buying and selling.	Two kacha built rooms with two fore-rooms.	Two kacha built rooms with one fore-room	
		Chamār ...	1 32 0	Clothes...	25 0 0					
		Potter ...	1 0 0							
		Jāt of Udesi- pur, Sonepat Tahsil.	1 0 0							
		Lohār ...	1 0 0							
		Expressing Sugar-cane	4 37 0 =Rs. 6 11 0 +16 12 6							
			23, 7 6		28 0 0	295 9 1				
Five—concluded.	Tenant with right of oc- cupancy; Nahchal son of Majlas Jāt of Udesipūr (see No. 4)	Chura ...	0 5 0	Salt ...	1 8 0	58 0 6	Marriage expenses and daily food	One kacha built room with one fore-room	Cattle are kept in the dwelling house	
		Chamār ...	2 34 0	Clothes...	10 0 0					
		Potter ...	1 0 0							
		Carpenter	1 0 0							
		Lohār ...	1 0 0							
		Expressing sugar-cane	5 39 0 =Rs. +8 0 6 12 8 0							
			20 8 6		11 8 0	178 6 6				
One of Delhi Tahsil—concluded.	Proprietor; Nānik Jāt of Uchandj Delhi Tahsil, Chak Nahri	Menials ...	8 4 0	Salt and oil	10 0 0	23 0 10	Marriage and burial ex- penses.	One room with its ve- randah, yard and kacha boundary.	One room	
		Laborers ...	20 0 0	&c.,	10 0 0					
		Expressing sugar-cane.	26 0 0	Clothes, utensils, and im- plements.	10 0 0					
			54 4 0		20 0 0	274 7 2				

OF RESIDENCE, CATTLE AND CHATTEL.				VI.—DEBTS.			REMARKS.
Cattle.		Chattels, stock of grain and cash.		How incurred.	Amount.	Percentage on total income.	
Details.	Number.	Detail.	Value, in rupees.				
81	82	83	84	85	86	87	88
Oxen ...	3	<i>Ornaments</i>	Rs. A. P.	...	Rs. A. P.	...	This is a good instance of a shrewd Ját, who though he has but a small holding, manages by thrift and his innate sagacity to amass no inconsiderable wealth. The property mentioned in col. 84 no doubt represents the result of many years of saving.
Buffaloes ...	3	Nose rings 2 (gold) ...	18 0 0		None		
Bull-calf ...	1	Necklace 2 (silver) ...	30 0 0				
Bull-buffalo calf	1	Brocchets 4 (silver) ...	40 0 0				
Cow buffalo calf	1	Ghan pachhall (silver) ...	40 0 0				
		Hár 2 ...	40 0 0				
		Forehead ornaments 1 (silver) ...	10 0 0				
		Balli 1 (silver) ...	10 0 0				
		Armlets 4 ...	16 0 0				
		Rings 4 (silver) ...	4 0 0				
		Kara 4 ...	30 0 0				
		Barrings 2 (gold) ...	30 0 0				
		Waist chain 2 (silver) ...	50 0 0				
		Gold rings 2 ...	10 0 0				
		Large necklace 1 ...	75 0 0				
		<i>Household vessels</i>					
		Cauldrons 2 ...	12 0 0				
		Large plates 4 ...	10 0 0				
		Parát 1 ...	5 0 0				
		Cups 3 ...	8 0 0				
		Waterpots 4 ...	6 0 0				
		Spoon 1 ...	0 12 0				
		Drinking glass 2 ...	2 0 0				
		Small cup 1 ...	2 0 0				
		Ironpot 1 ...	1 4 0				
		Grind-stone ...	1 4 0				
		Spinning wheel 1 ...	0 8 0				
		Bedsteads 4 ...	3 0 0				
		Wheat 25 maunds ...	62 8 0				
		Gram 52 maunds ...	104 0 0				
		Mustard 57 maunds ...	171 0 0				
		Clothes ...	20 0 0				
	9		992 2 0				
Bangar chak Sonapat—concluded.							An ordinary family of fair though humble means. The surplus here obtained no doubt is not always available. The general pecuniary condition may be taken as one of equilibrium. They manage to pay their way.
Oxen ...	2	<i>Ornaments</i>	28 0 0	...	None	...	
Cow ...	1	<i>Household utensils</i>					
		Pot 1 ...	2 0 0				
		Large plate 1 ...	0 14 0				
		Water pot 1 ...	1 1 0				
		Iron pot 1 ...	0 4 0				
		Spoon 1 ...	0 4 0				
		Grindstone 1 ...	1 4 0				
		Bedsteads 2 ...	0 8 0				
		Spinning wheel 1 ...	0 7 0				
		Clothes ...	5 0 0				
	8		89 10 0				
canal village—concluded.							A proprietor of small means in a canal village; he pays his way but saves nothing considerable. The land is good, but there is only one working hand. It is noticeable, and almost characteristic, that there are no children in this house. Uchandi has suffered from shor.
Oxen ...	2	Spinning wheel 1 ...	1 0 0	...	None	...	
Bull-calf ...	3	Bedsteads 4 ...	8 0 0				
Buffalo ...	1	Box 1 ...	5 0 0				
Bull-buffalo calf	1	Implements ...	10 9 0				
Cow-buffalo calf.	1	Household Utensils ...	11 11 0				
		Ornaments ...	30 0 0				
		Clothes ...	7 0 0				
Cows ...	2	Hemp 10 sérs ...	0 12 0				
		Cotton 2 maunds ...	7 0 0				
		Chaff 1 maund ...	0 4 0				
		Mustard 10 sérs ...	0 10 0				
	10		76 14 0				

I.—FAMILY AND THEIR HOLDING.									
No. of case.	Status.	No. of persons comprising the family.				Area of holding in acres.			
		Adults.		Children.	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.
		Male.	Female.						
1	2	3	4	5	6	7	8	9	10
Two; Delhi Tahsil.	Tenant with right of occupancy; Tota, Brahmia of Uchandi (See example No. 1).	Five; Tota, Salsag, Tukha, Khubi, Richcha	Seven; Mussummats Chhoni, Chhodi, Sahabkour, Jiwani, Lachi, Nanui.	Two; Sobha Chand (boy) Channi Lal (boy)	Fourteen	Cultivated by tenants with right of occupancy themselves.	23 acres	...	23 acres
Three of Delhi Tahsil.	Tenants-at-will; Badlu Jat of Uchandi (See example No. 1)	One; Badhi	Three; Mussummats Rajban, Lali, and Bhuru	One; Mussummat Nanki	Five	Cultivated by tenants-at-will themselves.	17 acres	No. 8	Tenant-at-will 17 acres
One, Ballabgarh Tahsil.	Proprietor & occupancy Tenant; Gokal son of Sita, caste Gaura of Saran Chak Dabri; Tahsil Ballabgarh	Two	Two	Four	Eight	Cultivated by proprietor himself	6 acres own property; 10 acres right of occupancy	No. 9—Proprietor, Chak	16 acres
Two (Ballabgarh).	Occupancy Tenant, Kallu son of Lachman, Brahmia of Saran, Tahsil Ballabgarh Chak.	One	Three	Three	Seven	Cultivated by occupancy tenant himself.	10 acres	No. 10 Tenants with right of	1 acre 11 acres

II.—INCOME.						III.—EXPENDITURE.					
One year's produce of the land.			Other miscellaneous income.		Total income.	Revenue, cesses, assignments charges and for tenants' rent.		By grain used as food and used as seed or otherwise expended.			
Kind of produce.	Amount, maunds.	Value.	Detail.	Value.	Amount rupees.	Detail.	Amount.	Detail.	Maunds.	Value.	
41	12	13	14	15	16	17	18	19	20	21	
<i>Canal village.</i>											
<i>Khari.</i>	M. S. C.	Rs. A. P.		Rs. A. P.	Rs. A. P.		Rs. A. P.		M. S. C.	Rs. A. P.	
Sugar-cane 4 acres	53 0 0	180 0 0	Brahmin's dues	125 0 0	...	Land revenue and cesses	53 13 2	Food Jowár and gram	40 0 0	50 0 0	
Cotton 1 acre	5 0 0	15 0 0				Water rate	58 12 0	Jaggery ...	8 0 0	20 0 0	
Jowár 8 acres	64 0 0	80 0 0				cess		Seed, sugar-cane	112 bundles	80 0 0	
<i>Rabi.</i>								Cotton seed	0 5 0	0 2 0	
Wheat and gram 10 acres	180 0 0	195 0 0						Jowár ...	216 0	3 0 0	
Straw bundles 8 acres	2400	72 0 0						Wheat and gram	10 0 0	15 0 0	
Chaff 10 acres	162 20 0	32 8 0						Cattle food	...	...
								Straw bundles	2,400	72 0 0	
								Chaff ...	162 20 0	32 8 0	
		524 8 0			649 8 0		112 9 2			314 2 0	
<i>Canal village.</i>											
<i>Khari.</i>	M. S. C.	Rs. A. P.		Rs. A. P.	...		Rs. A. P.		M. S. C.	Rs. A. P.	
Sugar-cane 2 acres	26 0 0	65 0 0	Ghi	5 0 0	...	Land revenue and cesses	62 8 7	Food Jowár and gram	12 0 0	15 0 0	
Cotton 1 acre	5 0 0	15 0 0				Water rate	40 4 0	Jaggery ...	3 0 0	7 8 0	
Jowár 7 acres	56 0 0	70 0 0				cess		Seeds, sugar-cane	66 bundles	15 0 0	
<i>Rabi.</i>								Jowár ...	2 4 0	2 10 0	
Wheat and gram 7 acres	91 0 0	136 0 0						Cotton seeds	0 5 0	0 2 0	
Straw bundles	2100	63 0 0						Wheat and gram	7 0 0	10 8 0	
Chaff 7 acres	113 80 0	22 12 0						Cattle food	...	...
								Straw bundles	2100	63 0 0	
								Chaff ...	113 80 0	22 12 0	
		371 12 0			876 12 0		102 12 7			172 8 0	
<i>Dabri, Ballabgarh Tahsil.</i>											
Cotton ...	6 0 0	18 0 0	...	...	...	Land revenue	10 7 2	Cotton ...	2 0 0	6 0 0
Bajra ...	15 0 0	18 12 0				Cesces	1 1 1	Jowár ...	25 14 0	28 15 0	
Jowár ...	27 0 0	80 13 9				Malba	0 15 8	Bajra ...	10 4 0	12 10 0	
Barley and gram	70 0 0	80 0 0				Rent	21 13 0	Barley and gram	89 10 0	44 13 9	
Wheat ...	30 0 0	45 0 0						Wheat ...	6 10 0	9 6 0	
Chaff ...	125 0 0	25 0 0						Chaff ...	125 0 0	25 0 0	
Straw bundles	1400 Nos.	42 0 0						Straw bundles	1400 Nos.	42 0 0	
		269 9 9			269 9 9		84 4 6			168 12 9	
<i>occupancy; same village as No. 8.</i>											
Cotton ...	6 0 0	18 0 0	...	...	...	Rent	20 11 9	Cotton ...	1 0 0	3 0 0
Bajra ...	6 0 0	7 8 0						Bajra ...	4 0 0	5 0 0	
Jowár ...	12 20 0	14 4 6						Jowár ...	7 0 0	8 0 0	
Barley and gram	90 0 0	102 14 0						Barley and gram	52 0 0	59 7 0	
Straw bundles	600 Nos.	18 0 0						Straw bundles	600 Nos.	18 0 0	
Chaff ...	115 0 0	23 0 0						Chaff ...	115 0 0	23 0 0	
		183 10 6			183 10 6					116 7 0	

No. of case.	Status.	III.—EXPENDITURE—concluded.				IV.—SURPLUS.		V.—DESCRIPTION.		
		Customary charges of village menials and hired labour.		Necessaries not produced on the land or by family labour.		Total expenditure.	Surplus income over expenditure.	Surplus how disposed of.	No. of rooms in house.	
		Detail.	Amount.	Detail.	Amount.				Used as dwelling rooms.	Used for sheltering cattle.
		22	23	24	25	26	27	28	29	30
Two. Delhi Tahsil—concluded	Tenant with right of occupancy; Fota Brahman of Uchandī (See example No. 1.)	Menials ...	M. S. C. 16 8 0	Salt and oil	Rs. A. P. 40 0 0	Rs. A. P. 815 3 1	Rs. A. P. 34 4 10	Marriage and burial expenses	Two rooms, four fore-rooms, one room and one thatched room in upper story	One room with a fore-room and one room in upper story
		Expressing sugar-cane	52 0 0	... Clothes ...	40 0 0					
			108 8 0		80 0 0					
Three. of Delhi Tahsil—concluded	Tenants-at-will; Badli Jat of Uchandī (see example No. 1)	Menials ...	8 4 0	Salt, &c. ... Implements and clothes	10 0 0	851 8 7	25 3 5	Marriage and funeral expenses	One room and a fore-room	A fore-room chappar
		Expressing sugar-cane	10 0 0		12 0 0					
			54 4 0		22 0 0					
One. Ballabgarh Tahsil—concluded	Proprietor & occupancy Tenant; Gokal son of Sita, caste Gaura of Sarán Chak Dahri; Tahsil Ballabgarh	Carpenter	Food grains 2 0 0	Clothes ...	8 0 0	243 1 8	16 8 6	Spent in paying his debts.	One kacha built room with chappar.	One kacha built room with chappar and Portico (Poli).
		Lohar ...	2 0 0	Utensils ...	4 0 0					
		Dhobi ...	1 0 0	Mi cellan-	14 0 0					
		Barber ...	1 0 0	eous ex-						
		Potter ...	2 0 0	penses such						
		Tailor ...	1 0 0	as price of						
		Chamar ...	2 20 0	spices,						
		Sweeper ...	0 20 0	tobacco,						
		Bairagi ...	0 10 0	salt, oil,						
		Hired labor	7 0 0	&c.						
			12 10 0		26 0 0					
			Rs. 14 0 0		26 0 0					
Two. Ballabgarh—concluded.	Occupancy Tenant; Kallu son of Lachman, Brahmin of Sarán, Tahsil Ballabgarh Chak.	Lohár ...	Food grains 2 0 0	Clothes ...	5 0 0	171 4 9	11 5 9	Paying debts	One Kacha built room with chappar.	One kacha built room with Portico (Poli).
		Carpenter...	2 0 0	Utensils ...	2 0 0					
		Dhobi ...	0 20 0	Miscellan-	10 0 0					
		Barber ...	0 20 0	eous ex-						
		Potter ...	1 0 0	penses						
		Tailor ...	0 20 0							
		Sweeper ...	0 10 0							
		Chamar ...	1 0 0							
		Bairagi ...	0 10 0							
		Hired labor	7 0 0							
			15 0 0		17 0 0					
			Rs. 17 2 0		17 0 0					

village—Brahmins' dues; Auxiliary income—concluded.

CH. I.

OF RESIDENCE, CATTLE AND CHATELS.				VI.—DEBTS.			REMARKS.
Cattle.		Chattels, stock of grain and cash.		How incurred.	Amount.	Percentage on total income.	
Details.	Number.	Detail.	Value rupees.				
31	32	33	34	35	36	37	38
			Rs. A. P.		Rs. A. P.		
Oxen ...	4	Bedsteads 22 ...	17 0 0	...	None	...	Here again the auxiliary income of parohital (see example 2) comes in to swell the yearly assets by nearly 26 per cent. Yet the Brahmin is successful in agriculture. His outgoings, it is true, are heavy; but he has the knack of keeping what he gets, and so the yearly surplus, invested in the shape of ornaments and other things becomes large: so that his priestly dues are available nearly in the gross for trade or sale.
Cow ...	2	Grindstones 5 ...	7 8 0				
Bull-calves ...	2	Spinning-wheels 4 ...	4 0 0				
Buffalo calves ...	4	Household utensils ...	54 2 0				
		Implements ...	31 2 0				
		Clothes ...	39 8 0				
		Ornaments ...	310 2 0				
		Drinking glass ...	1 0 0				
		Stools 6 ...	1 8 0				
		Carriage ...	50 0 0				
		Chairs ...	4 0 0				
		Box 1 ...	10 0 0				
		Wheat ...	176 0 0				
		Barley ...	23 0 0				
		Barley and gram ...	20 0 0				
		Flour ...	12 8 0				
		Gram ...	16 0 0				
		Chaff 2 maunds ...	0 8 0				
	12		777 14 0				
canal village	concluded						
Buffalo ...	1	Ornaments ...	17 2 0	...	None	...	A tenant-at-will doing fairly, with soil probably good, and crops protected by canal irrigation. Only one male in the family.
Cow-buffalo-calf ...	1	Household implements and Agricultural implements	9 14 0				
Ox ...	1	Clothes, &c. ...	85 8 0				
	3		112 8 0				
Ballabgarh	ahel—concluded						
Ox ...	2	Food grains ...	2 0 0	Incurred in drought last year.			Fair instance of a proprietor in Dahri Chak. Ballabgarh; standard of living rather low.
Buffalos ...	1	Cash ...	...			
Cow ...	1	Ornaments ...	7 0 0				
Calf ...	1	Other furniture such as bedsteads, grindstone, &c. ...	50 0 0				
	5				200 0 0	77	
occupancy, same village	as No. 9—concluded.						
Ox ...	2	Food grains ...	1 0 0	Incurred in drought of last year.			Tenant with right of occupancy in Saran. Soil here moderate; standard of living rather low. Tenant just pays his way in ordinary seasons; in the bad he goes to the bad.
Cow ...	2	Cash ...	...			
Calf ...	3	Ornaments ...	40 0 0				
	7				90 0 0	49	

FAMILY AND THEIR HOLDING.									
No. of case.	Status.	No. of persons comprising the family.				Area of holding in acres.			
		Adults.		Children.	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.
		Male.	Female.						
1	2	3	4	5	6	7	8	9	10
Three	Proprietor, Khandu son of Bhoir, Meo of Badkhál, Farganna Ballabgarh Chak.	Four	Four	Three	Eleven	Cultivated by Khandu himself.	Land of which he is proprietor, 11 acres.	...	11 acres
							Land of which he is occupancy tenant, 9 acres.	...	9 "
							Shámlát land 4 acres.	...	4 "
Four; Ballabgarh.	Occupancy tenant, Shámda son of Nanna, Meo of Badkhál, Farganna Ballabgarh, Chak Zerkohi.	Three	Four	Four	Eleven	By occupancy tenant himself.	No. 12.—Tenant with right of occupancy, Land of which he is occupancy tenant, 18 acres.	...	18 acres
							Land of which he is tenant-at-will, 4 acres.	...	4 acres
Five; Ballabgarh.	Tenant-at-will, Shahzád son of Gulab, Meo of Badkhal, Farganna Ballabgarh Chak.	Five	Five	Ten	Twenty	By tenant-at-will himself.	No. 13.—Tenant-at-will Chak, 6 acres.	...	6 acres
Six; (Ballabgarh Tahsil)	Proprietor, Kanhayia son of Bakhta, Gujar of Arangpur, Farganna Ballabgarh Chak.	One	Two	Three	Six	By proprietor himself 2 acres, and Sukhdeo and Basdeo tenants (occupancy) subconded 3 acres (Shámlát land).	No. 14.—Gujar Proprietor, Kohi, 2 acres.	...	2 acres
							3 acres.	...	3 acres
Seven; (Ballabgarh).	Tenant occupancy, Rámdál son of Bhoia, caste Gujar of Arangpur, Farganna Ballabgarh Chak.	One	One	One	Three	By occupancy tenant himself 1 acre and Shámlát land 1 acre 2 roods.	No. 15.—Tenant with right of occupancy, 1 acre.	...	1 acre
							1 acre 2 roods.	...	1 acre 2 roods.

II.—INCOME.						III.—EXPENDITURE.							
One year's produce of the land.			Other miscellaneous income.		Total income.	Revenue, cesses, assignments, charges and for tenants, rent.		By grain used as food and used as seed or otherwise expended.					
Kind of produce.	Amount, maunds.	Value.	Detail.	Value.	Amount, rupees.	Detail.	Amount.	Detail.	Maunds.	Value.			
11	12	13	14	15	16	17	18	19	20	21			
	M. S. C.	Rs. A. P.		Rs. A. P.	Rs. A. P.		Rs. A. P.		M. S. C.	Rs. A. P.			
Cotton ...	3 0 0	9 0 0	Discharging the duties of Lambardár.	10 0 0		Land revenue	20 7 9	Cotton ...	120 0	4 8 0			
Báira ...	48 0 0	63 0 0				Cesses ...	2 2 2	Báira ...	20 16 0	25 8 0			
Jowár ...	15 0 0	17 2 8				Other village charges.	0 7 2	Jowár ...	10 20 0	12 0 0			
Barley and gram.	75 0 0	85 11 6				Máikána to Govt.	1 13 2	Mung and moth.	2 0 0	2 10 6			
Mung and moth.	3 0 0	4 0 0				Rent ...	14 13 5	Barley and gram.	67 20 0	77 2 3			
Straw bundles.	1,000 Nos.	30 0 0					Straw bundles.	1000	80 0 0				
Chaff ...	95 0 0	19 0 0					Chaff ...	95 0 0	19 0 0				
		224 13 9			234 13 9		39 11 8			170 12 9			
<i>Chak Zerkohi, Ballabgarh Tahsil.</i>													
Cotton ...	3 0 0	9 0 0				Rent ...	37 5 1	Cotton ...	120 0	4 8 0			
Báira ...	60 0 0	75 0 0						Jowár ...	6 0 0	6 13 9			
Jowár ...	6 0 0	6 13 9						Báira ...	29 8 0	36 8 0			
Barley and gram.	60 0 0	68 9 3						Barley and gram.	60 0 0	68 9 3			
Mung and moth.	3 0 0	4 0 0						Mung and moth.	2 2 0	2 11 0			
Straw bundles.	400 Nos.	12 0 0						Straw bundles.	400 Nos.	12 0 0			
Chaff ...	89 0 0	17 12 0						Chaff ...	89 0 0	17 12 0			
		193 3 0			193 3 0					148 14 0			
<i>Zerkohi, Ballabgarh Tahsil.</i>													
Báira ...	18 0 0	22 8 0	Earnings of boys as herdsmen. Earnings of fourmen as labourers.	67 8 0		Rent ...	10 13 3	Cotton ...	120 0	4 8 0			
Jowár, mung and moth.	3 25 0	4 4 3								Jowár ...	10 0 0	11 6 0	
Barley and gram.	15 0 0	17 2 3								Báira ...	35 0 0	43 12 0	
Chaff ...	19 0 0	3 12 0								Barley and gram.	30 0 0	102 14 0	
Straw bundles.	300 Nos.	9 0 0								Chaff ...	19 0 0	3 12 0	
		56 8 0			214 0 0			Straw bundles.	300 Nos.	9 0 0			
<i>Chak, Ballabgarh Tahsil.</i>													
Báira ...	18 80 0	23 7 0	Ghi ...	86 0 0		Land revenue	6 4 10	Cotton ...	0 7 0	2 0 0			
Barley and wheat.	4 0 0	5 5 3							Cesses ...	0 10 5	Báira ...	12 10 0	15 5 0
Chaff ...	5 0 0	1 0 0									Barley and wheat.	120 0	2 0 0
		29 12 3						Barley and gram.	23 25 0	26 3 6			
					65 12 3		6 15 3	Chaff ...	5 0 0	1 0 0			
<i>Kohi, Chak, Ballabgarh.</i>													
Báira ...	7 20 0	9 6 0	(Fuel and leaves.)	12 0 0		Rent ...	4 8 9	Cotton ...	0 8 0	1 0 0			
Wheat and barley.	6 0 0	8 0 0								Báira ...	5 2 0	6 5 0	
Chaff ...	7 20 0	1 8 0								Wheat and barley.	0 25 0	0 12 0	
								Barley and gram.	9 14 0	10 11 0			
								Wheat ...	0 26 0	1 0 0			
								Chaff ...	7 20 0	1 8 0			
		18 14 0		80 0 0	48 14 0					21 4 0			

I.

No. 11—Proprietor, Zerkohi Chak,

No. of case.	Status.	III.—EXPENDITURE—concluded.				IV.—SURPLUS.		V.—DESCRIPTION.		
		Customary charges of village menials and hired labour.		Necessaries not produced on the land or by family labour.		Total expenditure.	Surplus over income.	Surplus how disposed of.	No. of rooms in house.	
		Detail.	Amount.	Detail.	Amount.				Used as dwelling rooms.	Used for sheltering cattle.
		22	23	24	25	26	27	28	29	30
Three—concluded.	Proprietor, Khandu son of Bholu Meo of Badkhal, Parganna Ballabgarh Chak.	Lohár ...	M. S. C. 1 20 0	Clothes ...	20 0 0	Rs. A. P. ...	Deficit Rs. 16 1 8	...	Three kacha built rooms with Porch (Poli).	Two kacha built chappar
		Carpenter...	1 20 0	Utensils ...	1 0 0					
		Dhobi ...	0 20 0	Other ex-penses.	12 0 0					
		Barber ...	0 20 0							
		Potter ...	1 0 0							
		Chamár ...	1 0 0							
		Sweeper ...	0 10 0							
		Fakir ...	0 10 0							
			6 20 0							
			= Rs. 7 7 0		38 0 0	260 15 5				
Four—Ballabgarh—concluded.	Occupancy tenant, Shámda son of Nanna Meo of Badkhal, Parganna Ballabgarh, Chak Zerkohi.	Carpenter...	1 10 0	Clothes ...	20 0 0	...	Deficit No. 33 0 1	No. 12.—Tenant ...	with right of occupancy, One kacha built room with Portico (Poli).	One chappar with Portico (Poli).
		Lohár ...	1 10 0	Utensils ...	2 0 0					
		Dhobi ...	0 10 0	Miscellan-ous ex-penses.	12 0 0					
		Barber ...	0 10 0							
		Potter ...	0 30 0							
		Fakir ...	0 10 0							
		Chamár ...	1 0 0							
		Sweeper ...	0 10 0							
			5 10 0							
			= Rs. 6 0 0		34 0 0	226 3 1				
Five—Ballabgarh—concl.	Tenant-at-will, Shazad son of Gulab Meo of Badkhal Parganna Ballabgarh Chak.	Carpenter...	0 10 0	Clothes ...	20 0 0	...	Deficit 11 12 6	No. 13.—Tenant-at-will ...	Chak Zerkohi Two kacha built rooms with story (upper).	Two kacha built rooms.
		Lohár ...	0 10 0	Miscellan-ous ex-pen-diture.	18 0 0					
		Dhobi ...	0 5 0							
		Barber ...	0 5 0							
		Potter ...	0 30 0							
			1 20 0							
			= Rs. 1 11 0		38 0 0	226 13 0				
Six—Ballabgarh, Tehsil—concl.	Proprietor Kanhayia son of Bakhta, Gujar of Arangpur Parganna Ballabgarh Chak.	Carpenter...	0 20 0	Clothes ...	6 0 0	...	Deficit 2 9 6	No. 14—Gujar Proprietor, Kohi ...	One kacha built chappar	One kacha built chappar
		Lohár ...	0 20 0	Utensils ...	1 0 0					
		Dhobi ...	0 5 0	Miscellan-ous ex-penses.	6 0 0					
		Barber ...	0 5 0							
		Potter ...	0 5 0							
			1 15 0							
			= Rs. 1 14 0		13 0 0	68 5 4				
Seven—Ballabgarh—concl.	Tenant (occupancy) Bámdial son of Bholu caste Gujar of Arangpur Parganna Ballabgarh Chak.	Lohár ...	0 20 0	Clothes ...	4 0 0	...	Debts and Miscellan-ous ex-pen-ses.	No. 15—Tenant with right of occupancy.	One kacha chappár.	One kacha chappár.
		Carpenter...	0 20 0	Utensils ...	1 0 0					
		Dhobi ...	0 5 0	Miscellan-ous ex-pen-diture.	6 0 0					
		Barber ...	0 5 0							
		Potter ...	0 10 0							
		Chamár ...	0 10 0							
			1 30 0							
			= Rs. 2 0 0		11 0 0	38 12 9	10 1 3			

OF RESIDENCE, CATTLE AND CHATTELS.				VI.—DEBTS.			REMARKS.
Cattle.		Chattels, stock of grain and cash.		How incurred.	Amount.	Percentage on total income.	
Details.	Number.	Detail.	Value rupees.				
31	32	33	34	35	36	37	38
Oxen ... Buffalo ... Cows ... Calf ...	4 1 7 1	Food grains ... Cash ... Ornaments ... Furniture ...	Rs. A. P. 6 0 0 ... 9 0 0 45 0 0	1. Drought of last year. 2. Marriages of two brothers and a sister. 3. Soil moderate only.	Rs. A. P.		An instance of the proprietor in a bad way. It is hardly to be expected that this man will extricate himself.
	13				1,000 0 0	426	
<i>Chak Zerhohi, Ballabgarh Tahsil—concluded.</i>							
Oxen ... Buffalo ... Cows ... Calves ...	4 1 4 10	Food grains ... Cash ... Ornaments ... Other furniture ...	2 0 0 35 0 0	1. Drought of last year. 2. Burial expenses of his father.			This man has a large family, and large expenses in prospect. To meet them his resources can in no way be thought adequate. Last year was bad for him.
	13				250 0 0	125	
<i>Ballabgarh Tahsil—concluded.</i>							
Oxen ... Buffalo ... Cows & calves ...	2 1 10	Food grains ... Cash ... Ornaments ... Other furniture ...	8 0 0 40 0 0	Short earnings last year.			Here are some sturdy hands, yet a bad year makes itself felt very hardly by them. The earnings of the children are noticeable. The practice is to take the sheep and goats of the neighbours out to the hills, and charge 1 or 2 annas a month per head for taking care of them.
	13		43 0 0		60 0 0	28	
<i>Chak, Ballabgarh Tahsil—concluded.</i>							
Ox ... Cow ... Calf ...	1 8 4	Food grains ... Ornaments ... Cash ... Other furniture ...	10 0 0 9 0 0 ... 20 0 0	Incurred last year in the drought.			This is the lowest standard we have yet come to. Receipts small, and scale of living low, yet in any scarcity the cultivator must get into debt. The price of ghi more than half his income. The soil here is good only in a few places, the greater part is stony hill.
	13		39 0 0		30 0 0	45	
<i>Kohi Chak, Ballabgarh Tahsil—concluded.</i>							
Ox ... Cows ... Calf ...	1 3 2	Cash ... Food grains ... Ornaments ... Other furniture ...	... 1 0 0 ... 15 0 0	In drought of last year.			"In lowest depth a lower deep." How three persons live on somewhat less than 3-8 a month would seem incomprehensible, yet it is evidently done from choice and not from absolute want. Saving is made at times; at others scarcity brings debt. There are many in this condition.
	6		16 0 0		15 0 0	21	

No. 16—Tenant-at-will—Kohi Chak

I.—FAMILY AND THEIR HOLDING.															
No. of case.	Status.	No. of persons comprising the family.				Area of holding in acres.									
		Adults.		Children.	Total.	How cultivated.	Cultivated.			Total.					
		Male.	Female.				A.	R.	P.						
1	2	3	4	5	6	7	8			9	10				
Eight (Ballabgarh).	Tenant-at-will. Sri Rám son of Rájs Rám, Brahman of Arangpur, Farganna Ballabgarh Chak.	One	One	Four	Six	By tenant-at-will 3 acres, Masá land (dohli) 2 roods.	A.	B.	P.	A.	R.	P.	A.	R.	P.
							3	2	...	1 rood	...	3	1	2	
Nine (Ballabgarh).	Proprietor Dharm Singh son of Chanisukh, Brahman of Kalukri, Farganna Ballabgarh Chak.	One	Two	...	Three	By hired labour.	11	2	...	No. 17—Lambardár			11 Ac. 2 Rd.		
									
Ten (Ballabgarh).	Occupancy tenant. Salay son of Sáhab Singh, Brahmin of Kalukri, Farganna Ballabgarh Chak.	Three	Two	Two	Seven	By occupancy tenant himself.	No. 18.—Tenant with right of occupancy.			13	2	...	13 2		
Eleven.	Tenant-at-will. Jesukh son of Ghisa, Chamar of Kalukri, Farganna Ballabgarh Chak.	Three	Four	Three	Ten	By tenant-at-will himself.	No. 19.—Tenant-at-will Khadir			7	...	...	7		
							7	...	...	...	...	...

Ballabgarh Tahsil—DELHI DISTRICT.

II.—INCOME.						III.—EXPENDITURE.				
One year's produce of the land.			Other miscellaneous income.		Total income.	Revenue, cesses, seigniorage charges and for tenants, rent.		By grain used as food and used as seed or otherwise expended.		
Kind of produce.	Amount, maunds.	Value.	Detail.	Value.	Amount, rupees.	Detail.	Amount.	Detail.	Maunds.	Value.
11	12	13	14	15	16	17	18	19	20	21
	M. S. C.	Rs. A. P.		Rs. A. P.	Rs. A. P.		Rs. A. P.		M. S. C.	Rs. A. P.
Bajra ...	14 11 0	17 13 6	Brahmin's dues.	86 0 0		Rent ...	4 3 0	Bajra ...	12 4 8	15 2 8
Wheat and barley ...	4 0 0	5 5 2						Cotton ...	0 3 8	1 0 0
Chaff ...	5 0 0	1 0 0						Wheat ...	1 0 0	1 8 0
								Barley and gram ...	13 0 0	15 0 0
								Chaff ...	5 0 0	1 0 0
		23 2 9			59 2 9					
Ballabgarh Khadir.										
Bajra and mung ...	15 0 0	18 12 0	Pachotra ...	19 14 0		Land revenue ...	13 5 2	Cotton ...	0 4 8	1 8 0
Jowar ...	12 0 0	13 12 0	Rents of land cultivated by tenants.	35 1 9		Cesses ...	1 1 6	Mung and rice, &c. ...	1 0 0	2 8 0
Wheat ...	15 0 0	22 8 0				Malba ...	0 12 0	Jowar ...	2 0 0	2 5 0
Barley and gram ...	24 0 0	27 7 0						Bajra ...	4 0 0	5 0 0
Peas and barley ...	9 24 0	9 9 9						Barley and gram ...	21 0 0	24 0 0
Chaff ...	52 20 0	12 8 0						Wheat ...	4 0 0	6 0 0
Straw bundles.	800 Nos.	24 0 0						Chaff ...	52 20 0	12 8 0
								Straw bundles.	800 Nos.	24 0 0
		128 8 9		54 15 9	183 8 6		15 2 8			77 13 0
Khadir Chak, Ballabgarh Tahsil.										
Bajra ...	31 8 0	38 12 0				Rent ...	28 14 10	Bajra ...	10 15 0	13 0 0
Jowar ...	6 0 0	6 13 9						Jowar ...	5 0 0	6 13 9
Barley and gram ...	24 0 0	27 4 6						Cotton ...	0 7 0	2 0 0
Peas and barley ...	8 0 0	8 0 0						Mung and mash ...	1 0 0	1 8 0
Wheat ...	15 0 0	22 8 0						Barley and gram ...	30 0 0	34 4 6
Chaff ...	58 30 0	11 12 0						Peas and barley ...	8 30 0	8 12 0
Straw bundles.	400 Nos.	12 0 0						Wheat ...	2 20 0	3 12 0
								Chaff ...	58 30 0	11 12 0
		127 2 3			127 2 3			Straw bundles.	400 Nos.	12 0 0
										98 14 3
Chak, Ballabgarh Tahsil.										
Jowar ...	3 30 0	4 4 8	Labor hired	11 6 6		Rent ...	24 0 0	Bajra ...	15 0 0	22 8 0
Bajra ...	3 0 0	3 12 0	Price of cow-dung, grass, &c.	25 0 0				Jowar ...	3 30 0	3 4 8
Wheat ...	15 0 0	22 8 0						Mash and mung ...	0 25 0	1 0 0
Barley and gram ...	24 0 0	27 6 6						Cotton ...	0 7 8	3 0 0
Peas and barley ...	8 0 0	8 0 0						Barley and gram ...	59 15 0	67 14 8
Chaff ...	58 30 0	11 12 0						Wheat ...	1 0 0	1 8 0
Straw bundles.	250 Nos.	7 8 0						Chaff ...	58 30 0	11 12 0
								Straw bundles.	250 Nos.	7 8 0
		85 8 0		86 6 6	121 9 6					117 6 9

No. 16—Tenant-at-Will—Kohi Chak

No. of case.	Status.	III.—EXPENDITURE—concluded.				IV.—SURPLUS.		V.—DESCRIPTION		
		Customary charges of village menials and hired labour.		Necessaries not produced on the land or by family labour.		Total expenditure.	Surplus income over expenditure.	Surplus disposed of.	No. of rooms in house.	
		Detail.	Amount.	Detail.	Amount.				Used as dwelling rooms.	Used for sheltering cattle.
		22	23	24	25	26	27	28	29	30
Eight (Ballabgarh)—concluded.	Tenant-at-will. Sri Rám son of Raja Rám Brahman of Arangpur Parganna Ballabgarh Chak.	M. S. C.			Rs. A. P.	Rs. A. P.	In paying debts and Miscellaneous expenses.	One kacha built room and one chappar.	Two kacha built rooms.	
		Lohár ...	0 20 0	Clothes...	4 0 0					
		Carpenter...	0 20 0	Utensils...	1 0 0					
		Dhobi ...	0 5 0	Miscellaneous ex-	12 0 0					
		Barber ...	0 5 0	penditure.						
		Potter ...	0 20 0							
			1 50 0							
			=Rs. 2 0 0		17. 0 0	56 13 3	2 5 6			
Nine (Ballabgarh)—concluded.	Proprietor Dharm Singh son of Chanisukh Brahman of Kalukri Parganna Ballabgarh Chak.	Lohár ...	0 30 0	Clothes ...	35 0 0	...	Paying debts	One kacha built room.	Lambardai, One kacha built chappar.	
		Carpenter...	0 30 0	Utensils...	2 0 0					
		Barber ...	0 20 0	Miscellaneous ex-	20 0 0					
		Potter ...	0 30 0	penditure.						
		Dhobi ...	0 20 0							
		Bairági ...	0 10 0							
		Chamár ...	1 20 0							
		Sweeper ...	0 10 0							
			5 10 0							
			=Rs. +6 0 0							
		Hired labour	Rs 36 0 0							
			=Rs. 42 0 0		37 0 0	171 15 8	11 8 10			
Ten (Ballabgarh)—concluded.	Occupancy tenant. Salay son of Sahab Singh Brahmin of Kalukri Parganna Ballabgarh Chak.	Village menials.	5 10 0	Clothes...	20 0 0		No. 18.—Tenant with right of occupancy.	One kacha chappar.	One kacha chappar.	
				Utensils...	2 0 0					
				Miscellaneous ex-	12 0 0					
				penditure.						
			=Rs. 6 0 0		34 0 0	162 13 1				
Eleven—concluded.	Tenant-at-will. Jesukh son of Ghisa Chamar of Kalukri Parganna Ballabgarh Chak.	Carpenter ..	0 15 0	Clothes...	5 0 0		No. 19.—Tenant-at-will Khadir	Two chappars	One chappar	
		Lohár ...	0 15 0	Utensils...	9 0 0					
		Dhobi ...	0 5 0	Miscellaneous ex-						
		Potter ...	0 10 0	penditure.						
		Barber ...	0 5 0							
			1 20 0							
			=Rs. 1 7 0		14 0 0	156 13 9				

OF RESIDENCE, CATTLE AND CHATTELS.				VI.—DEBTS.			REMARKS.
Cattle.		Chattels, stock of grain and cash.		How incurred.	Amount.	Percentage on total income.	
Details.	Number.	Detail.	Value rupees.				
31	32	33	34	35	36	37	38
Ox ...	1	Cash ...	Ra. A. P. ...	In drought of last year.	Ra. A. P.		This man seems a little higher than No. 15 in his circumstances—but the standard is very low. Without his Brahmin's dues he would do badly.
Cows ...	2	Food grains ...	1 0 0				
Calves ...	2	Ornaments ...	5 0 0				
		Other furniture ...	15 0 0				
	5				30 0 0	51	
<i>Ballabgarh</i>	<i>Khadir</i> —concluded.			In drought of last year.			A small lambardar who apparently does not use his own hands to earn his living. A bad year brings him also into debt.
Ox ...	2	Cash ...	...			
Buffalo ...	1	Ornaments ...	10 0 0				
Bull-calf ...	1	Food grains ...	5 0 0				
Buffalo-calf ...	1	Other furniture ...	35 0 0				
	5				50 0 0	27	
<i>Khadir Chak.</i>	<i>Ballabgarh</i>	<i>Tahsil</i> —concluded.		1. Drought and scarcity. 2. Death of his oxen.			This man is not doing well. His land barely gives him enough, and he has bad luck. What a boon to him would be a cattle Life Insurance Company.
Ox ...	2	Cash ...	...			
Cow ...	2	Ornaments ...	...			
Buffalo ...	1	Food grains ...	2 0 0				
Bull-calf ...	1	Other furniture ...	25 0 0				
	6				800 0 0	238	
<i>Chak. Ballabgarh Tahsil</i> —concluded.				Drought of last year exaggerated his habitual indebtedness.			Here is another cultivator on the downward road. He makes something by selling op ^l and grass, but cannot make way. There are only three men here to four women, and three children.
Ox ...	1	Food grains ...	1 0 0				
Cows ...	2	Ornaments ...	...			
Bull-calf ...	1	Cash ...	...			
	4	Other furniture ...	28 0 0				
	4				100 0 0	82	

CHAPTER I, QUESTION 9.

Ch.

Answer by MR. J. WILSON, Assistant Settlement Officer, Gurgaon.

I have been Assistant Settlement Officer in Gurgaon District for nine months only, but have more than once visited all parts of the District, and have had many opportunities of studying the condition and habits of the people. I have had less than three years' experience of India, the whole of that time having been spent in this and the two neighbouring Districts of Delhi and Rohtak. Having so little experience of my own, I was compelled to call in the aid of the Superintendents of Settlement, all of whom have been engaged in Settlement work in the District for more than six years.

2. The typical instances given in the statement herewith enclosed were collected by the Superintendents, who, in each case, visited the village, and enquired into the circumstances of particular individuals chosen as average specimens of their class. The area of the holding and amount of revenue and cesses are taken from the Settlement record, lately attested. The amount and value of the produce were calculated from the statements of the villagers as checked by the estimates submitted with the revenue-rate reports. The expenditure has been put down as given by the men themselves, their statements being to some extent checked by the evidence of their neighbours and their shop-keepers. The description of residence, cattle and chattels has been given by the Superintendent as he found them. The amount of debt is that stated by the man himself and his money-lender.

3. From the instances I was myself able to collect and from comparison of those given by the different Superintendents, I find that it is indeed extremely difficult to give with anything like exactness a detail of the income and expenditure of an ordinary agriculturist. The area of the holding and the amount of revenue and cesses or rent payable thereon can be given exactly, but the amount and value of the produce is subject to very great fluctuation year by year, according to the nature of the seasons. Still more difficult is it to calculate even the average expenditure of the family, for no account is kept except of the few things obtained on credit from the village shop-keeper, and the agriculturist himself is incapable of making anything but a very rough guess at the amount he has actually spent during the past year; and here again the fluctuations are so great, and depend so much on motives difficult to analyse, that it is well nigh impossible to strike a satisfactory average.

4. It seems necessary to note that the condition disclosed by the 5th and 6th columns of the accompanying statement (giving a description of the agriculturist's house, cattle and chattels, and the amount of his debts) is not to be taken as the normal condition of the agricultural community in the Gurgaon District. The *kharif* crop of 1877 was almost a total failure, and the *rabi* of 1878 was much below the average, so that all but the most well-to-do agriculturists have lost a large number of their cattle, and have been obliged to part with all their luxuries, and not a few of their necessaries, and to increase their debts. The inspection of their houses was made just before the threshing of the present *kharif* crop, so that the quantity of grain found in stock was very small: indeed many were then living on handfuls of the ripening grain gathered from their fields. It is to be feared that this *kharif* and the ensuing *rabi* will not enable those who have become indebted during the scarcity of the past year to recover their former position, and will barely suffice to prevent them from sinking deeper in the quick-sand.

5. In a District such as this, containing such a variety of soil and caste, and even climate, it is necessary to divide the agricultural community into classes, and describe their circumstances in some detail; no general description of their ordinary economic condition would apply to the whole community with any approximation to exactness.

Factors in the economic condition of the agriculturista.

6. The circumstances which determine the condition of an agriculturist come, in order of importance, as follows:—

1st. *Caste*.—As a general rule, whatever be the nature of the soil he cultivates, or the incidence of the revenue he pays, the caste of the agriculturist, which determines his habits and customs and natural disposition, will determine his economic condition. At the head of the prevalent castes in this District I would place the *Ahirs*, as the most industrious, thrifty and prudent; though much of the land occupied by them is of an inferior description, and the incidence of the revenue in Rewári tahsil, where most of the villages are owned by them, has for thirty years been very high, as compared with the rest of the District, they have, by unremitting toil, compelled the soil to yield them a wonderful amount of produce, and have by prudent thrift kept themselves and their lands free from debt. Next to them come the *Játs*, who own many villages in the east and north-east of the District. Their land is very fertile; and in Palwal tahsil, where they form the chief portion of the land-owning class, the incidence of the revenue has been hitherto extremely light. In industry and thrift they are inferior to the *Ahirs*, though superior to other castes; while on the whole very well-to-do, they have not been careful to keep themselves free from debt and their land from mortgage. After them come the *Rajputs*, owning land chiefly in the centre of the District, and the *Brahmans* scattered here and there, but neither caste forming a very important element in the agricultural population. Last of all on the list come the comparatively lazy and superlatively unthrifty *Meos*, who own some 350 villages in the two southernmost tahsils of the District (Nuh and Firozpur). Without the excuse of a barren soil or an excessive revenue, they live so closely up to their income, are so negligent in developing the resources of their land, and indulge so in unwarranted expenditure, that the failure of one harvest plunges them irretrievably into debt. Last year's scarcity found many of them still burdened with debt contracted in the famines of 1860-61 and 1868-69, and has left them with 17 per cent. of their land heavily mortgaged, and much floating debt hanging over them besides.

2. *The number of the family*.—Other things being equal, the lucky man who has few children has less difficulty in making ends meet. When the children are young, they make more mouths to feed without any corresponding increase in the number of hands to work, and even when they become old enough to help in the fields, the cost of their food is greater than would be the hire of labourers to give the same amount of work at the most pressing times. Each child too must be married, and marriages are the great extravagance of the agriculturist's family; even where one contracting party exacts a sum of money from the other, the expenses of the ceremony are sure to exceed the income. The greater the number of births, the greater will be the number of deaths in the family, and each funeral too is an expensive affair; the brotherhood and the poor must be luxuriously and extravagantly feasted. There was a time not many years ago when the agriculturist who had a number of sons and daughters to help him to break up new land was likely to better his condition; but now throughout the greater part of the District the population has overtaken the land, and hired labour is cheap. Happy is the man whose quiver is not too full. As might be expected, the unthrifty *Meos* are famous for the number of their children.

3. *Sub-division of the land*.—This is closely connected with the last head. Where the family is a large one, the family holding is, on the death of the head, sometimes worked in common by the sons, but very frequently divided between them in equal shares. The practice of separating off distinctly the different shares of the land is encouraged by our revenue and law system, and is rapidly becoming more common; and as the increase of a holding by the death of a brother or uncle without heirs is much less common than its sub-division among the sons of the deceased proprietor, this practice leads to the rapid increase of small holdings, the produce of which is barely sufficient to supply the necessaries of life to the agriculturist and his family; and while the heads of families in the village community are gradually becoming more distinct in their individual rights and responsibilities, they have not yet learned to co-operate in the modern sense of the word. There is thus little to fall back on when a season of misfortune comes. The extent of sub-division is generally much influenced by the tenure of the village. Where the village is held in *phayáchára* tenure, as is usual among the *Játs* and *Meos*, the land is much subdivided, and where the tenure is *patidári*

as it often is among the Ahirs, the owners of a share in the village often hold and cultivate it in common, and can thus meet misfortune better than if they had to fight it single-handed.

4. *Facility of irrigation.*—The introduction of the Agra Canal into the eastern part of the District has vastly improved the condition of the agriculturists in that tract by increasing the productiveness of their land in much greater proportion than it increases the cost of production, but most of all by protecting them against seasons of drought—the great source of indebtedness and poverty. Although irrigation from the canal commenced only some four years ago, its good effects are already seen, and it is to be hoped that the standard of comfort of the Jât agriculturists benefiting therefrom will be decidedly raised before the population overtakes the increase of produce; provided, however, that their prosperity does not make them lazy, and that the proximity of the canal does not permanently enervate them, as seems to have been the case with the Jât land-holders on the Western Jumna Canal. There seems some danger of the latter calamity, for this year in particular fever has literally devastated the tract through which the canal passes; some villages have in a few months lost one-sixth of their population, and scarcely a man is to be found who has not been greatly reduced in strength by repeated attacks. But if this prove to have been an exceptional year, as there is some reason to hope, the great diminution of the population may even prove a blessing to the survivors.

The facility of well irrigation is also an important factor, as on this depends the protection of the land from drought; but it must be taken advantage of. The Ahirs work their deep wells, night and day: the Meos often do not take the trouble to sink them when water is near.

5. *Nature of the soil.*—This factor, which at first sight seems most important, really comes low down in the list. The sandy soil of Rewari produces enough to keep the thrifty Ahirs in comfort, while the comparatively rich soil of the Firozpur valley is heavily mortgaged to meet the extravagances of the thriftless Meos.

6. *Incidence of the revenue.*—This too is of less importance than would at first sight seem probable. The Ahir land-owners of tahsil Rewari hitherto notoriously heavily assessed, are much less indebted than the lightly assessed Meos of Firozpur, and less even than the much more lightly assessed Jâts of Palwal, thrifty though the latter are said to be.

7. *Status of the agriculturist.*—There is much less difference between the condition of the owner of land, tenant with right of occupancy, and tenant-at-will throughout the greater part of the District than would be expected. The vast majority of tenants with rights of occupancy, and a very large number of tenants-at-will, have hitherto held their land on condition of paying simply the revenue and cesses due thereon, and they have generally shared on equal terms with the owners in the common rights of the village. However, since the operations of the present Settlement began, and more especially since the new assessments were announced last year, the tendency to distinguish more sharply between these classes of agriculturists has been rapidly growing. Tenants-at-will are called on to pay higher rents, or are ejected from land they have held for years on these favourable terms. Suits are instituted to have defined more exactly the rights of occupancy tenants and to enhance their rents. Property in land is becoming more valuable every day, and the rights of owners having been more clearly defined in the new Settlement records, money-lenders are willing to advance larger sums than before on the security of land. Thus it is generally remarked that tenants-at-will have greater difficulty in borrowing than owners or even than tenants with occupancy rights. All these tendencies may be expected to develop with remarkable rapidity in the few years following the close of the present Settlement operations.

8. The general condition of the agricultural population then may be said to be painfully dependent on the seasons; all their income comes from the land. Where a land-owner, besides the actual produce of his own separate holding, can count among his income the proceeds of hiring his cart between the busy times or those of the sale of his "ghi," he finds that in a year of drought even these are apt to fail him, for the difficulty of feeding his oxen and his buffaloes

swallows up all the income they bring; and where a cultivator ekes out the produce of his fields by his dues as a village menial or family priest, he finds the villagers in seasons of scarcity unable to pay him the full fee. The Jâts of Palwal are now greatly protected against drought, but are in some danger of increasing their expenditure too fast, and losing some of their old industry and thrift; but they may be generally described as well off, especially the land-owners. They can easily stand a year of scarcity, and will probably soon recover themselves, though even they are, like all agriculturists, apt to neglect payment of the principal, and even of the interest of a debt once contracted, and often carelessly allow the sum noted against them in the village money-lender's books to grow and grow until they can have little hope of paying it off, the wily banker knowing it to be his interest not to press for ready payment, but to encourage his debtor deeper into the toils, until he has him completely at his mercy. When this is so with men having such advantages as the Jâts of Palwal, what must it be with the Meos. Their condition is rapidly becoming hopeless. They live so literally from hand to mouth, carelessly contracting debt for marriages, funerals, and petty luxuries, even in average years, that when a year of drought comes they are thrown on the money-lender, who can make with them what terms he likes. During the past 15 months some 5 per cent. of the cultivated area of the two Meo tahsils of Nuh and Ferozepur has been mortgaged, and now 17 per cent. of the total cultivated area is so burdened that there is little hope of its ever being redeemed. The Meo land-owners are rapidly becoming practically reduced into the position of tenants. Their condition loudly calls for special consideration, though it is difficult to see what can be done for them. During the past year a large amount of revenue due from them has been suspended, but they have had to borrow for food, and the evil has only been reduced, not removed. Not a few who had no land to mortgage left the District to seek a means of livelihood elsewhere until better times. It is pleasant to turn from this state of things to that of the Ahîrs in Rewâri. With all their disadvantages, their industry reduces the evils of a year of drought to a minimum, and their thrift supplies them with a means of tiding over it, and reduces their expenditure for the time. Though the drought of last year was as bad with them as anywhere, they paid their revenue, and that without contracting a larger amount of debt than they are likely to clear off in a year or two of favourable harvest, should they be fortunate enough to have them.

9. The causes of debt are: (1) general extravagance, which leads to debt even in ordinary years; (2) marriages and funerals, the expenditure on which is enormously disproportionate to the income; (3) drought, which finds the agriculturist without any surplus saved, and kills his cattle and compels him to borrow to pay the revenue and support his family; (4) neglect to pay the interest on debts already contracted, which rapidly multiply themselves.

10. Taking the District as a whole I should estimate the extent of indebtedness as follows (but the estimate is worth very little):

Class.	Proportion of class indebted.	Average amount of indebtedness on gross annual income.
Owners	Five-eighths	Two years' gross income
Tenants with right of occupancy	Five-eighths	Two years' gross income
Tenants-at-will	One-half	One year's gross income

The proportion is abnormally high, owing to the late scarcity.

Statement enclosed.

11. In illustration of the above remarks, I would refer to the typical instances described in the accompanying statement.

I. Typical instances of the economic condition of the Agricultural Population of the Punjab, being a representatives of the majority of each main class, (owner, occupancy

I.—FAMILY AND THEIR HOLDING.										
Number of case.	Status.	Name of head of family, caste and residence.	Number of persons comprising the family.				Area of holding in acres.			
			Adults.		Children	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.
			Male.	Female.						
1	2	3	4	5	6	7	8	9	10	11
1	Biswadár— Owner	Mohna son of Chaina, Ját. of Sukráli, tahsil Gurgaon	Two ...	Three...	...	Five ...	Cultivated by himself.	81 acres, of which irrigable 1 acre, and bārání 80 acres.	...	81 acres ...
2	Biswadár— Owner	Rám Singh, son of Chaina, Ját of Sukráli, tahsil Gurgaon.	One ...	One ...	One ...	Three	Cultivated by himself.	18 acres (of which cháhi and irrigable 1 acre, 17 acres bārání).	...	18 acres ...
3	Biswadár— Owner	Akherám, son of Gariba, Ját of Sukráli, tahsil Gurgaon.	Three...	Two ...	Four...	Nine...	Cultivated by himself.	42 acres (of which irrigable 1 acre and 41 acres bārání).	...	42 acres ...
4	Occupancy tenant.	Yád Rám, son of Ganga Rám, Brahman, of Khandse, tahsil Gurgaon.	Four...	Five...	Seven	Sixteen	By tenant (occupancy) himself.	42 acres (of which cháhi and irrigable 5 acres, and 5 acres bārání).	1 acre ...	43 acres ...
5	Tenant-at-will ...	Kánha son of Dhanna, Gujjar of Narsingpur, tahsil Gurgaon.	Three...	Three...	Seven...	Thirteen	By tenant-at-will himself.	16 acres (bārání land)	...	16 acres ...
6	Tenant-at-will ...	Seth Rám, son of Dharm Chand, Chamár, of Narsingpur.	Two ...	Two ...	Three...	Seven...	By tenant-at-will himself.	5 acres (bārání).	...	5 acres (bārání).

description of the actual circumstances of several families of the Gurgaon District selected as fair tenant, and tenant-at-will) of the agricultural population.

II.—INCOME.						III.—EXPENDITURE.				
One year's produce of the land.			Other miscellaneous sources of income.		Total income from all sources.	Revenue, cesses and squireage charges and (in case of tenants) rent.		By grain consumed as food and seed, or otherwise expended.		
Kind of produce.	Amount in maunds.	Value.	Detail.	Value.	Amount in rupees.	Detail.	Amount.	Detail.	Maunds.	Value.
12	13	14	15	16	17	18	19	20	21	22
	Mds. S. C.	Rs. A. P.		Rs. A. P.	Rs. A. P.		Rs. A. P.		Mds. S. C.	Rs. A. P.
Gram (on 3 acres)	18 0 0	20 9 2	Ghi ...	15 0 0		Revenue	74 8 0	Gram ...	19 5 0	21 13 9
Cotton (on 2 "	9 0 0	30 0 0	Sale of cattle	20 0 0		Cesses	14 1 0	Cotton seed	0 18 0	0 13 0
Jowár (on 7 "	38 20 0	39 7 10	Lambardár's fees	23 0 0				Jowár ...	8 12 0	8 6 4
Indian corn (on 1 acre)	10 0 0	10 0 0	Interest ...	60 0 0				Bájra ...	28 33 0	28 14 1
Bájra (on 68 "	408 0 0	494 8 9								
	483 20 0	694 8 9		117 0 0	711 9 9		88 4 0		46 28 0	54 14 2
Cotton (on 1 acre)	4 20 0	15 0 0	Ghi ...	4 0 0		Revenue	14 13 0	Cotton seed	0 9 0	0 6 0
Bájra (on 17 "	102 0 0	128 10 2	Sale of cattle	20 0 0		Cesses	2 13 0	Bájra ...	9 38 0	12 1 1
			Interest ...	50 0 0						
	106 20 0	138 10 2		74 0 0	212 10 2		17 10 0		10 7 0	12 7 1
Gram (on 6 acres)	36 0 0	41 2 8	Ghi ...	4 0 0		Revenue	57 1 0	Gram ...	17 10 0	19 11 5
Cotton (on 3 "	13 20 0	45 0 0	Sale of cattle	10 0 0		Cesses	7 1 0	Cotton seed	0 27 0	1 2 0
Jowár (on 12 "	65 0 0	67 11 1						Jowár ...	7 10 0	7 7 0
Bájra (on 21 "	126 0 0	152 11 8						Bájra ...	26 7 4	31 11 9
	241 20 0	306 9 0		14 0 0	320 9 0		44 2 0		51 14 4	60 0 2
Safflower (on 1 acre)	0 15 0	6 10 8	Brahman's dues			Revenue	59 5 1	Safflower-seed	0 1 0	0 1 0
Wheat (on 5 acres)	30 0 0	40 0 0				Cesses	8 14 7	Wheat ...	7 15 0	9 13 4
Barley (on 6 "	61 0 0	61 0 0						Barley ...	63 23 0	63 12 0
Wheat and gram (on 1 acre)	7 0 0	8 7 9						Gram ...	12 5 0	13 13 9
Gram (on 2 "	14 0 0	16 0 0						Jowár ...	7 15 0	7 9 0
Barley and gram (on 2 acres)	14 0 0	14 11 9						Bájra ...	53 0 8	64 4 1
Jowár (on 2 "	12 0 0	12 4 11								
Bájra (on 23 "	188 0 0	167 4 4								
		326 7 5		10 0 0	336 7 5		59 3 8		143 19 8	69 5 2
Wheat (on 1 acre)	6 0 0	8 0 0	Ghi ...	19 0 0		Revenue	28 0 7	Wheat ...	6 5 0	8 2 8
Wheat and gram (on 1 acre)	7 0 0	8 7 9	Sale of cattle	20 0 0		Cesses	2 0 9	Wheat and gram ...	1 5 0	1 5 10
Cotton (on 1 "	5 0 0	16 10 8						Cotton seed	0 7 8	0 4 8
Bájra (on 18 "	78 0 0	94 8 9						Bájra ...	31 5 8	37 11 4
	96 0 0	127 11 2		39 0 0	166 11 2		25 1 4		36 23 0	47 8 6
Wheat (on 1 acre)	6 0 0	8 0 0	Hired labor...	24 0 0		Revenue	8 8 0	Wheat ...	1 5 0	1 8 0
Wheat and gram (on 1 acre)	7 0 0	8 7 9	(Customary income as a villagemental)			Cesses	1 4 9	Barley ...	5 0 0	5 0 0
Bájra (on 1 acre)	6 0 0	7 4 4	Bájra 3 Mds.	8 10 2				Wheat and gram ...	1 5 0	1 5 10
Moth (on 2 acres)	8 0 0	8 0 0	Moth 3 "	3 0 0				Bájra ...	9 3 8	11 0 4
			Barley 5 "	5 0 0				Moth ...	7 3 8	7 1 5
			Chaula 4 "	4 0 0				Chaula ...	4 0 0	4 0 0
	27 0 0	31 12 1		39 10 2	71 6 3		9 12 9		27 17 0	29 15 7

Typical instances of the economic condition of the Agricultural

Number of cases.	Status.	Name of head of family, caste and residence.	III.—EXPENDITURE—concluded.				IV.—SURPLUS.		
			Customary charges of village menials and hired labour of all sorts.		By purchase of necessaries which the family cannot produce on their own land or by their own labour.		Total Expenditure.	Surplus of income over expenditure.	Surplus income usually how disposed of.
			Detail.	Amount.	Detail.	Amount.			
23	24	25	26	27	28	29			
1	Biswadár—Owner.	Mohna son of Chaina, Ját, of Sukráli tahsil Gurgaon.	Hired labor ... Village menials.	Rs. A. P. 8 0 0 5 0 0	Cloth ... Salt, &c. ... Oil ... Rice ... Sugar (unrefined) ... Sugar (refined) ... Iron ... Wheat 5 maunds ... Barley 8 " ... Urd, 10 sers ... Moth, 30 sers ...	Rs. A. P. 10 0 0 3 4 0 3 0 0 5 0 0 3 0 0 0 12 0 1 0 0 6 10 8 3 0 0 0 5 0 0 12 0	Rs. A. P. 197 13 10	Rs. A. P. 513 11 11	Lending money, investing it in ornaments and spending in marriage ceremonies; must have Rs. 500 out on loan.
2	Biswadár—Owner.	Rám Singh, son of Chaina Ját, of Sukráli, tahsil Gurgaon.	Hired labor ... Village menials	5 0 0 4 4 0	Clothes ... Salt, &c. ... Oil ... Rice ... Gar ... Sugar ... Wheat 2 maunds ... Gram 8 " ... Barley 5 " ... Jowár 2 " ... Urd, 10 sers ... Moth 30 " ... Iron "	10 0 0 2 6 0 3 0 0 3 8 0 2 10 0 0 8 0 2 10 8 2 2 3 5 0 0 2 0 10 0 5 0 0 12 0 1 0 0	82 3 10	130 6 4	Lending money, investing in ornaments and spending in marriage ceremonies; must have Rs. 400 out on loan.
3	Biswadár—Owner.	Akherám, son of Gariba, Ját of Sukráli, tahsil Gurgaon.	Hired labor ... Village menials.	10 0 0 4 8 0	Clothes ... Salt, &c. ... Oil ... Rice ... Gar ... Iron ... Wheat 4 maunds ... Barley 12 " ... Urd, 10 sers ... Moth, 1 Md. 30 sers	5 0 0 4 0 0 3 0 0 3 0 0 2 0 0 1 0 0 5 5 4 12 0 0 0 5 0 1 12 0	156 0 6	164 8 6	Spending in marriage ceremonies and repaying debts.
4	Occupancy tenant.	Yad Rám, son of Gangá Rám, Brahman of Khanda, tahsil Gurgaon.	Hired labor ... Village menials.	86 0 0 7 0 0	Clothes ... Salt &c. ... Oil ... Rice ... Gar ... Moth 5 maunds ... Mung 2 " ... Iron "	12 0 0 5 0 0 5 0 0 4 0 0 4 0 0 5 0 0 2 4 6 1 0 0	299 13 4	36 10 1 Probably seldom any saving at all.	Clearing debts, investing in ornaments, spending in marriage ceremonies.
5	Tenant-at will.	Kanha son of Dhanna, Gujar of Narsingpur, tahsil Gurgaon.	Hired labor ... Village menials.	12 0 0 2 0 0	Clothes ... Salt &c. ... Oil ... Iron ... Barley 20 maunds ... Gram 12 " ... Moth 5 " ...	4 0 0 2 0 0 2 0 0 1 0 0 20 0 0 13 11 5 5 0 0	134 5 3	32 5 11 Probably seldom any saving at all.	Spending in marriage ceremonies and clearing debts.
6	Tenant-at will.	Seth Rám, son of Dharm Chand, Chamar, of Narsingpur.	...	...	Clothes ... Salt ... Oil ... Iron ... Barley 10 Mda ... Gram 10 " ...	1 0 0 1 0 0 1 0 0 0 8 0 10 0 0 11 6 10	64 11 2	6 11 1	Paying off debts; the surplus though it were saved annually would not pay the interest on his debt.
						24 14 10	64 11 2	6 11 1	

Population of the unjab, GURGAON DISTRICT—continued.

Ch. I.

V.—DESCRIPTION OF RESIDENCE, CATTLE AND CHATELS.					VI.—DEBTS.			REMARKS.	
No. of rooms in house.		Cattle.		Chatels, stock of grain and cash.		How incurred.	Amount.		Percentage of debt on total income.
Used as dwelling rooms.	Used for sheltering cattle.	Details.	Number.	Detail.	Value rupees.				
30	31	32	33	34	35	36	37	38	
2 large rooms and 1 small room.	1 Chhappar and 1 room.	Cows ...	2	Ornaments ...	100 0 0	...	...	...	Probably has some cash laid by, and likely has more out on loan than he admits.
		Buffaloes ...	4	Utensils ...	40 0 0				
Estimated at Rs. 1,000 in value. The dwelling house is an unusually good one of stone and mortar.		Oxen ...	2	Other articles ...	20 0 0				
		Calves ...	2		Mds. S. C.				
		Buffalo-calves	3	Grain ...	25 15 0				
					Ra. A. P.				
					=29 0 0				
					189 0 0				
2 Large rooms, 2 small rooms.	1 Large room.	Cow ...	1	Ornaments ...	50 0 0	...	...	...	Owns a masonry house, value Rs. 500; possibly has some cash laid by which he will not own to.
		Buffalo ...	1	Utensils (brass) ...	5 0 0				
A good house of stone and mortar.		Oxen ...	2	Other articles ...	10 0 0				
		Calf ...	1	Gram 5 maunds...	6 11 5				
		Bull-calf ...	1	Barley 1 " ...	2 0 0				
					71 11 5				
2 Katcha built rooms, 1 Katcha built small room (house of sun-dried brick) valued at Rs. 125.	1 Katcha built room, 1 Chhappar (small thatched stable).	Cows ...	3	Ornaments ...	4 0 0	Marriage of daughters, unusual loss of cattle, last year's drought.			
		Buffalo ...	1	Utensils ...	2 0 0				
		Oxen ...	2	Other articles ...	5 0 0				
		Calf ...	1	Barley 1 maund...	1 0 0				
					12 0 0		500 0 0	165 15 7	
2 Katcha built verandahs, 3 Katcha built rooms and portico, 1 katcha-built ante room—valued at Rs. 125).	1 Katcha built and 2 thatched stables.	Cow ...	1	Ornaments ...	50 0 0	Old standing debts, years of drought; a large family of children to support.			
		Oxen ...	3	Brass utensils ...	20 0 0				
		Buffalo ...	1	Other articles ...	7 0 0				
		Calf ...	1	Bajra 15 sers ...	0 7 5				
		Buffalo-calves	2	Barley 15 " ...	0 6 0				
					77 18 5		524 0 0	165 11 10	
2 Katcha built thatched huts and katcha built portico (Foli) 1.	5 Thatched stables.	Cow ...	1	Ornaments ...	24 0 0	Old debts running on, years of drought; a large family of children to support.			
		Buffalo ...	1	Brass utensils ...	7 0 0				
Valued at Rs. 50.		Oxen ...	4	Other furniture ...	2 0 0				
		Calf ...	1	Bajra 2 maunds 20 sers ...	8 0 6				
					86 0 6		250 0 0	149 15 7	
Katcha built 8 huts.	Katcha built 1 stable.	Cow ...	1	Brass utensils ...	2 0 0	Years of drought; small debt allowed to increase (most probably).			
		Ox ...	1	Other furniture ...	1 0 0				
Valued at Rs. 10.		Calf ...	1	Bajra 5 sers ...	0 2 5				
					3 2 5		70 0 0	103 14 8	

I.—FAMILY AND THEIR HOLDING.										
Number of case.	Status.	Name of head of family, caste and residence.	Number of persons comprising the family.				Area of holding in acres.			
			Adults.		Children	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.
			Male.	Female.						
1	2	3	4	5	6	7	8	9	10	11
1	Biswadár—Owner.	Firú, son of Dhanna Meo of Salaheri, tahsil Nuh.	Two ...	Two ...	Twelve	Sixteen	Cultivated by himself.	17 acres (biswadári, 5 acres, and 12 acres mortgaged land).	...	17 acres ...
2	Biswadár—Owner.	Dáud, son of Sáhab Khan Meo of Salaheri, tahsil Nuh.	Two ...	One ..	Four ...	Seven...	Cultivated by himself.	8 acres ...	...	8 acres ...
3	Occupancy tenant.	Iláhi Baksh son of Mandári, Faqr of Salam-bha, tahsil Nuh.	Two ...	One ...	Three	Six ...	Cultivated by himself.	10 acres ...	...	10 acres ...
4	Occupancy tenant.	Shabrátí son of Mandári, Faqr of Salam-bha, tahsil Nuh.	One ...	One ...	...	Two ...	Cultivated by himself.	5 acres ...	...	5 acres ...
5	Tenant-at-will.	Kháju son of Tunda, Faqr of Jogipur, tahsil Nuh.	Three...	Three...	Seven...	Thirteen	Cultivated by himself.	14 acres ...	...	14 acres ...
1	Occupancy tenant.	Imám Baksh Meo of Firozpur, tahsil Firozpur.	Three...	Two ...	...	Five ...	Cultivated conjointly.	6 acres 5 poles.	...	6 acres 5 poles.
2	Occupancy tenant.	Jowrihi Meo of Firozpur, tahsil Firozpur.	Two ...	Two ...	Four ...	Eight...	Cultivated conjointly.	6 acres 3 roods 10 poles.	10 poles ...	6 acres 3 roods 20 poles.

Population of the Punjab, GURGAON DISTRICT—continued.

CH. I.

II.—INCOME.						III.—EXPENDITURE.					
One year's produce of the land.			Other miscellaneous sources of income.		Total income from all sources.	Revenue, cesses and assignments charges and (in case of tenants) rent.		By grain consumed as food and used as seed, or otherwise expended.			
Kind of produce.	Amount in maunds.	Value.	Detail.	Value.	Amount in rupees.	Detail.	Amount.	Detail.	Maunds.	Value.	
12	13	14	15	16	17	18	19	20	21	22	
	Mds. S. C.	Rs. A. P.		Rs. A. P.	Rs. A. P.		Rs. A. P.		Mds. S. C.	Rs. A. P.	
Bájra (on 4 acres)	24 0 0	28 0 0	...	...	...	Revenue	29 5 0	Grain consumed	117 0 0	130 0 0
Cotton (on 3 "	19 20 0	59 0 0				Cesses	5 6 0	Used as seed	10 9 0	12 0 0	
Jowár (on 4 "	32 0 0	34 0 0									
Barley (on 5 "	38 0 0	41 0 0									
Gram (on 2 "	20 0 0	23 0 0									
Wheat (on 2 "	20 0 0	30 0 0									
		215 0 0			215 0 0		84 11 0		127 9 0	142 0 0	
Bájra (on 1 acre)	6 0 0	7 0 0	Hired labor ...	35 12 0	...	Revenue	4 10 0	Grain consumed	45 0 0	52 0 0	
Jowár (on 1 "	8 0 0	8 0 0	Cart-hire ...	5 0 0	...	Cesses	0 14 0	Used as seed	0 24 0	1 0 0	
Cotton (on 1 "	6 20 0	20 0 0									
		86 0 0		88 12 0	73 12 0		5 8 0			58 0 0	
Bájra (on 2 acres)	12 0 0	14 0 0	...	...	...	Revenue	20 11 0	Grain consumed	47 10 0	52 0 0
Jowár (on 2 "	16 0 0	17 0 0				Cesses	3 13 0	Used as seed	4 11 0	4 12 0	
Cotton (on 3 "	19 20 0	59 0 0									
Barley (on 3 "	21 0 0	23 0 0									
		113 0 0		113 0 0	113 0 0		24 8 0			56 12 0	
Jowár (on 1 acre)	8 0 0	8 0 0	...	...	...	Revenue	9 8 0	Grain consumed	18 0 0	19 0 0
Cotton (on 2 "	13 0 0	39 0 0				Cesses	1 11 0	Used as seed	2 27 0	3 0 0	
Barley (on 2 "	14 0 0	15 0 0									
		62 0 0		62 0 0	62 0 0		11 3 0			22 0 0	
Bájra (on 2 acres)	12 0 0	14 0 0	Labor hired ...	84 0 0	...	Revenue	84 10 0	Grain consumed	101 16 0	112 0 0	
Jowár (on 4 "	32 0 0	34 0 0				Cesses	6 5 0	Used as seed	7 0 0	10 0 0	
Cotton (on 2 "	13 0 0	39 0 0									
Wheat (on 2 "	20 0 0	30 0 0									
Gram (on 2 "	20 0 0	23 0 0									
Barley (on 2 "	20 0 0	22 0 0									
		162 0 0		196 0 0	196 0 0		40 15 0			122 0 0	
Wheat ...	13 80 0	18 5 4	Ghi ...	18 0 0	...	Rent...	12 9 0	Wheat ...	3 0 0	4 0 0	
Barley ...	21 12 0	19 5 10	Hire of plough ...	5 0 0	...			Barley ...	20 0 0	18 2 11	
Jowár ...	3 15 0	8 6 0						Bájra ...	10 0 0	11 1 9	
Bájra ...	12 37 0	14 5 9						Jowár ...	5 0 0	5 0 0	
								Gram ...	2 0 0	2 0 0	
								Urd ...	1 0 0	1 1 9	
								Mung ...	1 0 0	1 1 9	
								Rice ...	1 0 0	3 5 4	
	61 15 0	55 6 11		23 0 0	78 6 11				43 0 0	46 13 6	
Wheat ...	30 28 19	40 12 9	Labor hired ...	12 0 0	...	Rent...	13 8 0	Wheat ...	5 0 0	6 10 8	
Jowár ...	7 20 0	7 8 0	Ghi ...	24 0 0	...			Barley ...	20 0 0	18 2 11	
Bájra ...	16 27 8	18 8 8						Bájra ...	15 0 0	16 10 8	
								Jowár ...	8 0 0	8 0 0	
								Urd ...	2 0 0	2 3 6	
								Mung ...	1 0 0	1 1 9	
								Gram ...	5 0 0	5 0 0	
								Rice ...	1 0 0	3 5 4	
	54 31 6	66 13 5		96 0 0	102 13 6				57 0 0	61 2 10	

Typical instance of the economic condition of the Agricultural

Number of case.	Status.	Name of head of family, caste and residence.	III.—EXPENDITURE—concluded.				VI.—SURPLUS.		
			Customary charges of village menials and hired labor of all sorts.		By purchase of necessaries which the family cannot produce on their own land or by their own labor.		Total Expenditure.	Surplus of income over expenditure.	Surplus income usually how disposed of.
			Detail.	Amount.	Detail.	Amount.			
			23	24	25	26	27	28	29
			Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.		
1	Biswadar—Owner.	Piru, son of Dhanu Meo of Salaheri, tahsil Nuh.	Village menials	7 0 0	Iron and other instruments ... Salt and oil ...	1 0 0 3 0 0			Spending in marriage ceremony, and perhaps paying interest on his debt.
						4 0 0	187 11 0	27 5 0	
2	Biswadar—Owner.	Daud, son of Sahab Khan Meo of Salaheri, tahsil Nuh.	Village menials	2 0 0	Iron instruments Salt and oil ...	1 0 0 1 0 0			Surplus not worthy of remark.
						2 0 0	62 8 0	11 4 0	
3	Occupancy tenant.	Háhi Bakhsh son of Mandári, Faqir of Salammbha, tahsil Nuh.	Village menials To weighing cotton.	2 0 0 3 0 0	Iron instruments Salt and oil ... Miscellaneous charges ...	1 8 0 2 0 0 2 0 0			Spending in marriage ceremony, and repaying debts.
				5 0 0		5 8 0	91 12 0	21 4 0	
4	Occupancy tenant.	Shabrati son of Mandári, Faqir of Salammbha, tahsil Nuh.	Village menials To weighing cotton ... Hire of ox ... Reapers ...	2 0 0 3 0 0 10 0 0 2 0 0	Salt and oil ... Miscellaneous charges ...	1 8 0 1 8 0			No surplus to speak of.
				17 0 0		3 0 0	63 3 0	8 13 0	
5	Tenant-at-will.	Kháju son of Tunda, Faqir of Jogipur, tahsil Nuh.	Village menials	2 0 0	Iron instruments Salt and oil ... (Unrefined) sugar, &c. ...	1 0 0 2 0 0 3 0 0			In paying interest.
						6 0 0	170 15 0	25 1 0	
6	Occupancy tenant.	Imám Bakhsh Meo of Firozpur, tahsil Firozpur.	Lohár ... Carpenter ... Chamár ... Potter ...	1 0 0 1 0 0 2 0 0 0 8 0	Leather bucket ... Clothes ... Oil ... Salt ... Gur (unrefined sugar) ...	5 0 0 15 0 0 3 0 0 1 0 0 1 0 0			Repairs to house, spending in marriage ceremony and festivals.
				4 8 0		25 0 0	75 5 6	3 1 5	
7	Occupancy tenant.	Jowrihi Meo of Firozpur, tahsil Firozpur.	Lohár ... Carpenter ... Chamár ... Potter ...	1 0 0 1 0 0 2 0 0 0 8 0	Leather bucket ... Clothes ... Oil ... Salt ... Gur ...	5 0 0 20 0 0 3 0 0 1 0 0 1 0 0			Spending in marriage ceremony and festivals and repairs to house.
				4 8 0		30 0 0	95 10 10	7 2 7	

V.—DESCRIPTION OF RESIDENCE, CATTLE AND CHATTELS.					IV.—DEBTS.			REMARKS.	
No. of rooms in house.		Cattle.		Chattels, stock of grain and cash.		How incurred.	Amount.		Percentage of debt on total income.
Used as dwelling rooms.	Used for sheltering cattle.	Details.	Number.	Detail.	Value rupees.				
30	31	32	33	34	35	36	37	38	39
2 rooms.	1 yard (gaeth) with chappar (thatched stable).	Oxen ... Cows ... Buffalo ... Bull-calf ... Cow-calf ... Bull buffalo-calf ...	2 2 1 2 1 1	28 Silver earrings (half) ... 2 Grind-stones ... 2 Bed-steads ... 2 Forage cutters (Gandasa) ... 2 Iron-pots (tawa) ... 8 anas each ... 1 Axe ... 1 Stool (patra) ... 1 Leather bucket ... Food grains 10 maunds 15 sers ... 2 Clothes ... 1 Spinning wheel ...	Rs. A P. 12 0 0 2 0 0 5 0 0 0 8 0 0 8 0 1 0 0 0 4 0 0 4 0 4 0 0 19 5 0 1 4 0 0 12 0	Purchase of cattle and food; a large family of children.	40 0 0	18 9 0	...
1 room with upper story (Bāoti) thatched.	1 yard (Nahora) with chappar.	Oxen ... Cow ... Calf ...	2 1 1	2 Bed-steads ... 1 Stools (mundha) ... 1 Spinning wheel ... 1 Bullock-cart ... 1 Grind-stone ... 1 Scale ... 1 Iron-pot (tawa) ... 1 Axe ... 1 Thin quilt (rasāi) ... Bājra 2 maunds ...	1 0 0 0 2 0 0 12 0 10 0 0 1 0 0 0 4 0 0 12 0 0 4 0 0 12 0 4 0 0	Food and seed grain. And Rs. 101 on his land.	36 0 0	49 5 0	Besides this debt, this man's land is mortgaged for Rs. 101.
1 room with upper story (Bāoti).	1 Portico (Poli); 1 yard (Nahora) with Chhappar.	Oxen ... Bull-calf ... Cows ... Cow-calf ...	2 1 2 1	2 Bedsteads ... 1 Utensil ... 2 Grain ... 1 Clothes ... Spinning wheel, grindstone &c. ...	3 8 0 0 3 0 2 0 0 1 4 0 2 1 0	Owing to the late scarcity.	198 0 0	170 18 0	...
1 chappar (thatched hut).	...	Cow ... Calf ...	1 1	2 Utensils ... Thread (1½ sers) ... Grind-stone, Bedsteads, &c. ...	0 8 0 0 12 0 1 3 0	...	...	...	...
1 room, 1 chappar.	1 yard (hāta)	Oxen ...	2	2 Utensils ... Grind-stone, Bedsteads, &c. ...	0 10 0 2 9 0	For food & for the purchase of oxen; dates from 1871. A large family of children to support.	754 0 0	385 0 0	...
2 rooms with upper story, 1 chappar.	1 Chappar.	Oxen ... Cow ... Calves ...	2 1 3	3 Bed-steads ... Grind-stone, Iron pot, &c. ...	2 4 0 4 6 0	Owing to failure of crops in years of drought.	181 0 0	231 5 0	This tenant was moderately well off, but during last year's scarcity had to sell whatever he could spare.
2 chappar.	...	...	...	Bed-steads, Grind-stone, &c.	2 4 0	Failure of crops owing to drought.	160 0 0	145 10 2	...

Typical instances of the economic condition of the Agricultural

I.—FAMILY AND THEIR HOLDING.										
Number of case.	Status.	Name of head of family, caste and residence.	Number of persons comprising the family.				Area of holding in acres.			
			Adults.		Children.	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.
			Male.	Female.						
1	2	3	4	5	6	7	8	9	10	11
3	Tenant-at-will.	Samda son of Dhanna, Meo of Firozpur, tahsil Firozpur.	One ...	Two ...	One ...	Four...	Cultivated conjointly.	15 acres 2 roods 10 poles.	...	15 acres 2 roods 10 poles.
4	Tenant-at-will.	Wazir son of Pir Khan Meo of Firozpur, tahsil Firozpur.	Two ...	Two ...	One ...	Five...	Cultivated conjointly.	3 acres 2 roods.	1 acre 10 poles.	4 acres 2 roods 10 poles.
5	Biswahdar Owner.	Muhammad Khan son of Baz Khan Meo of Sadhrwat, tahsil Firozpur.	Two...	Two...	One...	Five...	Cultivated conjointly.	97 acres ...	2 roods 80 poles.	97 Acres 2 roods 80 poles.
6	Biswahdar Owner.	A'zam son of Kahu Meo of Maholi, tahsil Firozpur.	One...	...	One...	Two...	...	3 acres 25 poles.	...	3 acres 25 poles.
1	Occupancy tenant.	Khushali son of Bala Chamár of Khitwari, tahsil Falwal.	One ...	Two...	...	Three	Cultivated by occupancy tenant himself.	5 acres ...	...	5 acres ...
2	Occupancy Tenant.	Jhamman son of Bhawan Jat of Khitwari, tahsil Falwal.	2, Jhamman and Thakaria	One M-summát Sundar.	One...	Four...	By himself	4 acres ...	...	4 acres ...

Population of the Punjab, GURGAON DISTRICT—continued.

CH. I.

II.—INCOME.					III.—EXPENDITURE.					
One year's produce of the land.			Other miscellaneous sources of income.		Total income from all sources.	Revenue, cesses and seigniorage charges and (in case of tenants) rent.		By grain consumed as food and as seed or otherwise expended.		
Kind of produce.	Amount in maunds.	Value.	Detail.	Value.	Amount in rupees.	Detail.	Amount.	Detail.	Maund.	Amount.
12	13	14	15	16	17	18	19	20	21	22
Wheat ...	Mds. S. C.	Rs. A. P.		Rs. A. P.	Rs. A. P.	Rent...	Rs. A. P.	Wheat ...	Ms. S. C.	Rs. A. P.
Bajra ...	51 37 8	69 3 5	...	...	...	...	30 4 0	Barley ...	4 0 0	5 5 4
Jowar ...	33 2 8	35 9 9						Bajra ...	15 0 0	13 10 2
	33 7 8	33 3 0						Jowar ...	10 0 0	11 1 3
								Urd ...	5 0 0	5 0 0
								Mung ...	1 0 0	1 1 9
								Gram ...	1 0 0	1 1 9
								Rice ...	2 0 0	2 0 0
								Straw (Benola) ...	1 0 0	3 5 4
	117 7 8	138 0 2			138 0 2				3 0 0	2 0 0
									42 0 0	44 10 1
Gram ...	4 30 0	4 12 0	Service ...	60 0 0		Rent...	15 8 0	Wheat ...	5 0 0	6 10 8
Jowar ...	17 17 0	17 6 10	Labor hired...	36 0 0				Barley ...	15 0 0	13 10 2
								Bajra ...	15 0 0	16 10 8
								Jowar ...	10 0 0	10 0 0
								Mung ...	1 0 0	1 1 9
								Urd ...	1 0 0	1 1 9
								Gram ...	5 0 0	5 0 0
								Rice ...	1 0 0	3 5 4
		22 2 10		96 0 0	118 2 10				53 0 0	57 8 4
Wheat ...	138 25 0	184 13 4	Interest ...	50 0 0		Revenue	187 11 0	Wheat ...	20 0 0	26 10 8
Barley ...	69 11 0	62 15 11				Cesses	51 13 0	Barley ...	10 0 0	9 1 5
Jowar ...	659 30 0	659 12 0						Bajra ...	15 0 0	16 10 8
Gram ...	25 35 0	28 14 0						Jowar ...	12 0 0	12 0 0
Cotton ...	15 18 0	51 9 0						Urd ...	3 0 0	3 5 4
Goira ...	25 15 0	27 6 11						Mung ...	1 0 0	1 1 9
Bajra ...	5 25 0	6 4 0						Straw (Benola) ...	25 0 0	17 5 4
Vegetables ...	242 7 8	121 1 8						Gram ...	25 0 0	25 0 0
								Rice ...	4 0 0	13 5 4
	1083 7 12	1,040 12 10			1,090 12 10		219 8 0		116 0 0	124 8 6
Wheat ...	3 37 0	5 3 6	Labor hired ...	12 0 0		Revenue	8 5 0	Wheat ...	2 20 0	3 5 4
Barley ...	6 20 0	5 14 6				Cesses	0 15 0	Barley ...	9 0 0	7 15 3
Cotton ...	2 13 0	7 13 0						Gram ...	1 0 0	1 0 0
Jowar ...	12 10 0	12 4 0						Jowar ...	2 0 0	2 0 0
Bajra ...	1 27 8	1 14 6						Urd ...	1 0 0	1 1 9
								Mung ...	0 20 0	0 2 11
								Bajra ...	1 0 0	1 1 9
	26 23 12	33 1 0			45 1 0		6 4 0		17 0 0	17 1 0
Jowar ...	10 0 0	13 5 0	From cultivation as manial.	15 0 0		Rent as per Reve-	8 2 0	Food.		
Bajra ...	5 0 0	7 8 0	By labor ...	12 0 0		nuce rate.		Jowar ...	8 0 0	10 10 0
Moth ...	5 0 0	5 0 0						Bajra ...	4 0 0	6 0 0
Wheat and barley	14 0 0	14 0 0						Moth ...	1 20 0	1 8 0
Jowar and bajra	60 0 0	6 0 0						Wheat and barley ...	13 0 0	13 8 0
(Straw) Chaff ...	30 0 0	3 0 0						SEED.		
								Jowar ...	0 5 0	0 2 8
								Bajra ...	0 2 0	0 1 3
								Moth ...	0 5 0	0 2 0
								Wheat and barley ...	2 2 0	2 8 0
								Cattle food	60 0 0	6 0 0
								Chaff ...	80 0 0	3 0 0
		48 13 0		27 0 0	75 13 0					
										48 7 9
Kharif.						Rent...	5 4 0	Food.		
Jowar ...	8 0 0	10 11 0						Jowar ...	3 0 0	12 0 0
Bajra ...	5 0 0	7 8 0						Bajra ...	3 0 0	4 8 0
Cotton ...	5 0 0	15 0 0						Moth ...	1 0 0	1 0 0
Rabi.								Wheat and barley ...	13 0 0	13 0 0
Wheat and barley	7 0 0	7 0 0						SEED.		
Jowar and Bajra	60 0 0	5 0 0						Jowar ...	0 5 0	0 2 6
Straw Chaff ...	14 0 0	1 7 0						Bajra ...	0 2 0	0 1 3
								Cotton ...	0 13 0	0 5 0
								Wheat and barley ...	1 10 0	1 4 0
								Food of cattle chaff.	14 0 0	1 7 0
								Jowar and bajra straw.	50 0 0	5 0 0
		46 0 0			46 10 0					38 11 9

Typical instances of the economic condition of the Agricultural

Number of case.	Status.	Name of head of family, caste and residence.	III.—EXPENDITURE—continued.				IV.—SURPLUS.			
			Customary charges of village menials and hired labour of all sorts.		By purchase of necessities which the family cannot produce on their own land or by their own labour.		Total expenditure.	Surplus of income over expenditure.	Surplus income usually how disposed of.	
			Detail.	Amount.	Detail.	Amount.				
			23	24	25	26	27	28	29	
		Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.				
3	Tenant-at-will.	Samda son of Dhanna, Meo of Firozpur, tahsil Firozpur.	Lohár ... Carpenter ... Chamár ... Potter ... Clearing weeds from fields. Reaping ...	2 0 0 2 0 0 4 0 0 1 0 0 6 0 0 4 0 0 19 0 0	Leather bucket ... Clothes ... Oil ... Salt ... Gur ...	5 0 0 15 0 0 3 0 0 1 8 0 1 8 0				Spending in marriage ceremony and repairs to house.
						26 0 0	119 14 1	18 2 1		
4	Tenant-at-will.	Wazir son of Pir Khan Meo of Firozpur, tahsil Firozpur.	Lohár ... Carpenter ... Chamár ... Potter ... Weeding ... Reaping ...	0 8 0 0 8 0 1 4 0 0 4 0 1 8 0 1 0 0 5 0 0	Clothes ... Oil ... Salt ... Gur ... Tobacco ...	20 0 0 3 0 0 2 0 0 1 8 0 2 0 0				Spending in marriage ceremony and repairs to house.
						28 8 0	106 3 4	11 15 6		
5	Biswadár Owner.	Muhammad Khan son of Bís Khan Meo of Shad-brawat tahsil Firozpur.	Lohár ... Carpenter ... Chamár ... Potter ... Weeding ... Reaping ... Threshing ...	12 0 0 12 0 0 80 0 0 5 0 0 18 0 0 12 0 0 48 0 0 137 0 0	Leather bucket ... Clothes ... Oil ... Salt ... Gur ... Tobacco ... Spices ...	20 0 0 35 0 0 8 0 0 3 0 0 12 0 0 8 0 0 6 0 0				Spending in marriage ceremony, lending money and holding lands in mortgage.
						92 0 0	573 0 6	517 12 4		
6	Biswadár Owner	A'zam son of Kallu Meo of Maholi, tahsil Firozpur.	Lohár ... Carpenter ... Chamár ... Potter ... Weeding and reaping.	0 8 0 0 8 0 1 0 0 0 4 0 3 0 0 5 4 0	Clothes ... Salt ... Gur ... Oil ...	8 0 0 1 0 0 1 8 0 1 8 0				Spending in marriage ceremony and festivals.
						12 0 0	40 9 0	4 8 0		
1	Occupancy tenant.	Khusháli son of Bala Chamár of Khatwári, tahsil Palwal.	<i>Kharif.</i> 1 Md. 5 Sers. <i>Rabi.</i> 1 Md. 5 Sers.	1 2 0 1 2 0 2 4 0	Salt and oil &c.,	12 0 0				Expended in marriage and funerals.
							65 13 9	9 15 3		
2	Occupancy tenant.	Jhamman son of Bhawan, Ját of Khatwári, tahsil Palwal.	<i>Kharif.</i> 1 Md. 11 Sers. <i>Rabi.</i> 1 Md. 11 Sers.	1 11 0 1 4 0 2 4 0	Salt and oil &c.,	5 0 0			Loss Rs. 3 4 9	
							49 14 9			

Population of the Punjab, GURGAON DISTRICT—continued.

Ch. I.

V.—DESCRIPTION OF RESIDENCE, CATTLE AND CHATTELS.					VI.—DEBTS.				REMARKS.
No. of rooms in house.		Cattle.		Chattels, stock of grain and cash.		How incurred.	Amount.	Percentage of debt on total income.	
Used as dwelling rooms.	Used for sheltering cattle.	Details.	Number.	Details.	Value rupees.				
30	31	32	33	34	35	36	37	38	39
2 Chappars (thatched huts).	1 Chappar (thatched huts).	Oxen ... She-goats ...	2 5	Bed-steeds ... Hallock-cart ... Grind-stone, Iron-pot &c. ...	Rs. A. P. 3 0 0 20 0 0 4 4 0	Failure of crops in year of drought.			This tenant is considered to be well off.
			7		26 4 0		40 0 0	26 15 9	
2 Chappars (thatched huts).	...	...	...	Bed-steeds, Grind-stone, Spinning-wheel &c.	5 4 0	Failure of crops in year of drought.			Considered a poor tenant; asks out his income by service.
							50 0 0	42 5 10	
4 Upper rooms with attics; 3 lower rooms.	5 rooms ...	Oxen ... Cows ... Buffaloes ... Mares ...	2 4 3 2	Ornaments ... Clothes ... Utensils ... Grind-stone &c. ...	100 0 0 30 0 0 18 12 0 9 12 0	...	...	...	Has lent Rs. 235 to other cultivators. Has no grain or cash on hand.
					168 8 0				
2 rooms with upper stories (Raoi).	...	...	...	Bed-steeds, Grind-stone &c.	1 8 0	Failure of crops owing to drought.			Incurred debt during the past year.
							80 0 0	66 10 4	
1 Kacha room.	1 Kacha verandah.	Ox ... Buffalo ...	1 1	Grinding-stone ... Seires ... Chaj ... Musal ... Spinning wheel ... Iron pot ... Brass plate ... Wooden spoon ... Bed-steeds ... Ghilaf ... Kharpa ... Gandasa ... Jai ... Rai ... Plough ... Upla ... Stool ... Stone plate ... A're ...	0 8 0 0 1 0 0 1 0 0 4 0 0 4 0 0 4 0 1 0 0 0 1 0 3 0 0 1 2 0 0 4 0 0 8 0 0 1 0 0 1 0 1 8 0 1 8 0 0 3 0 0 4 0 0 7 0 10 4 0	...	...	...	Straw used to feed cattle, which also grass in the commonland of the village.
1 Fair room and 1 room (Kacha).	In dwelling house cattle are kept.	Ox ... Cow ... Calf ...	1 1 1	Chalni ... Chaj ... Iron pot ... Brass plate ... Pot ... Spoon ... Woodcup-plate ... Bed-stead ... Darant ... Gandasa ... Jaii ... Rai ... Stool ... Bajra ...	0 1 0 0 1 0 0 4 0 0 12 0 0 12 0 0 0 6 0 4 0 1 0 0 0 4 0 0 5 0 0 1 6 0 1 0 0 2 0 4 8 0	Failure of crops not provided for.			
					8 13 0		80 0 0	173 14 0	

Typical instances of the economic condition of the Agricultural

I.—FAMILY AND THEIR HOLDING.										
Number of case.	Status.	Name of head of family caste and residence.	Number of persons comprising the family.				Area of holding in acres.			
			Adults.		Children	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.
			Male.	Female.						
1	2	3	4	5	6	7	8	9	10	11
3	Proprietor	Harbhajan son of Sudda Rám Ját, of Kithwari, tahsil Palwal.	Two ...	One ...	Two ...	Five ...	Cultivated by proprietors themselves.	6 acres ...	...	6 acres ...
4	Proprietor	Hargobind son of Ramsukh Ját, Biswadár of Kithwari, tahsil Palwal.	One ...	Two ...	Three	Six ...	Cultivated by proprietor himself.	14 acres ...	...	14 acres ...
5	Proprietor	Euprám son of Mohan Lal, Ját Biswadár of Kithwari, tahsil Palwal.	Three	Two ...	...	Five ...	Cultivated by proprietor himself.	12 acres ...	...	12 acres ...
6	Tenant-at-will.	Mohar Singh son of Sita Rám, Ját of Kithwari, tahsil Palwal.	Two ...	...	...	Two ...	Cultivated by himself.	5 acres ...	...	5 acres ...
7	Tenant-at-will.	Ass son of Radhe Ját of Kithwari, tahsil Palwal.	Two ...	One ...	One ...	Four ...	Cultivated by tenant at will himself.	15 acres ...	...	15 acres ...

II.—INCOME.					III.—EXPENDITURE.					
One year's produce of the land.			Other miscellaneous sources of income.		Total income from all sources.	Revenue cases and assignments charges and (in case of tenants) rent.		By grain consumed as food and used as seed, or otherwise expended.		
Kind of produce.	Amount in maunds.	Value.	Detail.	Value.	Amount in rupees.	Detail.	Amount.	Detail.	Maunds.	Value.
12	13	14	15	16	17	18	19	20	21	22
	Mds. S. C.	Rs. A. P.		Rs. A. P.	Rs. A. P.	Land Revenue and Cesses.	Rs. A. P.	Food.	Mds. S. C.	Rs. A. P.
Jowár ...	17 0 0	23 10 0	Carriage hire,	6 0 0		Land Revenue and Cesses.	9 13 0	Jowár ...	12 0 0	16 0 0
Bájra ...	2 32 0	4 8 0	Ghi ...	12 0 0				Bájra ...	6 0 0	9 0 0
Moth ...	3 0 0	8 0 0	Thread ...	48 0 0				Wheat ...	6 0 0	9 0 0
Cotton ...	2 30 0	8 4 0	From land held in mortgage.	8 0 0				Wheat & barley.	12 0 0	12 0 0
<i>Rabi.</i>								Jaggery ...	1 30 0	5 12 0
Wheat ...	13 20 0	20 4 0						<i>Seed.</i>		
Wheat and barley.	9 30 0	9 12 0						Jowár ...	0 10 0	0 5 8
Jowár and bájra, straw.	80 0 0	8 0 0						Bájra ...	0 1 0	0 0 9
Chaff ...	50 0 0	5 0 0						Moth ...	0 3 0	0 1 0
		81 1 0			69 0 0			Cotton seed ...	0 7 8	13 0 0
					150 1 0			Wheat ...	1 15 0	2 0 0
								Wheat & barley.	1 15 0	1 2 0
								Cattle food ...	...	20 8 0
										76 0 0
<i>Khariif.</i>								<i>Khariif.</i>		
Jowár ...	40 0 0	53 4 0	Carriage hire,	13 0 0		Land Revenue and Cesses.	23 14 0	Jowár ...	28 0 0	37 0 0
Bájra ...	5 0 0	7 8 0	From land held in mortgage.	14 14 0				Bájra ...	4 0 0	6 0 0
Cotton ...	18 0 0	54 0 0						<i>Rabi.</i>		
Moth ...	5 0 0	5 0 0						Wheat ...	14 0 0	21 0 0
<i>Rabi.</i>								Barley and gram.	9 0 0	9 0 0
Wheat ...	6 0 0	9 0 0						Sugar ...	8 0 0	14 0 0
Wheat and barley.	30 0 0	30 0 0						<i>Seed.</i>		
Jowár and bájra, straw.	170 0 0	17 0 0						Jowár ...	0 25 0	0 13 0
Chaff ...	82 0 0	8 4 0						Bájra ...	0 2 0	0 1 0
		184 0 0			27 14 0			Cotton ...	0 39 0	0 15 0
					311 14 0			Moth ...	0 5 0	0 2 0
								Wheat ...	1 10 0	1 14 0
								Wheat & barley.	0 30 0	3 12 0
								Cattle food ...	274 0 0	47 6 0
										141 15 0
<i>Khariif.</i>								<i>Food.</i>		
Jowár ...	24 0 0	32 0 0	...	...		Land Revenue and Cesses.	19 14 6	Jowár ...	12 0 0	15 0 0
Bájra ...	12 0 0	18 0 0						Bájra ...	5 0 0	7 8 0
Cotton ...	5 0 0	15 0 0						Moth ...	5 0 0	5 0 0
<i>Rabi.</i>								Barley and gram.	22 0 0	22 0 0
Barley and gram.	28 0 0	28 0 0						Sugar ...	2 0 0	6 0 0
Jowár bájra, straw.	10 0 0	10 0 0						<i>Seed.</i>		
Chaff ...	45 0 0	4 8 0						Jowár ...	0 20 0	0 11 0
		107 0 0			107 8 0			Bájra ...	0 6 0	0 3 6
								Cotton ...	0 13 0	0 5 0
								Barley and gram.	5 0 0	5 0 0
								Cattle food, chaff &c.	145 0 0	14 8 0
										76 8 6
<i>Khariif.</i>								<i>Food.</i>		
Jowár ...	15 0 0	20 0 0	Carriage hire,	10 0 0		Rent for land.	7 14 0	Jowár ...	6 0 0	8 0 0
Bájra ...	5 0 0	7 8 0	Ghi ...	12 0 0				Bájra ...	3 0 0	4 8 0
<i>Rabi.</i>								Barley and gram.	6 0 0	6 0 0
Barley and gram.	16 0 0	16 0 0						Wheat ...	3 0 0	4 8 0
Jowár and bájra, straw.	80 0 0	8 0 0						<i>Seed.</i>		
Chaff ...	32 0 0	8 0 0						Jowár ...	0 10 0	0 5 0
		54 8 0			22 0 0			Bájra ...	0 2 0	0 1 0
					76 8 0			Barley and gram.	2 20 0	2 8 0
								Cattle food straw.	80 0 6	8 0 0
								Chaff ...	22 0 0	3 0 0
										36 4 0
<i>Khariif.</i>								<i>Food.</i>		
Jowár ...	20 0 0	26 11 0	...	...		Rent of land.	23 2 0	Jowár ...	12 0 0	16 0 0
Bájra ...	4 0 0	6 0 0						Bájra ...	4 0 0	6 0 0
Moth ...	9 0 0	9 0 0						Moth ...	2 0 0	2 0 0
Cotton ...	2 0 0	6 0 0						Barley and gram.	18 0 0	18 0 0
<i>Rabi.</i>								<i>Seed.</i>		
Barley and gram.	30 0 0	30 0 0						Jowár ...	0 30 0	0 10 6
Jowár and bájra, straw.	50 0 0	5 0 0						Bájra ...	0 2 0	1 3 0
Chaff ...	50 0 0	5 0 0						Moth ...	0 15 0	0 6 0
		87 11 0			87 11 0			Cotton ...	0 13 0	0 5 0
								Cattle food straw.	50 0 0	5 0 0
								Jowár, Bájra and Chaff.	50 0 0	5 0 0
										53 6 9

Typical instances of the economic condition of the Agricultural

Number.	Status.	Name of head of family, caste and residence.	III.—EXPENDITURE.				IV.—SURPLUS.			
			Customary charges of village menials and hired labour of all sorts.		By purchase of necessities which the family cannot produce on their own land or by their own labour.		Total Expenditure.	Surplus of income over expenditure.	Surplus income usually how disposed of.	
			Details.	Amount.	Details.	Amount.				
			23	24	25	26	27	28	29	
3	Proprietor.	Harbhajan son of Sarda Ram Ját of Kithwári, tahsil Palwal.	Kharif, 1 md. 11 sers. Rabi, 1 maund 11 sers. Labour ...	Rs. A. P. 1 11 0 1 4 0 12 0 0	Salt and Oil, &c.... Clothing and im- plements.	Rs. A. P. 10 0 0 12 0 0				In marriages, &c.
				14 15 0		22 0 0	122 12 0	27 5 0		
4	Proprietor.	Hargobind son of Ram ukh, Ját Biswadár of Kithwári, tahsil Palwal.	Kharif, 2 mds. and 22 sers. Rabi, 2 maunds and 22 sers. Labour ...	3 6 0 2 8 0 16 3 0	Salt and Oil, &c.... Clothing and im- plements.	14 0 0 10 0 0				...
				22 1 0		24 0 0	211 14 0	..		
5	Proprietor.	Bupram son of Mohan Lal, Ját Biswadár of Kithwári tahsil Palwal.	Kharif, 1 md. 11 sers. Rabi, 1 maund 11 sers.	1 11 0 1 4 0	Salt and Oil, &c.... Clothing ...	3 0 0 6 0 0				...
				2 15 0		9 0 0	108 1 0	...		
6	Tenant-at-will.	Mohar Singh son of Sita Ram, Ját of Kithwári tahsil Palwal.	Kharif, 1 md. 11 sers. Rabi, 1 maund 11 sers. Labour ...	1 11 0 1 4 0 12 0 0	Salt and Oil, &c.... Clothing, &c. ...	12 0 0 4 13 0				...
				14 15 0		16 13 0	76 8 0	...		
7	Tenant-at-will.	Asa son of Radhe, Ját of Kithwári tahsil Palwal.	Kharif, 1 md. and 11 sers. Rabi, 1 maund and 11 sers.	1 11 0 1 4 0	Salt Oil, &c. ... Clothing ...	6 0 0 10 0 0				...
				2 15 0		16 0 0	89 7 9	...		

Population of the Punjab, GURGAON DISTRICT—concluded.

V.—DESCRIPTION OF RESIDENCE, CATTLE AND CHATTELS.					VI.—DEBTS.			REMARKS.	
No. of rooms in house.		Cattle.		Chattele, stock of grain and cash.		How incurred.	Amount.		Percentage of debt on total income.
Used as dwelling rooms.	Used for sheltering cattle.	Details.		Value rupees.					
30	31	32	33	34	35	36	37		38
One kutcha room with verandah & one room on upper story.	One thatch.	Cow ... 1 Ox ... 1 Calf ... 1	1	Grain ... Bedsteads and Spinning Wheels, Implements ... Utensils ... Clothing ... Ornaments ...	Bs. A. P. 32 0 0 10 10 0 15 4 0 20 6 0 21 8 0 102 0 0	...	...	...	Owens a sixth of a cart which is let out for hire.
			8		201 12 0				
Three rooms and one fare room and three rooms and one fare room on upper story.	One kutcha room and 3rd part of a thatched Bungalow.	Oxen ... 2 Buffalo ... 1 Cow ... 1 Calf ... 1	2	Grain ... Bedsteads ... Spinning Wheels, Implements ... Utensils ... Clothing ... Ornaments ...	39 0 0 10 4 0 22 4 0 12 10 0 22 8 0 132 8 0	...	...	...
			6		249 2 0				
1 fare room and 1 room (kutcha).	One kutcha portico.	Oxen ... 1 Buffalo ... 1 Buffalo Calf ... 1	1	Bedsteads ... Utensils ... Implements ...	8 4 0 2 2 0 0 8 0	Lived beyond his income and spent too much on marriage of his daughter.	300 0 0	The principal was Rs. 30, with interest has brought it up to this.	
			5		6 7 0			280 6 0	
One kutcha room and one thatch on upper story.	One kutcha thatch.	Oxen ... 2 Buffalo ... 1 Buffalo Calf ... 1	2	Grain ... Bedsteads ... Implements ... Utensils ... Clothing ...	12 8 0 4 4 0 24 14 0 8 8 0 2 0 0	...	...	...
			4		47 2 0				
One roofed kutcha room.	One thatch	Cow ... 1 Calf ... 1	1	Bedsteads ... Implements ... Utensils ... Clothing ...	5 15 0 8 0 0 8 12 0 4 8 0	Lived beyond his income.	50 0 0	175 6 0	
			2		17 8 0				

I. QUESTION 9, CHAPTER I.

Answer by ALIMULLA, Honorary Extra Assistant Commissioner, Rohtak.

1st Division.—Being appointed Superintendent of tahsil Rohtak in 1873, I have had to gain acquaintance with this tahsil when testing measurement work, and when testing attestation papers of the people who used to come before me. I beg to lay before you the condition &c. of tenants and owners of the following villages of tahsil Rohtak with which I am acquainted since 1873: Kanhaur, Marodhi Rāngrān, Madina, Dobaldhan, Tatauli, Butāna, Kanahli, Sonāri kalān, Makrauli kalān, Jindran mazra Kalānaur, Gudhan mazra Kalānaur, Sonari khurd and Bohar.

2nd Division.—The ordinary economic condition of the agricultural population engaged in the cultivation of land is, that their sole means of livelihood is the income derived from cultivation of land on which they are engaged. Some of the owners also go into service, and some of the tenants work at trades.

3rd Division.—The reply of this and that of 2nd division could not be given satisfactorily in detail in words, so I have given it in tabulated forms, showing all kinds of income and expenditure of agricultural population of the above named villages, whether owners, occupancy tenants, or tenants-at-will. In these forms the condition of people of average circumstances cultivating unirrigated land is given.

The following is the difference between a tenant and an owner :—

1st.—The owners as compared with the tenants can command more credit in every matter connected with their welfare.

2ndly.—An owner can sell or mortgage his land in time of need ; while a tenant has no power to do so, for tenants falling under Section 5 of the Punjab Tenancy Act are only very few in this tahsil.

3rdly.—An owner keeps with him all income derived from his land after paying Government revenue and cesses ; while a tenant has to pay málíkāna in addition to land-revenue and cesses.

4thly.—The owners are in good circumstances as compared with the tenants.

5thly.—An occupancy tenant cannot be ejected without any good ground of his neglecting his duties, &c., but a tenant-at-will can be ejected at the expiry of a term of period for which he was entertained. This difference is clear to every one.*

The tenants in this tahsil are village servants, such as blacksmiths, carpenters, chamārs and potters, who in addition to agriculture pursue their own trades, and their holdings are usually small. Where Jāts are tenants, they do nothing besides agriculture. Some of the Jāt tenants of Kalānaur are entered as tenants.

The timely fall of rain is the only hope of progress and prosperity in the bārāni villages of the tahsil, on which occasion a cultivator repays his debts of seasons of drought. On the failure of timely rains for 2 successive harvests he is obliged to have recourse to borrowing, as the surplus of the previous year is never sufficient to support for so long.

No land is kept for grazing the cattle. The shāmilāt land or land kept for next crop in which spontaneous grass springs up, is used by cattle for grazing. Green mustard is sown mixed with the rabi crops, and cut and mixed with dry jowār and bhusa for cattle in some months of the year in the rabi ; and green "chari" and grass is cut to feed the cattle in kharif.

The following are the reasons of the indebtedness of the agriculturist :—

1st.—When an old member of a Hindu family dies, a ceremony is performed involving an expenditure of Rs. 100 at the least. The average cost is Rs. 500, and in extreme cases it reaches Rs. 1,000.

2ndly.—A son's marriage among Hindus. In such cases on an average Rs. 400 are required to pay to the bride's father, until this sum is paid, the marriage is not allowed to take place.

* NOTE. The proprietors themselves cultivate the land here, and among them the "Jāt" tribe is the most numerous and most industrious. The next to him are Hindu and Muhammadan Rajputs, who are also cultivators of average degree. The others are miscellaneous tribes of lower respectability and less prosperous.

3rdly.—In this tahsil the holdings of the owners are small ; and the owners are never free of dealings with the village bankers. The entire produce of a harvest is consequently usually made over by the owner to his banker. And what the owners need for their food and expenses, and seed and Government revenue, they take in kind and cash from the banker. The banker of course takes care that the produce paid to him is credited at cheap rates, and that what he advances to the agriculturist is charged at dear rates. The accounts are settled up at each harvest ; interest due being treated as principal in the next account.

4thly.—The seasons of drought here are very common in every 3rd or 4th year ; when it occurs there is little produce or no produce at all ; so a cultivator has to borrow for his livelihood, and it often occurs that in such year his cattle die, and he is obliged to ask his trader for a loan to pay revenue and buy bullocks for field. Such are the conditions, and the above are the reasons of the cultivators being in debt, as shown in the illustrative cases appended.

y.—There is no custom of batai in this tahsil ; the tenants pay rent in cash.

Typical instances of the economic condition of the agricultural population of the Punjab being a
of the majority of each main class (owners, occupancy tenants and tenants-at-will)

Number of case.	I. FAMILY AND THEIR HOLDING.								II. INCOME.				
	Status.	Name of head of family, caste and residence.	No. of persons comprising the family.				Area of holding in acres.				Kind of produce.	One year's produce of the land.	
			Male.	Female.	Children.	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.		Amount in maunds.	Value.
1	Owner ...	Mussallam and 2 others, Rájput of Kánhour.	5	5	6	16	Home cultivation.	32	...	32	Cotton ... Jowár, bájra, gram, barley and wheat.	M. S. C. 6 0 0 223 9 8	Rs. A. P. 16 0 0 203 12 6
					Total	...	32	...	32	...	229 9 8	219 12 6	
2	Do. ...	Mír Khan and Mussallam Rájput of Kánhour.	4	4	6	14	Home cultivation.	32	4	36	Jowár, bájra, wheat and barley.	240 6 0	200 15 8
					Total	...	32	4	36	...	240 6 0	200 15 8	
3	Do. ...	Dhuna Khan and Himmat Khan Rájput of Kánhour.	3	4	4	11	Home ...	31	...	31	Bájra, jowár, bayhar.	229 16 12	195 6 5
					Total	...	31	...	31	...	229 16 12	195 6 5	
4	Do. ...	Mussallam Khan and 2 other Rájput of Kánhour.	3	5	7	15	Home cultivation.	44	...	44	Bájra, jowár, bayhar and cotton	849 13 0 6 0 0	281 9 6 16 0 0
					Total	...	44	...	44	...	855 13 0	297 9 6	
5	Do. ...	Manla Bakh and Ibrahim Rájput of Kánhour.	2	1	1	4	Home cultivation.	16	...	16	Jowár, bájra, and gram.	124 8 0	107 14 7
					Total	...	16	...	16	...	124 8 0	107 14 7	
6	Do. ...	Boli Bakh, Rájput of Moradhi, Sangran.	1	3	3	7	Home cultivation.	47	12	59	Cotton ... Bájra, jowár, and gram.	1 20 0 183 0 0	4 0 0 169 12 3
					Total	...	47	12	59	...	184 20 0	173 12 3	
7	Do. ...	Ghulám Rasúl, Rájput of do.	4	3	3	10	Home cultivation.	26	...	26	Jowár bájra and wheat.	170 0 0	147 8 11
					Total	...	26	...	26	...	170 0 0	147 8 11	

description of the actual circumstances of several families in each District selected as fair representatives CH. I.
of the agricultural population.—ROHTAK DISTRICT.

INCOME.—Concluded.				III. EXPENDITURE.				
Other miscellaneous sources of income.			Total income from all sources.	Revenue, cesses and signorago charges and (in the case of tenants) rent.		By grain consumed as seed and used as food or otherwise expended.		
Detail.	Amount.	Value.	Amount in Rupees.	Detail.	Amount.	Detail.	Mands.	Value.
		Rs. A. P.	Rs. A. P.		Rs. A. P.		M. S. C.	Rs. A. P.
DISTRICT.								
Sale of cattle,	30 0 0	493 12 6	Revenue ...	15 0 10	Grain of all sorts.	159 14 0	146 2 6
Pay	184 0 0		Cesses ...	0 14 5			
Pension	7 0 0						
Pachotra	53 0 0						
...	...	274 0 0	493 12 6	...	15 16 3	...	159 14 0	146 2 6
Sale of cattle	15 0 0	315 15 8	Revenue ...	17 8 1	Grain of all sorts.	140 31 8	117 13 6
Pay	100 0 0		Cesses ...	1 1 3			
...	...	115 0 0	315 15 8	...	18 9 4	...	140 31 8	117 13 6
Sale of cattle,	25 0 0	220 6 5	Revenue ...	14 1 10	Grain of all sorts.	109 3 8	88 3 2
...		Cesses ...	0 14 0			
...	...	25 0 0	220 6 5	...	14 15 10	...	109 3 8	88 3 2
Pay	100 0 0	462 9 6	Revenue ...	16 1 8	Grain ...	154 3 8	123 15 6
Sale of cattle	45 0 0		Cesses ...	1 0 1			
Ghi	20 0 0						
...	...	165 0 0	462 9 6	...	17 1 9	...	154 3 8	123 15 6
Sale of cattle,	15 0 0	122 14 7	Revenue ...	11 11 2	Grain of all sorts.	42 8 8	36 10 2
...		Cesses ...	0 11 3			
...	...	15 0 0	122 14 7	...	12 6 5	...	42 8 8	36 10 2
Sale of cattle	20 0 0	211 12 3	Revenue ...	24 5 3	Grain ...	82 3 0	72 3 11
Ghi	18 0 0		Cesses ...	2 15 6			
...	...	88 0 0	211 12 3	...	27 4 9	...	82 3 0	72 3 11
Sale of cattle,	15 0 0		Revenue ...	10 11 9	Grain of all sorts.	99 18 8	88 11 11
Ghi	18 0 0		Cesses ...	1 12 3			
Pachotra	15 9 0						
...	...	48 9 0	196 1 11	...	12 8 0	...	99 18 8	88 11 11

Typical instances of the economic condition of the

Number of case.	Status.	Name of head of family, caste and residence.	EXPENDITURE.—Concluded.						IV. SURPLUS.	
			<i>Customary charges of village menials and hired labor of all sorts.</i>		<i>By purchase of necessities which the family cannot produce on their own land or by their own labor.</i>		Total expenditure.	Surplus of income over expenditure.	Surplus income usually low disposed of.	
			Detail.	Amount.	Detail.	Amount.				
				Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.		
1	Owner ...	Mussallam and 2 others, Rájput of Kánhour.	Village menials Hired labour,	10 3 2 4 0 0	Oil, salt and spice Tobacco ... Shoes ... Cloth ... Sugar ... Khali for cattle	8 0 0 4 0 0 10 0 0 15 0 0 2 0 0 3 0 0	...	275 7 7	...	ROHTAK Marriage expenses, purchase of cattle and used in dry seasons.
			Total ...	14 8 2	...	42 0 0	218 4 11	275 7 7		
2	Do. ...	Mir Khan and Mussallam Rájput of Kánhour.	Village menials Hired labor...	5 0 9 4 0 0	Oil, salt and spice Tobacco ... Shoes ... Cloth ... Sugar ... Khali for cattle	7 0 0 2 0 0 10 0 0 10 0 0 2 0 0 3 0 0	179 7 7	136 8 1	...	Marriage expenses, purchase of cattle and used in dry seasons.
			Total ...	9 0 9	...	34 0 0	179 7 7	136 8 1		
3	Do. ...	Dhunu Khun and Himmat Khan Rájput of Kánhour.	Village menials Hired labor ...	14 4 6 4 0 0	Oil, salt and spice Tobacco ... Shoes ... Cloth ... Sugar ... Khali ...	5 0 0 3 0 0 9 0 0 8 0 0 2 0 0 3 0 0	161 7 6	...	...	Ditto
			Total ...	18 4 6	...	30 0 0	161 7 6	68 14 11		
4	Do. ...	Mussallam Khan and 2 other Rájputs of Kánhour.	Village menials Hired labor ...	14 0 0 4 0 0	Oil, salt and spice Tobacco ... Shoes ... Cloth ... Sugar ... Food for cattle	7 0 0 3 0 0 10 0 0 15 0 0 2 8 0 3 0 0	199 9 3	...	...	Ditto
			Total ...	18 0 0	...	40 8 0	199 9 3	263 0 3		
5	Do. ...	Maula Baksh and Ibrahim Rájput of Kánhour.	Village menials Hired labor...	5 6 2 6 0 0	Oil, salt, spices, &c. Tobacco ... Shoes ... Cloth ... Sugar ... Food for cattle	3 0 0 1 0 0 3 0 0 5 0 0 1 8 0 3 0 0	76 14 9	...	...	Ditto
			Total ...	11 6 2	...	16 8 0	76 14 9	46 15 10		
6	Do. ...	Boli Baksh Rájput of Morachi, Sangran.	Village menials Hired labor...	8 5 5 6 0 0	Oil, salt and spice Tobacco ... Shoes ... Cloth ... Sugar ... Food for cattle	4 0 0 2 0 0 2 0 0 9 0 0 3 0 0 6 0 0	139 14 1	...	...	Ditto
			Total ...	14 5 5	...	26 0 0	139 14 1	71 14 2		
7	Do. ...	Ghulám Basál Rájput of Do.	Village menials Hired labor...	7 6 0 7 0 0	Oil, salt and spice Tobacco ... Shoes ... Cloth ... Sugar ... Food for cattle	6 0 0 2 0 0 4 0 0 10 0 0 5 0 0 6 0 0	148 9 11	...	...	Ditto
			Total ...	14 6 0	...	33 0 0	148 9 11	47 8 0		

V. DESCRIPTION OF RESIDENCE, CATTLE AND CHATTELS.						VI. DEBTS.			REMARKS.
Number of rooms in house.		Cattle.		Chattele, stock of grain and cash.		How incurred.	Amount.	Percentage of debt on total income.	
Used as dwelling rooms.	Used for sheltering cattle.	Detail.	No.	Detail.	Value rupees.				
DISTRICT.						Rs.	A.	P.	
4	3	Cows ...	3	Cash ...	200 0 0	...	...	...
		Oxen ...	3	Grain ...	100 0 0				
		Milch buffalo ...	1	Chattele ...	195 0 0				
		Calves of do. ...	1						
		Calves ...	4						
4	3	...	11	...	495 0 0	...	..	...
6	1	Cow ...	1	Grain ...	40 0 0	...	...	...
		Oxen ...	2	Jewels ...	100 0 0				
		Milch buffalo ...	1	Chattele ...	80 0 0				
6	1	...	4	...	220 0 0	...	...	...
9	8	Cows ...	2	Jewels ...	50 0 0	...	...	...
		Oxen ...	2	Chattele ...	40 0 0				
		Calves ...	6						
9	8	...	10	...	90 0 0	...	...	...
7	2	Cows ...	4	Jewels ...	70 0 0	...	...	...
		Oxen ...	2	Chattele ...	50 0 0				
		Calves ...	7						
		Buffalo calves ...	1						
		Horse ...	1						
7	2	...	15	...	120 0 0	...	...	...
5		Cow ...	1	Jewels ...	80 0 0	...	...	...
		Oxen ...	2	Chattele ...	25 0 0				
		Calf ...	1						
5		...	4	...	55 0 0	...	..	...
8	2	Cow ...	1	Jewels ...	80 0 0	Revenue pur- chased cattle and corn.	150 0 0	70	
		Oxen ...	4	Chattele ...	20 0 0				
		Milch buffalo ...	1						
8	2	...	6	...	50 0 0	...	150 0 0	70	
4	2	Cow ...	1	Jewels ...	40 0 0	Revenue and purchase of cattle.	60 0 0	30	
		Oxen ...	4	Chattele ...	23 0 0				
		Milch buffalo ...	1						
		Calves ...	3						
4	2	...	9	...	62 0 0	...	60 0 0	30	

I.

Typical instances of the economic condition of the

Number of case.	I. FAMILY AND THEIR HOLDING.							II. INCOME.					
	Status.	Name of head of family, caste and residence.	No. of persons comprising the family.				Area of holding in acres.				One year's produce of the land.		
			Adults.			Total.	Home cultivated.	Cultivated.	Uncultivated.	Total.	Kind of produce.	Amount in maunda.	Value
			Male.	Female.	Children.									M. S. C.	Rs. A. P.
8	Owner ...	Wazir Khan, &c. Rajput of Moradhi Ranghran.	8	8	8	24	Home cultivation.	77	...	77	Jowar, bajra, wheat.	918 0 0	267 1 9
						Total,	...	77	...	77	...	918 0 0	267 1 9
9	Do. ...	Amán Rajput of Do.	3	5	5	13	Home cultivation.	49	1	50	Bajra, jowar, wheat.	232 20 0	226 8 7
						Total,	...	49	1	50	...	232 20 0	226 8 7
10	Do. ...	Bhura Jat of Madina.	3	3	...	6	Home cultivation.	19	2	21	Jowar, bajra, wheat.	132 26 0	114 5 8
						Total,	...	19	2	21	...	132 26 0	114 5 8
11	Do. ...	Malik Ram Jat of Do.	1	1	3	5	Home cultivation.	24	...	24	Jowar, gram bajra, &c., Cotton.	270 24 0 12 0 0	237 10 4 82 0 0
						Total,	...	24	...	24	...	282 24 0	269 10 4
12	Do. ...	Ratan Singh and Mohan Jat of ditto.	2	2	2	6	Home cultivation.	39	...	39	Jowar, bajra, gram, gawar, Cotton ...	207 0 0 21 0 0	178 0 0 56 0 0
						Total,	...	39	...	39	...	228 0 0	234 0 0
13	Do. ...	Chet Ram and Shadi Jat of Do.	3	2	3	8	Home cultivation.	49	5	54	Jowar, bajra, gram and gawar. Cotton ...	294 20 0 6 0 0	255 0 0 16 0 0
						Total,	...	49	5	54	...	300 20 0	271 0 0
14	Do. ...	Hans Ram Jat of Dhaldhan.	6	2	1	9	Home cultivation.	22	1	23	Gram, bajra, jowar.	141 1 4	122 2 6
						Total,	...	22	1	23	...	141 1 4	122 2 6

Agricultural population of the Punjab.—ROHTAK DISTRICT.

INCOME.—Concluded.				III. EXPENDITURE.				
Other miscellaneous sources of income.			Total income from all sources.	Revenue, cesses and seigniorage charges and (in the case of tenants) rent.		By grain consumed as food and used as seed or otherwise expended.		
Detail.	Amount.	Value.	Amount in Rupees.	Detail.	Amount.	Detail.	Maunds.	Value.
		Rs. A. P.	Rs. A. P.		Rs. A. P.		M. S. C.	Rs. A. P.
DISTRICT.								
Sale of cattle.	...	45 0 0	377 10 9	Revenue	31 11 9	Grain	239 4 0	
Ghi	...	50 0 0		Cesses	3 14 4			
Pachotra	...	15 9 0						
...	...	110 9 0	377 10 9	...	35 10 0	...	239 4 0	208 10 7
Sale of cattle.	...	30 0 0	268 8 7	Revenue	20 6 8	Grain	134 10 0	117 9 6
Ghi	...	12 0 0		Cesses	2 8 6			
...	...	42 0 0		...	22 15 2	...	134 10 0	117 9 6
Sale of cattle.	...	20 0 0	188 5 8	Revenue	8 3 2	Grain	61 26 8	53 2 8
Ghi	...	24 0 0		Cesses	0 11 0			
Carrying hire,	...	80 0 0		...	8 14 2	...	61 26 8	53 2 8
...	...	74 0 0	188 5 8	...	8 14 2	...	61 26 8	53 2 8
Sale of cattle.	...	15 0 0	322 10 4	Revenue	4 0 0	Grain and	52 17 0	46 14 10
Ghi	...	18 0 0		Cesses	0 5 6	cotton.		
Carrying hire,	...	20 0 0		...	4 5 6	...	52 17 0	46 14 10
...	...	53 0 0	322 10 4	...	4 5 6	...	52 17 0	46 14 10
Sale of cattle	...	40 0 0	319 0 0	Revenue	12 6 11	Grain	66 23 8	59 4 9
Ghi	...	45 0 0		Cesses	1 12 4			
...	...	85 0 0		...	14 8 5	...	66 23 8	59 4 9
Sale of cattle,	...	80 0 0	321 0 0	Revenue	19 5 4	Grain	85 30 0	74 3 11
Ghi	...	20 0 0		Cesses	1 2 1			
...	...	50 0 0		...	20 7 5	...	85 30 0	74 3 11
Sale of cattle,	...	15 0 0	399 2 6	Revenue	11 7 9	Grain	86 16 0	74 13 4
Pay	...	250 0 0		Cesses	1 11 1			
Ghi	...	13 0 0		...	13 2 10	...	86 16 0	74 13 4
...	...	277 0 0	399 2 6	...	13 2 10	...	86 16 0	74 13 4

Typical instances of the economic condition of the

Number of case.	Status.	Name of head of family, cast and residence.	EXPENDITURE.—Concluded.					IV. SURPLUS.		
			Customary charges of village menials and hired labor of all sorts.		By purchase of necessaries which the family cannot produce on their own land or by their own labor.			Total expenditure.	Surplus of income over expenditure.	Surplus income usually how disposed of.
			Detail.	Amount.	Detail.	Amount.	Rs. A. P.			
8	Owner ..	Wazir Khan, &c. Rajput of Moradhi Ranghrán.	Village menials Hired labor...	13 5 9 5 0 0	Oil, salt and spice Tobacco ... Shoes ... Cloth ... Sugar ... Food for cattle	10 0 0 3 0 0 10 0 0 30 0 0 7 0 0 8 0 0	Rs. A. P. 352 10 5	Rs. A. P. 52 0 4	ROHTAK Marriage expenses, purchase of cattle and used in dry seasons.	
			Total ...	18 5 9	...	68 0 0				
9	Do. ...	Amán Rajput of Do.	Village menials Hired labor...	11 5 0 5 0 0	Oil, salt and spice Tobacco ... Shoes ... Cloth ... Sugar ... Food for cattle	7 0 0 3 0 0 4 0 0 15 0 0 4 0 0 4 0 0	Rs. A. P. 193 13 8	Rs. A. P. 74 5 11	Ditto	
			Total ...	16 5 0	...	37 0 0	193 13 8	74 5 11		
10	Do. ...	Budra Ját of Madina.	Village menials	5 11 1	Oil, salt, &c. ... Tobacco ... Shoes ... Sugar ... Food for cattle	3 0 0 2 0 0 3 0 0 1 0 0 5 0 0	Rs. A. P. 79 11 11		Ditto	
			Total ...	5 11 1	...	12 0 0	79 11 11	108 9 9		
11	Do. ...	Malik Rám Ját of Do.	Village menials	13 7 7	Oil, salt, &c. ... Tobacco ... Shoes ... Sugar ... Food for cattle	2 0 0 1 0 0 1 0 0 1 0 0 3 0 0	Rs. A. P. 72 11 11		Ditto	
			Total ...	13 7 7	...	8 0 0	72 11 11	249 14 5		
12	Do. ...	Ratan Singh and Mohan Ját of Do.	Hired labor .. Village menials	58 11 1 8 9 7	Oil, salt, &c. ... Tobacco ... Shoes ... Sugar ... Food for cattle	3 0 0 2 0 0 2 0 0 2 0 0 3 0 0	Rs. A. P. 152 12 8		Ditto	
			Total ...	67 4 8	...	12 0 0	152 12 8	166 3 4		
13	Do. ...	Chet Ram and Shádí Ját of Do.	Village menials	11 7 1	Oil, salt, &c. ... Tobacco ... Shoes ... Sugar ... Food for cattle	3 0 0 2 0 0 4 0 0 2 0 0 4 0 0	Rs. A. P. 121 2 5		Ditto	
			Total ...	11 7 1	...	15 0 0	121 2 5	199 13 7		
14	Do. ...	Hans Rám Ját of Dabaluhán	Village menials	10 6 4	Oil, salt &c. ... Tobacco ... Shoes ... Cloth ... Sugar ... Food for cattle	7 0 0 5 0 0 7 0 0 5 0 0 10 0 0 3 0 0	Rs. A. P. 135 6 0		Ditto	
			Total ...	10 6 4	...	47 0 0	135 6 0	263 12 0		

V. DESCRIPTION OF RESIDENCE, CATTLE AND CHATTELS.						VI. DEBTS.			REMARKS.
Number of rooms in house.		Cattle.		Chattele, stock of grain and pash.		How incurred.	Amount.	Percentage debt on total income.	
Used as dwelling rooms.	Used for sheltering cattle.	Detail.	Amount.	Detail.	Value rupees.				
DISTRICT.					Ra. A. P.	Dist.	Ra. A. P.		
13	5	Cows ... Oxen ... Milch buffaloes ... Calves ...	5 3 2 5	Jewels ... Chattele ...	70 0 0 40 0 0	Dist.	100 0 0	26	
16	5	...	20	...	110 0 0	...	100 0 0	26	
3	1	Cows ... Oxen ... Calves ...	2 4 2	Jewellery ... Chattele ...	20 0 0 20 0 0	Dist.	88 0 0	33	
3	1	...	8	...	40 0 0	...	88 0 0	33	
2		Cows ... Oxen ... Milch buffalo ... Calves ...	2 2 1 2	Jewels ... Chattele ...	112 0 0 55 0 0	...	...	...
2		...	7	...	167 0 0	...	...	...
2	1 Enclo- sure.	Cow ... Oxen ... Milch buffalo ... Calves ...	1 2 1 2	Jewels ... Chattele ...	50 0 0 80 0 0	...	...	...
2	1	...	6	...	80 0 0	...	...	...
4	3	Cows ... Oxen ... Milch buffalo ... Calves ...	4 2 1 12	Jewels ... Chattele ...	60 0 0 40 0 0	...	...	...
4	3	...	19	...	100 0 0	...	...	...
4	2	Cow ... Oxen ... Milch buffalo ... Calves ...	1 4 2 3	Jewels ... Chattele ...	120 0 0 80 0 0	...	...	...
4	2	...	10	...	200 0 0	...	...	...
8	3	Cows ... Oxen ... Calves ...	2 2 2	Jewels ... Chattele ...	100 0 0 40 0 0	Marriage and purchase of horses.	500 0 0	125	
8	3	...	6	...	140 0 0	...	500 0 0	125	

Typical instances of the economic condition of the

Number of case.	I. FAMILY AND THEIR HOLDING.								II. INCOME.								
	Status.	Name of head of family, caste and residence.	No. of persons comprising the family.				Area of holding in acres.				One year's produce of the land.						
			Adults.		Children.	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.	Kind of produce.	Amount in maunds.		Value.			
			Male.	Female.								M. S. C.	Rs. A. P.				
15	Owner ...	Udmi Rám Ját of Dobaldhán.	3	4	2	9	Home cultivation.	60	...	60	Jowár, bájra, gram, gawar, moth.	358	0	0	303	8	11
						Total	...	60	...	60	...	358	0	0	303	8	11
16	Do. ...	Mohar Singh, Ját of Do.	5	6	7	18	Home cultivation.	28	...	28	Jowár, bájra, gram.	220	39	0	194	5	11
						Total	...	28	...	28	...	220	39	0	194	5	11
17	Do. ...	Nand Karan Ját of Do.	3	2	...	5	Home cultivation.	17	...	17	Jowár, bájra, gram.	106	27	0	93	14	11
						Total	...	17	...	17	...	106	27	0	93	14	11
18	Do. ...	Mukh Rám Ját of Dobaldhán.	10	10	10	30	Home cultivation.	37	...	37	Jowár, gram, bájra, gawar, moth.	253	13	0	219	5	6
						Total	...	37	...	37	...	253	13	0	219	5	6
19	Occupancy tenant.	Meda Ját of Totoli.	3	2	4	9	Home cultivation.	30	...	30	Cotton ... Jowár, bájra,	33	0	0	88	0	0
						Total	...	30	...	30	...	110	12	0	90	6	0
20	Do. ...	Rerú Khatí of Do.	1	2	...	3	Home cultivation.	6	...	6	Cotton ... Jowár ...	3	0	0	8	0	0
						Total	...	6	...	6	...	25	5	0	20	1	6
21	Do. ...	Jamna Malí of Do.	4	4	2	10	Home cultivation.	14	...	14	Bájra and jowár.	80	30	0	67	6	10
						Total	...	14	...	14	...	80	30	0	67	6	10

Agricultural population of the Punjab—ROHTAK DISTRICT.

INCOME.—Concluded.				III. EXPENDITURE.				
Other miscellaneous sources of income.			Total income from all sources.	Revenue, cesses and seignorage charges and (in the case of tenants) rent.		By grain consumed as food and used as seed or otherwise expended.		
Detail.	Amount.	Value.	Amount in rupees.	Detail.	Amount.	Detail.	Measure.	Value.
		Rs. A. P.	Rs. A. P.		Rs. A. P.		M. S. C.	Rs. A. P.
DISTRICT:								
Sale of cattle,	20 0 0	366 8 11	Revenue ...	43 14 9	Grain ...	97 39 0	84 0 5
Ghi	12 0 0		Cesses ...	1 7 2			
Fuel	10 0 0						
Pachotra	21 0 0						
...	...	63 0 0	366 8 11	...	45 5 11	...	97 39 0	84 0 5
Sale of cattle,	20 0 0	258 5 11	Revenue ...	20 0 5	Grain ...	174 25 8	153 9 1
Ghi	18 0 0		Cesses ...	0 0 9			
Fuel	4 0 0						
Pachotra	22 0 0						
...	...	64 0 0	258 5 11	...	20 1 2	...	174 25 8	153 9 1
Sale of cattle,	15 0 0	165 14 11	Revenue ...	18 3 1	Grain ...	50 17 12	43 10 0
Ghi	12 0 0		Cesses ...	0 12 2			
Fuel	5 0 0						
Pachotra	40 0 0						
...	...	72 0 0	165 14 11	...	18 15 3	...	50 17 12	43 10 0
Sale of cattle,	35 0 0	430 9 6	Revenue ...	26 13 10	Grain ...	284 12 0	248 1 11
Pay	35 0 0		Cesses ...	0 12 1			
Ghi	18 0 0						
Pachotra	32 4 0						
Carrying hire,	30 0 0						
...	...	211 4 0	430 9 6	...	27 9 11	...	284 12 0	248 1 11
Sale of ghi	18 0 0	196 6 0	Revenue ...	24 2 0	Grain ...	87 9 0	71 7 5
				Cesses and seignorage charges.	2 15 10	Cotton ...	1 26 0	4 6 5
...	...	18 0 0	196 6 0	...	27 1 10	...	88 35 0	75 13 10
Ghi	6 0 0	40 5 6	Revenue ...	4 2 6	Grain ...	27 37 0	23 5 4
Wages for labor,	6 4 0		Cesses and seignorage charges.	0 8 1	Cotton ...	0 6 0	0 6 5
...	...	12 4 0	40 5 6	...	4 10 7	...	28 3 0	23 11 9
Ghi	6 0 0	73 6 10	Revenue ...	10 1 10	Grain ...	92 1 4	73 12 10
				Cesses and seignorage charges.	1 9 0			
...	...	6 0 0	73 6 10	...	11 10 10	...	92 1 4	73 12 10

Typical instances of the economic condition of the

Number of case.	Status.	Name of head of family, caste and residence.	EXPENDITURE.—Concluded.						IV. SURPLUS.	
			<i>Customary charges of village menials and hired labor of all sorts.</i>		<i>By purchase of necessities which the family cannot produce on their own land or by their own labor.</i>		Total expenditure.	Surplus of income over expenditure.	Surplus income usually how disposed of.	
			Detail.	Amount.	Detail.	Amount.				
			Rs. A. P.		Rs. A. P.		Rs. A. P.	Rs. A. P.		
15	Owner ...	Udmi Rám Ját of Madina.	Village menials	15 2 7	Oil, salt &c. ... Tobacco ... Shoes ... Cloth ... Sugar ... Rice ... Food for cattle	6 0 0 4 0 0 5 0 0 15 0 0 10 0 0 6 0 0 6 0 0	196 8 11	169 11 0	Marriage expenses, purchase of cattle and used in dry seasons.	
			Total ...	15 2 7	...	52 0 0	196 8 11	169 11 0		
16	Do. ...	Mohar Singh, Ját of Do.	Village menials	10 2 7	Oil, salt &c. ... Tobacco ... Shoes ... Cloth ... Sugar ... Rice ... Food for cattle	8 0 0 4 0 0 8 0 0 15 0 0 12 0 0 7 0 0 6 0 0	243 12 10	14 9 1	Ditto	
			Total ...	10 2 7	...	60 0 0	243 12 10	14 9 1		
17	Do. ...	Nan' Karan Ját of Do.	Village menials	4 10 3	Oil, salt &c. ... Tobacco ... Shoes ... Cloth ... Sugar ... Rice ... Food for cattle	6 0 0 3 0 0 3 0 0 10 0 0 8 0 0 5 0 0 3 0 0	99 8 6	66 11 5	Ditto	
			Total ...	4 10 3	...	37 0 0	99 8 6	66 11 5		
18	Do. ...	Mukh Rám Ját of Dubaldháu.	Village menials	10 15 7	Oil, salt &c. ... Tobacco ... Shoes ... Cloth ... Sugar ... Rice ... Food for cattle	13 0 0 7 0 0 15 0 0 20 0 0 15 0 0 8 0 0 6 0 0	370 11 5	59 14 1	Purchase of cattle, marriage expenses and used in dry seasons.	
			Total ...	10 15 7	...	84 0 0	370 11 5	59 14 1		
19	Occupancy tenant.	Meds Ját of Totoh.	Village menials	2 14 2	Oil, salt &c. ... Tobacco ... Shoes ... Sugar ... Rice ... Food for cattle	4 0 0 3 0 0 3 0 0 2 0 0 1 8 0 3 0 0	122 5 10	74 0 2	Marriage expenses and used in dry seasons and purchase of cattle.	
			Total ...	2 14 2	...	16 8 0	122 5 10	74 0 2		
20	Do. ...	Rerá Khati of Do.	Village menials	0 12 10	Oil, salt &c. ... Tobacco ... Shoes ... Food for cattle	2 0 0 1 8 0 1 8 0 1 8 0	34 11 2	5 10 4	Ditto	
			Total ...	0 12 10	...	6 8 0	34 11 2	5 10 4		
21	Do. ...	Jamna Mali of Do.	Village menials	3 12 0	Oil, salt ... Tobacco ... Shoes ... Food for cattle	4 0 0 1 0 0 4 0 0 3 0 0	101 3 8	...	Ditto	
			Total ...	3 12 0	...	12 0 0	101 3 8	...		

Agricultural population of the Punjab.—ROHTAK DISTRICT.—Continued.

V. DESCRIPTION OF RESIDENCE, CATTLE AND CHATTELS.					VI. DEBTS.			REMARKS.	
Number of rooms in house.		Cattle.		Chattele, stock of grain and cash.		How incurred.	Amount.		Percentage of debt on total income.
Used as dwelling rooms.	Used for shed ering cattle.	Detail.	Amount.	Detail.	Value rupees.				
DISTRICT.					Rs. A. P.				
13	3	Cow ... Oxen ... Milch buffalo ... Calves ...	2 4 ... 3	Jewels ... Chattele ...	153 0 0 105 12 0				
14	3	...	9	...	253 12 0				
15	6	Cow ... Oxen ... Milch buffalo ... Calves ...	1 5 1 3	Grain ... Jewels ... Chattele ...	41 15 10 280 0 0 125 0 0				
15	6	...	10	...	446 15 10				
8	3	Oxen ... Milch buffalo ... Calves ...	2 1 1	Jewels ... Chattele ...	125 0 0 94 0 0				
8	3	...	4	...	220 0 0				
6	2	Cow ... Oxen ... Milch buffalo ... Calves ... Horse ...	1 4 1 9 1	Jewels ... Chattele ...	250 0 0 180 0 0				
6	2	...	16	...	380 0 0				
2	1	Cow ... Oxen ... Milch buffalo ... Calves ...	1 2 1 2	Jewels ... Chattele ...	20 0 0 18 0 0				
2	1	...	6	...	88 0 0				
3	...	Cow ... Ox ... Calf ...	1 1 1	Jewels ... Chattele ...	7 0 0 8 0 0	Revenue, fodder and dist.	50 0 0	125	
8	...	...	3	...	15 0 0	...	50 0 0	125
2	1	Cow ... Oxen ...	1 2	Jewels ... Chattele ...	15 0 0 27 0 0	Dist.	20 0 0	27	
2	1	...	3	...	42 0 0	...	20 0 0	27	

Typical instances of the economic condition of the

Number of case.	I. FAMILY AND THEIR HOLDING.								II. INCOME.				
	Status.	Name of head of family, caste and residence.	No. of persons comprising the family.				Area of holding in acres.				One year's produce of the land.		
			Male.	Female.	Children.	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.	Kind of produce.	Amount in maunds.	Value.
22	Occupancy tenant.	Kháslí Rám Ját of Totoli.	1	1	2	4	Home cultivation.	5	...	5	Bájra and jowár.	M. S. C.	Rs. A. P.
						Total	...	5	...	5	...	31 8 0	25 12 2
23	Do. ...	Jemalla Shékh of Do. ...	2	2	1	5	Home cultivation.	14	...	14	Bájra, jowár	80 24 0	65 13 0
						Total	...	14	...	14	...	80 24 0	65 13 0
24	Do. ...	Gama and 2 others Dogar of Kotana.	4	3	4	11	Home cultivation.	29	3	32	Bájra, jowár, gram.	235 20 0	205 13 6
						Total	...	29	3	32	...	235 20 0	205 13 6
25	Do. ...	Bakshau Kahár of Do.	1	1	1	3	Home cultivation.	16	1	17	Bájra, jowár, gram.	188 11 0	102 7 0
						Total	...	16	1	17	...	188 11 0	102 7 0
26	Do. ...	Jeya Rám Abeer of Do.	3	1	1	5	Home cultivation.	15	...	15	Bájra, jowár, gram.	97 17 8	84 4 2
						Total	...	15	...	15	...	97 17 8	84 4 2
27	Do. ...	Jama Kahár of Do.	2	2	2	6	Home cultivation.	9	...	9	Bájra, jowár, gram.	75 36 0	66 2 2
						Total	...	9	...	9	...	75 36 0	66 2 2
28	Do. ...	Udmí Rám and Pat Rám Ját of Do.	2	2	2	6	Home cultivation.	16	17	33	Bájra, jowár, gram.	114 16 8	99 0 2
						Total	...	16	17	33	...	114 16 8	99 0 2
29	Do. ...	Maluka and Sheo Nath Ját of Kanahí	2	2	4	8	Home cultivation.	17	5	22	Bájra, jowár gram. Cotton	92 22 0	79 1 2
						Total	...	17	5	22	...	101 22 0	103 1 2

Agricultural population of the Punjab.—ROHTAK DISTRICT.

INCOME.—Concluded.				III. EXPENDITURE.				
Other miscellaneous sources of income.			Total income from all sources.	Revenue, cesses and seignorage charges and (in the case of tenants) rent.		By grain consumed as food and used as seed or otherwise expended.		
Detail.	Amount.	Value.	Amount in rupees.	Detail.	Amount.	Detail.	Masuda.	Value.
		Rs. A. P.	Rs. A. P.		Rs. A. P.		M. S. C.	Rs. A. P.
DISTRICT								
Ghi	13 0 0	...	Revenue ... Cesses and seignorage charges.	4 4 0 0 8 7	Grain ...	36 33 0	30 3 11
...	...	13 0 0	38 12 2	...	4 12 7	...	36 33 0	30 8 11
...	Revenue ... Cesses and seignorage charges.	10 13 4 1 0 3	Grain ...	47 8 0	37 13 11
...	65 13 0	...	11 13 7	...	47 8 0	37 13 11
Sale of cattle	...	20 0 0	...	Revenue ... Cesses and seignorage charges.	17 4 11 38 14 4	Grain ...	100 11 0	95 8 2
...	...	20 0 0	226 13 6	...	56 3 3	...	100 11 0	95 8 2
Pay	24 0 0	...	Revenue ... Cesses and seignorage charges.	9 14 0 16 6 9	Grain ...	31 4 0	27 12 11
...	...	24 0 0	126 7 0	...	26 4 9	...	31 4 0	27 12 11
Ghi	14 0 0	...	Revenue ... Cesses and seignorage charges.	9 2 0 15 2 0	Grain ...	49 3 0	42 6 6
...	...	14 0 0	98 4 2	...	24 4 0	...	49 3 0	42 6 6
Pay	36 0 0	...	Revenue ... Cesses and seignorage charges.	5 1 0 9 13 0	Grain ...	57 13 0	49 15 2
...	...	36 0 0	102 2 2	...	14 14 0	...	57 13 0	49 15 2
Ghi	11 0 0	...	Revenue ... Cesses and seignorage charges.	10 2 6 24 13 6	Grain ...	59 35 0	51 0 0
...	...	11 0 0	110 0 2	...	35 0 0	...	59 35 0	51 0 0
Ghi	15 0 0	...	Revenue ... Cesses and seignorage charges.	45 9 10 2 12 6	Grain ... Cotton ...	76 13 0 0 13 0	65 3 7 1 3 2
...	...	15 0 0	118 1 2	...	48 6 4	...	76 31 0	65 6 9

Typical instances of the economic condition of the

Number of case.	Status.	Name of head of family, caste and residence.	EXPENDITURE.—Concluded.					IV. SURPLUS.	
			Customary charges of village menials and hired labor of all sorts.		By purchase of necessaries which the family cannot produce on their own land or by their own labor.		Total expenditure.	Surplus of income over expenditure.	Surplus income usually how disposed of.
			Detail.	Amount.	Detail.	Amount.			
				R. A. P.		R. A. P.	R. A. P.	R. A. P.	
22	Occupancy tenant.	Khushi Rám Jat of Totahi.	Village menials	1 1 2	Oil, salt &c. ... Shoes ... Sugar ... Rice ... Food for cattle	2 0 0 1 0 0 1 0 0 1 0 0 3 0 0	44 1 8	...	...
			Total ...	1 1 2	...	8 0 0	44 1 8	...	
23	Do. ...	Jemalla Shékh of Do.	Village menials	3 4 7	Oil, salt ... Shoes ... Food for cattle	1 8 0 2 0 0 3 0 0	59 8 1	...	Daily expenses
			Total ...	3 4 7	...	6 8 0	59 8 1	6 4 11	
24	Do. ...	Gama and 2 others Dogar of Kotana.	Village menials	10 4 8	Oil, salt ... Shoes ... Sugar ... Food for cattle	3 0 0 3 0 0 2 0 0 3 0 0	173 0 1	...	Marriage expenses, purchase of cattle and corn and payment of debts.
			Total ...	10 4 8	...	11 0 0	173 0 1	52 13 5	
25	Do. ...	Bakshau Kahar of Do.	Village menials	5 2 1	Oil, salt &c. ... Shoes ... Food for cattle	1 0 0 1 0 0 3 0 0	64 3 9	...	Used in dry seasons.
			Total ...	5 2 1	...	5 0 0	64 3 9	62 3 3	
26	Do. ...	Jeya Rám Aheer of D.	Village menials	4 3 7	Oil, salt &c. ... Shoes ... Food for cattle	1 8 0 2 0 0 3 0 0	77 6 1	...	Ditto
			Total ...	4 3 7	...	6 8 0	77 6 1	20 14 1	
27	Do. ...	Jama Kahar of Do.	Village menials	3 5 0	Oil, salt ... Shoes ... Food for cattle	2 0 0 1 0 0 3 0 0	74 2 2	...	Ditto
			Total ...	3 5 0	...	6 0 0	74 2 2	28 0 0	
28	Do. ...	Udmí and Pat Rám Jat of Do.	Village menials	4 15 3	Oil, salt &c. ... Shoes ... Sugar ... Rice ... Food for cattle	3 0 0 1 8 0 2 0 0 2 0 0 3 0 0	102 7 3	...	Ditto
			Total ...	4 15 3	...	11 8 0	102 7 3	7 8 11	
29	Do. ...	Maluka and Shoe Nath Jat of Kanahli	Village menials	3 15 3	Oil, salt &c. ... Tobacco ... Shoes ... Sugar ... Rice ... Food for cattle	4 0 0 5 0 0 1 8 0 4 0 0 1 0 0 3 0 0	135 4 4	...	Ditto
			Total ...	3 15 3	...	16 8 0	135 4 4	...	

Agricultural population of the Punjab.—ROHTAK DISTRICT.—continued.

V. DESCRIPTION OF RESIDENCE, CATTLE AND CHATELS.						VI. DEBTS.			REMARKS.
Number of rooms in house.		Cattle.		Chattels, stock of grain and cash.		How incurred.	Amount.	Percentage of debt on total income.	
Used as dwelling rooms.	Used for sheltering cattle.	Detail.	No.	Detail.	Value rupees.				
DISTRICT.									
1	1	Oxen	2	Jewels	20 0 0				
	Shed.	Milch buffalo	1	Chattels	14 0 0				
1	1	...	3	...	34 0 0				
1	1	Oxen	3	Jewels	6 8 0	Revenue dist.	14 0 0	21	
	Shed.	Chattels	10 0 0				
1	1	...	2	...	16 8 0		14 0 0	21	
4	1 room 1 shed	Oxen	2	Jewels	80 0 0	Purchase of cattle and dict.	200 0 0	89	
		Calves	4	Chattels	86 0 0				
4	2	...	6	...	66 0 0		200 0 0	89	
1	...	Oxen	2	Jewels	10 0 0	Purchase of cattle mari- age, &c.	215 0 0	170	
		Chattels	9 0 0				
1	...	...	2	...	19 0 0		215 0 0	170	
1	1	Oxen	2	Jewels	10 0 0	Revenue and dict.	150 0 0	153	
	Shed.	Milch buffalo	1	Chattels	15 0 0				
1	1	...	3	...	25 0 0		150 0 0	153	
2	1	Oxen	2	Jewels	10 0 0	Cere- ny and dict.	200 0 0	196	
	Shed.	Chattels	14 0 0				
2	1	...	2	...	24 0 0		200 0 0	196	
4	1	Oxen	2	Grain	40 8 0				
	Shed.	Milch buffalo	1	Cash	15 0 0				
		Calves	2	Jewels	50 0 0				
		...	...	Chattels	86 0 0				
4	1	...	5	...	140 8 0				
3	1	Cows	2	Grain	8 0 0				
		Oxen	2	Jewels	60 0 0				
		Calves	3	Chattels	40 0 0				
3	1	...	7	...	108 0 0				

I.

Typical instances of the economic condition of the

Number of case.	I. FAMILY AND THEIR HOLDING.								II. INCOME.					
	Status.	Name of head of family, caste and residence.	No. of persons comprising the family.				Area of holding in acres.				One year's produce of the land.			
			Adults.			Total.	How cultivated.	Cultivated.	Uncultivated.	Total.	Kind of produce.	Amount in maunds.		Value.
			Male.	Female.	Children.							M.	S.		C.	Rs.	A.	P.
30	Occupancy Tenant.	Rámjas and 3 others Ját of Kanahli.	4	2	2	8	Home cultivation.	20	...	20	Jowár, bájra, gram. Cotton ...	118 21 8 6 0 0	101 5 10 16 0 0	
					Total	...	20	...	20	...	124 21 0	117 5 10		
31	Do. ...	Sálig Lohár of Sunari Kalán.	4	4	Home cultivation.	16	...	16	Cotton ... Jowár and gram.	4 29 0 105 0 0	12 10 2 89 5 8	
					Total	...	16	...	16	...	109 29 0	101 15 10		
32	Do. ...	Rám Dial Lohár of Do.	5	3	1	9	Home cultivation.	14	...	14	Jowár and gram.	101 0 0	86 13 0	
					Total	...	14	...	14	...	101 0 0	86 13 0		
33	Do. ...	Khubf and Rám Jas Brahmin of Makhrolí Kalán.	2	3	5	10	Home cultivation.	14	...	14	Cotton ... Jowár, bájra, gram.	5 10 0 59 36 0	14 9 9 59 13 1	
					Total	...	14	...	14	...	55 6 0	74 6 10		
34	Tenant at will.	Sukhi Rám Ját of Jindrán.	4	5	9	18	Home cultivation.	133	...	136	Cotton ... Jowár, bájra, gram.	21 0 0 650 0 0	56 0 0 608 12 5	
					Total	...	133	...	136	...	671 0 0	664 12 5		
35	Do. ...	Rám Sahai Ját of Do.	1	1	5	7	Home cultivation.	39	6	45	Jowár, bájra, and másh, wheat.	231 25 0	202 1 6	
					Total	...	39	6	45	...	231 25 0	202 1 6		
36	Do. ...	Majla Ját of Do.	6	4	2	12	Home cultivation.	61	1	62	Cotton ... Jowár bájra, gram.	4 5 0 399 37 0	11 0 0 349 1 9	
					Total	...	61	1	62	...	404 2 0	360 1 9		
37	Do. ...	Rám Singh Ját of Do.	3	5	4	12	Home cultivation.	43	7	50	Cotton ... Jowár bájra, másh and gram.	3 30 0 280 0 0	10 0 0 250 0 0	
					Total	...	43	7	50	...	283 30 0	260 0 0		

Agricultural population, of the Punjab.—ROHTAK DISTRICT.

C

INCOME.—Concluded.				III. EXPENDITURE.				
Other miscellaneous sources of income.			Total income from all sources.	Revenue, cesses and seignorage charges and (in the case of tenants) rent.		By grain consumed as food and used as seed or otherwise expended.		
Detail.	Amount.	Value.	Amount in Rupees.	Detail.	Amount.	Detail.	Masuda.	Value.
	Rs. A. P.	Rs. A. P.	Rs. A. P.		Rs. A. P.		M. S. C.	Rs. A. P.
DISTRICT.								
Ghi	...	14 0 0	...	Revenue ... Cesses and seignorage charges.	13 6 0 0 13 7	Grain ... Cotton ...	77 29 0 0 12 0	66 7 2 12 10
...	...	14 0 0	131 5 10	...	14 8 7	...	78 1 0	67 4 0
Wages for labor	20 0 0	20 0 0	...	Revenue ... Cesses and seignorage charges.	10 10 4 1 8 2	Grain ... Cotton ...	41 18 0 0 9 0	35 4 3 0 9 7
...	20 0 0	20 0 0	121 15 10	...	12 0 6	...	41 27 0	35 13 10
Wages for labor	20 0 0	20 0 0	...	Revenue ... Cesses and seignorage charges.	9 7 4 1 2 8	Grain ...	86 20 0	74 5 7
...	20 0 0	20 0 0	106 19 0	...	10 10 0	...	86 20 0	74 5 7
...	...	...	...	Revenue ... Cesses and seignorage charges.	9 0 8 1 1 7	Grain ... Cotton ...	98 8 0 0 12 0	86 6 6 0 13 4
...	...	...	74 6 10	...	10 2 3	...	98 15 0	87 3 10
Sale of cattle	...	40 0 0	...	Revenue ... Cesses and seignorage charges.	54 11 0 84 14 6	Grain ...	154 31 0	140 6 6
Ghi	...	448 0 0	...	...	139 9 6	...	154 13 0	140 6 6
...	...	88 0 0	762 12 5	...	17 14 0 35 9 0	Grain ...	67 34 0	59 3 4
Sale of cattle	...	15 0 0	...	Revenue ... Cesses and seignorage charges.	58 7 0	...	67 34 0	59 3 4
...	...	15 0 0	217 1 6	...	24 13 7 51 10 5	Grain ...	140 19 0	122 14 8
Sale of cattle	...	85 0 0	...	Revenue ... Cesses and seignorage charges.	76 8 0	...	140 19 0	122 14 8
Ghi	...	30 0 0	...	...	19 13 0 39 8 6	Grain ...	105 27 0	94 15 6
...	...	65 0 0	425 1 9	...	59 5 6	...	105 27 0	94 15 6
Sale of cattle	...	35 0 0	...	Revenue ... Cesses and seignorage charges.	...	...	...	...
Ghi	...	24 0 0	...	...	...	...	...	...
...	...	59 0 0	819 0 0	...	...	...	...	...

Typical instances of the economic condition of the

Number of case.	Status.	Name of head of family, caste and residence.	EXPENDITURE.—Concluded.					IV. SURPLUS.		
			Customary charges of village menials and hired labor of all sorts.		By purchase of necessaries which the family cannot produce on their own land or by their own labor.		Total expenditure.	Surplus of income over expenditure.	Surplus income usually how disposed of.	
			Detail.	Amount.	Detail.	Amount.				
				Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.		
30	Occupancy Tenant.	Rámjas and 3 others Ját of Kanahli.	Village menials	5 0 10	Oil, salt &c. ... Tobacco ... Shoes ... Sugar ... Food for cattle	4 0 0 4 0 0 4 0 0 2 0 0 8 0 0	103 8 5	...	ROHTAK	Marriage expenses, and purchase of cattle and used in dry seasons.
			Total ...	5 0 10	...	17 0 0	103 8 5	27 13 5		
31	Do. ...	Sálig Lohár of Sunari Kalán.	Village menials	3 9 2	Oil, salt &c. ... Shoes ... Food for cattle	2 0 0 2 0 0 3 0 0	58 7 6	...	Ditto	and payment of debts.
			Total ...	3 9 2	...	7 0 0	58 7 6	63 8 6		
32	Do. ...	Rám Dial Lohár of Do.	Village menials	2 13 9	Oil salt &c. ... Shoes ... Food for cattle	3 0 0 2 8 0 3 0 0	96 5 4	...	...	...
			Total ...	2 13 9	...	8 8 0	96 5 4	10 7 8		
33	Do. ...	Khúbi and Rám Jas Brahmin of Makhori Kalan	Village menials	2 10 3	Oil salt &c. ... Shoes ... Food for cattle	4 0 0 2 0 0 3 0 0	109 0 4	...	...	...
			Total ...	2 10 3	...	9 0 0	109 0 4	...		
34	Tenant at will.	Sukhí Rám Ját of Jíndran.	Village menials Hired labour,	33 3 9 13 0 0	Oil salt &c. ... Tobacco ... Shoes ... Sugar ... Rice ... Food for cattle	8 0 0 3 0 0 15 0 0 8 0 0 2 0 0 6 0 0	368 3 9	...	Purchase of cattle and interest on former debts.	
			Total ...	46 3 9	...	42 0 0	368 3 9	384 8 8		
35	Do. ...	Rám Sahai Ját of Do.	Village menials	9 12 7	Oil salt &c. ... Tobacco ... Shoes ... Sugar ... Rice ... Food for cattle	5 8 0 2 0 0 4 0 0 3 0 0 1 0 0 3 0 0	140 14 11	...	Marriage expenses.	
			Total ...	9 12 7	...	18 8 0	140 14 11	76 2 7		
36	Do. ...	Majla Ját of Do.	Village menials	17 7 2	Oil salt &c. ... Tobacco ... Shoes ... Sugar ... Rice ... Food for cattle	8 0 0 3 0 0 10 0 0 8 0 0 4 0 0 4 0 0	255 13 10	...	Ditto	
			Total ...	17 7 2	...	39 0 0	255 13 10	169 3 11		
37	Do. ...	Rám Singh Ját of Do.	Village menials	13 0 0	Oil salt &c. ... Tobacco ... Shoes ... Sugar ... Rice ... Food for cattle	7 0 0 1 0 0 7 0 0 7 8 0 2 0 0 6 0 0	197 13 0	...	Ditto	
			Total ...	13 0 0	...	30 8 0	197 13 0	121 3 0		

Agricultural population of the Punjab.—ROHTAK DISTRICT.—continued.

V. DESCRIPTION OF RESIDENCE, CATTLE AND CHATTELS.						VI. DEBTS.			REMARKS.
Number of rooms in house.		Cattle.		Chatteles, stock of grain and cash.		How incurred.	Amount.	Percentage of debt on total income.	
Used as dwellings room.	Used for sheltering cattle.	Detail.	No.	Detail.	Value rupees.				
DISTRICT				Rs. A. P.		Rs. A. P.			
2	1	Cows ...	2	Jewels ...	80 0 0	...	...	...
		Oxen ...	2	Chatteles ...	22 0 0	...	...	...
		Calves ...	2						
2	1	...	6	...	52 0 0	...	...	...
1	...	Oxen ...	2	Chatteles ...	9 0 0	Revenue and diet.	50 0 0	41	
1	...	...	2	...	9 0 0	...	50 0 0	41	
2	...	Oxen ...	2	Jewels ...	20 0 0	...	...	...
		...	...	Chatteles ...	16 0 0	...	...	...
2	...	...	2	...	86 0 0	...	...	...
1	...	Oxen ...	2	Jewels ...	10 0 0	...	...	...
		Buffalo calves ...	2	Chatteles ...	7 0 0	...	...	...
1	...	...	4	...	17 0 0	...	...	...
6	1	Cows ...	4	Jewels ...	180 0 0	Drought.	700 0 0	98	
		Oxen ...	6	Chatteles ...	40 0 0	...	...	...
		Milch buffaloes ...	2						
		Calves ...	5						
		Horse ...	1						
6	1	...	18	...	170 0 0	...	700 0 0	98	
3	1	Oxen ...	2	Jewels ...	10 0 0	Cattle and former debt.	240 0 0	110	
		Calves ...	3	Chatteles ...	14 0 0	...	...	...
3	1	...	5	...	24 0 0	...	240 0 0	110	
6	2	Cows ...	3	Jewels ...	15 0 0	Former debt purchased with and dist.	800 0 0	70	
		Oxen ...	4	Chatteles ...	22 8 0	...	...	...
		Milch buffalo ...	1						
		Calves ...	6						
6	2	...	14	...	37 8 0	...	800 0 0	70	
6	1	Cows ...	2	Jewels ...	15 0 0	Do.	400 0 0	125	
		Oxen ...	4	Chatteles ...	20 0 0	...	...	...
		Milch buffaloes ...	2						
		Calves ...	9						
6	1	...	17	...	35 0 0	...	400 0 0	125	

Typical instances of the economic condition of the

Number of case.	I. FAMILY AND THEIR HOLDING.								II. INCOME.				
	Status.	Name of head of family, caste and residence.	No. of persons comprising the family.				Area of holding in acres.				One year's produce of the land.		
			Adults.			Total.	Home cultivated.	Cultivated.	Uncultivated.	Total.	Kind of produce.	Amount in maunds.	Value.
			Male.	Female.	Children.								
38	Tenant at will.	Mohan Lal, Ját of Gudhán.	6	5	4	15	Home cultivation.	56	1	57	Jowár, másh, bájra, gram.	M. S. C. 347 14½ 0	Rs. A. P. 303 4 4
					Total	...		56	1	57	...	347 14½ 0	303 4 4
39	Do. ...	Hira Singh, Ját of Do.	1	1	2	4	Home cultivation.	15	...	15	Jowár, bájra, gram.	95 29 0	82 3 8
					Total	...		15	...	15	...	95 29 0	82 3 8
40	Do. ...	Sheo Nath, Ját of Do.	3	3	6	12	Home cultivation.	79	1	80	Jowár, bájra, gram.	482 17 0	416 7 4
					Total	...		79	1	80	...	482 17 0	416 7 4
41	Do. ...	Amar Singh, Ját of Do.	2	1	...	3	Home cultivation.	34	6	40	Jowár, másh, bájra, gram.	205 29½ 0	178 6 1
					Total	...		34	6	40	...	205 29½ 0	178 6 1
42	Do. ...	Indraj, Ját of Do.	1	1	1	3	Home cultivation.	39	3	42	Jowár, bájra, gram.	309 39 0	272 13 11
					Total	...		39	3	42	...	309 39 0	272 13 11
43	Do. ...	Hans Rám, Ját of Sunárf Khurd.	4	5	4	13	Home cultivation.	12	...	12	Gram and jowár.	36 0 0	29 13 10
					Total	...		12	...	12	...	36 0 0	29 13 10
44	Do. ...	Nanga, Ahír of Do.	2	3	3	8	Home cultivation.	12	...	12	Jowár, bájra, gram.	55 0 0	47 8 11
					Total	...		12	...	12	...	55 0 0	47 8 11

INCOME.—concluded.				III. EXPENDITURE.				
Other miscellaneous sources of income.			Total income from all sources.	Revenue, cesses and signorage charges and (in the case of tenants) rent.		By grain consumed as food and used as seed or otherwise expended.		
Detail.	Amount.	Value.	Amount in Rupees.	Detail.	Amount.	Detail.	Mands.	Value.
		Rs. A. P.	Rs. A. P.		Rs. A. P.		M. S. C.	Rs. A. P.
DISTRICT.								
Sale of cattle	...	30 0 0	357 4 4	Revenue ...	22 14 6	Grain ...	158 29 0	134 2 11
Ghi	24 0 0		Cesses and signorage charges.	15 12 0			
...	...	54 0 0	357 4 4	...	38 10 6	...	158 29 0	134 2 11
Sale of cattle	...	10 0 0	92 3 3	Revenue ...	6 3 0	Grain ...	50 2½ 0	42 15 8
...	...	10 0 0		Cesses and signorage charges.	8 10 0			
...	...	10 0 0	92 3 3	...	14 13 0	...	50 2½ 0	42 15 8
Sale of cattle	...	30 0 0	470 7 4	Revenue ...	32 3 3	Grain ...	132 11½ 0	114 6 8
Ghi	24 0 0		Cesses and signorage charges.	36 10 0			
...	...	54 0 0	470 7 4	...	67 13 3	...	132 11½ 0	114 6 8
Sale of cattle	...	25 0 0	227 6 1	Revenue ...	16 2 3	Grain ...	39 8½ 0	34 0 2
Ghi	24 0 0		Cesses and signorage charges.	24 0 0			
...	...	49 0 0	227 6 1	...	40 2 3	...	39 8½ 0	34 0 2
Pension	64 0 0	356 13 11	Revenue ...	16 10 6	Grain ...	56 32½ 0	41 3 11
...	...	84 0 0		Cesses and signorage charges.	3 10 0			
...	...	84 0 0	356 13 11	...	25 4 6	...	56 32½ 0	41 3 11
Cattle	20 0 0	49 13 10	Revenue ...	7 13 1	Grain ...	120 10½ 0	96 15 10
...	...	20 0 0		Cesses and signorage charges.	1 0 4			
...	...	20 0 0	49 13 10	...	8 13 5	...	120 10½ 0	96 15 10
Sale of cattle	...	50 0 0	97 8 11	Revenue ...	7 7 3	Grain ...	74 17½ 0	64 5 6
...	...	50 0 0		Cesses and signorage charges.	0 15 7			
...	...	50 0 0	97 8 11	...	8 6 10	...	74 17½ 0	64 5 6

Typical instances of the economic condition of the

Number of case.	Status.	Name of head of family, caste and residence.	EXPENDITURE,—concluded.					IV. SURPLUS.		
			Customary charges of village menials and hired labor of all sorts.		By purchase of necessaries which the family cannot produce on their own land or by their own labor.			Total expenditure.	Surplus of income over expenditure.	Surplus income usually how disposed of.
			Detail.	Amount.	Detail.	Amount.	Rs. A. P.			
38	Tenant at will	Mohan Lal, Jat of Gudhán.	Villagemenials	15 2 4	Oil, salt &c. ... Tobacco ... Shoes ... Sugar ... Rice ... Food for cattle ...	8 0 0 8 0 0 8 0 0 8 0 0 4 0 0 6 0 0	224 15 9	...	ROHTAK	Marriage expenses.
			Total ...	15 2 4	...	37 0 0	224 15 9	182 4 7		
39	Do. ...	Hira Singh, Jat of Do.	Villagemenials	4 1 7	Oil, salt &c. ... Tobacco ... Shoes ... Sugar ... Rice ... Food for cattle ...	3 8 0 1 0 0 2 0 0 2 0 0 2 0 0 3 0 0	75 6 8	...	Ditto	
			Total ...	4 1 7	...	13 8 0	75 6 8	16 13 0		
40	Do. ...	Sheo Nath, Jat of Do.	Villagemenials	20 13 0	Oil, salt &c. ... Tobacco ... Shoes ... Sugar ... Rice ... Food for cattle ...	10 8 0 3 0 0 6 0 0 7 0 0 3 0 0 6 0 0	38 8 11	...	Ditto	
			Total ...	20 13 0	...	35 8 0	38 8 11	231 14 5		
41	Do. ...	Amar Singh, Jat of Do.	Villagemenials	9 14 7	Oil, salt &c. ... Tobacco ... Shoes ... Sugar ... Rice ... Food for cattle ...	4 8 0 2 0 0 1 0 0 4 0 0 2 0 0 3 0 0	100 9 0	...	Ditto	
			Total ...	9 14 7	...	16 8 0	100 9 0	126 13 1		
42	Do. ...	Indráj, Jat of Do.	Villagemenials	13 10 4	Oil, salt &c. ... Shoes ... Cloth ... Sugar ... Rice ... Food for cattle ...	5 0 0 2 0 0 12 0 0 2 8 0 5 0 0 3 0 0	109 9 9	...	Ditto	
			Total ...	13 10 4	...	29 8 0	109 9 9	247 4 2		
43	Do. ...	Hans Ram, Jat of Banáfi Khurd.	Villagemenials	1 8 0	Oil, salt &c. ... Tobacco ... Shoes ... Cloth ... Sugar ... Rice ... Food for cattle ...	6 0 0 2 0 0 8 0 0 7 0 0 6 0 0 2 0 0 3 0 0	141 5 3	...	Ditto	
			Total ...	1 8 0	...	34 0 0	141 5 3	...		
44	Do. ...	Nanga, Ahir of Do.	Villagemenials	2 6 0	Oil, salt &c. ... Tobacco ... Shoes ... Cloth ... Sugar ... Rice ... Food for cattle ...	6 0 0 2 0 0 3 0 0 2 0 0 5 0 0 2 0 0 3 0 0	98 2 4	...	Ditto	
			Total ...	2 6 0	...	23 0 0	98 2 4	...		

V. DESCRIPTION OF RESIDENCE, CATTLE AND CHATTELS.						VI. DEBTS.			REMARKS.
Number of rooms in house.		Cattle.		Chattele, stock of grain and cash.		How incurred.	Amount.	Percentage of debt on total income.	
Used as dwelling rooms.	Used for sheltering cattle.	Detail.	No.	Detail.	Value rupees.				
DISTRICT.									
6	3	Cows ... Oxen ... Milch buffalo ... Calves ...	3 4 1 4	Jewels ... Chattele ...	50 0 0 50 0 0	Farmer debt purchase of oxen and diet.	300 0 0	84	
6	3	...	11	...	100 0 0	...	300 0 0	84	
3	...	Oxen ... Milch buffalo ...	2 1	Jewels ... Chattele ...	16 0 0 14 0 0	Farmer debt and diet.	150 0 0	163	
3	...	...	3	...	80 0 0	...	150 0 0	168	
3	3	Oxen ... Cows ... Milch buffalo ... Calves ...	4 2 1 4	Jewels ... Chattele ...	50 0 0 40 0 0	Do.	200 0 0	42	
3	3	...	11	...	90 0 0	...	200 0 0	42	
2	2	Cows ... Oxen ... Milch buffalo ... Calf ...	2 2 1 1	Jewels ... Chattele ...	20 0 0 20 0 0	...	...	...
2	2	...	6	...	40 0 0	...	...	...
5	...	Cow ... Oxen ... Calves ...	1 2 6	Grain ... Jewels ... Chattele ...	22 8 6 50 0 0 35 0 0	Purchase of cattle and diet.	60 0 0	16	
5	...	...	9	...	107 8 8	...	60 0 0	16	
3	...	Oxen ...	2	Jewels ... Chattele ...	100 0 0 37 0 0	Farmer debt and diet.	400 0 0	816	
3	...	...	2	...	137 0 0	...	400 0 0	816	
2	1 Shed.	Cows ... Oxen ... Calves ...	2 2 4	Jewels ... Chattele ...	36 0 0 32 0 0	...	...	...
2	1	...	3	...	68 0 0	...	...	...

I.

Typical instances of the economic condition of the

Number of case.	I. FAMILY AND THEIR HOLDING.							II. INCOME.					
	Status.	Name of head of family, caste and residence.	No. of persons comprising the family.				Area of holding in acres.				One year's produce of the land.		
			Adults.			Total.	How cultivated.	Cultivated.	Uncultivated.	Total.	Kind of produce.	Amount in maunds.	Value
			Male.	Female.	Children.								
45	Tenant at will.	Sheo Lal, Ját of Sunári Khurd.	1	1	1	3	Home cultivation.	7	...	7	Jowár, bájra, gram.	M. S. C.	Rs. A. P.
						Total.	...	7	...	7	...	24 20 0	26 10 8
46	Do. ...	Khayáli, Ját of Do.	4	4	2	10	Home cultivation.	9	...	9	Jowár, bájra, gram.	62 0 0	54 0 9
						Total.	...	9	...	9	...	62 0 0	54 0 9
47	Do. ...	Rup Rám, Jhamar of Bohar.	8	3	6	11	Home cultivation.	9	...	9	Cotton ... Jowár, bájra, and chari. Fodder ...	4 0 0 20 85 0 ...	12 13 5 17 8 6 4 0 0
						Total.	...	9	...	9	...	24 85 0	84 0 11
48	Do. ...	Udmi, Jhamar of Do.	5	3	2	10	Home cultivation.	5	...	5	Jowár, bájra, Todder ...	22 18 0 ...	18 13 7 3 0 0
						Total.	...	5	...	5	...	22 18 0	21 13 7
49	Do. ...	Kahar, Jhamar of Do.	2	2	4	8	Home cultivation.	5	...	5	Jowár, bájra, Todder ...	24 0 0 ...	19 13 10 4 0 0
						Total.	...	5	...	5	...	24 0 0	23 13 10
50	Do. ...	Jai Kishen, Bairagi of Kanahb.	3	2	1	6	Home cultivation.	13	...	13	Cotton ... Bájra, jowár, gram.	8 0 0 75 0 0	7 12 0 83 7 5
						Total.	...	13	...	13	...	78 0 0	71 3 5
51	Do. ...	Kirpa and Udmi, Barbers of Do.	2	1	...	8	Home cultivation.	9	...	9	Jowár, bájra, gram.	51 21 0	44 3 3
						Total.	...	9	...	9	...	51 21 0	44 3 3
52	Do. ...	Lál Púri, Gushain of Do.	7	2	8	17	Home cultivation.	49	...	49	Cotton ... Jowár, bájra, gram. Fodder ...	9 0 0 232 18 0 ...	24 0 0 238 8 2 50 0 0
						Total.	...	49	...	49	...	241 18 0	362 8 2
53	Do. ...	Juna, Bájpát of Do.	3	1	4	8	Home cultivation.	17	...	17	Jowár, bájra, gram.	102 10 0	84 14 0
						Total.	...	17	...	17	...	102 10 0	84 14 0

INCOME.—concluded.				III. EXPENDITURE.				
Other miscellaneous sources of income.			Total income from all sources.	Revenue, cesses and signorage charges and (in the case of tenants) rent.		By grain consumed as food and used as seed or otherwise expended.		
Detail.	Amount.	Value.	Amount in rupees.	Detail.	Amount.	Detail.	Maunds.	Value.
		Rs. A. P.	Rs. A. P.		Rs. A. P.		M. S. C.	Rs. A. P.
DISTRICT.								
Sale of cattle,	...	12 0 0	38 10 8	Revenue ...	4 6 2	Grain ...	29 4½ 0	24 15 10
				Cesses and signorage charges.	0 2 2			
...		12 0 0	38 10 8	...	4 15 4	...	29 4½ 0	24 15 10
Sale of cattle,	...	25 0 0	79 0 9	Revenue ...	5 9 1	Grain ...	93 0 0	81 1 1
				Cesses and signorage charges.	0 11 8			
...		25 0 0	79 0 9	...	6 4 9	...	93 0 0	81 1 1
Sale of hides,	...	4 0 0	58 4 4	Revenue ...	8 5 9	Grain ...	102 16½ 0	82 12 0
Sale of shoes,	...	15 0 0		Cesses and signorage charges.	0 7 1			
Wages for labor,	...	8 11 5		...	8 12 10	...	102 16½ 0	82 12 0
Menial's dues,	...	1 8 0		...		...
...		24 3 5	58 4 4	...	8 12 10	...	102 16½ 0	82 12 0
Sale of shoes,	...	15 0 0	49 9 1	Revenue ...	5 1 7	Grain ...	90 30½ 0	76 8 4
Wages for labor,	...	8 11 6		Cesses and signorage charges.	0 4 10			
Menial's dues,	...	1 0 0		...	5 6 5	...	90 30½ 0	76 8 4
Sale of hides,	...	8 0 0		...		...
...		27 11 6	49 9 1	...	5 6 5	...	90 30½ 0	76 8 4
Sale of hides,	...	5 0 0	49 11 1	Revenue ...	5 5 2	Grain ...	72 32½ 0	60 4 8
Sale of shoes,	...	15 0 0		Cesses	0 5 0			
Wages for labor,	...	8 18 3		...	5 10 2	...	72 32½ 0	60 4 8
Menial's dues,	...	2 0 0		...		...
...		25 13 3	49 11 1	...	5 10 2	...	72 32½ 0	60 4 8
Sale of cattle,	...	35 0 0	106 3 5	Revenue ...	8 14 8	Grain ...	57 25 0	49 0 1
				Cesses and signorage charges.	0 9 0			
...		35 0 0	106 3 5	...	9 7 8	...	57 25 0	49 0 1
Marriage dues,	...	20 0 0	64 8 8	Revenue ...	6 0 1	Grain ...	29 7½ 0	25 0 7
				Cesses and signorage charges.	0 5 9			
...		20 0 0	64 8 8	...	6 5 10	...	29 7½ 0	25 0 7
Sale of cattle,	...	42 0 0	404 8 2	Revenue ...	48 4 2	Grain ...	170 20½ 0	148 15 8
				Cesses and signorage charges.	3 12 1			
...		42 0 0	404 8 2	...	46 0 8	...	170 20½ 0	148 15 8
...			84 14 0	Revenue ...	11 6 6	Grain ...	76 27½ 0	65 11 3
				Cesses and signorage charges.	0 11 7			
...			84 14 0	...	13 2 1	...	76 27½ 0	65 11 3

Typical instances of the economic condition of the

Number of case.	Status.	Name of head of family, caste and residence.	EXPENDITURE.—concluded.					IV. SURPLUS.	
			Customary charges of village menials and hired labor of all sorts.		By purchase of necessaries which the family cannot produce on their own land or by their own land.		Total expenditure.	Surplus of income over expenditure.	Surplus income usually how disposed of.
			Detail.	Amount.	Detail.	Amount.			
			Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.		
45	Tenant at will.	Sheo Lal, Ját of Sunári Khurd.	Village menials	1 5 4	Oil, salt &c. ... Shoes ... Cloth ... Sugar ... Food for cattle ...	0 8 0 2 0 0 1 0 0 1 0 0 8 0 0	38 12 6	...	ROHTAK In ordinary dist.
			Total ...	1 5 4	...	7 8 0	38 12 6	...	...
46	Do. ...	Khayáhi, Ját of Do.	Village menials	2 11 2	Oil, salt ... Shoes ... Cloth ... Sugar ... Food for cattle ...	3 0 0 4 0 0 4 0 0 2 0 0 3 0 0	108 1 0	...	...
			Total ...	2 11 2	...	18 0 0	108 1 0	...	...
47	Do. ...	Rup Rám, Jhamar of Bohar.	Village menials	1 3 8	Oil, salt &c. ... Tobacco ... Sugar ... Food for cattle ...	1 12 0 0 3 0 1 8 0 1 8 0	98 0 1	..	...
			Total ...	1 3 8	...	5 4 0	98 0 1	...	...
48	Do. ...	Udmí, Jhamar of Do.	Hired labor ... Village menials	3 0 0 0 12 2	Oil, salt ... Tobacco ... Sugar ... Food for cattle ...	2 6 0 2 0 0 2 0 0 1 8 0	98 3 11	...	...
			Total ...	3 12 2	...	7 14 0	98 3 11	...	...
49	Do. ...	Kahar, Jhamar of Do.	Hired labor ... Village menials	3 0 0 2 12 9	Oil, salt &c. ... Tobacco ... Sugar ... Food for cattle ...	1 10 0 1 0 0 1 0 0 1 8 0	76 13 7	...	...
			Total ...	5 12 9	...	5 3 0	76 13 7	...	...
50	Do. ...	Jai Kishen, Bairagi of Kanahh.	Village menials	3 8 10	Oil, salt &c. ... Tobacco ... Shoes ... Sugar ... Food for cattle ...	6 0 0 4 0 0 5 0 0 2 0 0 5 0 0	82 0 2	24 3 3	...
			Total ...	3 8 10	...	20 0 0	82 0 2	24 3 3	...
51	Do. ...	Kirpe and Udmí, Barbers of Do.	Village menials	2 3 5	Oil, salt &c. ... Shoes ... Tobacco ... Sugar ... Food for cattle ...	3 0 0 2 0 0 2 0 0 1 0 0 3 0 0	44 9 10	19 9 5	...
			Total ...	2 3 5	...	11 0 0	44 9 10	19 9 5	...
52	Do. ...	Lál Puri, Gashain of Do.	Village menials	15 10 0	Oil, salt &c. ... Shoes ... Sugar ... Food for cattle ...	2 0 0 3 0 0 2 0 0 3 0 0	220 9 11	183 14 3	...
			Total ...	15 10 0	...	10 0 0	220 9 11	183 14 3	...
53	Do. ...	Jíuna, Rájput of Do.	Village menials	4 3 9	Oil, salt ... Shoes ... Sugar ... Food for cattle ...	5 0 0 3 0 0 1 0 0 3 0 0	92 1 1	...	...
			Total ...	4 3 9	...	12 0 0	92 1 1	...	...

V. DESCRIPTION OF RESIDENCE, CATTLE AND CHATTELS						VI. DEBTS.			REMARKS.						
Number of rooms in house.		Cattle.		Chattels, stock of grain and cash.		How incurred.	Amount.	Percentage of debt on total income.							
Used as dwelling rooms.	Used for sheltering cattle.	Detail.	No.	Detail.	Value rupees.										
DISTRICT	2	Shed.	1	Oxen	...	2	Chattels	...	Rs. A. P.	13 0 0	Former debt, revenue and diet.	Rs. A. P.	105 0 0	276	
	2		1	...	...	2	...	...	Rs. A. P.	13 0 0	...	Rs. A. P.	105 0 0	276	
	3	Shed.	1	Cow	...	1	Jewels	...	Rs. A. P.	40 0 0	Revenue and diet.	Rs. A. P.	87 0 0	110	
				Oxen	...	2	Chattels	...	Rs. A. P.	12 0 0	...	...	...	...
				Calf	...	1	...	...	Rs. A. P.	...	...	...	...	...
	3		1	...	...	4	...	...	Rs. A. P.	62 0 0	...	Rs. A. P.	87 0 0	110	
	3			Ox	...	1	Chattels	...	Rs. A. P.	10 0 0	Former debt and diet.	Rs. A. P.	90 0 0	155	
	3			...	...	1	...	...	Rs. A. P.	10 0 0	...	Rs. A. P.	90 0 0	155	
	4			Cows	...	2	Chattels	...	Rs. A. P.	10 0 0	Revenue and diet.	Rs. A. P.	70 0 0	143	
				Ox	...	1	...	...	Rs. A. P.	...	...	...	...	...
	4			...	...	3	...	...	Rs. A. P.	10 0 0	...	Rs. A. P.	70 0 0	143	
	2	Shed.	1	Cows	...	2	Chattels	...	Rs. A. P.	10 0 0	Revenue and diet.	Rs. A. P.	40 0 0	81	
				Ox	...	1	...	...	Rs. A. P.	...	...	...	...	...
	2		1	...	...	3	...	...	Rs. A. P.	10 0 0	...	Rs. A. P.	40 0 0	81	
	2			Cows	...	3	Grain	...	Rs. A. P.	22 3 6	...	...	...	...
				Oxen	...	2	Jewels	...	Rs. A. P.	15 0 0	...	...	...	...
				Calves	...	7	Chattels	...	Rs. A. P.	35 0 0	...	...	...	...
	2			...	...	12	...	...	Rs. A. P.	72 8 6	...	...	...	...
	2			Cows	...	1	Chattels	...	Rs. A. P.	7 0 0	...	...	...	...
				Oxen	...	2	...	...	Rs. A. P.	...	...	...	...	...
				Calf	...	1	...	...	Rs. A. P.	...	...	...	...	...
	2			...	...	4	...	...	Rs. A. P.	7 0 0	...	...	...	...
	1			Cows	...	3	Jewels	...	Rs. A. P.	10 0 0	...	...	...	...
				Oxen	...	2	Chattels	...	Rs. A. P.	24 0 0	...	...	...	...
				Calf	...	1	...	...	Rs. A. P.	...	...	...	...	...
	1			...	...	6	...	...	Rs. A. P.	34 0 0	...	...	...	...
	3			Cows	...	2	Jewels	...	Rs. A. P.	7 0 0	...	...	...	...
				Oxen	...	2	Chattels	...	Rs. A. P.	8 0 0	...	...	...	...
				Calf	...	1	...	...	Rs. A. P.	...	...	...	...	...
	3			...	...	5	...	...	Rs. A. P.	15 0 0	...	...	...	...

CHAPTER I, QUESTION 9.

Reply by Mr. A. W. Stoggon, Deputy Commissioner, Hissar.

I have the honor to submit in the prescribed form, 30 typical instances of agriculturists taken from various villages in this district.

2. I have been officiating as Deputy Commissioner of the District for the last 2½ months only. I have never been into camp in it, and I am therefore hardly in a position to be able to give a valuable account of the economic condition of the portion of the agricultural population directly engaged in the cultivation of land. I could give my opinion in general terms regarding the economic condition of the people in one or two other districts with which I am better acquainted than I am with this District, but I could not illustrate it by typical instances as required, and, as far as I understand, the Famine Commission require facts rather than theories.

3. The Gazetteer of the District contains some information on the subject. On page 72 it is stated that, "It is estimated that the ordinary household expenditure of a peasant family in easy circumstances averages from Rs. 8 to Rs. 10 per month; and again, that in Chak Bāgar it would require a holding of 60 acres, or in the Hariāna and Nali Chaks, a holding of 30 acres, to bring in a net income of Rs. 8 to a present proprietor." It is stated that a man can support life for Rs. 2 per month, or in cheap times even for Re. 1.

4. The greater portion of the District is entirely dependent on the rain-fall for the production of crops. It is unfortunately often very scanty and partial, and in such seasons the agricultural population undoubtedly suffer great hardship. They have become so accustomed to them that they are much better able to endure privations and a state of semi-starvation than agriculturists who occupy fertile lands which are usually watered with an abundant rain-fall.

5. The description on pages 7 and 8 of the Gazetteer of the spontaneous vegetable products of the District affords some food for reflection on the miserable state of many of the people. On page 7 it is stated that, "The commonest shrubs in brushwood which cover so great a portion of the District are the "jāl" and the "kair." The fruit of these shrubs, called respectively "pīlu" and "tendu" berries, plays an important part in the diet of the common people. In times of scarcity the "pīlu" berry is said to constitute the principal food of the poorer classes, who camp out day and night in the "jangals" while the season lasts. The "kair" bush from which the "tendu" berry is produced is said to be twice covered with berries in seasons of drought, which is not the case in ordinary years, and the people look upon it as a special provision of Providence for the succour of the poor. Were it not for these berries and for some wild herbs, the poorest classes and even the Zamīndārs would be unable to exist in seasons of scarcity, which are unfortunately only too frequent. I am informed that they often get nothing else to eat for days together.

6. Bājra is the staple food of the people. In ordinary seasons it can be purchased at a cheap rate, and there is probably enough for all. They desire nothing better, and do not care for wheat, which is less satisfying than "bājra." The District is thinly populated, and owing to this fact and also to the fact that it is far from any railway, the selling rate of "bājra," "jowār" and "channa" is generally lower than in most of the other Punjab Districts. Camels and bullocks are bred in large numbers, and it is to them that the people owe what little wealth they may possess. They cannot be said to be prosperous, and, judging from a high state of civilization, they may be said to be in a wretched condition; but they have never known a better, and I believe they are at least as happy and contented as their brethren in more favoured districts, who are occasionally able to provide themselves with luxuries, and who consequently are much more dismayed and discontented in seasons of want and famine.

Typical instances of the economic condition of the agricultural population of the Hissar District, selected as fair representatives of the majority of each main class (owners,

Number of case.	Status.	Name of head of family, caste and residence.	I.—FAMILY AND THEIR HOLDING.							
			Number of persons comprising the family.				Area of holding in acres.			
			Adults.		Children.	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.
			Male.	Female.						
1	Owner ...	Dahnir, caste Ját Muhammadan, resident of Kabir, Tahsil Hissar.	3	3	...	6	Cultivates his own land.	Acres. 16	...	Acres. 16
2	Owner ...	Mushták, caste Rághar, resident of Burak, Tahsil Hissar.	3	4	5	12	Ditto ...	118	...	118
3	Owner ...	Rámji, caste Veshno, resident of Kajal Heri, Tahsil Fatahabád.	3	2	4	9	Ditto ...	26	...	26
4	Owner ...	Mána, caste Gujar, resident of Manawáli, Tahsil Fatahabád.	2	3	4	9	Self cultivation.	38	13	51
							By lease ...	37	...	37
							Total ...	75	13	88
5	Owner ...	Karim, caste Pathán, resident of Tosham, Tahsil Bhiwáni.	3	3	2	8	Cultivates his own lands.	89	...	89
6	Owner ...	Harji, caste Rajput, resident of Miran, Tahsil, Bhiwáni.	4	5	4	13	Ditto ...	52	...	52
7	Owner ...	Bakar, caste Pachadá, resident of Akanwáli, Tahsil Barwala.	5	4	6	15	Ditto ...	38	...	38
8	Owner ...	Musalim, caste Sayad, resident of Barwala.	9	16	8	33	Self cultivator.	100	...	100
9	Owner ...	Magni, caste Ját, resident of Guálin, Tahsil Hánsi.	6	4	2	12	Self cultivator.	82	20	102

District, being a description of the actual circumstances of several families in the Hissar (occupancy tenants and tenants-at-will) of the agricultural population.

II.—INCOME.					III.—EXPENDITURE.												
One year's produce of the land.			Other miscellaneous sources of income.		Total income from all sources.	Revenue, cesses and storage charges, and (in the case of tenants) rent.		By grain consumed as food and seed as seed or otherwise expended.									
Kind of produce.	Amount in mounds.		Detail.	Value.	Amount in rupees.	Detail.	Amount.	Detail.	Maunds.	Value.							
	Mds.	Bs.									Bs.	Ra.	Bs.	Ra.			
Bájra	40	50	Joint share of miscellaneous income.	25	112	Land revenue.	15	Food grain	52	65							
Wheat	15	37				Miscellaneous revenue.	8										
Total	55	87				Water rent	4	Total	22								
Bájra	380	475	Joint share of miscellaneous income. Mukaddmi remuneration.	9	514	Land cess	44	Bájra	120								
				30		Miscellaneous cesses.	7	Seed grain	7								
			Total	39		Total	51	Total	127	168							
Bájra	60	60	Ghi	30	179	Land and Miscellaneous cesses.	6	Food grain	98	88							
Jowár	20	16	Sale of cattle.	34					Seed do.	6	8						
Moth	12	10							Fodder	190	21						
Guar	13	6							Total	289	112						
Karbi and Bhusa.	190	21	Total	64													
Total	294	115															
Bájra	100	100	Ghi	10	207	Land and Miscellaneous cesses.	11	Food grain	98	98							
Jowár	20	16	Sugar	22					Seed do.	8	12						
Moth	20	16							Fodder	275	31						
Guar	18	12	Total	32					Total	381	138						
Fodder	275	31															
Total	438	175															
Bájra	49	65	Ghi	30	162	Land cess	18	Jowár	1	1							
Moth	12	12						Miscellaneous cesses.	4	Gram	19	25					
Jowár	20	28									Bájra	85	47				
Gram	24	32									Moth	19	19				
			Total	30							Total	74	92				
Total	105	132															
Bájra	48	64	Ghi	40	157	Land cess	10	Bájra	80	66							
Moth	19	19	Sale of cattle.	10				Miscellaneous cesses.	2	Moth	42	42					
Guar	10	8	Joint share of miscellaneous income	16							Guar	15	12				
			Total	66							Total	107	120				
Total	77	91															
Bájra	70	70	Ghi	15	161	Land and Miscellaneous cesses.	18	Food grain	86	86							
Jowár	20	16							Seed grain	10	10						
Barley	80	50	Total	15					Total	96	96						
Total	150	136															
Bájra	150	160	Ghi	20	300	Land and Miscellaneous joint income.	69	Food grain	175	175							
Bajhar	100	80	Miscellaneous joint income.	50					Seed grain	25	25						
			Total	70					Total	200	200						
Total	250	280															
Cotton	28	112	Sale of cattle.	50	1,004	Land cess	54	Food grain	168	225							
Dhan	60	90	Ghi	25				Miscellaneous cess.	13	Seed grain	25	50					
Bájra	515	578	Miscellaneous joint income.	6						Canal cess	22	Fodder	1,800	310			
Bhusa	540	100										Chaukidári Tax.	1				
Karbi	62	43															
			Total	81											Total	90	1,988	585
Total	1,205	923															

Typical instances of the economic condition of the agricultural

Number of case.	Status.	Name of head of family, caste and residence.	III.—EXPENDITURE—concluded.					IV.—SURPLUS.		
			Customary charges of village menials and hired labor of all sorts.		By purchase of necessaries which the family cannot produce on their own land or by their own labor.			Total Expenditure.	Surplus of income over expenditure.	Surplus income usually how disposed of.
			Detail.	Amount.	Detail.	Amount.	Rs.			
1	Owner ...	Dahnir, caste Ját Muhammadan, resident of Kabir, Tahsil Hissar.	Village members.	Rs. 7	Condiments, salt and gur. ...	Rs. 3 6	9	103	9	In marriages, births and deaths.
2	Owner ...	Musták, caste Ránghar, resident of Burak, Tahsil Hissar.	Village members.	6	Condiments, salt gur and cloth.	40	256	259	259	In marriages and in paying of debts.
3	Owner ...	Ránji, caste Veshno, resident of Kajal Heri, Tahsil Fatahabád.	Village members.	8	Condiments, salt gur and cloth.	30	156	23	23	In births, marriages and deaths.
4	Owner ...	Mana, caste Gujar, resident of Manawali, Tahsil Fatahabád.	Village members.	8	Condiments, salt gur and cloth.	40	195	12	12	In clearing of debts.
5	Owner ...	Karim, caste Pathán, resident of Tosham, Tahsil Bhiwáni.	Village menials.	29	Thread and cloth Condiments and salt.	16 2	161	1	1	In births, marriages and deaths.
6	Owner ...	Harji, caste Rajput, resident of Miran, Tahsil Bhiwáni.	Village menials.	8	Clothes ... Salt &c. ...	12 3	155	2	2	In births, marriages and deaths.
7	Owner ...	Bakar, caste Pachada, resident of Akanwali, Tahsil Barwala.	Village menials.	17	Salt and condiments. ... Tobacco ... Cotton ... Gur ... Oil ... Making up of clothes ... Shoes ... Dyeing ...	5 5 18 3 2 9 7 8	188	...	...	...
8	Owner ...	Musalim caste Sayad, resident of Barwala.	Village menials.	40	Salt and condiments. ... Tobacco ... Cotton ... Gur ... Oil ... Weeding &c. &c.	16 12 32 10 24 22	425	...	...	...
9	Owner ...	Magni caste Ját, resident of Gwalin, Tahsil Hánai.	Village menials. Hired labor ...	30 100	Clothes ... Utensils ... Other miscellaneous expenditure.	60 14 25	904	100	100	Same as No. 5.
			Total ...	130	Total ...	99	904			

population of the Hissar District—continued.

Ch.

V.—DESCRIPTION OF RESIDENCE, CATTLE AND CHATTELS.						VI.—DEBTS.			REMARKS.
Number of rooms in lease.		Cattle.		Chattels, stock of grain and cash.		How incurred.	Amount.	Percentage of debt on total income.	
Used as dwelling rooms.	Used for sheltering cattle.	Detail.	Number.	Detail.	Value rupees.				
3	...	Bullocks ... Buffaloes ...	4 4	Clothes and utensils.	60	On account of the late drought and the usual scanty fall of rain.	150	134	
		Total ...	8						
4	1	Cows ... Bullocks ... Buffaloes ... Camels ...	11 12 3 2	Clothes and utensils.	60	On account of the late drought and the usual scanty fall of rain.	500	97	
		Total ...	28						
3	1	Cows ... Bullock ... Camel ... Buffaloes ...	4 1 1 3	Clothes ... Jewels ... Utensils ... Cash ...	60 150 50 150	...	...	...
		Total ...	9	Total ...	400				
1	1	Cows ... Sheep and goats.	3 50	Clothes ... Utensils ...	10 5	On account of the late drought and the usual scanty fall of rains and in marriages.	300	146	
		Total ...	53	Total ...	15				
2	1	Bullocks ... Cows ... Buffaloes ...	3 1 2	Utensils ... Clothes ... Jewels ...	8 20 30	On account of the famine.	250	154	
		Total ...	6	Total ...	58				
3	...	Bullocks ... Cows ...	4 9	Utensils ... Clothes ...	10 30	...	...	...
		Total ...	13	Total ...	40				
1	...	Buffaloes ... Bullocks ...	2 2	...	...	On account of famine and produce of land not sufficient.	150	100	
		Total ...	4						
20	1	Bullocks ... Cows ... Buffaloes ...	10 20 1	...	...	On account of famine and produce of land not sufficient.	600	200	
		Total ...	31						
4	2	Bullocks ... Buffaloes ... Cows ...	6 6 2	Grain ... Clothes ... Utensils ...	150 80 20	On account of the Famine.	200	30	
		Total ...	14	Total ...	250				

I.

Typical instances of the economic condition of the agricultural

Number of case.	Status.	Name of head of family, caste and residence.	I.—FAMILY AND THEIR HOLDING.							
			Number of persons comprising the family.				Area of holding in acres.			
			Adults.		Children.	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.
			Male.	Female.						
10	Owner ...	Sheodial, caste Mali, resident of Kot Kalan tahsil Hisar.	2	2	2	6	Self cultivator.	Acres. 15	...	Acres. 15
11	Occupancy Tenants.	Toda, caste Jat, resident Rawalwas Khurd tahsil Hisar.	2	3	4	9	Ditto ...	7	...	7
12	Ditto ...	Kehta, caste Jat, resident of Rawalwas Khurd tahsil Hisar.	1	1	1	3	Ditto ...	16	...	16
13	Ditto ...	Kamal, caste Ranghar, resident of Kukai tahsil Fatahabad.	4	3	4	11	Ditto ...	26	...	26
14	Ditto ...	Sana, caste Pachada, resident of Bhiraen tahsil Fatahabad.	2	2	3	7	Ditto ...	21	...	21
15	Ditto ...	Peynia, caste Bania, resident of Nivran tahsil Bhiwani.	2	1	2	5	Ditto ...	7	...	7
16	Ditto ...	Kishna, caste Gujar, resident of Alifpura tahsil Bhiwani.	3	4	3	10	Ditto ...	22	...	22
17	Ditto ...	Moti, caste Baloch, resident of Siniána, tahsil Barwála.	5	5	1	11	Ditto ...	16	...	16
18	Ditto ...	Rám Náth, caste Brahmin, resident of Barwála.	2	...	...	2	Ditto ...	11	...	11

II.—INCOME.						III.—EXPENDITURE.				
One year's produce of the land.			Other miscellaneous sources of income.		Total income from all sources.	Revenue, cesses and storage charges and (in the case of tenants) rent.		By grain consumed as food and used as seed, or otherwise expended.		
Kind of produce.	Amount in mannds.		Detail.	Value.	Amount in rupees.	Detail.	Amount.	Detail.	Maunds.	Value.
	Mds.	Rs.								
Jowár ...	30	30	Sale of camels	35	160	Land cess ...	4	Food Grain ...	49	71
Bájra ...	20	25				Miscellaneous	2	Seed Grain ...	4	8
Gram ...	50	50						Fodder ...	200	86
Ehusa ...	50	8								
Karbi ...	18	12								
Total ...	168	125				Total ...	6	Total ...	253	114
Bájra ...	36	45	Hire of camels	30	65	Rent of land	4	Bájra ...	40	50
Ditto ...	80	100	...	...	100	Ditto ...	10	Bajra ...	27	84
Bájra ...	60	60	Ghi ...	25	138	Ditto ...	8	Food Grain ...	105	94
Moth ...	20	16						Seed Grain ...	3	8
Jowár ...	25	20						Fodder ...	185	17
Fodder ...	185	17								
Total ...	290	113						Total ...	293	114
Bájra ...	52	52	Ghi ...	30	126	Ditto ...	12	Food Grain ...	79	75
Moth ...	16	12						Seed Grain ...	3	8
Jowár ...	20	16						Fodder ...	160	16
Fodder ...	160	16								
Total ...	248	96						Total ...	243	94
Bájra ...	6	8	Hire of camels	55	70	Ditto ...	2	Bájra ...	25	84
Moth ...	4	4	Ghi ...	3				Moth ...	15	15
Total ...	10	12	Total ...	58				Total ...	40	49
Bájra ...	12	16	Ghi ...	40	145	Ditto ...	9	Gram ...	10	13
Gram ...	14	19	Sale of cattle	15				Jowár ...	15	17
Moth ...	5	5	Hire of Cart	40				Bájra ...	30	40
Gur ...	5	5						Gur ...	80	24
Jowár ...	5	5						Moth ...	15	16
Total ...	42	50	Total ...	95				Total ...	160	109
Bájra ...	80	30	Hire of carts	30	126	Ditto ...	9	Food Grain ...	71	71
Jowár ...	24	20						Seed Grain ...	4	4
Mung ...	5	4								
Moth ...	2	2								
Beja ...	50	40								
Total ...	111	96						Total ...	75	75
Bájra ...	45	45	...	...	45	Ditto ...	7	Food Grain ...	17	17
								Seed Grain ...	3	3
								Total ...	20	20

Typical instances of the economic condition of the agricultural

Number of case.	Status.	Name of head of family, caste and residence.	III.—EXPENDITURE—concluded.				IV.—SURPLUS.		
			Customary charges of village menials and hired labor of all sorts.		By purchase of necessaries which the family cannot produce on their own land or by their own labor.		Total Expenditure.	Surplus of income over expenditure.	Surplus income usually how disposed of.
			Detail.	Amount.	Detail.	Amount.			
10	Owner ...	Sheodiál, caste Mali, resident of Kot Kalán tahsil Hissar.	Village menials Hired labor ...	Rs. 10 8	Clothes ... Utensils ... Other Miscellaneous charges	Rs. 10 2 7	Rs. 157	Rs. 3	Same as No. 5
			Total ...	18	Total ...	19			
11	Occupancy tenant.	Toda, caste Jat, resident of Ráwalwas Khurd tahsil Hissar.	Villagemenials	5	Clothes, salt, condiment, &c., &c.	15	74	...	...
12	Ditto ...	Kehta, caste Jat, resident of Ráwalwas Khurd tahsil Hissar.	Ditto ...	5	Ditto ...	10	59	41	In paying debts and in marriages, &c., &c.
13	Ditto ...	Kamál, caste Banghar, resident of Kukai tahsil Fatahabad.	Ditto ...	7	Ditto ...	20	149	...	...
14	Ditto ...	Sana, caste Pachada, resident of Bhiraien tahsil Fatahabad.	Ditto ...	5	Ditto ...	12	123	3	Same as No. 2
15	Ditto ...	Peunia, caste Bania, resident of Nivran tahsil Bhiwáni.	Ditto ...	4	Thread and sewing of clothes Salt and condiments, &c.	7 7	69	1	Same as No. 5
					Total ...	14			
16	Ditto ...	Kishna, caste Gújar, resident of Alifpura tahsil Bhiwáni.	Ditto ... Hired labor ...	6 3	Cotton ... Making of clothes Salt, condiments, &c.	5 4 2	138	7	Ditto ...
					Total ...	11			
17	Ditto ...	Moti, caste Balooh, resident of Siniána, tahsil Barwála.	Villagemenials	9	Salt, condiments, &c., &c. Tobacco ... Gur ... Cotton ... Weaving, &c. ... Oil ... Shoes ...	3 2 2 5 4 2 4	115	11	In marriages and deaths.
					Total ...	22			
18	Ditto ...	Rám Náth, caste Brahmin, resident of Barwála.	Ditto ...	2	Salt, condiments, &c. Clothes ... Shoes ... Gur ...	4 4 2 2	41	4	Ditto ...
					Total ...	12			

population of the HISSAR DISTRICT—continued.

V.—DESCRIPTION OF RESIDENCE, CATTLE AND CHATTLE.						VI.—DEBTS			REMARKS.
Number of rooms in house.		Cattle.		Chattle, stock of grain and cash.		How incurred.	Amount.	Percentage of debt on total income	
Used as dwelling rooms.	Used for sheltering cattle.	Details.	Number.	Detail.	Value rupees.				
2	1	Bullocks ...	2	Grain ...	5	On account of the famine.	20	125	
		Cows ...	2	Clothes ...	10				
				Utensils ...	10				
		Total ...	4	Total ...	25				
4	1	Cows ...	5	Jewels ...	11	Same as No. 7 ...	500	769	
		Camels ...	2	Utensils ...	9				
		Bullocks ...	2	Clothes ...	10				
		Total ...	9	Total ...	30				
1	Ditto ...	200	200	
4	1	Bullocks ...	2	Clothes ...	80	Ditto ...	100	72	
		Cows ...	4	Jewels ...	20				
				Utensils ...	5				
		Total ...	6	Total ...	55				
2	1	Cows ...	6	Clothes ...	20	Ditto ...	20	16	
		Bullocks ...	4	Jewels ...	5				
				Utensils ...	5				
		Total ...	10	Total ...	30				
2	...	Camels ...	2	Utensils ...	7	
		Cows ...	1	Clothes ...	12				
				Jewels ...	15				
		Total ...	3	Total ...	34				
4	2	Buffaloe ...	1	Utensils ...	5	On account of famine and expenses in marriages.	300	206	
		Cows ...	4	Clothes ...	20				
		Bullocks ...	3						
		Total ...	8	Total ...	25				
1	...	Bullocks ...	2	Jewels ...	10	Same as No. 16	100	79	
				Clothes ...	10				
		Total ...		Total ...	20				
1	...			Clothes ...	5	
				Utensils ...	5				
		Total ...		Total ...	10				

Typical instances of the economic condition of the agricultural

Number of case.	Status.	Name of head of family, caste and residence.	I.—FAMILY AND THEIR HOLDING.							
			Number of persons comprising the family.				Area of holding in acres.			
			Adults.		Children.	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.
			Male.	Female.						
19	Occupancy Tenants.	Khubi, caste Mali, resident of Hansi.	4	5	8	17	Self cultivator.	Acres 35	...	35
20	Ditto ...	Mungla, caste Alur, resident of Badchapar, tahsil Hansi.	4	2	2	8	Ditto ...	31	...	31
21	Tenant at will.	Tiloka, caste Jat, resident of Kabrair, tahsil Hisar.	2	1	1	4	Ditto ...	37	...	37
22	Ditto ...	Amia, caste Kumar, resident of Rawalwas Khurd, tahsil Hisar.	1	2	3	6	Ditto ...	15	...	15
23	Ditto ...	Sakhu, caste Pachka, resident of Karnoli, tahsil Fatahabad.	3	2	2	7	Ditto ...	26	...	26
24	Ditto ...	Bakna, caste Banghar, resident of Kalan- tha, tahsil Fatahabad.	5	4	6	15	Ditto ...	62	...	62

population of the HISSAR DISTRICT—continued.

II.—INCOME.						III.—EXPENDITURE.					
One year's produce of the land.			Other miscellaneous sources of income.		Total income from all sources.	Revenue, cesses and tenancy charges, and (in the case of tenants) rent		By grain consumed as food and used as seed or otherwise expended.			
Kind of produce.	Amount in maunds.	Value.	Detail.	Value.	Amount in rupees.	Detail.	Amount.	Detail.	Maunds.	Value.	
	Mds.	Ra.	Ra.	Ra.					Mds.	Ra.	
Cotton ...	48	192	Sale of cattle	25	546	Rent of land	70	Food grain ...	119	177	
Wheat ...	80	160	Ghi ...	30		Water-rate ...	80	Seed grain ...	9	18	
Gram ...	80	80						Fodder ...	800	138	
Jowár ...	25	25									
Bhussa ...	160	26									
Karbi ...	12	8									
Total ...	405	491	Total ...	55		Total ...	150	Total ...	928	528	
Jowár ...	50	50	Ghi ...	12	285	Rent of land	8	Food grain ...	75	107	
Bájra ...	50	52	Sale of cattle	10		Chaukidári Tax	1	Seed grain ...	8	16	
Gram ...	110	110						Fodder ...	400	70	
Bhussa ...	110	18									
Karbi ...	54	23									
Total ...	354	268	Total ...	22		Total ...	9	Total ...	481	193	
Bájra ...	180	225			225	Rent of land	22	Bájra	86	45	
								Seed grain ...	8	4	
								Total ...	89	49	
Bájra ...	72	90			90	Ditto ...	8	Bájra	86	45	
								Seed grain ...	1	1	
								Total ...	87	46	
Wheat ...	91	186	Ghi ...	20	220	Scignorage ...	51	Food grain ...	68	82	
Jowár ...	40	32						Seed grain ...	12	18	
Fodder ...	210	32						Fodder ...	210	32	
Total ...	341	200						Total ...	285	132	
Bájra ...	90	90	Ghi ...	25	198	Rent of land	25	Food grain ...	125	114	
Jowár ...	50	40	Sale of cattle	20				Seed grain ...	10	9	
Fodder ...	250	18						Fodder ...	250	18	
Total ...	390	148	Total ...	45				Total ...	385	141	

Typical instances of the economic condition of the agricultural

Number of case.	Status.	Name of head of family, caste and residence.	III.—EXPENDITURE—concluded.				IV.—SURPLUS.		
			Customary charges of village menials and hired labor of all sorts.		By purchase of necessaries which the family cannot produce on their own land or by their own labor.		Total Expenditure.	Surplus of income over expenditure.	Surplus income usually how disposed of.
			Detail.	Amount.	Detail.	Amount.			
19	Occupancy Tenants.	Khubi, caste Múli, resident of Hānsi.	Village menials Hired labor...	Rs. 12 25	Cloth ... Utensils ... Salt, condiments	Rs. 20 2 7	544	2	In marriages and deaths.
			Total ...	37	Total ...	29			
20	Ditto ...	Mangla, caste Alur, resident of Badchapar, tahsil Hānsi.	Village menials Hired labor...	10 10	Cloth ... Utensils, chattles, condiments, &c.	15 20	257	28	Ditto ...
			Total ...	20	Total ...	35			
20	Tenant at will.	Tiloka, caste Jat, resident of Kabriair, tahsil Hissar.	Village menials	4	Salt, clothes, condiments.	10	85	140	Ditto ...
22	Ditto ...	Amia, caste Kumhar, resident of Rawaiwas, Khurd, tahsil Hissar.	Ditto ...	2	Ditto ...	5	55	35	Ditto ...
23	Ditto ...	Sakhu, caste Pachada, resident of Karnoli, tahsil Fatahabad.	Ditto ...	12	Salt, condiments, &c.	25	220	...	...
24	Ditto ...	Bukna, caste Ranghar, resident of Kalantha, tahsil Fatahabad.	Ditto ...	15	Ditto ...	20	206	...	...

V.—DESCRIPTION OF RESIDENCE, CATTLE AND CHATTELS.						VI.—DEBTS.			REMARKS.
Number of rooms in house.		Cattle.		Chattels, stock of grain and cash.		How incurred.	Amount.	Percentage on total income.	
Used as dwelling rooms.	Used for sheltering cattle.	Details.	Number.	Detail.	Value rupees.				
3	2	Bullocks ...	3	Grain ...	20	Same as No. 16	Es. 400	73	
		Buffaloes ...	3	Clothes ...	20				
		Cows ...	3	Jewels ...	50				
				Utensils ...	25				
		Total ...	9	Total ...	115				
2	1	Bullocks ...	3	Clothes ...	10	
		Buffaloes ...	1	Jewels ...	15				
		Cows ...	2	Utensils ...	15				
		Total ...	6	Total ...	40				
3	...	Bullocks ...	2	Clothes & Utensils.	20	Same as No. 16	400	178	
		Cows ...	2						
		Total ...	4						
3	1	Cows ...	1	Ditto	25	
		Bullocks ...	2						
		Total ...	3						
2	1	Cows ...	3	Bullocks ...	80	
		Buffaloes ...	1						
		Bullocks ...	4						
		Total ...	8						Total ...	80
5	1	Bullocks ...	6	Clothes ...	20	In marriages and deaths.	225	116	
		Buffaloes ...	1	Utensils ...	5				
		Mare ...	1	Jewels ...	20				
		Cows ...	2						
		Total ...	10	Total ...	45				

Typical instances of the economic condition of the agricultural.

Number of case.	Status.	Name of head of family, caste and residence.	I.—FAMILY AND THEIR HOLDING.							
			Number of persons comprising the family.				Area of holding in acres.			
			Adults.		Children.	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.
			Male.	Female.						
25	Tenant at will,	Jāti, caste Bania, resident of Chang, tahsil Bhiwāni.	3	2	3	8	Self cultivator.	Acres. 7	...	Acres. 7
26	Ditto ...	Lachman, caste Rājput, resident of Bhera, tahsil Bhiwāni.	1	1	2	4	Ditto ...	45	...	45
27	Ditto ...	Dāra, caste Rāin resident of Rimath, tahsil Bār-wāla.	5	3	2	10	Ditto ...	53	...	53
28	Ditto ...	Mādn Khan, caste Kāim Khāni, resident of Bār-wāla.	2	2	3	7	Ditto ...	10	...	10
29	Ditto ...	Ishar, caste Gujar, resident of Hānsi.	3	3	1	7	Ditto ...	25	...	25
30	Ditto ...	Nathu, caste Kasī, resident of Hānsi.	3	3	1	7	Ditto ...	40	...	40

population of the HISSAR DISTRICT—continued.

CH

II.—INCOME.						III.—EXPENDITURE.					
One year's produce of the land.			Other miscellaneous sources of income.		Total income from all sources.	Revenue, cesses and seigniorage charges and (in the case of tenants) rent.		By grain consumed as food and used as seed, or otherwise expended.			
Kind of produce.	Amount in maunds.	Value.	Detail.	Value.	Amount in rupees.	Detail.	Amount.	Detail.	Maunds.	Value.	
Jowár ...	Mds. 8	Rs. 9	Income from shop Hire of camels	Rs. 50	145	Rent of land	Rs. 5	Wheat ...	Mds. 3	Rs. 6	
Bájra ...	3	4		50				Bájra ...	20	26	
Gram ...	32	42		40				Gram ...	20	26	
								Mung ...	3	4	
								Urd ...	3	6	
								Rice ...	1	4	
								Jowár ...	10	12	
Total ...	43	5	Total ...	90				Total ...	60	84	
Bájra ...	45	60	Ghi ...	10	120	Ditto ...	18	Bájra ...	30	40	
Moth ...	20	20	Hire of camels	30				Moth ...	20	20	
Total ...	65	80	Total ...	40				Total ...	50	60	
Paddy ...	162	202	Ghi ...	10	216	Ditto ...	52	Food grain ...	65	65	
Bájra ...	3	4						Seed grain ...	5	5	
Total ...	165	206						Total ...	70	70	
Bájra ...	16	16	Service ...	60	76	Ditto ...	4	Food grain ...	42	42	
								Seed grain ...	3	3	
								Total ...	45	45	
Cotton ...	32	128	Ghi ...	10	381	Ditto ...	71	Food grain ...	62	90	
Jowár ...	25	25				Water rate ...	52	Seed grain ...	6	12	
Wheat ...	70	140						Fodder ...	500	81	
Gram ...	50	50									
Bhúsa ...	120	20									
Karbi ...	12	8									
Total ...	309	371				Total ...	123	Total ...	568	183	
Cotton ...	20	80	Sale of meat...	40	568	Rent of land	65	Food grain ...	80	111	
Jowár ...	80	80	Hire of cart...	80		Water rate ...	44	Seed grain ...	10	20	
Wheat ...	70	140	Sale of cattle	10				Fodder ...	900	150	
Gram ...	130	130									
Bhúsa ...	200	84									
Karbi ...	36	24									
Total ...	536	488	Total ...	80		Total ...	109	Total ...	990	281	

Typical instances of the economic condition of the agricultural

Number of case.	Status.	Name of head of family, caste and residence.	III.—EXPENDITURE—concluded.				IV.—SURPLUS.		
			Oustomary charges of village menials and hired labor of all sorts.		By purchase of necessaries which the family cannot produce on their own land or by their own labor.		Total Expenditure.	Surplus of income over expenditure.	Surplus, income usually how disposed of.
			Detail.	Amount.	Detail.	Amount.			
25	Tenant at will.	Jati, caste Bania, resident of Chang, tahsil Bhiwani.	Village menials Hired labor...	Rs. 7 2	Cloth ... Cotton and making up of clothes. Salt, condiments, &c., &c.	Rs. 15 11 10	Rs. 134	Rs. 11	In marriages, deaths, &c.
			Total ...	9	Total ...	36			
26	Ditto ...	Lachman, caste Rajput, resident of Dhara tahsil Bhiwani.	Village menials Hired labor...	5 16	Cotton ... Cloth ... Salt, condiments	5 8 2	109	11	Ditto ...
			Total ...	21	Total ...	10			
27	Ditto ...	Dara, caste Rain, resident of Rimath, tahsil Barwala.	Village menials	10	Salt, condiments Gur ... Tobacco ... Oil ... Shoes ... Cotton ... Weaving, &c. ...	2 4 5 2 8 8 6	167	49	In marriages and deaths.
					Total ...	35			
28	Ditto ...	Madu Khan, caste Kain Khani, resident of Barwala.	Ditto ...	2	Cotton ... Weaving ... Shoes ... Salt, condiments, &c.	3 2 2 4	62	14	Ditto ...
					Total ...	11			
29	Ditto ...	Jahar, caste Gajar, resident of Hansi.	Ditto ... Hired labor...	10 20	Cloth ... Utensils ... Salt, condiments, &c., &c.	20 2 5	363	18	Ditto ...
			Total ...	30	Total ...	27			
30	Ditto ...	Nathu, caste Kasal, resident of Hansi.	Village menials Hired labor...	12 50	Cloth ... Utensils ... Salt, condiments, &c., &c.	20 5 10	487	81	Ditto ...
			Total ...	62	Total ...	35			

population of the Hissar District—concluded.

V.—DESCRIPTION OF RESIDENCE, CATTLE AND CHATTELS.						VI.—DEBTS.			REMARK
Number of rooms in house.		Cattle.		Chattels, stock of grain and cash.		How incurred.	Amount.	Percentage of debt on total income.	
Used as dwelling rooms.	Used for sheltering cattle.	Detail.	Number.	Detail.	Value rupees.				
5	...	Camel ...	1	Jewels ... Clothes ... Utensils ...	Es. 50 50 10	In marriages and deaths.	500	345	
				Total ...	110				
2	...	Cows ... Bullocks ... Camels ...	3 1 2	Utensils ... Clothes ... Jewels ...	5 10 10	...	...	...
		Total ...	6	Total ...	25				
2	...	Bullocks ... Buffaloes ... Cows ...	6 2 2	Clothes ... Jewels ... Utensils ...	10 50 10	...	...	...
		Total ...	10	Total ...	70				
1	...	...	...	...	...	Same as No. 5...	100	76	
2	1	Bullocks ... Buffaloes ... Cow ...	4 1 1	Clothes ... Jewels ... Utensils ... Grain ...	15 5 10 10	Ditto ...	70	18	
		Total ...	6	Total ...	40				
3	2	Bullocks ... Buffaloes ... Cows ...	5 3 2	Grain ... Clothes ... Jewels ... Utensils ...	20 20 15 10	Ditto ...	200	35	
		Total ...	10	Total ...	66				

CHAPTER I, QUESTION 9.

Answer by MR. T. J. WALKER, C. S., Settlement Officer, Ludhiána.

1. The information in this answer refers to the Ludhiána District, the revised Settlement of which is about to be started. My connection with and knowledge of the District are of the slightest character, as I was sent to it four months ago with a small staff of subordinates to frame schedules and make other preliminary arrangements for starting settlement work in the cold weather. CH. I.

2. The District has a river front on the Sutlej of about 60 miles, and stretches to the south of it some 20 or 30. The alluvial tract between the river and high land is more extensive than in most districts, reaching inland 8 or 10 miles. It is inhabited by Muhammadans of the Rájputs and Gújar tribes, who form about one-sixth of the agricultural population of the whole District. The upland tract is almost entirely in the hands of Játs, principally Hindús, who form about two-thirds of the whole agricultural populations of the District. The difference in the condition of the inhabitants of these two tracts is so very marked that it will be better to give a separate account of each.

(1). *The Bét or alluvial tracts* has a most fertile soil requiring very little exertion from man for its cultivation. If the overflow from the river fail, the kharíf harvest may be bad; but it is not probable that there will be a failure of rain in the same year, and a good rabi crop makes up the deficiency. The water is so near the surface that it can be raised with little exertion in any amount for irrigation. What the people dread is excess of flood from the river, not so much a drought.

Notwithstanding these advantages, the Rájputs and Gújars who own and cultivate the land are in a very bad condition. Naturally indolent and thriftless, they are the worst cultivators and the most reckless spenders of any money that comes into their hands. They have no idea of regulating their expenditure by their means, and are consequently in the power of the money-lenders, who are too willing to make advances on the security of their lands. I believe that all the owners in this tract are in debt, and most of them deeply. They have no property except the jewelry of their women and a few cattle. Their houses are squalid, they have none but earthenware dishes, seldom any store of grain, and they are generally dependent for their daily food on their money-lenders, whose terms preclude the chance of any part of the produce remaining in their hands. The only cause of their indebtedness, I may add, is their thriftlessness. Special allowance was made for their habits in fixing the Government assessment, which is comparatively light.

These remarks apply to the owners of the land. The condition of the tenants is for several reasons much superior. Rent is generally paid in kind, so that the distinction between tenants-at-will and occupancy tenants is not marked. Of late years, owing to the influx of grain principally, there has been a great demand for labour in and about the town of Ludhiána; and men have been drawn away largely from cultivation. A tenant can earn 3 to 8 annas a day by manual labour, and thus add largely to his means of subsistence.

The Rájput proprietors who are themselves much above working as coolies, are really at the mercy of their tenants. I have heard of many cases in which a tenant with occupancy rights holding of a Rájput proprietor cultivates a small portion only of his holding; the proprietor taking a share of the produce which is worth actually less than the Government assessment of the holding.

I can give no reliable figures as to the amount of indebtedness of the various classes at this stage of the Settlement. All of the proprietors in the Bét are probably in debt, most of them deeply, and very few of the tenants.

(2). Turning to the *Bángar or upland* tract of the District, we see a very different picture. "The country stretches to the south, a clear and fertile plain unbroken by a single stream. The soil is light and capable of yielding the richest staples." In the eastern part of the District the water is near the surface, and a large proportion of the land is irrigated, while towards the west the soil becomes lighter and more mixed with sand, and irrigation, rarer. But the people (Játs) are much the same everywhere. They make the best use of the land that their knowledge admits of, and are most frugal in their mode of life, eating whatever grain is in season, and spending little money in extravagance.

CH. I. The people are almost entirely cultivating owners. The tenants that there are consist principally of (1) owners cultivating the land of other owners; (2) village menials.

In the small populous portion of the District adjoining Umballa the land is mostly irrigated, and the conditions are a little different. But the greater portion, roughly speaking, all to the south and west of the railway is unirrigated. The soil, though light and sandy, is most fertile, and in a good year the supply of grain from a holding is much more than sufficient for the support of the household. The surplus is either stored, or sold, and the proceeds laid away or lent. If there is a scanty rain-fall, the people are not at a loss. What generally happens is this. There is no fodder for the cattle (as there is no land left for grazing in the whole District), and the cows and buffaloes are sold for almost nothing, or die. The men of the family leave the other members to subsist as they can on the store of grain or money hoarded, and go to seek work elsewhere. Few Zamindárs' houses in the District are without a cart; and the men, yoking their bullocks, not now required for agriculture, into this, go off to Lahore, Pesháwar, and Dehli, conveying goods for hire. In a few months they return with earnings sufficient to live over the bad harvest.

The seasons have been particularly good recently, and the high price of grain has brought a good deal of money into the agriculturists' hands; some of them speak of being in debt; but there are very few indeed who owe more than a couple of good harvests will pay off. The debts they refer to are temporary, and the creditor is generally a brother proprietor. In very few villages is there a professional money-lender.

The houses testify by their outward appearance to the prosperity of the people. Brass dishes are always to be found in them, and there is generally a store of grain and some money hoarded. The women all wear silver jewelry. Most houses have 2 or 3 cows or buffaloe cows, and something is made by selling the young stock or the "ghí."

The custom in this tract is for a tenant, invariably in the case of occupancy tenants, and usually in the case of tenants-at-will, to pay a consolidated rent, that is, the Government demand and something over. This system does not appear to work so well for the tenants, who are not generally men of sufficient means to bear the burden of a bad year, and debt is not uncommon amongst them.

In conclusion I should say that the condition of the agricultural population was most flourishing except in the lands along the river. The owners in that tract are mostly indebted, many whole villages being mortgaged. Among the Ját owners the amount of debt is very small. I regret that I can give no figures at present as to the amount of indebtedness. Occupancy tenants hold less than 5 per cent. of the whole cultivation. They are well off in the low lands, but not so prosperous in the higher lands, but I should not say that they were generally in debt.

Tenants-at-will hold about 20 per cent. of the cultivated land; but a large proportion of these have also land of their own or are village servants, having other means of eking out a livelihood.

Tenants depending entirely for support on their holdings do not form a great part of the agricultural community. This class is, as a rule, free from debt.

Typical instances of the economic condition of agricultural population of the Punjab, being description
majority of each main class (owners, occupancy tenants-

I.—FAMILY AND THEIR HOLDING.										
Number of case.	Status.	Name of head of family, caste and residence.	No. of persons comprising the family.				How cultivated.	Area of holding in acres.		
			Adults.			Total.		Cultivated.	Uncultivated.	Total.
			Male.	Female.	Children.					
1	Cultivating owner.	Bagga Singh, Ját of Kamálpur, Tahsil Jagraon.	4	4	8	16	Unirrigated.	A. R. P. 9 3 20	A. R. P. 0 0 15	A. R. P. 9 3 35
2	Occupancy Tenant.	Deva Singh, Ját of Kamálpur, Tahsil Jagraon.	5	3	2	10	Unirrigated.	11 0 20	...	11 0 20
3	Tenant-at-will.	Báta Singh, Tarkhán of Kamálpur, Tahsil Jagraon.	1	1	1	3	Unirrigated.	8 1 15	0 0 25	8 2 0
4	Owner.	Díál Singh, Ját, Shekh Dowlat, Tahsil Jagraon.	2	2	4	8	Unirrigated.	54 1 10	...	54 1 10
5	Occupancy Tenant.	Nathu, Gujar, Shekh Dowlat, Tahsil Jagraon.	1	1	6	8	Unirrigated.	8 1 0	...	8 1 0
6	Owner.	Shám Singh, Ját, Káduke, Tahsil Jagraon.	4	5	2	11	Unirrigated.	23 2 0	...	23 2 0
7	Occupancy Tenant.	Gahna, Lohár, Káduke, Tahsil Jagraon.	4	5	6	15	Unirrigated.	15 2 10	...	15 2 10

of the actual circumstances of several families in the Ludhiana District, selected as fair representatives of the at-will) of the agricultural population. CH. I.

II.—INCOME.						III.—EXPENDITURE.													
One year's produce of the land.			Other Miscellaneous sources of income.		Total income from all sources.	Revenue, cesses and assignments charges and (in the case of tenants) rent.		By grain consumed as food and used as seed or otherwise expended.											
Kind of produce.	Amount in maunds.		Value.		Detail.	Value.	Amount in rupees.	Detail.	Amount.	Detail.	Maunds.		Value.						
	M.	S.	Rs.	A. P.							Rs.	Es.		A. P.	Rs.	A. P.	Mds.	S.	Rs.	A. P.
Wheat	60	0	75	0	0	Ghi &c.	40	...	15	2	3	Food...	100	0	112	0	0		
Gram	60	0	60	0	0							Seed...	14	0	15	8	0		
Jowar	8	0	8	0	0							Food of cattle	6	0	8	0	0		
Moth	8	0	8	0	0														
Cotton	2	0	7	0	0														
Total	138	0	158	0	0	...	40	198	0	0	Government demand and cesses.	15	2	3	134	0	0
Wheat	12	0	15	0	0	Occasionally advances for which profit is shown	...	...	...	...	Consolidated Rent.	...	Food	40	0	45	0	0
Gram	12	0	12	0	0								Seed	7	10	7	12	0	
Jowar	6	0	6	0	0														
Moth	6	0	6	0	0														
Total	36	0	39	0	0	...	35	74	0	0	Consolidated Rent.	19	4	8	52	12	0
Wheat	5	0	6	4	0	Works as car-penter.	20	...	2	0	0	Consolidated Rent.	...	Food	18	0	20	4	0
Gram	5	0	5	0	0								Seed	0	82	0	14	4	
Total	10	0	11	4	0	...	20	81	4	0	Consolidated Rent.	2	0	0	21	0	0
Wheat	86	0	107	8	0	which has money which is at interest. Also at times it is not possible to say what his receipts are exactly.	200	...	71	6	4	Govt. demand	...	Food	108	0	120	8	0
Gram	86	0	86	0	0								Seed	28	0	51	4	0	
Maize	16	0	16	0	0														
Total	188	0	209	8	0	408	8	0	...	71	6	4	151	12	0
Wheat	30	0	37	8	0	12	2	6	Govt. demand	...	Food	50	0	56	4	0
Gram	30	0	30	0	0							Rent	4	10	5	4	6		
Chari Green	...	...	2	0	0													
Total	39	8	0	69	8	0	...	12	2	6	61	4	0
Wheat	80	0	100	0	0	Ghi &c...	20	...	22	5	8	Govt. demand &c.	...	Food	180	0	134	8	0
Gram	80	0	80	0	0								Seed	14	20	15	18	0	
Moth	12	0	12	0	0														
Jowar	60	0	48	0	0														
Maize	8	0	8	0	0														
Total	240	0	248	0	0	...	20	268	0	0	Government demand &c.	22	5	8	160	5	0
Wheat	32	0	40	0	0	By work as blacksmith.	53	...	14	12	0	Government demand &c.	...	Food	120	0	120	0	0
Gram	32	0	32	0	0								Seed	8	0	8	6	0	
Barley	16	0	13	0	0														
Jowar	24	0	19	0	0														
Moth	16	0	16	0	0														
Total	120	0	119	0	0	...	53	172	0	0	Government demand &c.	14	12	0	128	6	0

Number of case.	Status.	Name of head of family, caste and residence.	III.—EXPENDITURE.—Concluded.				IV.—SURPLUS.		
			Customary charges of village menials and hired labour of all sorts.		By purchase of necessaries which the family cannot produce on their own land or by their own labour.		Total expenditure.	Surplus of income over expenditure.	Surplus of income usually how disposed of.
			Detail.	Amount.	Detail.	Amount.			
1	Cultivating owners.	Bagga Singh, Ját of Kamálpur, Tahsil Jagraon.	Village menials &c.	Ra. A. P. 10 0 0	Clothes and vessels &c. 30	30	...	...
				10 0 0	30	189 0 0	9 0 0		
2	Occupancy Tenants.	Deva Singh, Ját of Kamálpur, Tahsil Jagraon.	Village menials.	6 6 2	Clothes and vessels &c. 10	10	...	...
				6 6 2	10	87 6 6	Deficit...		
3	Tenant at will.	Báta Singh, Tarkhán of Kamálpur, Tahsil Jagraon.	None.*	...	Clothes &c. 5	5	...	...
					5	28 0 0	3 1 8		
4	Owner.	Dial Singh, Ját, Sheikh Dowlat, Tahsil Jagraon.	Deducted from receipts already.	...	Clothes, vessels &c. 50	50	...	Lent on mortgage of lands.	
						278 2 0	186 0 0		
5	Occupancy Tenant.	Nathu, Gujar, Sheikh Dowlat, Tahsil Jagraon.	Village servants.	1 5 6	Clothes &c. 15	15	...	...
				1 5 6		90 0 6	Deficit.		
6	Owner.	Shám Singh, Ját, Kádúke, Tahsil Jagraon.	Village servants.	35 0 0	Clothes &c. 25	25	...	...
				35 0 0	25	232 10 0	35 0 0	Purchase cattle &c.	
7	Occupancy Tenant.	Gahna, Lohár, Kádúke, Tahsil Jagraon.	Village servants.	7 8 0	Clothes &c. 20	20	...	...
				7 8 0	20	170 10 0	1 6 0		

V.—DESCRIPTION OF RESIDENCE, CATTLE AND CHATTELS.					VI.—DEBTS.			REMARKS.	
No. of rooms in house.		Cattle.		Chattele, stock of grain and cash.		How incurred.	Amount.		Percentage of debt on total income.
Used as dwelling rooms.	Used for sheltering cattle.	Details.	Numbers.	Details.	Value rupees.				
1	1	Bullocks ... Buffalo cows ...	4 2	Wheat ... Jewelry ... Dishes ... Miscellaneous ...	20 0 0 60 0 0 20 0 0 10 0 0	Rs. A. P. No debt.			The rates used to calculate the value of grain on the average ones at which a cultivator sells.
1	1	Buffalo cow Bullocks ... Cows ...	1 6 2	Jewelry ... Dishes ... Miscellaneous ...	30 6 0 10 0 0 10 0 0	Incurred in celebration of 2 marriages recently	240	326	The produce in this case is under estimated, but the land is very poor. I do not think that this can be called a fair specimen.
2	2	Bullocks ...	2	Wheat ... Jewelry ... Dishes ... Cart ...	8 12 0 8 0 0 4 0 0 10 9 0	For ordinary expenses.	10	32	* Himself a kamin and exchanges services. Produce under estimated.
2	2	Bullocks ... Buffalo cows ... Cows ... Mare ... Camel ...	5 2 2 1 1	Dishes ... Jewelry ... Clothes ... Grain ... Cart ...	50 0 0 600 0 0 100 0 0 300 0 0 300 0 0	No debts.			This is an instance of a very well-to-do Ját, who engages in trade. There are good many men of this kind.
1	1	Bullocks ...	2	Jewelry ... Dishes ... Clothes ...	5 0 0 2 0 0 5 0 0	Incurred to defray ordinary expenses.	76	100	
2	2	Bullocks ... Buffalo cows ... Cow ...	4 2 1	Grain ... Jewelry ... Dishes ... Clothes &c. ... Cart ...	39 8 0 60 0 0 10 0 0 20 0 0 40 0 0	No debts.			The consumption of food is over-estimated, and the surplus ought to be larger.
2	1	Bullocks ... Cows ...	3 2	Grain ... Jewelry ... Dishes ... Carts ...	86 6 0 80 0 0 20 0 0 70 0 0	Purchase of a bullock a month ago.	20	121	

Typical instances of the economic condition of

Number of case.	Status.	Name of head of family, caste and residence.	III.—EXPENDITURE.—Concluded.				IV.—SURPLUS.		
			Customary charges of village menials and hired labour of all sorts.		By purchase of necessaries which the family cannot produce on their own land or by their own labour.		Total expenditure.	Surplus of income over expenditure.	Surplus of income usually how disposed of.
			Detail.	Amount.	Detail.	Amount.			
1	Cultivating owner.	Bagga Singh, Ját of Kamálpur, Tahsil Jagraon.		Rs. A. P.		Rs.	Rs. A. P.	Rs. A. P.	
			Village menials &c.	10 0 0	Clothes and vessels &c &c.	80	...	...
			10 0 0		80	189 0 0	0 0 0		
2	Occupancy tenant.	Deva Singh, Ját of Kamálpur, Tahsil Jagraon.	Village menials.	6 6 2	Clothes and vessels &c.	10	...	...
				6 6 2		10	87 6 5	Deficit ..	
3	Tenant at will.	Béta Singh, Tarkhán of Kamálpur, Tahsil Jagraon.	None.*	...	Clothes &c.	5	...	...
					5	28 0 0	3 1 8		
4	Owner.	Díal Singh, Ját, Sheikh Dowlat, Tahsil Jagraon.	Deducted from receipts already.	...	Clothes, vessels &c.	50	...	Lent on mortgage of lands.	
						278 2 0	136 0 0		
5	Occupancy tenant.	Nathu, Gujar, Sheikh Dowlat, Tahsil Jagraon.	Village servants.	1 5 6	Clothes &c.	15	...	...
				1 5 6		90 0 6	Deficit.		
6	Owner.	Shám Singh, Ját, Kádúke, Tahsil Jagraon.	Village servants.	35 0 0	Clothes &c.	25	...	...
				35 0 0		25	232 10 0	35 0 0	Purchase cattle &c.
7	Occupancy tenant.	Gahna, Lohár, Kádúke, Tahsil Jagraon.	Village servants.	7 8 0	Clothes &c.	20	...	...
				7 8 0		20	170 10 0	1 6 0	

V.—DESCRIPTION OF RESIDENCE, CATTLE AND CHATTELS.					VI.—DEBTS.			REMARKS.	
No. of rooms in house.		Cattle.		Chattele, stock of grain and cash.		How incurred.	Amount.		Percentage of debt on total income.
Used as dwelling rooms.	Used for sheltering cattle.	Details.	Numbers.	Details.	Value rupees.				
1	1	Bullocks ... Buffalo cows		4 Wheat ... 2 Jewelry ... Dishes ... Miscellaneous	20 0 0 60 0 0 20 0 0 10 0 0		No debt.		The rates used to calculate the value of grain on the average ones at which a cultivator sells.
1	1	Buffalo cow Bullocks ... Cows ...		1 Jewelry ... 6 Dishes ... 2 Miscellaneous	30 6 0 10 0 0 10 0 0	Incurred in celebration of 2 marriages recently	240	326	The produce in this case is under estimated, but the land is very poor. I do not think that this can be called a fair specimen.
2		Bullocks ...		2 Wheat ... Jewelry ... Dishes ... Cart	8 12 0 8 0 0 4 0 0 10 0 0	For ordinary expenses.	10	32	* Himself a kamin and exchanges services. Produce under estimated.
2	2	Bullocks ... Buffalo cows Cows ... Mare ... Camel ...		5 Dishes ... 2 Jewelry ... 2 Clothes ... 1 Grain ... 1 Cart	50 0 0 600 0 0 100 0 0 300 0 0 300 0 0		No debts.		This is an instance of a very well-to-do Jat, who engages in trade. There are good many men of this kind.
1	1	Bullocks ...		2 Jewelry ... Dishes ... Clothes ...	5 0 0 2 0 0 5 0 0	Incurred to defray ordinary expenses.	70	100	
2	2	Bullocks ... Buffalo cows Cow ...		4 Grain ... 2 Jewelry ... 1 Dishes ... Clothes &c. ... Cart	89 8 0 60 0 0 10 0 0 20 0 0 40 0 0		No debts.		The consumption of food is over-estimated, and the surplus ought to be larger.
2	1	Bullocks ... Cows ...		9 Grain ... 2 Jewelry ... Dishes ... Carts ... Total ...	86 6 0 80 0 0 20 0 0 70 0 0 206 0 0	Purchase of a bullock a month ago.	20	121	

I.

Typical instances of the economic condition of

Number of cases.	I.—FAMILY AND THEIR HOLDING.									
	Status.	Name of head of family, caste and residence.	No. of persons comprising the family.				Area of holding in acres.			
			Adults.		Children.	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.
			Male.	Female.						
8	Tenant-at-will.	Mána, Ját, Kádúke, Tahsil Jagraon.	2	...	...	2	Unirrigated.	8 3 10	...	8 3 10
9	Owner.	Dewa Singh, Ját, Mánakwál, Tahsil Ludhiána.	2	1	3	6	1 Irrigated 1 Unirrigated.	11 1 0		11 1 0
10	Owner.	Rallia, Rájput of Hybowál, Tahsil Ludhiána.	1	1	1	3	1 acre irrigated 10 acres unirrigated.	16 0 10	7 0 0	23 0 10
11	Occupancy Tenant.	Náhu, Rájput, Hybowál, Tahsil Ludhiána.	1	1	1	3	1 acre irrigated 10 acres unirrigated.	11 0 8		11 0 8
12	Tenant-at-will.	Dewa, Ját of Dholewál, Tahsil Ludhiána.	3	3	...	6	Unirrigated.	7 0 9		7 0 9
13	Owner.	Lang, Ját of Dholewál, Tahsil Ludhiána.	4	4	1	9	Unirrigated.	9 0 9	2 0 0	11 0 9
14	Owner cultivating.	Rám Singh, Ját of Chána, Tahsil Jagraon.	5	3	1	9	Irrigated 1 A. 20 P. Unirrigated 15 acres.	16 0 20	0 2 10	16 2 30

Agricultural population of the Indus Valley District—Continued.

II.—INCOME.					III.—EXPENDITURE.									
One year's produce of the land.			Other Miscellaneous sources of Income.		Total Income from all sources.	Revenue, cesses and assignage charges and (in the case of tenants, rent).		By grain consumed as food and used as seed or otherwise expended.						
Kind of produce.	Amount in mounds.		Detail.	Value.	Amount in rupees.	Detail.	Amount.	Detail.	Mounds.					
	Mds.	S.							M. S.	Ra. A. P.				
Wheat	24	0	One of the brothers is a Chaukidar.	36	96 0 0	Consolidated Rent.	11 11 0	Food Seed	24	0				
Barley	8	0		6					8	0	8	28	4	2
Sarson	1	24		2					10	0				
Jowar	16	0		12					14	0				
Moth	8	0		8					0	0				
Total	58	24	60	0	0		11 11 0							
Cotton	3	0	Interest on money lent.	25	208 8 0	Government demand and cesses.	20 0 0	Food Seed	43	0				
Maize	18	0		15					0	0	8	0	68	8
Chari green				30					6	0			12	0
Moth	12	0		12					0	0				
Barley	1	0		1					8	0				
Gram	8	0		8					0	0				
Wheat	18	0		36					0	0				
Sarson	4	0		16					0	0				
Straw				50					0	0				
Total				183					8	0			Total		78 8 0
Maize	4	8	Labour.	24	24	Government demand and cesses.	30 6 0	Food Seed	22	0				
Wheat	22	8		45					0	0	10	0	12	0
Chari				50					0	0				
Straw				15					0	0				
Total			115	4	0		30 6 0	Total		52 0 0				
Chari*			Labour.	24	24	Rent and Government Revenue.	14 0 0	Food Seed	22	0				
Wheat	24	0		29					0	0	4	20	8	4
Straw				8					0	0				
Total			79	0	0			Total		48 4 0				
Wheat	20	0	Service.	72	72	Consolidated Rent.	9 11 4	Food Seed	43	0				
Milons				24					0	0	5	0	2	8
Straw				8					0	0				
Total			57	0	0		9 11 4	Total		56 8 0				
Chari			Hire of cart. Labour.	50	48	Government demand and cesses.	17 0 0	Food Seed	65	0				
Wheat	18	0		22					0	0	3	8	4	0
Straw				7					0	0				
Total			45	0	0		17 0 0	Total		85 0 0				
Wheat	82	0	Ghi &c... Receipts from land mortgaged	10	30	Government demand and cesses.	15 8 11	Food Seed	80	0				
Gram	16	0		16					0	0	8	22	8	10
Barley	16	0		10					10	0				
Maize	8	0		8					0	0				
Moth	8	0		8					0	0				
Jowar	16	0		11					7	0				
Total	96	0	94	1	0		15 8 11	Total	88	22 87 10 11				

*Solt green for fodder.

Typical instances of the economic condition of

No. of case.	Status.	Name of head of family, caste and residence.	III.—EXPENDITURE.—Concluded.				IV.—SURPLUS.		
			Customary charges of village menials and hired labour of all sorts.		By purchase of necessaries which the family cannot produce on their own land or by their own labour.		Total expenditure.	Surplus of income over expenditure.	Surplus of income usually how disposed of.
			Detail.	Amount.	Detail.	Amount.			
8	Tenant-at-will.	Maná, Ját, Kádúke, Tahsil Jagraon.	Village servants.	Rs. A. P. 4 15 3	Clothes.	Rs. 8	Rs. A. P. 75 9 3	Rs. A. P. 20 8 9	...
9	Owner.	Dewa Singh, Ját, Manakwál, Tahsil Ludhiána.	Village menials. Food of Cattle.	10 0 0 40 0 0	Clothes ... Iron & wood work &c. Purchase of Bullocks.	9 6 12	27 155 8 0	53 0 0	Spent on a marriage &c., or if no such necessity lent at interest.
10	Owner.	Rallia, Rájput, of Hybowál, Tahsil Ludhiána.	Village menials. Food of cattle.	6 0 0 15 0 0	Clothes &c. Purchase of Cattle.	6 6	12 115 6 0	23 14 0	Payment of debt.
11	Occupancy Tenant.	Nathu, Rájput, Hybowál, Tahsil Ludhiána.	Village menials. Food of cattle.	9 0 0 8 0 0	Clothes &c. Cattle.	6 5	11 90 4 0	12 12 0	Payment of debt.
12	Tenant-at-will.	Deva, Ját of Dholewál, Tahsil Ludhiána.	Village menials. Cattle food.	2 0 0 8 0 0	Clothes &c. For agricultural purpose. Cattle purchased.	38 12 5	53 129 3 4	Nil.	...
13	Owner.	Lag, Ját, of Dholewál, Tahsil Ludhiána.	Village menials. Food of cattle.	2 0 0 7 0 0	Clothes. Bullocks.	12 10	22 133 0 0	10 0 0	Payment of debt &c.
14	Owner cultivating.	Rám Singh, Ját of Chinna Tahsil Jagraon.	Village menials.	8 13 3	Clothes &c. &c.	15	15 122 1 1	11 15 11	...

agricultural population of the Ludhiana District.—Concluded.

C

V.—DESCRIPTION OF RESIDENCE, CATTLE AND CHATTELS.					VI.—DEBTS.			REMARKS.	
No. of rooms in house.		Cattle.		Chattels, stock of grain and cash.		How incurred.	Amount.		Per-centage of debt on total income.
Used as dwelling rooms.	Used for sheltering cattle.	Details.	Numbers.	Detail.	Value approx.				
2		NIL.		Grain ... Cash ... Dishes ... Total ...	Ra. A. P. 20 0 0 16 0 0 5 0 0 41 0 0	For expenses of funeral recently.	14	14	
2	1	Bullocks ... Buffalow Cow ... Calf ...	2 1 1	Jewelry ... Dishes ... Clothes ... Barley ... Wheat ... Cash ... Total ...	79 0 0 10 0 0 15 0 0 4 0 0 9 0 0 200 0 0 317 0 0	No debts.			Straw and fodder of cattle included in receipt and expenditure. Price of cattle is distributed over 2 or 3 years.
1		Bullocks* ... Cow ...	1 1	Dishes ... Grinding stone ... Total ...	0 8 0 0 8 0 1 0 0	Owms other land; but could not get tenants to cultivate. Borrowed to pay Government demand.	109	80	This is a village in the low lands (Bat) owned and cultivated by Rajputs. *1 Bullock died recently.
1	1	Bullocks ... Goats ...	2 2	Dishes ... Grinding stone ...	0 8 0 0 8 0	Purchase of cattle	25	25	
2	1	Bullock ... Buffalow cow ... Cow ...	1 1 1	Dishes ... Jewelry ... Total ...	12 0 0 1 0 0 13 0 0	Due to high price of grain which has been purchased by the family.	80	70	
2	1	Bullocks ... Cow ... Calf ...	4 1 1	Wheat ... Dishes ... Jewelry ... Total ...	1 8 0 28 8 0 5 0 0 80 0 0	Just borrowed for a marriage.	140	100	
2	1	Bullocks ... Cows ... Calves ...	4 2 2	Money lent ... Jewelry ... Clothes ... Grain ... Total ...	80 0 0 10 0 0 5 0 0 80 0 0 225 0 0	Purchase of cattle	40	80	

CHAPTER I, QUESTION 9.

Answers by MR. W. COLDSTREAM, C. S., Deputy Commissioner, Hoshiárpur.

1. The District to which these replies refer is the District of Hoshiárpur, which lies in the Jullundur Doáb between the Sutlej and the Beas. The northern half consists of hilly country comprising the 2 outer ranges of the Siwálik, and the Juswán Dún, which lies between these ranges. The southern half of the District is plain country, generally of great fertility, and covered with mango groves, but intersected by numerous sandy beds of torrents sometimes extending to $\frac{1}{2}$ a mile in breadth. The Juswán Dún is generally fertile. There are low-lying alluvial tracts on the banks of the Beas and Sutlej which are subject to destructive inundations.

I have been Deputy Commissioner of Hoshiárpur District for nearly 3 years, and have been over the District repeatedly in every direction.

2. The ordinary economic condition of the agricultural population is not uniform.

The large land-owners are well-to-do, and some are even wealthy. These, however, are few in number. The average land-owner who cultivates 10 to 15 acres, the occupancy tenants, tenants-at-will, all live from hand to mouth, and the majority are in debt. In the Hoshiárpur Parganah it is calculated that one quarter of the agriculturists have hypothecated or alienated their land; about one-fifth are well off, and have something in reserve; while about one-fifth are free from the pressure of debt, though not able to save.

In this District occupancy tenants are frequently, it would seem, as well or better off than the neighbouring owners. This applies to the plain portions of the District. The owners are often Rájputs, and from pride of caste or some other reason, do not cultivate with their own hands. The occupancy tenants are as a class more industrious cultivators than the owners; in virtue of their inferior social position they have less temptation to extravagance: and they cannot raise money with the same facility as the owners, for their interest in the soil does not form so valuable a security. Further, in the plain parts of the District, the owner's share is so small—8 to 12 per cent.—as not materially to affect his position where he is compared with the occupancy tenant.

At the same time I should mention that in some tracts, for instance about Una, the occupancy tenants are very badly off. Their share of the produce is allotted in kind; and except in very good years the amount they take seems hardly enough to support their families. They take $\frac{55}{100}$ or $\frac{50}{100}$, while the owners get $\frac{45}{100}$ or $\frac{50}{100}$.

The tenant-at-will is uniformly a poor creature living from hand to mouth. He has little credit, and therefore his debts are not so large as those of the other classes.

It may be asked why, when the value of produce has so much increased, the agricultural community have not generally been able to better their position and to accumulate wealth. The reason is that generally the produce raised on a holding is not much more than sufficient, if it is even sufficient, to support the family of the cultivator. It is only the larger owners who cultivate extensive holdings who have a surplus for sale. And as (in most part of the District probably) the owner's share is a very small proportion of the produce, it is only the very large owners in tracts where the tenants are hereditary as a rule, who make a substantial income out of their proprietary rights.

Proportion of agriculturists who are in debt.

Of those whom I have consulted on these points, Tahsildárs and intelligent land-owners, no one has suggested any less proportion of indebted persons than 33 per cent., and only one has put it so low.

In the Dasúya Parganah the Tahsildár estimates the proportion at 75 per cent., while a very intelligent Zaildár has put it down at 90 or 95 per cent.

According to the inquiries I have made, it seems probable that about 70 per cent. of the proprietors throughout the District are in debt.

- I. The same proportion in the case of tenants of both classes is slightly smaller, and may be put down at about 66 per cent.

These results are I believe close to the truth.

Causes of indebtedness of agriculturists.

In the case of owners, I believe one great cause of indebtedness is the sudden command of money which the stability of the tenure of land conferred some 20 or 25 years ago, leading to laziness on the one hand and social extravagance on the other.

Social ceremonies, as more money income became available, and the economic use of it had not yet been learned, increased in expensiveness. I believe the next generation or that part of it which still finds itself owner of its ancestral acres (for some land has changed and is changing hands) will have learned a lesson and be more careful.

As regards occupancy tenants, one cause of their indebtedness in the Una Parganah is that their share of the produce is small, and hardly sufficient to serve as a sufficient maintenance.

There are certain other circumstances which embarrass all classes of cultivators, and bring them into debt, or prevent their getting out of it.

1. Increased price of bullocks and other necessaries which the cultivators must buy.
2. The short period of limitation for parole and bond debts. This law enforces too frequent rests in running accounts, and thus gives opportunity for piling up compound interest very rapidly.
3. High rate of interest charged by bankers. There appears to me no remedy for this.
4. Large quantities of land have in this District been yearly destroyed by sand deposited from the hill torrents. Special measures have been suggested to remedy this.

3. *Proportion of average indebtedness to average yearly income.*

This is a difficult question to answer. As far as I have been able to judge from opinions recorded, I think the average indebtedness of owners and tenants is a sum equal to 3 years income.

The economic condition of agriculturists of all classes is illustrated by the typical instances detailed in the annexed statement, in which actual facts have been recorded.

P.S. The following additional remarks on the same subject received from Mr. Coldstream, in another communication, will here find a suitable place.

I believe that the majority, *i. e.*, considerably more than half of the agriculturists of this District, are in debt.

I have had occasion to make particular inquiries into the subject in connection with a proposal for remission of revenue (in 1876-77), in the villages of the Bet, or alluvial land bordering the Beas in the Dasuya Parganah, and took occasion to have statistics compiled with some degree of accuracy.

61 villages or about one-tenth of the Parganah then formed the subject of inquiry; of these villages only 2 were found to be not indebted. The other 58 villages owed Rs. 2,64,682 to their bankers, or on an average Rs. 4,563 per village; while the average jama is Rs. 466 per village; that is to say, they owed on an average nearly 10 years' jama, or nearly $\frac{1}{2}$ the average selling price of the (assessed) land of their villages. The details of this enormous mass of debt were as follows:—

	Secured on mortgage of land.	Cash debts unsecured.	Total.
Owners	70,964	1,47,596	2,18,560
Tenants with rights of occupancy ...	9,256	36,866	46,122
	80,220	1,84,462	2,64,682

The debts in 9 of these 58 villages exceeded 20 years' jama : and in 22 villages the Ch. I. debts equalled or exceeded 10 years' jama.

It is not that the land is highly assessed. In only 22 of them does it exceed Rs. 2 per acre : while the land is good and bears fine crops of wheat and rice.

I formed the opinion that the cause of this state of indebtedness is the relation in which they stand to their bankers on the one hand, and on the other natural improvidence and carelessness of their character, and their extravagant social habits. They are nearly all Ját Rájputés and Gújar Muhammadans.

Twenty years ago they found out the value of their land, and that they were able to raise large sums on its security. They forthwith proceeded to enjoy the pleasures of a command of cash. They had now the temptation to borrow for a daughter's marriage, and again (*e. g.* in Sambat 1913) when a bad season came, were driven to a loan. Once into the banker's toils they were not able to escape.

Their apathy and ignorance made them an easy prey to the astute bafya, whose accounts they could neither read nor understand.

Afraid to demand an acknowledgment or receipt for any payment, even when they understood the value of such a document, they get credit loans and make payments in kind for a series of years till all recollection of individual transactions has faded from their memories, and then they have to give a bond bearing heavy interest or go into court.

My own opinion is that the next generation would be somewhat better able and willing to take care of themselves : but the question is, will another generation see them the owners of the soil? In many cases it certainly will not. Land has already to some extent changed hands. When the harvest is ready, the banya proceeds to the threshing floor, and the grain is laden on the carts of the Zamíndárs and borne off to the granaries in the town. All is taken except a few months' supply for the needs of the cultivators and their families. This very grain they are forced to take back again at a valuation perhaps 50 per cent. higher than that at which they parted with it.

Thus they go on living from hand to mouth on the edge of starvation, and hardly anticipating the time which appears to be drawing near for many of them, when their proprietary rights will cease to exist even in name.

This state of matters is to be found in a good many villages of Dasúya tahsil. The description is not applicable to the District generally, but it represents a state of matters not at all uncommon throughout the District.

5	4	3	2	1	Number of case.	
Ditto	Málik	Ditto	Ditto	Owner	Status.	
Sikandar Khan, Rájput, Sahjowál	Seru, Rájput, village Allivah Tappah Dareroh	Tábu, Ját, Saidpur	Ganga, Rájput, Rámpur	Bái Singh, Rájput, Rámpur	Name of head of family, caste and residence.	
2	1	8	1	1	Male.	Number of persons comprising the family. Adults.
3	1	2	1	8	Female.	
2	...	2	1	8	Children.	
7	2	7	8	7	Total.	
Ditto	Cultivates himself	Ditto	Ditto	Khudkásht	How cultivated.	Area of holding in acres.
18 0 80	8	28 8 27	8 0 4	10 2 10	Cultivated.	
...	...	...	...	...	Uncultivated.	
18 0 80	8	28 8 27	8 0 4	10 2 20	Total.	
Grain ... 120 8 0 Sugar ... 24 0 0 Cotton ... 1 8 0 Hemp ... 0 82 0 Rape seed ... 1 8 0	Maize, wheat, acramum	Grain ... 195 0 0 Cotton ... 10 0 0 Sugar ... 20 0 0	Grain ... 30 maunds Cotton ... 2 " Sugar ... 9 "	Grain ... 54 0 0 Cotton ... 4 0 0 Sugar ... 4 0 0	Kind of produce.	One year's produce of the land.
147 16 0	48 0 0	225 0 0	41	62 0 0	Amount in maunds.	
268 6 8	61 0 0	894 0 0	92 8 0	Rs. 90 0 0	Value.	
...	Fruit ... 1 0 0 Butter ... 6 0 0	...	...	From common water-mill 8 "	Detail.	Other miscell-aneous sources of income.
...	7 0 0	...	...	8	Value.	
268 6 8	68 0 0	894 0 0	92 8 0	98 0 0	Amount in rupees.	Total income from all sources.
Government Revenue ... 42 13 6	Land Revenue	Government Revenue... 50 6 0	Government Revenue .. 20 0 0	Government Revenue ... 10 6 0	Detail.	Revenue, cesses and mortgages charges and (in the case of tenants) rent.
42 13 6	18 12 0	50 6 0	20 0 0	Rs. 10 6 0	Amount.	
Food ... 75 24 0 Seed ... 5 84 0	...	Food ... 68 38 0 Seed ... 18 10 0	Food ... 28 32 0 Seed ... 5 11 0	Food ... 33 32 0 Seed ... 6 8 0	Detail.	By grain con-verted as food and used as seed or otherwise expended.
81 18 0	21 0 0	77 8 0	34 3 0	40 0 0	Maunds.	
117 8 4	27 0 0	96 0 0	42 9 0	50 0 0	Value rupees.	

I.—FAMILY AND THEIR HOLDING.

II.—INCOME.

III.—EXPENDI-

Typical instances of the economic condition of the agricultural population of the Punjab, being a description of the majority of each main class (owners, occupancy tenants)

of the actual circumstances of several families in the District of Hoshiarpur, selected as fair representatives and tenants-at-will) of the agricultural population.

XVIII.						Description of charges of this kind which the head labourer of all sorts.	By purchase of iron articles and tools on their own account.
Y.—SURPLUS INCOME.							
V.—DESCRIPTION OF RESIDENCE, CATTLE AND ORNAMENTS.						No. of rooms in house.	Cattle.
VI.—DEBTS.							
Menials ...	19 0 0	6½ maunds, kamins	Menials	Menials ... 4 0 0	Menials.	Detail.	
Labour ...	10 0 0	1½ labourer's hire					
	29 0 0	10 0 0	12 0 0	4 0 0	12 0 0	Rs. Amount.	
Ditto		Iron 1-0-0, Tobacco 2-0-0 Salt 1-0-0, Masālah 0-4-0	Ditto	Ditto	Salt, iron, &c.	Detail.	
	26 0 0	4 4 0	12 0 0	4 0 0	12 0 0	Rs. Amount.	
	215 1 5	55 0 0	170 8 0-	70 9 0	84 6 0	Rs. Total expenditure.	
	48 5 8	18 0 0	223 10 0	21 15 0	18 10 0	Surplus of income over expenditure.	
In buying cattle, marriage and paying debts.		Spent among his relatives.	Ditto	Ditto	The social and religious expenses.	Surplus income usually how disposed of.	
	4	1	2	1	2	Used as dwelling rooms.	No. of rooms in house.
	2	2	2	1	2	Used for sheltering cattle.	
Bullocks ...	5	Buffaloes ... 2	Bullocks ... 7	Bullocks ... 2	Bullocks ... 2	Detail.	
Cows ...	2	Cow and calf ... 1	Buffaloes ... 6	Cow ... 1	Calf ... 1		
		Bullocks ... 3	Cows ... 2	Calves ... 2	Buffalo calves 2		
	7		15	5	Cow ... 1	Number.	
Ornaments ...	150		Agricultural implements ... 15	Agricultural implements ... 2	Agricultural implements 5	Detail.	Ornaments, stock of grain and cash.
Vessels and clothes ...	40		Vessels ... 10	Vessels ... 8	Vessels ... 10		
			Clothes ... 40	Clothes ... 40	Clothes ... 20		
			Ornaments ... 100	Ornaments ... 70	Ornaments ... 25		
	190	20 or 25.	165	120	and 20 maunds of grain 60	Value rupees.	
Buying cattle and marriage expenses		Bad crops and excessive revenue demand which was reduced 3 years ago	None.	None.	In social expenses	How incurred.	
	300 0 0		...	...	500 0 0	Rs. Amount.	
	114 per cent.	Rs. 800 per cent.	...	...	510 per cent.	Per-centage of debt on total income.	
REMARKS.							

10	9	8	7	6	Number of case.			
Ditto	Ditto	Ditto	Ditto	Málik	Status.			
Suchet Singh, Ját, Mahilpur	Rúpa, Ját, Khwáspur	Sába, Rájput, Muham- madan, Salempur	Mehtáb Singh, Ját, Nánowál	Nathe Khan, Rájput, Kakon	Name of head of family, caste and residence.			
4	3	5	2	3	Male.	Number of persons comprising the family.	Adults.	
4	2	3	2	2	Female.			
1	6	2	3	4	Children.			
9	11	10	7	9	Total.			
Ditto	Ditto	Ditto	Ditto	Cultivates himself	How cultivated.	Area of holding in acres.		
25 1 10	27 1 30	15 1 0	11 3 20	24 1 10	Cultivated.			
...	...	1 0 0	0 1 20	...	Uncultivated.			
25 1 10	27 1 30	16 1 0	12 1 0	24 1 10	Total.			
Grain ... 132 16 0 Sugar ... 24 0 0 Cotton ... 0 16 0 Hemp ... 0 16 0	Grain ... 184 0 0 Sugar ... 24 0 0 Cotton ... 0 82 0 Hemp ... 0 16 0	Grain ... 97 0 0 Sugar ... 26 0 0 Indigo ... 0 6 0 Cotton ... 0 6 0	Grain ... 108 9 0 Sugar ... 25 24 0 Hemp ... 0 16 0	Grain ... 144 24 0 Sugar ... 38 16 0	Kind of produce.	One year's produce of the land.		
173 8 0	209 8 0	128 12 0	134 4 0	183 0 0	Amount in maunds.			
331 4 0	368 5 4	239 6 8	234 1 4	383 6 8	Value.			
Mango crop ... 30 0 0 Shamlát income 20 0 0	...	Gardens ... 10 0 0	Mango crop	Lambardári	Detail.	Other miscellaneous sources of income.		
50 0 0	...	10 0 0	7 0 0	22 8 0	Value.			
881 4 0	868 5 4	249 6 8	241 1 4	405 14 8	Amount in rupees.	Total income from all sources.		
Government Revenue ... 45 0 0	Government Revenue ... 60 8 0	Government Revenue ... 33 2 5	Government Revenue ... 47 12 0	Government Revenue ... 61 12 6	Detail.	Revenue, cesses and mortgage charges and (in the case of tenants) rent.		
45 0 0	60 8 0	33 2 5	47 12 0	61 12 6	Amount.			
Food ... 97 8 0 Seed ... 15 22 0	Food ... 77 0 0 Seed ... 13 20 0	Food ... 70 0 0 Seed ... 7 24 0	Food ... 75 24 0 Seed ... 6 10 0	Food ... 81 0 0 Seed ... 7 4 0	Detail.	By gifts con- ferred on food and used as seed or otherwise expended.		
112 30 0	90 20 0	77 24 0	81 34 0	88 4 0	Maunds.			
178 4 0	131 8 0	112 0 0	125 3 7	128 0 7	Value rupees.			

I.—FAMILY AND THEIR HOLDING.

II.—INCOME.

III.—EXPENDI-

Typical instances of the economic condition of the agricultural population of the Punjab, being a description of the majority of each main class (owners, occupancy tenants)

of the actual circumstances of several families in the District of Hooghly, selected as fair representatives and taken-at-will) of the agricultural population—continued.

TABLE						REMARKS.
IV.—SUMMARY.					VI.—DEBTS.	
V.—DESCRIPTION OF RESOURCES, CATTLE AND CRAFTS.					No. of rooms in house.	Cattle.
					Used as dwelling rooms.	Ornaments, tools of grain and such.
					Used for sheltering cattle.	
Menials ... 10 0 0 Labour ... 6 1 4	Menials ... 20 19 0 Labour ... 18 11 0	Menials ... 19 0 0 Labour ... 9 0 0	Menials ... 7 12 8 Labour ... 7 5 4	Menial ... 20 8 0 Labour and 2 paid servants ... 78 0 0	Detail.	Summary of changes of status of the large quantities and hired labour of all sorts.
16 1 4	89 8 0	28 0 0	15 2 0	98 8 0	Amount.	
Iron, clothes, salt, spices, &c.	Salt, iron, &c.	Ditto	Ditto	Iron 1-0-0, tobacco 2-0-0, Salt 1-0-0, maslah 0-4-0	Detail.	By purchase of articles on their own land or by their own labour.
10 0 0	86 8 0	44 0 0	20 0 0	43 0 0	Amount.	
249 5 4	288 0 0	217 2 5	208 1 7	881 5 1	Total expenditure.	
181 14 8	100 5 4	82 4 8	82 15 9	74 9 7	Surplus of income over expenditure.	
Ditto	Ditto	Ditto	Ditto	In buying cattle, marriage and paying debts	Surplus income usually how disposed of.	
6	4	8	5	9	Used as dwelling rooms.	
2	2	2	2	8	Used for sheltering cattle.	
Bullocks ... 4 Cow ... 1 Buffalo ... 1 Calves ... 5	Bullocks ... 6 Cow ... 1 Buffalo ... 1 Calves ... 8	Bullocks ... 4 Buffaloes ... 2 Calves ... 2	Bullocks ... 4 Buffalo ... 1 Calf ... 1	Bullocks ... 5 Cow ... 1 Buffalo ... 1 Calf ... 1	Detail.	Cattle.
11	11	8	6	8	Number.	
Ornaments ... 300 Vessels and clothes ... 150 Cart ... 20	Ornaments ... 125 Vessels ... 40 Iron pan ... 20 Sugar press ... 16 Cart ... 15	Ornaments ... 50 Vessels and clothes ... 30 Balma (sugar press) ... 20 Cart ... 20 Pan ... 20	Ornaments ... 25 Vessels and clothes ... 30	Ornaments ... 125 Vessels ... 75	Detail.	Ornaments, tools of grain and such.
470	216	140	55	200	Value rupees.	
Buying cattle and social expenses	...	Ditto	Ditto	Buying cattle and marriage expenses.	How incurred.	VI.—DEBTS.
800 0 0	...	400 0 0	220 0 0	250 0 0	Amount.	
79 per cent.	...	160 per cent.	91 per cent.	62 per cent.	Per-centage of debt on total income.	

3			2			1			Number of case.	
Ditto			Ditto			Mauria			Status.	
Buta Singh, Jat, carpenter, Satár			Pira, Ráin, Sebjowál			Gopi, brahman of Golehr			Name of head of family, caste and residence.	
8			4			2			Male.	
4			8			2			Female.	
2			2			1			Children.	
9			9			5			Total.	
Ditto			Ditto			Cultivated by himself			How cultivated.	
9 0 2			19 2 15			8 0 0			Cultivated.	
...					Uncultivated.	
9 0 2			19 2 15			8 0 0			Total.	
Grain 59 4 0			Grain 177 16 0			Rice, maiz, Moth, Sugar, Cotton, Safflower, Wheat,			Kind of produce.	
Sugar 88 8 0			Sugar 19 8 0			50 0 0			Amount in maunds.	
97 12 0			198 0 0			74 6 0			Value.	
192 8 0			315 0 0			Butter 30 sers			Detail.	
"Sépl"			Cart hire			Rs. 6 0 0			Other miscell-aneous sources of income.	
18 10 0			36 0 0			Rs. 80 6 0			Total income from all sources.	
211 2 0			351 0 0			Rs. As. 27 13 owner's share in cash and kind, malbáh			Detail.	
Rent			Rent			29 13 0			Amount.	
25 8 10			49 9 0			Food 7½ maunds per individual			Detail.	
Food 57 24 0			Food 97 8 0			Food ... 37 mds. 20 sers. Total 41 20 0			Maunda.	
Seed 4 18 0			Seed 9 28 0			Seed ... 4 ..			Value rupees.	
62 2 0			106 36 0			Rs. 60 0 0			By grain con-sumed as food and used as food or otherwise expended.	
103 0 0			154 5 4							

I.—FAMILY AND THEIR HOLDING.

II.—INCOME.

III.—EXPENDI-

Typical instances of the economic conditions of the agricultural population of the Punjab, being a description of the majority of each main class (owners, occupancy tenants

of the actual circumstances of several families in the District of Hoshiarpur, selected as fair representatives and tenants-at-will) of the agricultural population—continued.

IV.—SUB-FARM.		V.—DESCRIPTION OF RESIDENCE, CATTLE AND CHATTEL.		VI.—DEBT.	
Menials 6 0 0	Menials 10 8 0				
Labour 10 0 0	Labour 4 0 0				
18 0 0	14 8 0				
Ditto	Ditto	Iron ... 1 4 0	Musalah ... 1 0 0		
		Salt ... 3 0 0	Oil ... 1 8 0		
		Tobacco 1 8 0	Shoes ... 3 0 0		
		Sochal 0 8 0	Roofing ... 3 0 0		
30 0 0	38 0 0			Rs. 14 12 0	Amount.
174 8 10	251 6 4			98 9 0	Total expenditure.
36 14 2	99 9 8	No surplus, deficient of Rs. 18 per annum		Surplus of income over expenditure.	
Social expenses.	In buying cattle, marriage and paying debts.	None		Surplus income usually how disposed of.	
8	4	2		Used as dwelling rooms.	
1	2	1		Used for sheltering cattle.	
Bullocks 3	Bullocks 5	Buffalo 1			
Buffaloes 2	Buffalo 1	Cow 1			
Cow 1	Calves 2	Calf 1			
		Bullocks 2			
		Buffalo calf 1			
6	8			6	Number.
Ornaments 160	Ornaments 50	Dishes, ornaments, busts, grindstone, &c., &c.			
Vessels 20	Vessels and clothes ... 15				
Clothes 20	Carb 25				
200	90	50			
Marriage of sons and daughters	Buying cattle and social expenses	The produce of his land is not sufficient for wants of the family.		How incurred.	
300 0 0	300 0 0	Rs. 200 0 0		Amount.	
142 per cent.	98 per cent.	250 per cent.		Per-centage of debt on total income.	
		This is a fair specimen of the condition of the hereditary cultivator, who pays in kind in the Jaswāndūn. They are mostly falling into debt.		REMARKS.	

5		4		3		2		1		Number of case.			
Ditto		Ditto		Ditto		Ditto		Tenant at will		Statua.			
Mábjí, Gujar, Mábilpur		Umra, Ját, Satár		Bahádar, Ráin, Schjowál		Gardhari, caste Chung, residence Basantpur, thána Hájipur.		Fauje, Gujar, Nagnanli		Name of head of family, caste and residence.			
8		2		3		1		4		Male.			
8		1		2		1		1		Female.			
2		1		3		1		5		Children.			
8		4		8		8		10, but say 9, as 2 sons are absent half the year		Total.			
Ditto		Ditto		Ditto		Ditto		Cultivated by himself		How cultivated.			
20 2 20		4 0 5		8 1 25		7 0 0		7 acres		Cultivated.			
...		...		...		...		...		Uncultivated.	
20 2 20		4 0 5		8 1 25		7 0 0		...		Total.			
Grain ... 87 16 0 Sugar ... 12 0 0 Hemp ... 1 8 0 Cotton ... 2 16 0 Kasumba ... 0 26 0		Grain ... 21 8 0 Sugar ... 16 0 0 Hemp ... 1 8 0		Grain 72 0 0		1 ghumáo ... Maize 6 " ... Wheat 1 " ... Til 1 " ... Cotton		Maize, cotton, rape, wheat		Kind of produce.		One year's produce of the land.	
108 26 0		88 16 0		72 0 0		33 0 0		45 0 0		Amount in maunds.			
199 4 8		84 8 0		98 0 0		45 0 0		61 8 0		Value.			
...			Goats 2		Butter 12 Goats 5 Service 30		Total 47 0 0		Detail.	
...			2		Rs. 47 0 0		Value.		Other miscel- lanous sources of income.	
199 4 8		84 8 0		98 0 0		45 0 0		Rs. 108 0 0		Amount		Total income from all sources.	
Ditto		Ditto		Ditto		1/4 produce to landlord, who pays Government Revenue		Maunds 56 20 0		Detail.		Revenue, taxes and royalties paid (in the case of tenants) rent.	
82 0 0		42 8 0		80 9 0		Rs. 14 5 0		Rs. 28 8 0		Amount.			
Food ... 72 0 0 Seed ... 7 1 0		Food ... 28 32 0 Seed ... 1 8 0		Food ... 57 34 0 Seed ... 1 13 0		4 1/2 maunds per mensem = 54 maunds per annum		9 persons @ 5 mds. each		Detail.		By grain con- sumed as food or otherwise expended.	
79 1 0		80 0 0		58 37 0		22 0 0		45 0 0		Maunds.			
121 8 4		50 0 0		94 13 10		27 0 0		54 0 0		Value rupees.			

Typical instances of the economic condition of the agricultural population of the Punjab, being a description of the majority of each main class (owners, occupancy tenants).

I.—FAMILY AND THEIR HOLDING.

II.—INCOME.

III.—EXPENSE.

of the actual circumstances of several families in the District of Hoatekrpur, selected as fair representatives and tenants-at-will) of the agricultural population—concluded.

IV.—SURPLUS.						V.—DESCRIPTION OF RESIDENCE, CATTLE		VI.—DEBT.	REMARKS.
FARM.						AND CHATTELS.			
Menials ... 2 14 8 Labour ... 6 5 4	Menials ... 4 4 0	Menials ... 4 0 0	8½ maunds	Kamin ... 8 maunds Seed ... 80 "	Detail.	Customary charges of cultivation, viz. large menials and hired labour of all sorts.	By purchase of materials which the family cannot produce or by their own labour.		
9 4 0	4 4 0	4 0 0	Rs. 1 12 0	Rs. 4 + Rs. 6 = 10	Amount.				
Ditto	Ditto	Ditto	Iron ... 1 0 0 Salt ... 1 0 0	Iron 1 8 0 Masdleh 1 0 0 Salt 4 0 0 Oil 1 0 0 Tobacco 2 0 0 Shoes 4 0 0 Sochal 1 0 0 Roof 3 0 0	Detail.				
18 4 0	14 0 0	10 0 0	2 0 0	Rs. 17 8 0	Amount.				
175 11 0	110 12 0	138 15 10	45 1 0	28 8 0 + 54 + 10 + 17 8 0 = Rs. 110 "	Total expenditure.				
28 9 4	...	...	None	No surplus, deficient of Rs. 2 per annum	Surplus of income over expenditure.				
social expenses and buying cattle	...	...	None	None	Surplus income usually how disposed of.				
4	1	2	1	1	Used as dwelling rooms.	No. of rooms in house.			
1	1	1	1	2	Used for sheltering cattle.				
Bullocks ... 4 Calves ... 2 Cow ... 1	Bullocks ... 2	Bullocks ... 8 Cows ... 8 Calves ... 3	3 bullocks, 2 cows, 2 calves, 3 goats	1 buffalo and calf 2 cows and 2 calves 2 bullocks, 80 goats	Detail.	Cattle.			
7	2	9	10	88	Number.				
Ornaments ... 20 Vessels and clothes 13	Ornaments ... 5 Vessels ... 1 Clothes ... 2	Ornaments ... 10 Vessels and clothes 15	Ornaments, clothes, furniture, &c.	Bedsteads, grindstone, spinning wheel	Detail.	Cattle, stock of grain and cash.			
38	8	25	20	Rs. 5 0 0	Value rupees.				
An advance for paying rent.	Ditto.	Buying cattle and social expenses	Occasional bad crops and high rate of interest	Insufficiency of income to meet family expenditure	How incurred.				
10 0 0	80 0 0	125 0 0	30 0 0	Rs. 225 0 0	Amount.				
5 per cent.	71 per cent.	127 per cent.	66 per cent.	200 per cent.	Per-centage of debt on total income.				
				This is a fair specimen of the tenant-at-will.					

QUESTION 9, CHAPTER I.

Answer by MR. HAWKINS, Deputy Commissioner of Amritsar.

My connection with the Amritsar District has been short. I joined as District Officer on 12th of last month, having before served in the same capacity for eight or nine months in 1876; not having passed a camping season in the District, my knowledge of its inhabitants is limited to that acquired by visits to the different tahsil head-quarters. I have, however, spent some time in the neighbouring, and in many respects similar, District of Lahore. CH. I.

So far as I am aware, there is no material difference in welfare between the three classes of "owners," "occupancy tenants," and "tenants-at-will." This may seem improbable, but it may be explained that good tenants are seldom evicted, and that both classes of tenants practically hold much the same position.

Their economic condition is, I believe, good, if comparison be made with any similar class of peasant proprietors in European countries. One point is perhaps specially worthy of notice, that the Zamindár has since annexation increased his material comforts and possessions considerably, and apparently this progress still continues: it is by no means unusual now to hear of a Zamindár combining a little money-lending with his agriculture, or able to add to his land by purchase or mortgage. The average dress is better; more ornaments and cattle are kept.

The agricultural population has never much capital, but that this class in the Punjab is not quite without capital is shown by the fact that they have tided over at least three bad years on their own resources, without further help than occasional remissions of revenue. The last three years would have gone far to break a good many tenant farmers in England.

As a rule, the agriculturist is somewhat in debt, but this appears to be the normal condition of the peasant proprietor in all countries. The money-lender is a power in Ireland, France or Germany. But as a rule also I should be inclined to think that the agriculturist is solvent, *i. e.*, his estate would pay 20s. in the £. Foreclosure of mortgage is the real ruin of the peasant proprietor, but this is not peculiar to the Punjab; how many estates in England are clear?

As to the proportion of debts to income or of insolvents to the whole population, I could give no answer but a guess. The agriculturist will probably over-state his debts in view of future taxes: the money-lender would over-state them for fear they should be afterwards cut down. The indebtedness is certain to be exaggerated. Even in England the local banks only could furnish similar statistics of any value, and the information could hardly be demanded from them.

The debts of the agriculturist are due to various causes: marriage ceremonies will generally be the reply given to a question on the point. Purchase of cattle or advances of seed-grain are, I believe, really the most common cause of debt, and my experience in tracing the origin of book debts and bonds has been somewhat large. It often appears that the original debt, which was merely a small balance due to the general shop of the village, has swollen like a snow ball in the course of a generation; a fresh bond for principal and interest being made out every two or three years.

The illustrations given in reply to the 3rd question may give some idea of proportion when collected for the entire Province, the figures given below are too few for any generalization.

The accompanying instances have been taken quite at random with no view of illustrating any particular theory. I trust that they approach correctness, but would remark that the produce of the land is almost impossible to estimate, unless real farming accounts are kept, and is probably under-stated. Also, as noted above, the amount of debt is probably exaggerated; still the value of the property in cattle and brass vessels &c. will, in most cases, meet the debt, if the value of the cattle be only taken at Rs. 10 per head.

Typical instances of the economic condition of the agricultural population of the District selected as fair representatives of the majority of each main class, (owners,

I.—FAMILY AND THEIR HOLDING.										
No. of case.	Status.	Name of head of family, caste and residence.	No. of persons comprising the family.				Area of holding in acres.			
			Adults.		Children.	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.
			Male.	Female.						
1	Proprietor.	Indar Sing, son of Anup Sing, Jât (Vadâich) of Adliwalâ Ferganah Ajndia.	3	3	7	13	Self.	19 acres	...	19 acres.
2	Hereditary tenant.	Mutasaddi, son of Pir Baksh, Musliman, Kamboh of Rodala Ferganah Ajndia.	1	3	1	7	Do.	4 acres.	...	4 acres.
3	Proprietor.	Sardool Sing, son of Ghasita Singh, Jât (Dadwâl) of Balia Manjpur, Ferganah Amrisar.	1	2	2	5	Do.	21 acres.	...	21 acres.
4	Hereditary tenant.	Sawan, Son of Thobî, Musliman Arin of Gil, Ferganah Amrisar.	2	2	2	6	Do.	12 acres and 2 Boods.	...	12 acres and 2 Boods.
5	Proprietor.	Bir Sing, Lamberdâr, Caste Jât of Mughal Chak, Tahsil Tarn Taran.	6	5	4	15	Do.	33 acres 2 Boods.	...	33 acres 2 Boods.
6	Tenant-at-will.	Bari Sing, son of Nar Sing, Carpenter Sikh of Palasore, Ferganah Tarn Taran.	5	5	5	15	Do.	24 acres.	...	24 acres.

Punjab, being a description of the actual circumstances of several families in the Amritsar occupancy tenants, and tenants-at-will) of the agricultural population.

II.—INCOME.						III.—EXPENDITURE.					
One year's produce of the land.			Other miscellaneous sources of income.		Total income from all sources.	Revenue, cesses and seigniorage charges, and (in the case of tenants) Rent.		By profits consumed as food and used as seed or otherwise expended.			
Kind of produce.	Amount in maunds.	Value.	Detail.	Value.	Amount in Rs.	Detail.	Amount.	Detail.	Maunds.	Value.	
	Maunds.	Rs. A. P.			Rs. A. P.					Rs. A. P.	
Makki ...	24	40 0 0	...	...	...	Revenue ...	38 5 9	Food ...	100	} 282 0
Gur ...	12	24 0 0	...	...	...	Cesses ...	8 11 9	Seed ...	16	
Cotton ...	4	16 0 0	...	...	...	Canal and W. A. ...	...	...	...
Wheat ...	128	240 0 0	...	...	...	Revenue, ...	12 0 0	...	...
Geji Do. ...	23	52 0 0	...	...	...	Chaukidara ...	0 8 0	...	...
Total ...	200	402 0 0	...	...	402 0 0	Total ...	60 5 6			
Makki ...	3	8 5 0	From land cultivated as tenants-at-will.	...	77 5 0	Chaukidara ...	0 8 0	Seed ...	2	} 86	
Cotton ...	1 and 24 sars.	5 5 0	...	20 0 0	...	Rent ...	1 4 5	Food ...	40		
Gur ...	2	6 10 0	Sale of Pathi or cowdung.	5 0 0	...	Cesses ...	2 0 0	...	...
Wheat ...	12	24 0 0	...	...	...	Revenue ...	8 5 8	...	...
Barley ...	4 and 22 sars.	6 0 0	...	...	...			...	...
Tobacco ...	2 and 16 sars.	8 0 0	...	...	...			...	...
Fodder ...	...	...	...	...	...			...	...
Total ...	24 and 22 sars.	54 5 0	Total ...	28 0 0		Total ...	11 15 9				
Moth ...	7	10 8 0	From land cultivated by tenants-at-will.	8 0 0	214 12 0	Cesses ...	5 9 8	Mis. expenses ...	...	36 0 0
Fodder ...	122	80 0 0	...	...	...	Revenue ...	24 11 10	Seed ...	...	3 10 0 0
Mash ...	...	...	...	...	...			...	...	...
Wheat ...	80	125 0 0	...	...	...			...	...	...
Cotton ...	1-20	5 0 0	...	...	...			...	...	...
Makki ...	5	6 4 0	...	...	...			...	...	...
Total ...	...	206 12 0				Total ...	20 5 6	Food ...	80	120 0 0
Mash, Moth, and Oil-seed.	2-20	8 12 0	...	...	127 4 0	Rent ...	0 8 0	Mis. or cash ...	...	12 0 0
Berra ...	15-0	22 8 0	...	...	...	Cesses ...	8 9 7	Food ...	...	28 0 0
Fodder ...	45-0	87 8 0	...	...	...	Revenue ...	24 10 0	Seed ...	...	11 18 8 0
Wheat ...	0-15	2 0 0	...	...	...			...	...	...
Red Pepper ...	0-0	27 0 0	...	...	...			...	...	...
Sugar-cane ...	1-20	5 0 0	...	...	...			...	...	...
Cotton ...	...	...	...	...	...			...	...	...
Total ...	...	127 4 0				Total ...	39 11 7			
Cotton, Makki, Jowar, Moth, Mash, and Wheat &c.	244	282 5 4	Lambardari-fee.	17 0 0	279 5 4	Chaukidara ...	0 3 0	Seed ...	172	40 8 6	
						Cesses ...	8 2 10	Food ...	163	162 0 0	
						Revenue ...	25 7 8	...	...	...
								
						Total ...	31 18 6				
Cotton, Makki, Jowar, Moth, Mash, Gram, and Wheat &c.	222-0	291 11 0	Hire of Bullock Cart.	25 0 0	316 11 0	Chaukidara ...	0 8 0	Seed ...	21 7 0	30 7 6	
						Rent ...	17 1 2	Food ...	172 82 0	112 15 0	
						Cesses ...	8 10 5	...	...	...
						Revenue ...	25 4 10	...	...	...
								
						Total ...	60 9 6	Total ..	...	208 4 6

Typical

EXPENDITURE.—concluded.				IV.—SURPLUS.			V.—DESCRIPTION OF BRES.	
Customary charges of village menials and hired labour of all sorts.		By purchase of necessaries which the family cannot produce on their own land or by their own labour.		Total Expenditure.	Surplus of income over expenditure.	Surplus income usually how disposed of.	No. of rooms in houses.	
Detail.	Amount.	Detail.	Amount.				Used as dwelling rooms.	Used for sheltering cattle.
Semethri, Ojál, Blacksmith, Potter, Carpenter, Barber, Shoemaker, Dhoby, Bhewar.	66 8 0	Bullocks Blankets, seeds and shoes &c.	80 10	Rs. A. P. 389 1 6	Rs. A. P. 18 14 6	In funeral and marriage &c. ceremonies.	A house consisting of 3 rooms, 1 yard, 2 Kitchens and a Dalan Terinla.	2 Rooms of Kothas.
Potter, Blacksmith, Carpenter, Jewar, Shoemaker, Barber.	6 6 0	No balance for expenditure as stated.	...	104 6 9	...	...	A katcha house consisting of 3 rooms.	2 Kothas.
Working men	65 0 0	No balance	...	261 5 6	...	...	A katcha house consisting of 3 rooms.	A katcha house consisting of 3 rooms.
Potter, Blacksmith and others.	12 0 0	...	...	129 3 7	...	...	One house.	One house.
Working men	16 0 0	Iron, Salt, Turmeric, Pepper &c.	5 0 0	214 13 6	64 7 10	Marriage and Funeral ceremonies.	1 katcha house; 4 used for dwelling, and half for cattle.	...
Working men	25 0 0	Iron, Salt, Turmeric, Pepper, &c.	6 0 0	284 14 0	21 13 0	Marriage and Funeral ceremonies.	1 House khám.	1 House khám.

Instances, Amritsar District.—concluded.

CH. I.

DEBTS, CATTLE AND CHATTELS.				VI.—Debts.			REMARKS.
Cattle.		Chattele, Stock of grain and cash.		How incurred.	Amount.	Per-centage of debt on total income.	
Detail.	Number.	Detail.	Value.				
Ploughing bullocks	6	Gégar	Rs. A. P.	One Nephew's marriage.	Rs. A. P.	Rs. A. P.	Good head of stock and good produce. * Includes 10 interest.
Buffaloes	2	Garwa	4 0 0				
Cows	2	Parā	10 0 0				
Calves	2	Tiāl	4 0 0				
Female calves	2	Katara	7 0 0				
Kati	1	Kol	2 0 0				
		Tāhi	2 0 0				
		Grain	20 0 0				
		Ornaments	20 0 0				
Total	17	Total	195 0 0				
Cows	2	Ornaments	60 0 0	Debt incurred owing to failure of crops for 4 successive years.	100 0 0	129 0 0	Produce of land probably much understated, or debt would be larger.
Calves	4	Makl	1 0 0				
Bullock	1	Wheat	2 0 0				
Male Buffalo	2	Fan or tava	0 2 0				
		Parā	2 8 0				
		Deqha	1 0 0				
		Katara	4 0 0				
		Thāl	1 8 0				
Total	10	Total	78 2 0				
Buffaloes	2	Brass vessels	100 0 0	Failure of crops and expenses of a large family.	200 0 0	159 0 0	Annual deficit stated: reported debt covered by property.
Male Buffalo	4						
Bullocks	2						
Cow and a calf	2	Brass Vessels 4 cows	5 0 0	Failure of crops and expenses of a large family.	100 0 0	78 0 0	
Scads or Male Buffalo	1						
Bullocks	2						
Calves	4	Brass vessels	25 0 0	Family marriage expenses and partly purchase of cattle.	72 0 0	25 0 0	
Cows	2						
Buffaloes	2						
Bullocks	4						
Total	12						
Calves	2	Brass vessels	8 0 0		150 0 0	47 0 0	Amount of debt vaguely stated.
Cows	2						
Buffaloes	1						
Bullocks	4						
Total	9						

Typical

EXPENDITURE.—concluded.				IV.—SURPLUS.			V.—DESCRIPTION OF RES.	
Customary charges of village menials and hired labour of all sorts.		By purchase of necessaries which the family cannot produce on their own land or by their own labour.		Total Expenditure.	Surplus of income over expenditure.	Surplus income usually how disposed of.	No. of rooms in house.	
Detail.	Amount.	Detail.	Amount.				Used as dwelling rooms.	Used for sheltering cattle.
Sepathi, Odai, Blacksmith, Potter, Carpenter, Barber, Shoemaker, Dhoby, Bhowar.	56 8 0	Bullocks Blankets, seeds and shoes &c.	80 10	Rs. A. P. 389 1 6	Rs. A. P. 18 14 6	In funeral and marriage &c. ceremonies.	A house consisting of 3 rooms, 1 yard, 2 Kitchens and a Dalan Terinla.	2 Rooms of Kothas.
Potter, Blacksmith, Carpenter, Jhowar, Shoemaker, Barber.	6 6 0	No balance for expenditure as stated.	...	104 5 9	...	...	A katcha house consisting of 3 rooms.	2 Kothas.
Working men	65 0 0	No balance	...	261 5 6	...	...	A katcha house consisting of 3 rooms.	A katcha house consisting of 3 rooms.
Potter, Blacksmith and others.	13 0 0	...	...	129 2 7	...	...	One house.	One house.
Working men	15 0 0	Iron, Salt, Turmeric, Pepper &c.	5 0 0	214 12 6	64 7 10	Marriage and Funeral ceremonies.	1 katcha house; used for dwelling, and half for cattle.	...
Working men	25 0 0	Iron, Salt, Turmeric, Pepper, &c.	6 0 0	284 14 0	31 12 0	Marriage and Funeral ceremonies.	1 House kham.	1 House kham.

Instances, Amritsar District.—concluded.

CH. I.

DEBTS, CATTLE AND CHATTELS.				VI.—Debts.			REMARKS.
Cattle.		Chattele, Stock of grain and cash.		How incurred.	Amount.	Per-centage of debt on total income.	
Detail.	Number.	Detail.	Value.				
Flourishing bullocks	6	Gdgar	Rs. A. P.	One Nephew's marriage.	Rs. A. P.	87 3 6	Good head of stock and good produce. * Includes 70 interest.
Buffaloes	2	Garwa	4 0 0				
Cows	3	Fardh	10 0 0				
Calves	3	Thali	4 0 0				
Female calves	2	Katara	7 0 0				
Kahi	1	Tachi	2 0 0				
		Grain	80 0 0				
		Ornaments	80 0 0				
Total	17	Total	198 0 0				
Cows	3	Ornaments	60 0 0					Debt incurred owing to failure of crops for 4 successive years.	100 0 0	129 0 0	Produce of land probably much understated, or debt would be larger.
Calves	4	Makhi	1 0 0				
Bullock	1	Wheat	2 0 0				
Male Buffalo	2	Pan or lava	0 2 0				
		Fardh	3 2 0				
		Doghra	1 0 0				
		Katara	4 0 0				
		Thali	1 8 0				
Total	10	Total	78 2 0				
Buffaloes	4	Brass vessels	100 0 0	Failure of crops and expenses of a large family.	300 0 0	128 0 0	Annual deficit stated; reported debt covered by property.
Male Buffalo	1						
Bullocks	2						
Cow and a calf	2	Brass Vessels 4 sets	5 0 0	Failure of crops and expenses of a large family.	100 0 0	78 0 0	
Heads or Male Buffalo	1						
Bullocks	2						
Calves	4	Brass vessels	25 0 0	Partly marriage expenses and partly purchase of cattle.	73 0 0	28 0 0	
Cows	2						
Buffaloes	2						
Bullocks	4						
Total	12						
Calves	2	Brass vessels	8 0 0		180 0 0	47 0 0	Amount of debt vaguely stated.
Cows	2						
Buffalo	1						
Bullocks	4						
Total	9						

QUESTION 9, CHAPTER I.

Report of Rájá SIR SAHIB DYAL, of Amritsar.

The lands which were uncultivated at the first Settlement (1850), have since then been nearly all of them cultivated ; and the village cattle are grazed on the lands free of crops. It is the custom to take a rabi crop off half the land of each village, and a kharif crop off the other half, so the cattle graze on the land from which a crop was last harvested.

Grazing.

The only difference between the hereditary tenants, and owners who cultivate their own lands, is that the former pay to the owners a fixed cash charge in addition to the Government's revenue and cesses.

Hereditary tenants.

Most of the tenants-at-will pay cash rents ; both owners and tenants prefer cash rents to kind. A man who takes land only for one or two harvests not uncommonly pays in kind ; viz., either $\frac{1}{3}$ or $\frac{2}{3}$ of the produce. If the tenant takes waste land to reclaim it, it is usual to charge no rent for 4 or 5 years ; in which time the tenant has thereby reimbursed his expenses of bringing the land under cultivation.

Tenants-at-will.

Agriculturists are dependent on their plough cattle. If they die or grow old or are carried off by contagious disease, the agriculturists must borrow to replace them. This is generally the beginning of their debts. The cost of the cattle cannot be repaid in a year ; and thus interest begins, and so adds to the original debt that the agriculturists cannot clear the debt except with great difficulty.

Debt.

In the same way when the agriculturists borrow cash or grain, they are over-weighted with interest. The general custom is to charge for cash 25 per cent. per annum, and for grain 25 maunds per harvest for every 100 maunds borrowed. But the bankers now usually make the agriculturist promise to pay interest at 50 per cent. in kind. For instance, if a Zamíndár borrows 100 maunds wheat in February, they make him promise to pay 150 maunds in June, when the wheat is cut ; and if he fails to do so, they charge 75 maunds more as interest at the next harvest, and require him to pay in pulses (mash) which are more valuable than wheat. This is stipulated for when the grain loan is originally made. But it of course completely crushes the Zamíndárs. Such practices are followed even by those bankers who pay respect to their religion. Unprincipled men claim interest at $\frac{1}{2}$ anna per rupee per mensem ; and in grain transactions advance bad grain at dear prices, and at harvest time take the best at very cheap prices. So that once a Zamíndár gets into debt, it is very unlikely that he can clear himself, except by making over his land to his creditor.

It is difficult to say how many persons are in debt. Very few agriculturists are free of debt. Nearly all are in debt. Every 6 months the bankers make up their accounts, and add to the principal the interest due. If a man can pay the interest at one harvest he fails to do so at the next, and so the principal increases.

How many persons are in debt ?

I have lived in the Amritsar District at Kishan Kot for the last 40 years.

Typical instances of the economic condition of the Agricultural population of the Punjab, representatives of the majority of each main class (owners, occupancy

I.—FAMILY AND THEIR HOLDING.											
Number of case.	Status.	Name of head of family caste, and residence.	Number of persons comprising the family.				Area of holding in acres.				
			Adults.		Children.	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.	
			Male.	Female.							
1	Owner...	Kharak Singh Ját of Thatti...	12	6	4	22	Home cultivation ...	45	...	45	AMRITSAR
							Total ...	45	...	45	
2	Owner...	Amir Khan, Rajput of Tathpur.	5	5	...	10	Home cultivation ...	40	...	40	AMRITSAR
							Held by tenants ...	80	...	80	
							Total ...	70	...	70	
1	Owner...	Shere Singh Ját of Soda Munda.	4	3	1	8	Home cultivation ...	30½	...	20½	GURDASPUR
							Held by tenants ...	147½	...	178	
							Total ...	178	26½	204½	
2	Owner...	Kanda and Gulábs Ját of Jandiala.	5	2	...	7	Home cultivation ...	25	...	25	GURDASPUR
							Held by tenants ...	15	...	10	
							Total ...	40	...	40	

being a description of the actual circumstances of several families in each District selected as fair C tenants and tenants-at-will) of the agricultural population.—AMRITSAR DISTRICT.

II.—INCOME.							III.—EXPENDITURE.				
Kind of produce.	One year's produce of the land.		Other miscellaneous sources of income.			Total income from all sources.	Revenue, cesses and assignments charges and in the case of tenants, rent.		By grain consumed as food and seed and otherwise expended.		
	Amount in maunds.	Value.	Detail.	Amount.	Value.		Detail.	Amount.	Detail.	Maunds.	Value.
DISTRICT.	M. S.	Rs. A. P.									
Gur	40 32	128 0 0	...	...	...	...	Revenue and cesses.	70 0 0	Grain used for food and seed &c.	...	344 0 0
Cotton	9 24	24 0 0	...	...	...	...			Fodder for cattle.	...	91 0 0
Makki	28 32	28 13 0	...	...	...	...	
Chari	32 0	32 0 0	...	...	...	...	
Mash	9 24	19 3 0	...	...	...	...	
Moth	14 16	18 0 0	...	...	...	...	
Sawak	25 24	16 0 0	...	...	...	...	
Wheat & gram	163 8	204 0 0	...	...	...	...	
Fodder	...	91 0 0	...	...	...	...	
...	324 0	661 0 0	...	...	...	561 0 0		70 0 0	...	...	436 0 0
Gur	20 18	64 0 0	...	...	...	...	Revenue	114 0 0	Grain used for food and seed &c.	...	249 5 0
Cotton	6 16	16 0 0	...	...	...	...	Canal rate	26 0 0		...	116 0 0
Makki	28 32	28 13 0	...	...	...	...			Fodder	...	
Mash	3 0	16 0 0	...	...	...	...	
TI	0 8	0 8 0	...	...	...	...	
Jhona (Rice)	80 0	80 0 0	...	...	...	...	
Fodder & sauni	...	116 0 0	...	...	...	...	
Wheat & gram	211 8	264 0 0	...	...	...	...	
Rent at 1/3rd produce.	365 2	685 5 0	...	...	...	685 5 0					
Grain	32 0	40 0 0	...	...	...	...	
Cash	...	60 0 0	...	...	...	...	
...	32 0	100 0 0	...	...	...	...	
...	387 2	685 5 0	...	...	...	685 5 0		189 0 0	...	...	365 0 0
DISTRICT.	30 29	96 0 0	...	...	...	...	Revenue	202 1 3	Grain used for food & seed &c.	...	340 12 5
Cotton	8 8	8 0 0	...	...	...	...			Fodder	...	89 0 0
Makki	16 32	16 18 0	...	...	...	...	
Mash	20 0	40 0 0	...	...	...	...	
TI	0 20	1 4 0	...	...	...	...	
Rice	19 8	16 0 0	...	...	...	...	
Wheat & gram	144 0	180 0 0	...	...	...	...	
Fodder	...	89 0 0	...	...	...	...	
Rent in cash.	234 17	447 1 0	...	...	...	...	
...	...	278 12 8	...	...	...	...	
...	284 17	725 13 8	...	...	...	725 13 8		202 1 3	...	...	429 12 5
Gur	20 18	64 0 0	...	...	...	...	Revenue	73 0 0	Grain for food and seed &c.	...	194 15 0
Cotton	8 8	8 0 0	...	...	...	...			Fodder	...	72 0 0
Makki	92 4	9 10 0	...	...	...	...	
Mash	16 0	32 0 0	...	...	...	...	
Sawak	25 24	16 0 0	...	...	...	...	
Moth	9 24	12 0 0	...	...	...	...	
Wheat & Gram	86 16	108 0 0	...	...	...	...	
Berra Wheat	28 32	86 0 0	...	...	...	...	
Fodder, Sauni	...	72 0 0	...	...	...	...	
Rent at 1/3rd produce.	199 26	367 10 0	...	...	...	...	
Grain	18 26	28 5 0	...	...	...	...	
Cash	...	16 0 0	...	...	...	...	
...	18 26	89 5 0	...	...	...	...	
...	218 12	396 16 0	...	...	...	396 16 0		73 0 0	...	...	266 15 0

Typical instances of the condition of the

No. of case.	Status.	Name of head of family, caste and residence.	III.—EXPENDITURE.—Concluded.					IV.—SURPLUS.	
			Customary charges of village menials and hired labour of all sorts.		By purchase of necessaries which the family cannot produce on their own land and by their own labour.		Total expenditure.	Surplus of income over expenditure.	Surplus of income usually how disposed of.
			Detail.	Amount.	Detail.	Amount.			
1	Owner.	Kharak Singh Ját of Thatti.	Village Menials ...	8 0 0	Iron ...	4 0 0	...	...	AMRITSAR
			Farm servant ...	41 0 0	Salt ...	3 0 0			
			Total ...	49 0 0	...	7 0 0				561 0 0
2	Owner.	Amfr Khan Rájput of Tathpur.	Village Menials ...	9 0 0	Iron ...	3 0 0	...	...	Purchase of cattle and also given to poor men as loan.
			2 farm servants ...	67 0 0	Salt ...	2 0 0			
			Total ...	76 0 0	...	5 0 0				685 5 0	100 0 0
1	Owner.	Shere Singh Ját of Soda Manda.	Village Menials ...	8 0 0	Iron ...	3 0 0	...	...	GURDASPUR Purchase of cattle and marriage expenses.
			2 farm servants ...	81 0 0	Salt ...	2 0 0			
			Total ...	89 0 0	...	5 0 0				725 13 8	...
2	Owner.	Kanda and Gholába Ját of Jandiála.	Village Menials ...	18 0 0	Iron ...	2 0 0	...	...	Purchase of cattle and payment of debts.
			Farm servants ...	36 0 0	Salt ...	2 0 0			
			Total ...	54 0 0	...	4 0 0				896 15 0	...

agricultural population of the Punjab—continued.

V.—DESCRIPTION OF RESIDENCE, CATTLE AND CHATTLE.						VI.—DEBTS.			REMARKS.
No. of rooms in house.		Cattle.		Chattle, stock of grain and cash.		How incurred.	Amount.	Percentage of debt on total income.	
Used as dwelling rooms.	Used for sheltering cattle.	Detail.	Number.	Detail.	Value rupees.				
DISTRICT—concluded.									
6	6	Oxen ...	12	Not stated		Death of Oxen.	400	71	
		Cows and Calf ...	14						
6	6	...	26	...	...	...	400	71	
7	3	Oxen ...	9	Not stated		...	...	...
		Cows & calves ...	6	Grain ...	100 0 0				
		Milch buffaloes and calves.	8						
		Mares ...	2						
7	3	...	24	...	100 0 0	...	...	...
DISTRICT—continued.									
6	2	Oxen ...	5	Not stated		Marriage of son	250	34	
		Cows ...	3						
		Calves ...	3						
		Mare ...	1						
		Colt ...	1						
8	2	...	13	...	...	...	250	34	
2	1	Oxen ...	4	Not Stated		Purchase of cattle and dist.	140	35	
		Cows ...	3						
		Milch buffalo ...	3						
		Mare ...	1						
		Sheep ...	2						
2	1	...	12	...	...	...	140	35	

Typical instances of the economic condition of

Number of case.	1.—FAMILY AND THEIR HOLDING.									
	Status.	Name of head of family, caste and residence.	No. of persons comprising the family.				Area of holding in acres.			
			Adults.		Children.	Total.	How cultivated.	Cultivated.	Uncultivated.	Total.
			Males.	Females.						
3	Owner...	Sundar Singh and Lál Singh Ját of Kahnúwán.	5	2	...	7	Home cultivation	19½	...	19½
							Total ...	19½	...	19½
4	Owner...	Data Ram Khairi of Kúsa ...	10	12	...	22	Home cultivation ...	493	72½	565½
							Total ...	493	72½	565½
5	Tenant at will.	Umar Jat of Kúra ...	2	4	3	9	Home cultivation ...	8½	...	8½
							Total ...	8½	...	8½
6	Do. ...	Phola Jat of Kúra ...	2	3	2	7	Home cultivation	13½	...	13½
							Total ...	13½	...	13½

agricultural population of the Punjab—continued.

II.—INCOME.						III.—EXPENDITURE.					
One year's produce of the land.			Other Miscellaneous sources of income.		Total In- come from all sources.	Revenue cesses and signo- rage charges and in the case of tenants rent.		By grain consumed as food and used as seed or otherwise expended.			
Kind of produce.	Amount in maunds.	Value.	Detail.	Amount.	Value.	Amount in rupees.	Detail.	Amount.	Detail.	Maunds.	Value.
	Mds. Srs.										
Gur	10 9½	32 0 0	...	...	...	...	Revenue	25 3 0	Grain for food and seed &c. Fodder	...	142 11 0
Makki	12 0	12 9 0	...	...	...	...	...	...	...	...	52 0 0
Mash	17 24	35 3 0	...	...	...	...	...	...	...	...	...
Til	5 24	12 0 0	...	...	...	...	...	...	...	...	...
Sarak	20 32	13 0 0	...	...	...	...	...	...	...	...	...
Wheat and Gram Berra.	79,30	99 11 0	...	...	...	...	...	...	...	...	...
Fodder	...	52 0 0	...	...	...	...	...	...	...	...	...
...	145,29½	257 14 0	...	...	...	257 14 0	...	25 3 0	...	...	194 11 0
Gur	11 21½	28 13 9	...	...	...	...	Revenue	568 7 0	Food fodder and seed.	...	412 0 5
Cotton	0 28	3 8 3	...	...	...	...	...	...	...	...	...
Mash	107 27	160 15 8	...	...	...	...	...	...	...	...	...
Sarak	0 13	0 3 9	...	...	...	...	...	...	...	...	...
Til	0 34	2 13 4	...	...	...	...	...	...	...	...	...
Rice (Dhan)	20 24	16 11 4	...	...	...	...	...	...	...	...	...
Wheat	24 17	322 9 0	...	...	...	...	...	...	...	...	...
Berra, Wheat and Gram.	766 28	801 0 0	...	...	...	...	...	...	...	...	...
Barley	7 16	4 11 1	...	...	...	...	...	...	...	...	...
Sarshaf	1 27	4 2 8	...	...	...	...	...	...	...	...	...
Gram	79 25	65 14 7	...	...	...	...	...	...	...	...	...
...	1208 19	1,411 7 8	...	...	...	1,411 7 8	...	568 7 0	...	...	412 0 5
Cotton	0 20	2 2 0	...	...	...	...	The amount of rent taken by the owner in kind is not stated.	...	Food, &c. Seed	...	9 15 3
Mash	2 14	3 5 9	...	...	...	...	...	...	...	...	6 0 0
Dhan (Rice)	0 24	0 8 0	...	...	...	...	...	...	...	...	...
Wheat	4 3½	6 5 0	...	...	...	...	...	...	...	...	...
Berra wheat and Gram.	6 32	7 8 8	...	...	...	...	...	...	...	...	...
Gram	1 13	1 1 10	...	...	...	...	...	...	...	...	...
...	16 28½	20 15 3	...	...	...	20 15 3	...	...	...	...	15 15 3
Gur	5 27	34 8 8	...	...	...	...	The amount of rent taken by the owner in kind is not stated.	...	Food & seed...	...	47 11 0
Mash	3 16	4 10 8	...	...	...	...	...	...	...	...	...
Wheat	4 15	7 4 4	...	...	...	...	...	...	...	...	...
Berra wheat and gram.	20 0	22 3 8	...	...	...	...	...	...	...	...	...
Barley	1 13	0 10 4	...	...	...	...	...	...	...	...	...
Gram	4 6½	3 7 4	...	...	...	...	...	...	...	...	...
...	38 37	52 11 0	...	...	...	52 11 0	...	...	...	...	47 11 0

Typical instances of the economic condition of

No. of case.	Status.	Name of head of family, caste, and residence.	III.—EXPENDITURE.—Concluded.					IV.—SURPLUS.	
			Customary charges of village menials and hired labour of all sorts.		By purchase of necessaries which the family cannot produce on their own land or by their own labour.		Total expenditure.	Surplus of income over expenditure.	Surplus of income usually how disposed of.
			Detail.	Amount.	Detail.	Amount.			
3	Owner.	Sunder Singh & Lall Singh Jat of Kahumán.	Village Menials ...	4 0 0	Iron...	2 0 0	...	...	GURDASPUR.
			1 farm servant ...	30 0 0	Salt...	2 0 0			
			Total ...	34 0 0	...	4 0 0	257 14 0	...	In payment of debts
4	Owner.	Data Ram Khatri of Kuza.	Farm servants and Malba.	131 0 0	...	...	...	...	Diet purchase of cattle &c.
			Total ...	131 0 0			
5	Tenant at will.	Umar Jat of Kúra.	Village Menials ...	2 8 0	Iron...	0 8 0	...	...	...
			Hired labor ...	1 8 0	Salt...	0 8 0			
			Total ...	4 0 0	...	1 0 0	20 15 3	...	...
6	Do. ...	Phola Jat of Kúra.	Village Menials ...	2 8 0	Iron...	0 8 0	...	...	...
			Hired labor ...	1 8 0	Salt...	0 8 0			
			Total ...	4 0 0	...	1 0 0	52 11 0	...	...

agricultural population of the Punjab.—Concluded.

CH. I.

V.—DESCRIPTION OF RESIDENCE, CATTLE AND CHATTELS.					VI.—DEBTS.			REMARKS.	
No. of rooms in house.		Cattle.		Chattels, stock of grain and cash.		How incurred.	Amount.		Percentage of debt on total income.
Used as dwelling rooms.	Used for sheltering cattle.	Detail.	Number.	Detail.	Value approx.				
DISTRICT—concluded.									
2	2	Oxen Cow and calf ... Milch buffalo and calves.	4 2 4	Not stated			250 0 0	97	Deficiency of crops ...
2	2	...	10	...	...	...	250 0 0	97	
22	10	Oxen Cows and calves ... Milch buffalo and calves. Mares	10 12 12 4	Grain ...	900 0 0	...	...	...
22	10	...	98	...	900 0 0	...	...	...
1	1	Oxen Cow and calf ... Milch buffalo and calf. Calf	8 2 2 1	...	...	Death of cattle, drought and deficiency of crops.	220 0 0	1,100	
1	1	...	8	...	...	...	220 0 0	1,100	
1	1	Oxen Cow and calf ... Milch buffalo and calf.	8 2 2	...	...	Do.	300 0 0	576	
1	1	...	7	...	...	...	300 0 0	576	

**GLOSSARY OF INDIAN TERMS USED IN THE PUNJAB REPLIES TO THE INQUIRIES OF THE
FAMINE COMMISSION.**

N. B.—The meanings given are confined strictly to those which the words express in these papers. Owing to delay in the printing of the papers the glossary is not as complete, as it was hoped to make it.

A

abī irrigated land, usually applicable to lands irrigated by canals or streams.
abpāshī irrigation (Persian).
abwābs cesses.
adawlatī a Sikh judge with civil and criminal powers.
ahāl manure.
ahīr cowherd, tribe or caste of men so employed.
ājīr shepherds.
arhar cajanus flavus, a pulse.
asāmi a tenant.
asāmiwār tenant by tenant.
asārā or hār Hindi month about 13th June to 13th July.
asārā or usāmī (Mooltan dialect) Brassica eruca; elsewhere known as taramira.
asāf or asoj Hindi month about 13th September to 13th October.
astālik teacher.
astālik zamindārān the teacher of agriculturists; the name of a native periodical devoted to agriculture, published at Hoshiārpur.
atīrī a field servant or labourer.
atīā the flour of wheat or other cereals.
ajwāin a small heating spice.

B

bāīr the wheel on which the rope of the Persian wheel hangs.
beldār workman employed principally in excavating earth.
bairīgī Hindū fakīr.
bāīkīā beans.
bājra or bajrī spiked millet.
basādkh Hindi month about 13th April to 13th May.
bār waste dorsal tracts of the Punjab doabs (daitās).
bāri or vāri a turn.
barī balls of pulse, mixed with spices and eaten with bread as a relish.
bārānī dependent on rain & a. unirrigated land.
banīā petty village trader.
bāngār upland high tracts, as opposed to khādīr or low alluvial tracts.
banjar uncultivated land.
band an earthen embankment to hold up water or drainage; also applied to the land on which the water is thus retained.
bārī manured lands close to the villages or towns.
bannūchi a resident of the Bannū town or tract immediately adjoining it.
bazar market place.
bāsmatī a fine variety of rice.
batāl share of the produce paid as rent.
bera or bherra wheat and gram mixed.
besan ground pulse, mash and gram.
bet or bhēt alluvial land on the bank or in the bed of a river.
bhāyāchāra a tenure, described in the reply to Question 10 Chapter I.
bhāttawāla noon or about 12 o'clock.
bhūsa straw of wheat or barley.
bhādon or bhadrā Hindi month about 13th August to 13th September.
bhātī a tribe said to be of Rājput origin.
bhīstī water-carrier.
bharāī musician.
bhang an intoxicating drug, made from the hemp plant, cannabis sativa.
bharunī one of the wooden pieces of the Persian wheel.
bhūts demons or goblins.
bharī a sheaf.
bhor sandy soil.
biswadār owner of land; a term used in the south east portion of the province.
bigāh a measure of land of varying sizes usually about ½ an acre.
bijrāhī

boras gunny bags.
būrijī a pillar.
būdhi old.
brahmins priestly caste, Hindūs.
bāch rating, distribution of a tax.
baigār or begār forced labour.
bhūr a poor sandy soil.

C

chhaj a sieve.
chak any area of land large or small with known boundaries; commonly applied in assessment work to a cluster of villages of similar qualities.
chakdār a description of subowner common in the Mooltan and Derajāt Divisions—see reply to Question 10 Chapter I.
chāfdār sheet.
chāfī land irrigated by wells.
chamārā name of a caste, usually employed as tanners and leather-workers.
chakī name of one of the wheels in a Persian well.
charas an intoxicating drug made of the resin of hemp flowers and seeds.
chana gram, cicer ariselinum.
chana chabīna roasted gram and wheat or gram and jowār.
chāwāl rice.
chāpātī unleavened cakes of bread.
chārpāī a bed.
chārpāī badgeman, messenger.
charas bucket.
charākdār a field labourer (Peshāwar District).
chauki a Police station.
chāukīdār village watchman.
chāudhri headman of trade, also a leading agriculturist.
charri the straw of jowār.
chhappār a veranda roofed by thatch.
chāupāl or chāupār village assembly room.
chet Hindi month about 13th March to 13th April.
cher statute labour supplied to irrigation canals.
chhāthwēla the time of the agriculturists' morning meal, about 9 A. M.
china panicum mallescum.
chitāak one-sixteenth part of a ser or one-eighth of a pound.
chhola gram—see chana.
chob the sandy bed of a torrent (Hoshiārpur District).
chokī kayna hoeing.
chūra a sweeper.
churāl latbyrus sativus, a poor description of pulse.
chhallī maize combs.
coolī a labourer.
chashmāī land irrigated by streams.
chikrōt clay.
charkhri irrigated by wells.

D

dāl split pulse.
daatak demand for payment of arrears issued to a revenue defaulter.
dāhri naturally moist soil (Delhi District).
damān a plain in Dera Ismail Khan District at the foot of the Suleman hills.
dāk post journey, arrangements for travelling.
darāwā a scarecrow.
darkhāst petition or request.
darbār public assembly held by a ruler.
dagrī a pulse (cajanus) usually known as arhar.
dākūr low lying stiff clay.
dalyā wheat and bājra mixed or jowār alone, boiled and used as food.
dāgar wheat of first quality in which there is no barley or gram mixed.

GLOSSARY OF INDIAN TERMS—continued.

dákhilá bahf register of receipts given for payments of revenue.
 degchá a cooking pot.
 dhán unhusked rice.
 dharmarth (or sankalap) land given rent or revenue free for religions or charitable purposes.
 dharmasá (Hindú or Sikh place of worship, also a hostelry for travellers kept by a Hindú or Sikh fakir.
 dhákar a grayish brown coloured land in Delhi District.
 dhák butea frondosa.
 dhaniá coriander.
 dheri a heap.
 dheri shámíat a heap common to all the owners of any land.
 dhonak a tribe.
 doáb delta.
 dosúti country coarse cloth.
 dofasi land bearing two crops per annum.
 dogar a tribe of hill Rajputs.
 doshabi good light loam.
 dramam sandy soil topped with a thin layer of clay.
 duffadar a sergeant (mounted.)
 dahri naturally moist.
 dákar strong clayey loam.
 deg moist alluvial tracts on the river of that name.

E

ekfaali land bearing one crop per annum.

F

fakír a monk.
 faal harvest.

G

gári a cart.
 gaddi a tribe of shepherds (Kángra District).
 gasár loamy soil (Montgomery District)
 gasár cyamopsis, a hard gray pulse, principally used to feed cattle (Delhi Division).
 gágar a large brass vessel for water.
 garwá a small brass vessel for water.
 ghát parched barley (Lahore).
 ghi clarified butter.
 ghewará an edible weed.
 ghúmsó a measure of land, usually corresponding to an acre but of varying size in different districts.
 ghidáwri going the rounds; annual inspection of fields by village accountants.
 godí karna hoeing.
 godái hoeing.
 godaba those who hoe.
 gorhá a manure, or manured land.
 goji wheat and barley mixed.
 gojar a tribe of agriculturists and herdsmen.
 gur raw sugar.

H

hak a right.
 hak kasur an allowance for service customarily rendered by a land owner to the ruler; the allowance usually consisting in a remission of part of the revenue (Dera Ghazi Khan District.)
 háf or assarh Hindi month about 13th June to 13th July.
 háth a measure the length of a man's forearm from elbow to top of fingers.
 háil manured land, also in Shahpur District land which receives hill drainage.
 hakim native physician.
 hitbár low lands.
 harkárah a messenger.

I

Iláká tract.
 inám a draw-back of revenue allowed in return for service, also any gift from a superior for service done.
 ijáradár revenue farmer.

J

jagirdár an assignee of Land Revenue.
 ját an agriculturist.
 jama the amount of Land Revenue payable by any land.
 jamábandi rent roll or revenue roll.
 jau barley.
 jawi or jawi oats.
 jeth a Hindi month about 13th May to 13th June.
 jhál a swamp.
 jhallár a Persian wheel applied to the raising of water from a canal or stream.
 jhallári land irrigated by jhallárs.
 jhúri a fee paid in the Mooltan and Deraját Divisions as a fine on institution and in return for allowing a non-proprietor to sink a well, and to hold the land attached as a sub proprietor, subject to payment to the original land owner of nothing more than a small fixed quit rent or proprietary fee.
 jilhan hard sticky clay mixed with "kankar" below the surface of the earth.
 jora horizontal and vertical wheels of a well.
 joláha a weaver.
 jowár great millet.
 jungle waste or forest.
 jhouna a sort of rice.

K

kahi a spade.
 kála black.
 káispáni perennial hill stream.
 kangni Italian millet.
 kattik a Hindi month from about 13th October to 13th November.
 kallar a noxious white efflorescence, common on many lands in the Punjab, described in the reply to Question 7 Chapter I.
 karúr clay soil (Ferozepore District).
 kahár a doolie bearer, also a caste of men usually so employed.
 kassi water course or ravine.
 kasumba safflower.
 kamin a menial.
 kana thatch or reed.
 kacha rough buildings or excavations, in which neither stone nor burnt bricks have been used.
 kachálu the edible arum.
 kámáhu a field servant or labourer
 kanak wheat.
 kánjan black pulse.
 kankar nodular limestone—see reply to Chapter IV by General MacLagan.
 karíl the leafless caper.
 kanál a measure of land, generally equal to $\frac{1}{2}$ a rood.
 kháisa government of state.
 karor or crore a hundred laks i. e., 10 millions.
 kasúr khowár one who enjoys hak kasúr, which see.
 kanfngo superintendent of village accountants.
 kattí a calf of a buffalo.
 katora a metal glass, a vessel larger than koul, which see.
 khádir low lying land adjacent to rivers.
 kharif autumn harvest.
 khatík a menial class.
 khát manure.
 khasánchi a treasurer.
 khasra a field register.
 khatanni a lodger.
 khánkáh a Muhammadan grave-yard.
 khabáni a sling.
 khurgáh-nál-gáhna to thresh by the trampling of hoofs.
 khád diet.
 khúd kásh land cultivated by the owner himself, as opposed to that which tenants cultivate for him.
 khír kangni or rice or jowar boiled in milk.
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 kítar acacia senabiá.
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 kishári system of cash payment of field labourer.
 kóhi of or belonging to a mountain.
 koul a small glass of metal for drinking water.
 kothí a chamber added at the bottom of a well.
 kos distance varying in different districts from 1 to 2 miles.
 koll a tribe.
 kuppas or kapas cotton.

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 khuwēd green wheat or green barley.
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 mahājān banker.
 mahant a Sikh priest.
 māhal the rope which carries the water pots of the Persian well.
 mahāl an estate paying land revenue.
 māni a measure = 8½ maunds.
 māgh or mānh Hindi month about 13th January to 13th February.
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 māli a gardener.
 māliār an agricultural tribe.
 māria a pole of land.
 mān a maund of 40 seers.
 mānna a platform raised on stakes or fixed on the top of a tree from which men watch the crops.
 mālguzār one who pays land revenue.
 mālguzārī the amount paid by a mālguzār or the act of doing so.
 mālik owner.
 mālikāna owner's dues.
 mākki or makai maize.
 masār or masar arum lens, a pulse.
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 mattar field pea.
 mandal or maddal or mandwa a millet, eleusine coracana.
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 museif a civil judge.
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 mūng or mūngī pulse, phaseolus mungo.
 mūsh pulse, phaseolus aconitifolius.
 mousah a village.
 mohri same as masār, which see.
 mochi a tanner or a leather-worker.
 moharir a writer.
 moghal a tribe.
 mohalla a quarter of a town.
 mohalladār the headman of a mohalla.
 mullick a headman of a village or a tribe.

mulvānah a learned Mahomedan.
 matyyār clayey land.
 masōs sandy loam.
 mehndī a dye, Lawsonia inermis.
 moshakhsā cash assessment or lease.
 mosāhib aide-de-camp assisant.
 mausāwār village by village.

N

nāhri land irrigated by canals.
 nalladār land irrigated by hill drainage (Shahjpur and Bannu).
 nāsheb alluvial lands annually flooded by the river.
 narka when the Rabi crops have been cleared, the land is called narka until sown again with Kharif crop.
 nazar a present by an inferior to his superior.
 nazarānūh quit rent payable to Government usually by an assignee of Land Revenue or feudatory.
 niāi (or gorba) manured land.
 nīgāī blue deer.
 narmot good loam.
 niāi manured.

O

oogrāhi collection.

P

paggu flow irrigation as opposed to lift.
 pakka masonry work of stone or burnt brick, as opposed to kacha, which see.
 pachād high lands at the foot of the Sulaimā hills (Dera Ghazi Khan District).
 pathān an afghan tribe.
 palla stack.
 panfri seedlings raised in nurseries.
 pakkā pāni the water supply is abundant and does not fail when worked continuously, the water (pāni) is called pakka i. e., permanent.
 panchāyat a council of five or more.
 patwāri village land accountant.
 patidārī a tenure, see reply to question 10 chapter 1.
 parohitāī priestly dues.
 pardānashin or pardārā those who sit behind the veil, i. e., women of a respectable class.
 patta a lease.
 parāt a large plate of wood or brass.
 pashm shawl wool.
 pashmīnāh cloth made from pashm.
 phāgan Hindi month from 13th February to 13th March.
 phourāh a spade.
 pipal ficus religiosa.
 pilohī tamarix gallica, a dwarf tamarisk common on alluvial lands in the larger rivers.
 poh Hindi month from 13th December to 13th January.
 por a hallow bamboo attached to the ploughs through which the seed is sown.
 post poppy.
 pulāhī acacia modesta.

R

rabbi spring crop.
 rāj rule or government.
 rahak a field labourer who is paid his wages in cash.
 rasām cesses.
 rakh a preserve of grass or forest land.
 rājbahā a canal distributory.
 rangar a tribe of poor rajputs.
 rausi light loam (Dehri).
 rasidwāhī a fee in kind paid by agriculturists to mulvanahs or mulviā who pray for them at the time of the reaping of the harvest, i. e., the mulviā's share.
 reh same as kallār, which see.
 robī stiff loam.
 rausi light loam.
 retar sandy soil.
 rakkar hard stony soil.

GLOSSARY OF INDIAN TERMS—concluded.

S

sāg green vegetables.
 safaid white.
 san brown hemp fibre, *rotularia juncea*.
 sandā a male buffalo.
 sarī body.
 sarī kā karza body debt.
 sāhtkār a merchant, a money lender.
 sattī parched barley or parched gram well ground.
 sambāt Hindi year.
 samukā same as sanwak, which see.
 sanad deed of grant.
 sarson mustard.
 sankalep same as dharmath, which see.
 sānwāk or sawānk or Shamakha, poor millet, *optismenum frumentaceum*.
 sāwan Hindi month from 13th July to 13th August.
 sayād a Muhomedan tribe.
 sāilāba moist alluvial land on the bank or in the bed of a river.
 ser or seer a measure of weight = 2 lbs.
 serai travellers' hostelry.
 senja trefoil.
 sepidār hired labourer for agricultural purposes.
 shām evening.
 shor same as kallār, which see.
 sirki reeds.
 sikand dry soil (Montgomery district).
 sitta an ear of corn.
 siropā same as jhūri, which see.
 somā swampy exudations caused by water-logging.
 sohāgā a flat heavy piece of wood dragged over the surface of a ploughed field to smooth the furrows.
 sohā a kind of fennel.
 souf aniseed.
 sūhā ashes.
 sutranjī a carpet.
 sewāī excess, additional.

T

tāramirā brassica crucea, produces a coarse oil, similar to but less pungent than mustard.
 tahsil sub-division of a district.
 tahsildār revenue officer in charge of a tahsil.
 ditto (nāib) his deputy.
 takāī place where a Muhomedan fakīr lives.
 talookā a small local division of a district.
 talukdār a tenure.
 takāvi a loan to agriculturists.
 tādī a holiday, or taking water out of turn.
 tappa a small local division in the Bannu and other districts.

tāshi a metal vessel used for drinking water.
 tawā a pan.
 thal sandy waste.
 thāna a police station.
 thāl a flat metal dish used as a bread plate.
 thāli a small ditto.
 til *sessamum orientale*, sweet oil.
 tinfaeli land bearing 3 crops in the year.
 telā insects or a disease which attacks vegetables and crops.
 tobā or thobā men who dig wells and clean wells or divers.
 tobāī a tobā's work.
 topā a measure.
 talbāna process money.

U

urd a pulse.
 usaim or assir same as taramira, which see.

V

vādānak a remarkably fine description of wheat.
 varī or bāri a turn.
 varsa clothing (Multan.)

W

wāri large wells on which 2 Persian wheels work (Montgomery District).
 warihāl cultivated land under preparation for the Rabi crops before the sowings have taken place; generally so described from January to September.
 wilāyat a foreign country, generally used of Europe and western Asia.

Z

zail a cluster of villages.
 zaidār the headman of a zail.
 zamindār an agriculturist.
 zillāh a district.
 zillahdār a subordinate canal official charged with the distribution of the water along a defined length of a canal, and under the control of the Executive Engineer.
 " naib his deputy.
 zira cumin.
 zabti cash rates charged on the more valuable crops.

GLOSSARY OF INDIAN TERMS USED IN THE PUNJAB REPLIES TO THE INQUIRIES OF THE
FAMINE COMMISSION.

N. B.—The meanings given are confined strictly to those which the words express in these papers. Owing to delay in the printing of the papers the glossary is not as complete, as it was hoped to make it.

A			
abi	irrigated land, usually applicable to lands irrigated by canals or streams.	botas	gunny bags.
abpéshi	irrigation (Persian).	búrji	a pillar.
abwabs	cesses.	búdhí	old.
adawitthi	a Sikh judge with civil and criminal powers.	brahmíns	priestly caste, Hindús.
ahal	manure.	bách	rating, distribution of a tax.
ahír	cowherd, tribe or caste of men so employed.	baigár or begár	forced labour.
ájri	shepherd.	bhúr	a poor sandy soil.
arhar	cajanus flavus, a pulse.		
asámi	a tenant.	C	
asámtwár	tenant by tenant.	chhaj	a sieve.
asárh or hár	Hindi month about 13th June to 13th July.	chak	any area of land large or small with known boundaries; commonly applied in assessment work to a cluster of villages of similar qualities.
asádn or ussím	(Mooltan dialect) Brassica eruca; elsewhere known as taramira.	chakdár	a description of subowner common in the Mooltan and Deraját Divisions—see reply to Question 10 Chapter I.
asáí or asoj	Hindi month about 18th September to 18th October.	chádar	sheet.
astáik	teacher.	cháhi	land irrigated by wells.
astáik samúndáran	the teacher of agriculturists; the name of a native periodical devoted to agriculture, published at Hoshiárpur.	chamárs	name of a caste, usually employed as tanners and leather-workers.
attri	a field servant or labourer.	chaki	name of one of the wheels in a Persian well.
atta	the flour of wheat or other cereals.	charas	an intoxicating drug made of the resin of hemp flowers and seeds.
ajwáin	a small heating spice.	chana	gram, cloer arctinum.
B		chana chabins	roasted gram and wheat or gram and jowár.
háir	the wheel on which the rope of the Persian wheel hangs.	cháwal	rice.
haldár	workman employed principally in excavating earth.	chápáti	unleavened cakes of bread.
haurági	Hindú fakír.	chárpái	a bed.
háikla	beans.	chaprái	badgeman, messenger.
háira or háiri	spiked millet.	charea	bucket.
háiskh	Hindi month about 13th April to 13th May.	charákár	a field labourer (Pesháwar District).
háí	waste dorsal tracts of the Punjab doabs (deltas).	chauki	a Police station.
hári or vári	a turn.	chaukidár	village watchman.
hári	balls of pulse, mixed with spices and eaten with bread as a relish.	chaudhri	headman of trade, also a leading agriculturist.
háráni	dependent on rain & c., unirrigated land.	charri	the straw of jowár.
bania	petty village trader.	chhappar	a veranda roofed by thatch.
bángar	upland high tracts, as opposed to khádir or low alluvial tracts.	chhapal or chhapár	village assembly room.
banjar	uncultivated land.	chet	Hindi month about 13th March to 13th April.
band	an earthen embankment to hold up water or drainage; also applied to the land on which the water is thus retained.	cher	statute labour supplied to irrigation canals.
bári	manured lands close to the villages or towns.	cháháwela	the time of the agriculturists' morning meal, about 9 A. M.
bandochi	a resident of the Banná town or tract immediately adjoining it.	chána	panicum miliaceum.
basár	market place.	chitták	one-sixteenth part of a ser or one-eighth of a pound.
básmati	a fine variety of rice.	chibla	gram—see chana.
batái	share of the produce paid as rent.	chob	the sandy bed of a torrent (Hoshiárpur District).
berra or bherra	wheat and gram mixed.	choki karna	boeing.
besan	ground pulse, mash and gram.	chúra	a sweeper.
bet or bhet	alluvial land on the bank or in the bed of a river.	churál	lathyrus sativus, a poor description of pulse.
bháyáchára	a tenure, described in the reply to Question 10 Chapter I.	chhalli	maize combs.
bhattawéla	noon or about 12 o'clock.	cooli	a labourer.
bhúsa	straw of wheat or barley.	chashmai	land irrigated by streams.
bhadon or bhadra	Hindi month about 18th August to 18th September.	chiknot	clay.
bhatti	a tribe said to be of Rájput origin.	charkhri	irrigated by wells.
bharri	water-carrier.		
bharál	musician.	D	
bhang	an intoxicating drug, made from the hemp plant, cannabis sativa.	dál	split pulse.
bharunni	one of the wooden pieces of the Persian wheel.	dastak	demand for payment of arrears issued to a revenue defaulter.
bhúts	demons or goblins.	dáhrí	naturally moist soil (Delhi District.)
bharri	a sheaf.	damán	a plain in Dera Ismail Khan District at the foot of the Suleman hills.
bhoor	sandy soil.	dák	post journey, arrangements for travelling.
biswadár	owner of land; a term used in the south east portion of the province.	daráwá	a scarecrow.
bigáh	a measure of land of varying sizes usually about $\frac{1}{2}$ an acre.	darbáat	petition or request.
bijráhi		darbár	public assembly held by a ruler.
		daugri	a pulse (cajanus) usually known as arhar.
		dákur	low lying stiff clay.
		dalyá	wheat and háira mixed or jowár alone, boiled and used as food.
		dágar	wheat of first quality in which there is no barley or gram mixed.

GLOSSARY OF INDIAN TERMS—continued.

dākhilā bahī register of receipts given for payments of revenue.
 degchā a cooking pot.
 dhān unhusked rice.
 dharmarth (or sankalap) land given rent or revenue free for religious or charitable purposes.
 dharmśālā (Hindu or Sikh place of worship, also a hostelry for travellers kept by a Hindu or Sikh fakir.
 dhākūr a grayish brown coloured land in Delhi District.
 dhāk butea frondosa.
 dhanīā coriander.
 dherī a heap.
 dherī shāmlāt a heap common to all the owners of any land.
 dhonak a tribe.
 doāb delta.
 dosūti country coarse cloth.
 doṭasī land bearing two crops per annum.
 dogar a tribe of hill Rajpūts.
 doṣahī good light loam.
 draman sandy soil topped with a thin layer of clay.
 duffadar a sergeant (mounted).
 dahri naturally moist.
 dākār strong clayey loam.
 deg moist alluvial tracts on the river of that name.

E

ekṣasī land bearing one crop per annum.

F

fakīr a monk.
 faal harvest.

G

gāri a cart.
 gaddī a tribe of shepherds (Kāngra District).
 gasrā loamy soil (Montgomery District).
 gawār oyamopsis, a hard gray pulse, principally used to feed cattle (Delhi Division).
 gāgar a large brass vessel for water.
 garwā a small brass vessel for water.
 gbāt parched barley (Lahore).
 ghi clarified butter.
 ghwārā an edible weed.
 ghūmāo a measure of land, usually corresponding to an acre but of varying size in different districts.
 girdāwri going the rounds; annual inspection of fields by village accountants.
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 moharir a writer.
 moghal a tribe.
 mohalla a quarter of a town.
 mohalladār the headman of a mohalla.
 mullick a headman of a village or a tribe.

mulvanah a learned Mahomedan.
 mátyar clayey land.
 magot sandy loam.
 meludf a dye, lamsonia inermis.
 moekahsh cash assessment or lease.
 moekhib aide-de-camp assistant.
 maasáwár village by village.

N

nābri land irrigated by canals.
 nalladār land irrigated by hill drainage (Shahpur and Bannu).
 nasbeh alluvial lands annually flooded by the river.
 marka when the Rabi crops have been cleared, the land is called marka until sown again with Kharif crop.
 nazar a present by an inferior to his superior.
 nazarásh quit rent payable to Government usually by an assignee of Land Revenue or feudatory.
 niai (or gorha) manured land.
 nigái bine deer.
 narrot good loam.
 niái manured.

O

oográhi collection.

P

pagga flow irrigation as opposed to lift.
 pakka masonry work of stone or burnt brick, as opposed to kacha, which see.
 pachád high lands at the foot of the Sulémán hills (Dera Ghazi Khan District).
 pathán an afghan tribe.
 palla sack.
 panri seedlings raised in nurseries.
 pakká páni the water supply is abundant and does not fail when worked continuously, the 'water' (-páni) is called pakka too, permanent.
 pancháyat a council of five or more.
 patwári village land accountant.
 pattidári a tenure, see reply to question 10 chapter 1.
 parohátái priestly dues.
 pardánashin or pardásh those who sit behind the veil, i. e., women of a respectable class.
 patte a lease.
 parát a large plate of wood or brass.
 pashm shawi wool.
 pashmíná cloth made from pashm.
 phágen Hindi month from 13th February to 13th March.
 phourán a spade.
 pipal ficus religiosa.
 pilchí tamarix gallica, a dwarf tamarisk common on alluvial lands in the larger rivers.
 poh Hindi month from 13th December to 13th January.
 por a hollow bamboo attached to the ploughs through which the seed is sown.
 post poppy.
 puláshí acacia modesta.

R

rabbi spring crop.
 réj rule or government.
 rahak a field labourer who is paid his wages in cash.
 rasám cesses.
 rakh a preserve of grass or forest land.
 rájbahá a canal distributory.
 rangar a tribe of poor rajputs.
 rasulí light loam (Delhi).
 rasulwáshí a fee in kind paid by agriculturists to mulvanahs or moulvis who pray for them at the time of the reaping of the harvest, i. e., the moulvis' share.
 reh same as kallax, which see.
 rohí stiff loam.
 rasulí light loam.
 retar sandy soil.
 rakkar hard stony soil.

GLOSSARY OF INDIAN TERMS—concluded.

S

sāg green vegetables.
 safaid white.
 san brown hemp fibre, crotolaria juncea.
 sandā a male buffalo.
 sarir body.
 sarir kā karsa body debt.
 sārūkār a merchant, a money lender.
 sattū parched barley or parched gram well ground.
 sambat Hindi year.
 samukā same as sanwak, which see.
 sanad deed of grant.
 sarson mustard.
 sankalap same as dharmarh, which see.
 sawānk or sawānk or Shamakha, poor millet, oplismenum frumentaceum.
 sāwan Hindi month from 13th July to 13th August.
 sayad a Muhomedan tribe.
 sailāba moist alluvial land on the bank or in the bed of a river.
 ser or seer a measure of weight = 2 lbs.
 serai travellers' hostelry.
 senja trefoil.
 sepidār hired labourer for agricultural purposes.
 shām evening.
 shor same as kallar, which see.
 sirki reeds.
 sikand dry soil (Montgomery district).
 sitta an ear of corn.
 siropā same as jhūri, which see.
 somā swampy exudations caused by water-logging.
 sohāgā a flat heavy piece of wood dragged over the surface of a ploughed field to smooth the furrows.
 sohā a kind of fennel.
 souf aniseed.
 sohā ashes.
 sutranji a carpet.
 sewāi excess, additional.

tārāmīf brassica eruca, produces a coarse oil, similar to but less pungent than mustard.
 tahsil sub-division of a district.
 tahsildār revenue officer in charge of a tahsil.
 ditto (nāib) his deputy.
 takīā place where a Muhomedan fakir lives.
 talookā a small local division of a district.
 talukdārī a tenure.
 takārī a loan to agriculturists.
 tatil a holiday or taking water out of turn.
 tappa a small local division in the Banna and other districts.

tāshi a metal vessel used for drinking water.
 tawā a pan.
 thal sandy waste.
 thāna a police station.
 thāl a flat metal dish used as a bread plate.
 thālī a small ditto.
 til sēsamum orientale, sweet oil.
 tinafali land bearing 3 crops in the year.
 telā insects or a disease which attacks vegetables and crops.
 tobā or thobā men who dig wells and clean wells or divers.
 tobāi a tobā's work.
 topā a measure.
 tubāna process money.

U

urd a pulse.
 usim or assir same as taramira, which see.

V

vadīnak a remarkably fine description of wheat.
 vari or bāri a turn.
 varsa clothing (Multan).

W

wāri large wells on which 2 Persian wheels work (Montgomery District).
 warihāl cultivated land under preparation for the Rabi crops before the sowings have taken place; generally so described from January to September.
 wilāyat a foreign country, generally used of Europe and western Asia.

Z

zail a cluster of villages.
 zaidār the headman of a zail.
 zamūdār an agriculturist.
 zillāh a district.
 zillahdār a subordinate canal official charged with the distribution of the water along a defined length of a canal, and under the control of the Executive Engineer.
 „ nāib his deputy.
 zira cumin.
 zabti cash rates charged on the more valuable crops.