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LEVELS OF ECONOMIC ACTIVITY AND PUBLIC EXPENDITURE IN INDIA

Levels of Economic Activity and Public Expenditure in India

A HISTORICAL AND QUANTITATIVE STUDY

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DEDICATION

to a severe illness which incapacitated me for a long period between 1953 *and* 1958 *and compelled me to turn to academics*

Foreword

THIS publication of the Institute represents a part of research work completed by Dr. Mukerji many years ago. The delay in publication has been due, in the first instance, to revision having to be undertaken in spare time from other work and secondly to the time taken in arranging for publication and getting the work printed. The delay may not make much difference in this case as the work represents, essentially, an exercise in the reconstruction of historical statistics. The period chosen by Dr. Mukerji for the purpose is the first half of the 20th century and little work has been done in recent years which would lead to the need for any substantial modifications of Dr. Mukerji's calculations or presentation.

Dr. Mukerji has attempted to deal with a problem that is both large and difficult. The major part of his attention has been devoted to construction of an index of agricultural production and another of industrial production. The latter, the index of industrial production, was inevitably confined to what might be termed modern industrial activity. On the basis of these two indices, he has also attempted the construction of a series of annual national income figures for India for the five decades under consideration. Dr. Mukerji does not, however, confine himself to the attempt at construction of these general series. He also probes into economic dynamics and attempts to assess the impact of public expenditure or public sector activity on the fortunes and operations of the economy. Dr. Mukerji's task was difficult because the statistical and other information on the basis of which he had to operate were fragmentary and inadequate. In the circumstances, he had to make many assumptions and to rely, to a considerable extent, on guess work. However, he has been careful to explain fully the assumptions he makes and the basis on which and the methods through which he has prepared his estimates.

The value of such work as that of Dr. Mukerji to students of economics and economic history is obvious. Economists have begun of recent years to exhibit lively interest in accounts of operations of economies of underdeveloped countries in the recent past. Such accounts are put together usually with the help of annals or accounts of past events and limited statistical data relating to particular fields. However, for a proper appreciation of the operation of the economy an aggregative statistical frame is required in relation to which magnitudes of phenomena and their interactions can be judged. The need for the construction of such a statistical frame remains important even when the basic data are fragmentary and unsatisfactory. No doubt, the labours involved and the care with which the work has to be done become greater thereby. Also, the resulting product has to be interpreted carefully and has to be used with caution. Dr. Mukerji has been at pains to show how in particular instances the statistical results for particular years

or periods yielded by following what appear to be the best methods do not square up with informed accounts or impressions of what happened. Therefore, all such frames have to be used with care; they are all the same indispensable.

Apart from inadequacies of data, there arise many questions relating to the significance of such aggregative estimates in particular contexts. For example, in a number of places in Dr. Mukerji's work the question of interpretation of data where a sharp rise or fall in prices are involved comes up. It has been generally noticed that because of the need to deflate for a sharp fall in prices a number of indicators in real terms make specially good showing at the time of depression. How this has to be interpreted, in view of the well known characteristics of the overall depression situation, needs careful consideration. For example, with a constancy of salary and wage scales, public sector or governmental outlay made up largely of payments of salaries and wages to permanent or semipermanent cadres would show sharp increase in real terms with a rapid fall in prices such as occurred at the time of depression. What this statistical increase in real terms in fact signifies in terms of effects on the operations of the economy must be spelt out in detail.

It is the virtue of statistical exercises such as that conducted by Dr. Mukerji that they raise these and other questions sharply and force the economic historian and the economic analyst to ponder over them. Dr. Mukerji has rendered very useful service through the careful preparation of a statistical frame to which all users concerned with the period must necessarily refer and by raising many important points of economic dynamics in connection with it. The points raised by him and the hypotheses tentatively tested have significance not only for the period with which he deals but also for a study of the general operation of the Indian economy even in these later times when the statistical data are beginning to be somewhat more plentiful and satisfactory.

Gokhale Institute of Politics and Economics, Poona 4
10 October, 1964

D. R. GADGIL

Preface

THE work emerged from an effort to measure the impact of public expenditure on the levels of economic activity in India. In a sense it was directly inspired by Villard's work on the impact of deficit spending in the United States during the Roosevelt era (Henry H. Villard, *Deficit Spending and National Income*). The work soon ran into very formidable difficulties. In the first place, the theories that sought to link up public expenditure and national income seemed very tenuous and incapable of empirical verification. A certain amount of exploration of the theoretical literature in this area had, accordingly, to be undertaken. The exploration was, however, not very fruitful, as none of the more sophisticated, realistic and generally accepted hypotheses could be adequately tested with the data that could, within reason, be drawn upon. The second problem related to the availability of comparable data for a sufficient period of time. At best, data could be marshalled in an effort to verify only the simplest of the hypotheses. Even here, there was no escape from having to undertake heavy estimational work, which, after all, was not the main target. As a matter of fact, the minimum estimational work had to be assigned the topmost priority and given the maximum time allocation. In a sense, therefore, the estimational work of CHAPTERS II and III stand by themselves. At the same time, the estimational part of the work suffers from not being thorough enough. This, as explained in the context, is very largely due to lack of adequate data. But a part of it must also be attributed to the divided attention involved in the original position.

The work is thus, still, in a certain sense, rather obviously incomplete. Any effort to give completeness to the formulation would, however, involve so much more work, particularly of an estimational nature, and progressively over areas covered by doubtful and incomplete source materials, that very serious considerations of diminishing marginal productivity of research efforts has to be taken into account. Since any material improvement can only come from further prolonged work, it seemed advisable not to hold back the results obtained so far from my professional colleagues. Further work in filling up the gaps in information and analysis of the data are obviously indicated, but it is not easy to set any clear limits to such work at this stage.

In the present form, the book suffers from being originally written as a thesis submitted for D.Phil (Arts) degree to the Calcutta University. As generally recognised, a thesis has to include a considerable amount of review material which is unnecessary in a book of this type. As an absolute minimum, the following transformations have been made : (1) the first chapter of the thesis that was concerned with the establishment of the need for verifying the quantity-theory hypothesis, being of doubtful validity and usefulness, has been deleted, (2) CHAPTER II

of the thesis has been rewritten to take out the abruptness arising from this transformation and included as CHAPTER I; and (3) some additional verificatory materials have been introduced in CHAPTERS II and III, while some further work on the analysis of the trend of the major constituent series has been introduced in CHAPTER IV. In the process, the bulk of the statistically rigorous analysis of the constituent series and the interrelations between them was left out.

The final structure of the book, therefore, emerges as under: The first chapter deals with the existing information about agricultural activity in India and reviews the available material; the second chapter seeks to derive a comparable series of agricultural production for the present Indian Union territory over the years 1900-01 to 1952-53. The third chapter deals with the trends in physical production and ancillary activities over the same period and seeks to establish a derived set of national income figures. The fourth chapter deals with the estimation, comparability and structure of public expenditure activity in India and seeks to mark out certain interrelations between them, in so far as they are theoretically non-controversial.

It is difficult to assess the debts I owe to various persons in this connection, and, in mentioning a few names, no suggestion as to the exhaustiveness of the list or of the relative importance of the persons is indicated. My first debt is to Dr. S. N. Sen of the Calcutta University, under whom I worked. My debt to my brother Shri Monimohon Mukerjee is likewise very considerable. It was his preoccupation with national income work both in India and abroad that kept me constantly in touch with the various problems in the subject. To him and my numerous friends in the Indian Statistical Institute, Calcutta, must go the credit of keeping me on the rails, if, in fact, they have succeeded.

I must express my gratitude to Professor Wilfred Malenbaum, who, as my examiner, not only recommended the acceptance of the thesis for my degree but also advised its early publication. Dr. I. G. Patel read through the thesis immediately after its preparation and assured its acceptance. His assessment turned out to be correct. I have also profited greatly from my association with Mr. George Blyn. His earlier work on crop production in India provided a basis for my exposition while his subsequent criticism and appreciation helped materially in carrying out the work of revision. Finally, my thanks are due to Professor D. R. Gadgil, not only for agreeing to publish the book on behalf of the Institute, but also for giving me the benefit of his advice in rearranging the work and more generally in having made the continuation of the study possible.

The help that I received from others was not so much about the work as about being able to work at all. The extent of the indebtedness is too great to be put in specifically. My wife, as one of them, has also read through the manuscript and suggested many improvements, technical and expository.

In spite of all these, the work is essentially a singlehanded effort and I must take the full responsibility for it. It now seems that I had taken on too big a task and must, therefore, accept the criticism for not being able to do it well. The point,

however, is not whether I have succeeded or otherwise, but whether work along the correct lines has been attempted. The task is, in any way, too vast to be successfully accomplished by any one person. I can only look forward to further sustained work in collaboration with the various other workers in the field.

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1 *March* 1963

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CHAPTER ONE

Agricultural Production—Assessment

It has been repeated *ad nauseam* that India is an agricultural country. No adequate effort has, however, been made to measure the actual proportion of the agricultural sector of the Indian economy over, say, the last fifty or sixty years. According to the estimates of the National Income Committee, as much as between 50 and 60 per cent of the net national income of the Indian Union for the years 1948-49 and 1950-51 was derived directly from agriculture and animal husbandry.[1] It is obvious, therefore, that any assessment of the economic conditions of the country over a number of years would depend on the availability of an accurate measure of the movements in agricultural production. Unfortunately, however, until quite recently, there was an imperfect understanding of the requirements on this count, and rather too much was sought to be argued from too little material. The debate which dominated the entire period covering the first half of the present century, namely, whether English rule has led to the prosperity or impoverishment of the country and its people, neglected the more vital question, whether, on the whole, anything useful could be said about the subject on the basis of the available information. To use Thorner's expression, we simply cannot say whether agricultural production "has increased proportionately with the rate of population growth, has slightly exceeded it, or has lagged somewhat behind."[2]

In spite of a fairly voluminous literature on the subject, it becomes necessary, therefore, to fall back on, building up from scratch, some measure of agricultural activity of the country for the entire period, from 1900-01 to 1948-49 which the study is designed to cover. This work does not fall within the natural ambit of the primary objective, which consists of examining the impact of the size of the government or public sector activities on the economic life in India. Nevertheless, without some confidence in the indicated movements in prosperity and recessions in the economic life of the country, it seems futile to set about to judge the activity of the public sector. While, therefore, the serious lack of information at various points, which is considered essential in economic analysis, prevents the formulation of anything approximating to a theory of public policy, the very effort at a quantitative understanding of the country's economic life may be of considerable significance. The vital part of the present effort, therefore, consists of stating and testing the available data for coverage and accuracy on the basis of suitable

[1] *Final Report of the National Income Committee*, Government of India, February 1954, Table A 1.1, p. 143, etc.

[2] *Thorner, D., Longterm Trends of Output in India, in Economic Growth, Brazil, India, Japan*, Ed. Kuznets, Simon, *et al*, 1955, p. 119.

comparisons with other more or less partial estimates of agricultural production that are available.

It is convenient to commence the review with the significant work of Thomas and Shastry[3] for several reasons, the most important of which are that the authors draw upon and present the basic data in the most straightforward form and that they exclude the territory of Burma right from the beginning. For purposes of comparability this latter adjustment is most convenient. The direct adoption of the readily available official statistics is, however, a severe shortcoming for several other purposes. The most important limitation of the picture as presented by Thomas and Shastry for the present purpose is that their figures relate to the former British Indian provinces only. The implication of this limitation is not only that the Indian states are entirely omitted from consideration but also that the so-called non-reporting areas within the former British provinces are left unconsidered. Moreover, no efforts have been made by the authors to extend the acreage or output figures for the secondary cereals like jowar and bajra and the oil-seeds beyond the initial year in which they appear in the official estimates, which for a number of cases relate to the year 1911-12 or the later years.

In their study, Thomas and Shastry are not primarily concerned with the overall food supply situation or with any such specific problem. They do not therefore, comment on the welfare aspect of agricultural production and leave the figures to speak for themselves. Certain comments that they make on the reliability of the published official figures are, however, important. For instance, Thomas and Shastry are of the opinion that for the purposes of comparison between the trends of population and of food supply, the deficiencies in agricultural statistics mentioned in their study are not quite serious, "because the errors are more or less systematic." "If the annawari estimates are more or less guesses," they continue, "they have been so for the whole period under consideration. Therefore, whatever error there is, is common for the whole period."[4] They add, "our crop statistics may be defective for the estimation of the total food supply and generally unhelpful as commercial information but they are helpful for time comparisons." "Such comparison may not be free from defects but is useful for watching the trend." The authors, however, add a warning that for the purposes of such a comparison the figures as available should not be used for the period prior to the year 1911 "because production statistics of that period excluded certain areas both in British India and the Indian States and as these areas came to be included by 1911, the figures for the two periods are not comparable."[5]

The statistical basis of Karve's[6] work is comparatively flimsy. Karve apparently takes the official figures entirely at their face value and in a study restricted to the former British Indian provinces only comes to the conclusion that, "we might, therefore take it as proved in so far as facts statistically ascertained can prove

[3] Thomas, P. J. and N. S. R. Shastry, *Indian Agricultural Statistics*, 1939.
[4] *Ibid*, P. 89. [5] *Ibid.*
[6] Karve, D. G., *Poverty and Population in India*, 1936.

anything that the population of India during the last thirty years has not grown and is not growing faster than the wealth or production of the nation."[7] His other comment that both ill health and poverty are the symptoms of a deeper degradation[8] hangs somewhat loosely in a "world of facts statistically ascertained." In spite of the unsatisfactory statistical basis, Karve's review is, nevertheless, important, not only for his overall judgement but also because of what he has to say about the officially and generally accepted view that the official figures have a tendency to underestimate the agricultural production. Karve asserts that contrary to the official view that the published figures generally tend to underestimate, there is a common belief that they err on the other side. "There are no reasons given for the view", he states, "that the officers responsible for experiments regarding average yield incline towards underestimates." Karve goes on to say, "on the other hand the close relation between the revenue collection and the figures for area and the anna estimates are clear grounds for expecting an inaccuracy on the side of over-estimation." Further, according to him, "There is even a more widely acknowledged ground for the belief that the indication of later figures for yield should be taken with great reservation. In the earlier estimates crop records are collected only for the principal crops in each area. Thus the figures for the basic and the earlier years are shown to be unduly low, and against them the figures for the later years loom unjustifiably large. Both on account of the connection between revenue assessment and collection on the one hand, and the submission of estimates of area and anna fractions on the other, as also on account of the acknowledged understatement of early years, it is clear that the index of agricultural production based on official figures for area and yield of principal crops represents outside limits."[9]

At this stage, the significant contribution of Mukerjee[10] may also be referred to. Mukerjee makes a straightforward use of the official figures available. "The figures for crop areas and outputs of food grains year by year are obtained from the Agricultural Statistics of British India and the Indian States." (Appendix I to chapter 1 of his book, p. 30.) This is somewhat unusual, because the only source of production figures of agricultural produce is the "Estimates of Area and Yield of Principal Crops in India" and not the "Agricultural Statistics of British India and the Indian States." What, however, makes his work interesting is that in spite of the resultant underestimation involved in his comparative figures through his failure to allow for areas that came in for reporting from time to time, he finds that "it is clearly evident that the food position is gradually becoming worse both with reference to the relative proportion of the food production to mouths to feed and also with reference to the nutritive quality of the cereals,[11] which is contrary to the findings of both Karve and Thomas and Shastry. Mukerjee's case for a certain amount of substitution of inferior cereals as an indicator

[7] *Ibid*, p. 113. [8] *Ibid*, p. 115. [9] *Ibid*, p. 101.

[10] Mukerjee, Radhakamal, *Food Planning for Four Hundred Millions*, 1938, p. 21.

[11] *Ibid.*

of comparative poverty is interesting; but what is of greater significance is that he notices a certain amount of impingement into the food supply over a period where other observers have found, at least, a proportionate growth. The difference may be attributed to three factors even if the factor of under-coverage, which would accentuate rather than work against Mukerjee's findings, is, for the time being, left out of consideration. In the first place, the movement of population and agricultural production within the former British Indian provinces and the Indian States are considerably different. The other alternative is that the Indian States are food deficiency areas on the whole and their gradual inclusion accounts for the impinging on the food supply observed by Mukerjee. The third is that there has been a considerable migration into British provinces which the crude figures used by Karve or Thomas and Shastry for noting the population growth do not bring into clear relief. The question whether Mukerjee's is a closer picture of the reality is commented upon in connection with the estimated reliability of the more comprehensive efforts to study the movement of agricultural production, including the present study.

Two other studies, on the basis of what may be designated as uncorrected data, that are drawn upon in this connection are those of Meek[12] and Sinha,[13] and are presented in Appendices I and II. The latter work by Sinha seeks to establish a link of continuity with Meek's series. The picture that emerges from these studies by Meek and Sinha, in so far as they relate to agricultural production, is presented hereunder.

As regards the source of information Meek states simply that the "figures of physical production of thirteen principal crops are readily available from government publications from the year 1907" and that these could be utilised to construct an index of the "volume" of agricultural production by the simple method of combining the various index numbers of production for each crop on the basis of, say, five pre-war years 1909-10 to 1913-14, by giving to each of these index numbers a weight proportional to the average values of the particular crop during the same base period.[14] Blyn[15] has somewhat pithily observed that "they are", it is true, "readily available," but if he (Meek) used them in the "readily available" state, then his figures do not give a true picture of production trends.[16] Blyn's comments cover the only major lacuna in Meek's study. Meek's conclusions are nevertheless, of considerable interest. "There are", Meek notes, "two very bad

[12] Meek, D. B., "Some Measures of Economic Activity in India", *Journal of Royal Statistical Society*, Vol. C. III, 1937.

[13] Sinha, A. R., "The Trend of Agricultural Production in India during the last thirty years —A preliminary study, with some observations on the food situation of the country", International Statistical Conferences, Dec. 1951, India; *Bulletin of the International Statistical Institute*, Vol. xxxiii, Part V, pp. 207-20.

[14] Meek, D. B., *op. cit.*, pp. 864-68.

[15] Blyn, George, *The Agricultural Crops of India, 1893-1946—A Statistical Study of Output and Trends*, mimeographed ed. 1951.

[16] *Ibid*, p. 22.

years 1918-19 and 1920-21, and the very low figures in the year 1918-19 may be ascribed to the combination of the failure of the monsoon in that year and the terrible influenza epidemic which very seriously reduced the available labour force."[17] In reviewing the findings of Meek's paper Sir Harry Lindsey makes two significant observations. The first is that without such evidence as Meek's one would expect "an enormous amount of fluctuations" particularly during the war time; and secondly, it is natural to expect that the plantation products like tea or sugarcane "are likely to fall under laws" which are "rather different from the laws which govern other agricultural production."[18]

Sinha's paper, which has already been referred to, presents a more thorough study covering a longer period and as such deserves a closer attention. It is unfortunate that he does not pay any attention to the question of undercoverage, either in his own figures or in those of Meek for the earlier period, which he utilises. Sinha's findings can be summarised in two parts, the first part relating to the agricultural conditions in the country and the second relating to the reliability of the figures used for the purpose. As regards the latter, he is of the opinion that "notwithstanding the theoretical imperfections, the series of index numbers presented" (by him) "may be regarded as fairly satisfactory."[19] Nevertheless, Sinha notes that the index suffers from being of the gross output rather than of the net output type. Further, he feels that for "a satisfactory study of the agricultural situation in the country, the indices are not quite adequate but should at least be supplemented by similar indices based on acreages and yields per acre." He also reinforces Sir Harry Lindsey's suggestion that for the purposes of economic analysis the non-food crops should be further split into such sub-groups as "plantation crops", "fibre crops", etc.[20]

Sinha's conclusions as regards the overall agricultural situation are as follows :

"(*i*) The problem of food shortage in the country is neither of recent origin nor of a temporary character. For instance, the adjusted index since 1939-40 show unmistakably the effects of the progressively declining volume of home grown supplies (excluding Burma), in relation to the growing size of the population in the country.

"(*ii*) Owing to the long and continued default in food production coupled with a tremendous growth of population, the margin of food deficiency has now grown wide enough to render any easy and quick solution of the problem extremely difficult.

"(*iii*) The volume of agricultural production in the country has not increased much during the last thirty years. Whatever little improvement is noticeable appears to be entirely due to the increase in the production of non-food crops—a feature which seems to be the natural outcome of an emerging money economy in place of the barter economy of the country. This tendency has apparently been reinforced by the economic considerations of comparative costs and returns.

[17] Meek, D. B., *op. cit.*, p. 369. [18] *Ibid.*, p. 389.
[19] Sinha, A. R., *op. cit.* [20] *Ibid.*, p. 211.

"(*iv*) The movements of non-food crops series show that the production of these crops went on increasing year after year from the beginning of the period of study, the first reversal of the trend appearing in 1929-30 with the onset of the great depression. During the earlier part of the war, production showed a sudden spurt but it could not maintain that high level owing to pressure subsequently brought to bear on it by the increased demand for growing food crops as a result of food shortage in the country. The pressure became so great and insistent in recent years that the production of non-food crops was drastically curtailed as a matter of policy, the effect of which will be found clearly reflected in the primary index of 1948-49."

Actually, the most important reason for the contradictory judgements as to whether or not food supply is increasing at a rate fast enough to keep the per capita availability of food supply constant, lies in an inadequate understanding of the trend in population growth. As examined later, the ordinary census figures for 1901 and 1911 underestimate the population of the country due to certain under-coverage, the 1901 census more so than the 1911 census figures. In comparisons with the years 1931 and 1941, therefore, the crude figures show a faster rate of population growth than the probable real growth. The rate of growth of population between 1901 and 1911 was considerably smaller than the growth rate during the decades subsequent to 1921. Between 1911 and 1921, however, the growth is somewhat uneven. The rate of growth, by all indications, is quite in line with the decades following 1921, but the actual growth of population between 1911 and 1921 is insignificant. This is due to the serious famines and epidemics in the years 1918 and 1919, which actually reduced the population between 1917 and 1920. The result is a very small overall increase from 1911 to 1921. In comparing the trends in food crop production and population growth, it matters a great deal, therefore, what period is considered by the particular author. Accordingly, it is not unnatural that Datta, considering the period 1891 to 1911, and Karve and Thomas and Shastry considering the period from 1900 up to the middle 'thirties, do not find the population impinging on the food supply, the latter two because they graft in the 1918-19 retardation into the growth rate of the population, while Mukerjee and Sinha find that the population has been impinging on the food supply partly because they have reviewed the situation after the separation of Burma in 1937 and Sinha, in particular, has taken into account the faster population growth of the decade 1931 to 1941. In the case of Datta, the conclusion that food supply is not keeping pace with the growth of population can be attributed to his having considered the population growth up to 1911 only. In other words Datta considers the population growth to be higher than the authors whose studies are influenced by the population retardation or slowness of growth between 1911 and 1921. Thus Datta's conclusions are more in line with Sinha's and Mukerjee's as against those of Karve and Thomas and Shastry whose decisions are affected by the population movement between 1911 and 1921.

The picture as drawn by Sinha particularly in paragraph (iv) is not dissimilar

to the one drawn by Van Geldern[21] for the Netherland East Indies. "The N.E.I.", Van Geldern notes, "have developed as a part of a world economy based on the so-called division of labour. As long as expansion had been characteristic of world economy the N.E.I. had a full share in this rapid development."[22] "Suddenly two severe menaces arose, bringing this social and economic structure to the brink of a total breakdown: (*a*) the world crisis since 1930, and (*b*) the growing dislocation of world trade, especially due to the increasing tendency for commercial bilateralism."[23]

As regards the structure of Sinha's indices, the whole period from 1921 to 1950 is divided into two broad segments; one, the inter-war period from 1921-22 up to 1938-39 and the other, the war and post-war period from 1939 to 1950-51. As Sinha himself explains, "For the second period a series of index numbers has been specially constructed by us, but for the earlier period the series has been linked up with Dr. D. B. Meek's series on the basis of a common and overlapping period by rearranging and extending it a little."[24] The claim of the alternative series available, namely that of Roy and Sinha,[25] which is free from the Burma element was not lost sight of by Sinha in this connection, but no modification of the index was considered necessary by him "because the Burma element did not bring about a material change in the weights to be assigned to the various elements" and in fact "the extended Meek's series and Roy and Sinha's series did show a very close correspondence."

Before passing on to a fuller consideration of Meek's or Sinha's study which can only be done in comparative terms, it is desirable to draw on the very important contributions to the subject by Datta[26] and Shah and Khambatta.[27] Shah and Khambatta's efforts in arriving at a comparable series of agricultural output stand out as a major contribution of their work. In their path-breaking effort, Shah and Khambatta have considered the possibilities of adopting the figures as given by K. L. Datta but have rejected the idea because Datta excludes Burma and the Indian States from the purview of his study and because the period of coverage extends only up to 1912.[28] For the purpose of the present study, however, all the three apparent shortcomings of Datta's study have been found useful.

The particular significance of the exclusion of Burma from Datta's study does not need any comment on account of the subsequent exclusion of this territory from the Indian Union. Further, as a result of the particular method adopted in the subsequent estimation, the availability of a continuous and homogeneous series for the former British provinces, as the base on which to work, has been

[21] Van Geldern, J., *The Recent Development of Economic Foreign Policy in the Netherlands East Indies*, 1939.

[22] *Ibid.*, p. 33. [23] *Ibid.*, p. 9. [24] Sinha, A. R., *op. cit.*, p. 209.

[25] Roy, P. R. and H. C. Sinha, "Index of Business Activity in India", *Sankhya*, Vol. 5, Part 2, 1941.

[26] Datta, K. L., *Report on the Enquiry into the Causes of Rise of Prices in India*, Vol. 1.

[27] Shah, K. T. and K. J. Khambatta, *Wealth and Taxable Capacity in India*, 1924.

[28] *Ibid.*, p. 84.

found exceedingly useful. The period of coverage of Datta's study also has a particular relevance when one considers that the figures available from the "Area and Yield of Principal Crops in India" prior to 1911-12 suffer somewhat severely from considerable and irregular undercoverage in respect of reporting areas, a feature that came to be more or less corrected by the year 1911-12.

In spite of what has been indicated above, Datta's findings have been found less useful in actual practice in constructing a comparable series than might have been anticipated in view of the favourable features. This is due to the fact that Datta rejected the figures of the area sown, as the official figures had their origin "in the mere guess work of the village chowkidar." He, therefore, revised the figures in the light of the direct first-hand data and information which he and his assistants were able to obtain from their extensive tours. Datta similarly revised normal yield and the percentage of the year's crops to the normal's for the various parts of the country, by taking the weighted mean of the district figures as available from the Agricultural Departments and grouping them into suitable circles for the purpose of his study. The result is that for comparable areas, while his acreage figures can, on the whole, be accepted in view of the undercoverage known to have existed even after the revision of the years 1909-12, his yield figures obviously do not furnish information comparable with those of the "Estimates of Area and Yield of Principal Crops in India", relating to the majority of crops. Before Datta's figures can be effectively used, it is therefore important to form some sort of a judgement as to whether Datta's figures are overestimates and how far the alternative explanation of the official figures being underestimates will meet the case. While a detailed comparison for the purpose of ascertaining the reliability of the figures forms an important part of the discussion that follows, it seems, on the whole, that Datta's figures are overestimates and cannot be used directly for the present purposes. Unfortunately, without a considerably detailed study it is not possible to ascertain the extent to which the overestimation can be attributed to the two elements from which they emanate, namely, the average yield and the seasonal factor. The other consideration that prevent a comparatively straightforward use of Datta's figures is that while he takes Western Punjab and North Western Frontier Province as also Northern and Eastern Bengal as separate circles in his study, these areas do not exactly correspond to the latter division of the country into India and Pakistan and his circle groupings somewhat complicate the division of the figures into those relating to the present Indian Union territory and those relating to Pakistan territory.

Nevertheless, Datta's figures are undoubtedly the most important that are available for the period up to 1911-12. The importance lies not only in their relating to a period where the routine official estimates are known to be incomplete and deficient in many ways but also in the fact that Datta's figures amount to a more or less independent check on other available figures when suitably corrected for coverage. Moreover, in view of the extremely detailed study conducted by Datta, his opinion may perhaps be given greater weight than that of many others.

His conclusions in so far as they relate to agricultural production as a whole, are that "in recent years, the production of foodgrains has not been keeping pace with population." There has also been an increased demand for Indian products in the world markets and in India itself, owing to the growth of the general prosperity of the country and a remarkable improvement in the standard of living among all classes of society.[29] "Nevertheless, strictly speaking there has been no substitution of non-food for food crops in the country as a whole." In view of the very small proportion of the total area which these crops occupy, they cannot have exercised any considerable influence on the general level of food prices.[30]

Shah and Khambatta find it most advisable to adopt the figures as available from the *Estimates*[31] which they have corrected for under-coverage. They have rejected as too elaborate, the problem of year by year correction in detail on the basis of available information. Moreover, they regard such a procedure as not only cumbrous but also capricious because such allowances assume that the area cultivated in any particular year subsequent to which certain figures are available is the same as the average area cultivated in the later years, the presumption on the absence of contrary evidence being that the figure for the earlier years would be somewhat less.[32] They have, therefore, resorted to the following formula with full recognition that it is not likely to give very precise results:

$$\text{Total error} = \text{Average yield per acre} \times (\text{Total area cultivated} - \text{Area for which yield is reported})^{33}$$

The total yield is thus equal to the yield reported in the *Estimates* plus the yield discovered by the above method. "The system", they claim, "was the best available as it made use of the official figures of yield as much as possible, only supplementing them where they are deficient." Their final result for any year, they hold, "may be taken to be correct within a margin of error of five per cent."[34] They also find that their figures agree in more than one instance with those of Datta for comparable areas. For this, more evidence has been adduced later.

In passing on to the more exhaustive studies and analyses of the available material, reference may be made to an interesting study by Madalgi.[35] The impressions that linger in Madalgi's mind are that "agricultural supply is marked by its inelasticity which again is due to intractability of factors of production. Farm organisation of family type accentuates this inelasticity which is

[29] Datta, K. L., *op. cit.*, p. 188. [30] *Ibid.*, p. viii.

[31] The contracted form *Estimates* has been used throughout hereafter for the *Estimates of Area and Yield of Principal Crops in India.*

[32] Shah, K. T. and K. J. Khambata, *op. cit.*, p. 87.

[33] *Ibid.*, p. 88. [34] *Ibid.* p. 88, footnote 4.

[35] Madalgi, S. S., "Prices and Production Trends in Indian Agriculture During 1900 and 1953" *The Indian Journal of Agricultural Economics*, March 1954.

more sticky during falling prices than at the time of rising prices... agricultural production during 1900-29 and again during 1940-52 showed a limited elasticity of supply to rising prices". Apart from this, the production of individual crops depends on relative prices, e.g., during the depression of 1930's rice and other foodgrains were substituted for jute and cotton respectively, and again during 1947-51 commercial crops were substituted for foodgrains. After 1952 there is a constant tendency to switch over from cash to food crops due to low prices of commercial crops. From this behaviour of agricultural production vis-a-vis price changes, "the policy conclusion may be drawn that, "by means of a rational price policy (and for this relative prices are important) it is possible to achieve an optimum crop pattern".[36]

The next important work on which it is necessary to draw upon is that of Burns.[37] Burns has actually worked on the central theme of the efficacy or otherwise of the "grow more food campaigns" relating to the crop seasons 1942-43 and 1943-44 but in doing so he has presented a large body of quantitative information. For the purpose of the present study, however, such figures are not directly available for quantitative measurement because Burns' figures generally relate to the period between 1911-12 and 1943-44 (both inclusive) and is exhaustively presented only for the former British Indian provinces. Moreover, Burns does not make a detailed effort to correct the known under-coverage in any systematic manner for the majority of the crops. Most of the subsequent studies in the subject including those of Blyn and the present one have naturally to draw heavily on the information available from this source. No efforts have, therefore, been made to present the direct quantitative information from Burns. Considering the exhaustive nature of his study, however, his conclusions must be given a great deal of weight. The following points relating to the overall agricultural situation emerge from his study:

"(*i*) Season has an overwhelming effect, on both acreage and production, particularly in the case of,

(*a*) Crops dependent on rainfall,

(*b*) Crops not of the 'cash' type. 'Cash' crops are also much affected by the prices during the producing seasons.

(*ii*) There is a very large gap between the production in the best and the worst years, whether we take all-India or individual provinces. It is most marked naturally in individual provinces.

(*iii*) 1918-19 is a year of peculiarly low production. There are several cases of a bad year following a good one.

(*iv*) Where there are considerable fluctuations from year to year in crops, these are most marked in crops dependent upon rainfall.

(*v*) The slump in prices between 1929-30 and 1933-34 had comparatively little

[36] *Ibid.*, pp. 82-3.

[37] Burns, W., *Technological Possibilities of Agricultural Development in India*, 1944.

effect on the level of agricultural production. If at all, the production of major oil-seeds and foodgrains showed slight increases."[38]

Finally, the major work on this subject by Blyn[39] may be considered. Blyn goes in for a detailed consideration of the available material in building up his figures and presents a wealth of information on various aspects of the problem. In the present context the primary concern is with the method adopted by him and with his final conclusions. His work is drawn upon heavily, when an effort is made to assess the reliability of the information on agricultural production of the country. Some of the quantitative information on the basis of which Blyn's general conclusions have been drawn, are, however, presented in Tables 1 and 2. The method adopted by Blyn may be best described in his own words: "The core and largest part of area statistics, is taken directly from the *Estimates* 'tables of out-put.' To these are added our estimated outputs for regions which are reported in the later *Estimates*, but not in the earlier. Similarly, our estimated outputs for regions reported in *Agricultural Statistics*[40] but never reported in the *Estimates*, are added to the core. In other words, we have added to the core of *Estimates* yield statistics, our estimates for all regions embraced by our minimum coverage during the entire period." And again, "A small exception to this procedure concerns states reported in later *Estimates*, but for which no figures are given in *Agricultural Statistics*." The provinces primarily affected by this omission are Bombay and Central Provinces. As regards the manner in which the estimates for such regions were arrived at "the general rule", followed by Blyn, "was to multiply the crop acreage of such regions by the average yield per acre of the given year for the regions reported in *Estimates*."[41] The crop acreage of the unreported regions is obtained from the annual reports in *Agricultural Statistics*. When such reports are not available, Blyn uses an average of crop acreage for each such region as later reported in *Agricultural Statistics*, usually an average of the first ten-year figures.[42] In connection with the actual coverage of the estimates arrived at after the necessary corrections, Blyn feels confident that virtually the entire cultivated area of the crops for which he has estimated the outputs is reflected in his statistics, because even if the outputs from certain regions which have been omitted by him for lack of information could be added to his totals, it would affect the absolute levels of production but slightly, and would not affect the trends at all.[43]

On the basis of the decennial averages centered approximately on the census years, it can be seen from Blyn's charts, that between 1901 and 1921 population and food production increased at about the same rate, which, however, is extremely small. The post-1921 period shows a striking disparity inasmuch as the food

[38] *Ibid.*, pp. 33-4. [39] Blyn, George, *op. cit.*

[40] Throughout the subsequent discussion the Agricultural Statistics of India parts I and II (formerly Agricultural Statistics of British India and Indian States) have been referred to as *Agricultural Statistics*.

[41] Blyn, George, *op. cit.*, p. 29. [42] *Ibid.*, p. 30. [43] *Ibid.*, p. 28.

production figures actually decrease slightly but there is a significant growth in population. "This would certainly indicate a falling level of food consumption unless food imports rose considerably."[44] It can also be inferred that for the later period non-food crop production was growing at a faster rate than all crop production, since the rate of food production was decreasing, and the rate of all crop production was increasing at a rate fast enough to counterbalance the decline of food, and even significantly to cause all crops to show an increase in the rate of growth.[45] "In short", to summarize in Thorner's words,[46] "the statistical survey indicates that since the 1890s total output of all crops has risen, but unimpressively; total output of food-crops has fallen off; and per capita production fell from nearly 600 pounds per year to about 400 pounds in the closing period. The trend in agricultural output over the last sixty years may be characterized as stagnation."

Before seeking to complete the overall picture and to adjust the discrepancies in the alternative estimates, if any, it is, however, necessary to form some idea as to the reliability of the estimates themselves: In other words, it is important to be able to ascertain whether the figures that are available even after they have be en corrected for coverage, represent the actual physical conditions obtaining in the country over the period under consideration. It will be useful in this context to recall that the estimates of crop outturn are based on three components which are put together in accordance with the undernoted formula:

> Estimated yield = Area sown × Standard yield per acre × Seasonal factor.

For example, if crop was sown in 1,000 acres, if the standard yield per acre was 800 lbs. and the condition of the current output was 12 annas in the rupee, i.e three-fourth of the standard, then the :

$$\text{Yield} = 1{,}000 \times 800 \times 3/4 \text{ or } 6{,}00{,}000 \text{ lbs.}$$

Before entering into a detailed consideration of the error involved in the usual method of evaluation employed in getting together the agricultural production statistics, it is desirable to note that the statistics available from the permanently settled areas are generally recognised as "almost worthless"[47] and are "mere guesses and are, not infrequently, manifestly absurd guesses".[48] Such areas of low level accuracy represent about 25 per cent of the total cultivated area for which yields are reported in the *Estimates*. To obviate any considerable error from this

[44] *Ibid.*, p. 64. [45] *Ibid.*, p. 64.

[46] Thorner, D., In Kuznets, Simon, *et al, op. cit.*, p. 122.

[47] Bowley, A. L. and D. H. Robertson, *A Scheme for an Economic Census of India*, 1934, p. 36, etc.

[48] *Report of the Royal Commission on Agriculture in India*, p. 605, etc.

source, Blyn has tried the most obvious method in the shape of utilising the statements on coverage that appeared in the *Area and Yield of Principal Crops in India* and the *Agricultural Statistics* up to the year 1911-12.

In the temporary settled areas, where the primary source of agricultural data is the village accountant, or *patwari* "it is generally agreed that the annual figures of areas sown with various crops are on the whole accurate and they compare in this respect very favourably with those published for any other country in the world."[49] Blyn, in estimating the margin of error for his estimates accepts this finding of the Royal Commission and the official statisticians. Agricultural statistics, by the very nature of their source, are not very accurate in any country and a vague guess as to whether they are as accurate as in any other country does not materially assist in the judgement formation as regards the reliability of the figures. What is of importance, therefore, is to be able to make some sort of a quantitative evaluation of the degree of accuracy involved. Two possible sources from which the accuracy of the acreage data may be checked can plausibly be indicated. In the permanently settled regions, settlement data are available with gaps of about ten years. Unfortunately, such settlement records are not readily available and a complete check on the basis of such figures on an all-India scale is outside the scope of a work of the present magnitude.

It is, however, possible to get a general indication of some work that has been done on this basis. Mahalanobis[50] quoting Chakravarti[51] indicates that the settlement figures in respect of area under rice for the province of Bengal were about 20 per cent in excess of the official estimates and comes to the conclusion that the official figures are usually underestimated.[52] The figures on which Mahalanobis bases his conclusions are given in Table A.

TABLE A

COMPARISON OF SETTLEMENT RECORDS AND OFFICIAL ESTIMATES OF AREA UNDER PADDY IN BENGAL

(*lakhs of acres*)

Type of paddy	*Settlement records*	*Official estimates*	*Difference*	*Percentage difference*
Aman (Winter)	192.2	144.6	47.6	24.8
Aus (Autumn)	59.7	49.2	10.6	17.6
Bora (Summer)	3.8	3.9	0.1	2.6
TOTAL	255.7	197.7	58.0	22.7

[49] *Ibid.*, p. 605.

[50] Mahalanobis, P. C., "Organization of Statistics in the Post-War Period, *Proceedings of the National Institute of Sciences of India*, Vol. X, No. 1, 1944. pp. 69-78.

[51] Chakravarti, N., *Supply of Rice in Bengal*, Board of Economic Enquiry Publications No. 51 (B), 1939.

[52] *Report of the Royal Commission on Agriculture in India*, p. 78.

Chakravarti's findings are generally corroborated, if not quantitatively confirmed, for some other permanently settled tracts. For instance, in the *Final Report of the National Income Committee*,[53] it is pointed out that "the recent Bihar Area Survey based on complete enumeration revealed the previous reported estimate of the total cultivated area to be an under-estimate by as much as eight million acres for all crops taken together. The position regarding land utilisation statistics is even more unsatisfactory in the case of non-reporting areas, the bulk of which is unsurveyed and relates to that part of the Indian Union which was previously included in the Indian States.[54] Moreover, Rao cites that the random sample surveys carried out at the instance of the Bengal Government showed that official returns of the area under rice was under-estimated to the tune of 3.5 million acres.[55]

It would be clear from what has been said above that the area statistics are much less reliable than is commonly supposed, particularly for the permanently settled regions. Recent experiences in the field have tended to show that a biased estimation of the area under crops even in the temporarily settled regions is not ruled out. For several reasons, however, it is not possible to use this information for any quantitative correction of the under-estimation involved. In the first place, the data relate to the permanently settled tracts, in respect of which all information including that of acreage of crops is known to be extremely inaccurate. As Subramanian notes,[56] "In the permanently settled and unsurveyed areas, owing to the absence of trained village staff, the figures for acreage are reported by police chowkidars and are believed to be only rough estimates. This is true of the returns from Bengal (except the area under jute), Bihar and considerable portions of Madras and the United Provinces. (These tracts together account for about one fifth of the total cultivated area in India)." The other major reason is that these studies including the check on the accuracy of *Patwari* records on the basis of random sample surveys recently undertaken by the Government of India, relate to only one point of time and in case there are any reasons to believe that the error in estimation, if any, is not likely to be constant over years, it would be quite incorrect to accept the degree of under-estimation as given by Chakravarti and others as final. For the country as a whole, therefore, these partial studies must be considered to be inconclusive in so far as the determination of the accuracy of the official acreage figures are concerned.

It has already been noted that Blyn generally accepts the official view that the acreage statistics for the surveyed and temporarily settled areas are generally reliable.[57]

[53] *Final Report of the National Income Committee*, Government of India, February 1954, Table A 1.1, p. 143, etc.

[54] Subramanian, S., "Production and Prices", *Guide to Current Official Statistics*, Vol. I, 3rd Ed., 1945, pp. 3-4.

[55] Rao, V. K. R. V. in *The Food Statistics of India*, Department of Food, Government of India, 1946, p. 4.

[56] Subramanian, S., *op. cit.*, pp. 25-6.

[57] Blyn, George, *op. cit.*, p. 12.

The National Income Committee, however, does not even regard the information available from the surveyed and temporarily settled areas as being quite satisfactory. "Even in regard to the surveyed and reporting areas", they note, "which are generally based on a system of *patwari* records, some doubt exists regarding their accuracy. It is suspected that *patwari* records of land utilisation may become conventional in the sense that year to year fluctuations are not always recorded and the estimates of the area under any crop, therefore, tend to become serially correlated to a large extent."[58] Though the results of the survey were not officially published, it is generally known that a check up on the accuracy of the *patwari* records, attempted by the Government of India as a result of the above findings of the National Income Committee, on the basis of random sample surveys, has indicated that the *patwari* records may involve an under-estimation of as much as 15 per cent. The particular point that is required to be emphasised in respect of the above observation of the National Income Committee is that the official figures fail to reflect the "year to year fluctuations", and that "the estimates of area under any crop, therefore, tend to become serially correlated." This point is taken up further in summarising the basic findings regarding the accuracy of the estimates.

The other elements in the making up of the final out-turn figures, as officially published, are the so-called "standard yield" and the "condition factor". Both these elements have, from time to time, been subjected to severe criticism. But it is only recently that the quantitative element of the inaccuracy in the information conveyed has been sought to be ascertained. As regards "the method followed in working out the estimates of 'standard yield' it varies from province to province" and in most of these "a system of crop cutting experiments is in force"; but owing to the admitted inadequacy of the number of experiments and the undefined nature of the part played by these experiments in the calculation of standard yield it is impossible to find reasonably accurate limits for the errors of estimate due to this source.[59] The National Income Committee is also quite critical of this element of the official output figures. In their opinion, there are several difficulties, attendant on this procedure. The crop cutting experiments conducted by the district authorities are based, on purposive sampling and not strictly on random sampling. Neither the size of the plot nor the number of experiments is adequate for the purpose of generalization. The normal yield thus determined is taken to be the normal yield of the entire district irrespective of variations within the district.[60] The National Income Committee does not, however, go on to establish any measure of the inaccuracy that may creep into the official figures from this source alone.

It may, however, be noted that for the present purposes this factor, as such, does not introduce as serious a handicap as it may otherwise seem. Estimation of

[58] *Final Report of the National Income Committee*, Govt. of India, February 1954, p. 25.
[59] Subramanian, S., *op. cit.*, pp. 3-4.
[60] *Final Report of the National Income Committee*, Govt. of India, February 1954, p. 27.

crop yield through crop-cutting experiments based on random sampling methods is of comparatively recent origin. For the greater partof the period under review, the standard yield was derived in a manner that can only be described as "best judgement estimates". The definition of standard yield that has been accepted is in itself so vague that it is difficult to derive an accurate measure for it. The standard yield is defined as the "figure which in existing circumstances might be expected to be attained in the year if the rainfall and season were of an ordinary character for the tract under consideration, that is neither very favourable nor the reverse.... 'Briefly', it is stated to be 'the average yield on average soil in a year of average character'."[61] In other words "it is that crop which past experience has shown to be the most generally recurring crop in a series of years; the typical crop of the local area, the crop which the cultivator has a right to expect."[62] "This normal or average yield will not necessarily correspond with the average of a series of years' figures, which is an arithmetical average."[63] As Blyn somewhat pithily remarks "this definition dates back to at least 1897 and has successfully defied the clarifying effects of time". The average intended is evidently the mode of a series, but it is not clear from the definition, nor does the method of calculation of standard yield indicate a mode.[64]

The third element, namely, the condition-factor for each crop is arrived at after a series of averagings from the annawari estimates reported by the village accountants. These estimates being generally in the form of an integral number of annas per rupee when they are first reported are likely to be in excess of, or deficit of, the true value to the extent of half an anna owing to this cause alone. The error may not be a serious one in case of a nearly normal crop but for a crop much below normal it will be large, e.g., in the case of an eight anna crop the error may be more than 6 per cent. If the errors were random ones, i.e. if positive and negative errors were equally likely, the successive averagings may be expected to make the error in the final figures as small as possible. But these errors are believed to be systematic ones and the figures reported by the village accountants are usually considered to have strong downward bias. Hence, it is quite likely that the condition-factor as finally worked out is smaller than the actual figure by a large percentage.[65] The National Income Committee, however, comes to a somewhat different conclusion as regards the nature of the inaccuracy involved. "In fact", according to the National Income Committee, "each *patwari* has his own conception of the normal crop for his village and there is no way of relating this to the district figure. Apart, therefore, from the subjective bias in estimation, the interpretation of normal yield rests entirely with the *patwari*. The seasonal factor

[61] Quoted by Blyn from India, Department of Revenue and Agriculture, Circular No. 9-22, 23-10, 1897.

[62] Quoted by Blyn from India, Department of Statistics, Manual of Crop Forecasts, 1917, p. 5.

[63] *Estimates of Area and Yield of Principal Crops in India*, 1940-41, p. 46.

[64] Bowley, A. L. and D. H. Robertson, *op. cit.*, p. 39.

[65] Subramanian, S., *op. cit.*, pp. 3-4.

is usually expressed as so many annas in the rupee, and in a large number of cases the normal is taken to be either 12 or 14 annas rather than 16 annas. Further, the method of eye estimation makes for a general toning down of the fluctuations in the actual yield. The result is some sort of a moving average for a period of years rather than the actual out-turn from year to year.[66] It has already been noted that Karve's view in the matter is that the official assumption that there is a strong downward bias in the anna estimates cannot be sustained if only because no plausible reasons have been advanced why this should be so; and on the contrary, government agencies have every reason for arriving at a higher instead of a lower figure because of the close association of the getting together of the output figures and the collection of land revenue.

A reason for persistent under-reporting has, however, been indicated by Sinha.[67] An examination of the actual reports made by the *patwaris*, according to him, makes this point clear, as "any report in excess of the normal is conspicuously absent". "This", Sinha argues, "shows that the Indian *patwaris* like crop reporters elsewhere, are unduly pessimistic; they confuse normal with an ideal or a bumper crop; they forget that even a normal crop must have its normal share of vicissitudes."

Sinha goes on to consider a method for correcting the under-reporting suggested by G. A. D. Stuart. The suggested correction envisages the use of the average of past ten years' condition factor. Thus, if the reported condition factor in any year is say 60 and the average condition factor for the past ten years is 57, the adjusted condition factor would be $\frac{60 \times 100}{57}$. The correction, of course, is based on the idea that a period of ten years is a long enough period to eliminate year to year fluctuations. As Sinha rightly points out, the correction is not conceptually accurate as the normal does not necessarily correspond to the arithmetic average for a series of years. Sinha's final conclusions are: "There is no means of knowing the error in particular years. A comparison of the ten-yearly moving averages of final forecasts of cotton and jute with those disclosed by trade and consumption statistics reveals that the forecasts are generally underestimated. But the figures for individual years cannot be accurately determined by this method." It will be seen that while for jute, Sinha's apprehension seems to have been confirmed by the crop-cutting estimates, the official estimates for food-crops have not been similarly shown to be systematic under-estimates.

What is of particular interest in this specific study is that the adoption of the more reliable sampling and crop cutting methods of estimates which would check up both on the "standard yield" and the "condition factor" elements of the output figures has not revealed that the old official figures under-estimated the production figures uniformly. Beginning with the earlier experiments in Bengal

[66] *Final Report of the National Income Committee*, Govt. of India, February 1954, p. 27.

[67] Sinha, H., "Indian Agricultural Statistics", *Journal o Royal Statistical Society*, 1934, Part I, pp. 155-62.

and Bihar conducted by the Indian Statistical Institute at the instance of the respective governments, by the year 1952-53, most of the States had carried out crop-cutting experiments on a random sample basis. The results are inconclusive. "In Bengal and Orissa, estimates of yield on the basis of sample surveys were higher than the official figures while the contrary was the case in the U. P. In the case of C.P. and Madras, there is a fairly close agreement between the official figures and the figures based on sample surveys."[68] Sukhatme who guided these investigations and Panse[69] find that in the case of the Central Province normal yield accepted as standard over years is 15 to 25 per cent higher than the average yields arrived at through sample surveys.

The actual position in the matter is brought out in Table 15. It will be seen from the table that out of 42 random crop-cutting experiments listed therein, comparison is not possible in 6 cases because of the non-availability of the alternative estimates from official sources. Out of the remaining 36 cases, there are 19 in which the official figures are under-estimates as compared to the random crop-cutting estimates, while in 17 cases, the random crop-cutting estimates are less than the corresponding official figures. As indicated by Panse,[70] the final outcome is however, inconclusive. This is so not only because of this rough equivalence of the positive and negative errors, but because the final corrections, if any, must not only, consider the direction of the error but also its magnitude. Any idea as to the magnitude of the error would, in turn, depend on the relative rather than the absolute difference between the official estimates of yield and the estimates available from the crop-cutting experiments, which require a comparison of the relative difference with the official estimates as the base. It is not, however, sufficient that this be done. The proportion of the total area under any particular crop to which such corrected figures should relate, would also form an important part of the judgement.

In view of the recognised short-comings of the very basis of the available information discussed above, it is essential to ask the question how reliable any final estimate of India's agricultural production is likely to be. Though for the immediate purpose, what is of greater significance is not so much the actual level of output but how far such figures, as are available, truly reflect the movements in production trends. The question of the overall margin of error cannot, however, be entirely disregarded. The advantages and disadvantages that emerge out of having to consider both the types of errors will be discussed more fully in a different context.

As regards the absolute margin of error, the question of both the magnitudes and directions thereof may be considered. It has been noted that the official view is that the published figures involve some 15 to 20 per cent underestimation.

[68] Rao, V. K. R. V., *op. cit.*, p. 4.

[69] Sukhatme, P. V. and V. G. Panse, "Crop Surveys in India", *Indian Journal of Agricultural Statistics*, Vol. III, No. 2, 1951, pp. 98-168.

[70] *Ibid.*

This is entirely separate from the issue of coverage which is the principal element of error that is sought to be corrected in Blyn's estimate as also in the present study. It has also been pointed out that responsible and competent opinions have held that in view of the close association of land revenue assessment with the agricultural production figures, the official estimates should be generally regarded as the "outside limits". The possibility that a more acceptable position may be evolved on the basis of contemporary investigations into this problem is indicated later. The basis of this investigation is, of course, the fact that if the earlier production figures are written up on the basis of the 15 to 20 per cent underestimation and the necessary correction is made for the known under-coverage, it would reveal a production trend which is even more unfavourable as compared to that derived by Blyn; and that notwithstanding the fact that Blyn works on a basis, which in spite of its accuracy, is likely to lead to an exaggeration of the earlier figures. The implication, or rather, one of the implications of this would be that one is forced to concede a continually falling per capita national income from the beginning of the century. If the whole body of evidence leads to the same conclusion, there is, of course, no technical objection in accepting this view. But where there are other reasons to believe that there has been some improvement in the situation, the corrections envisaged in the study have to be re-examined. Moreover, it is difficult to hypothesize that the rise in population has been going on in spite of a continuous diminution in the per capita incomes over decades.

Regarding the magnitude of error, Shah and Khambatta[71] believe that their "final result for any year may be taken to be correct within a margin of error of 5 per cent "because it is extremely unlikely that all details will be wrong in the same direction and to the full extent." That the errors could be all in the same direction is, however, exactly what Subramanian suspects. "If the errors were random ones", he writes, "the successive averagings may be expected to make the error... as small as possible. But these errors are systematic ones" and "are known to have a strong downward bias."[72] Blyn does not try to estimate the overall accuracy of his figures and on the whole tends to accept the official view that a minimum error of 3 per cent each way or 6 per cent is reasonable. Rao, on the other hand, considers that "the results obtained have shown that taking the country as a whole the figures of agricultural output are not likely to be subject to an error of more than 10 per cent."[73] The National Income Committee, however, takes a somewhat gloomier view in so far as it regards that for its estimates for "agriculture, animal husbandry and ancillary activities" the error would be as large as 20 per cent.[74] It would, nevertheless, seem that the difference between Rao's estimate and that of the National Income Committee are not quite as much

[71] Shah, K. T. and K. J. Khambatta, *op. cit.*

[72] Subramanian, S., *op. cit.*, pp. 3-4.

[73] Rao, V. K. R. V., *op. cit.*, p. 7.

[74] *Final Report of the National Income Committee*, February 1954, Table A 2.1

in conflict as might seem at first sight, because while Rao's estimates depend on the major crops generally, that of the National Income Committee includes a host of minor products where the accuracy of the figures are obviously of a low order. Since for several reasons, it has been found expedient to work on the basis of output figures for certain major crops it would be reasonable to accept the possibility of an error of 10 per cent, that is 5 per cent each way, in respect of the output figures, subject, however, to certain qualifying conditions indicated in the following paragraphs.

In concluding this study, Panse's general review appears to present the most balanced and acceptable view.[75] Crop-cutting surveys by random sampling methods, according to Panse, carried out during recent years for cotton, rice and wheat have established that there is a general tendency on the part of the official crop reporters to overestimate the production in bad seasons and underestimate it in good seasons." A striking feature that emerges out of the examination of the trends is that "in several cases yield-fluctuations during the recent years are much less marked than in the earlier part of the period. The only possible explanation, according to Panse is that, "sufficient care does not appear to have been bestowed upon assessing the seasonal influence on the crops, allowing for seasonal fluctuations, during recent years." "It is well known", he goes on to point out, "that the normal yields were initially pitched too high. In the course of subsequent revision, normal yields have been brought down, as seems to be the case in certain States," and this will no doubt have a depressing effect on the seasonal yield.

The general picture that Panse finds possible to draw is that "for cash crops the data reveal clear evidence of generally increasing yield rates and, in respect of sugarcane, an expansion of area as well. In respect of food crops also an expansion in area is perceptible in several cases as also an increase in the proportion of irrigated areas. Yield trends are rather heterogeneous. Generally speaking, an expansion of area under crops has been seen to be a factor associated with the lowering of the yield rate, while an increase in the proportion of irrigated area has the opposite effect. An important point to notice is that in no State have all crops studied shown a consistent decline in yield. There is thus little ground for the belief that there has been a deterioration in the fertility or in the standard of husbandry in recent years."[76]

Panse's findings are of considerable interest. While it is not possible without further considerable and sustained enquiry to work out the overall quantitative implications relating to the indications emphasised in his study, his finding, that there is a consistent tendency to overestimate the yield figures in bad years and to underestimate them in good years is extremely interesting and peculiarly pertinent in the immediate context. This observation, it will be noted, confirms the general

[75] Panse, V. G., "Trends in Areas and Yields of Principal Crops in India", *Agricultural Situation in India*, June 1952, Vol. VII, No. 3, p. 144, etc. seq.

[76] *Ibid.*, p. 146.

impression of the National Income Committee that the official yield figures present a sort of "moving average" for a number of years and do not measure the inherent fluctuations correctly, a finding that would be of considerable use in this study. It will be appreciated that this point furnishes a very cogent reason as to why any particular measure of underestimation on the basis of the figures for a specific year cannot be accepted for scaling-up the official figures. Such under-estimations are likely to be found particularly in good years or rather in years when there is a tendency for production to rise. It is not unlikely that enquiries regarding accuracy of output data would be undertaken during years when the country is pressed for more and more of a particular crop that may have caused a specific bottleneck. Moreover, extending the consideration to the question of acreage it is found that it is likely, on the same logical basis, that acreage of particular crops would have a tendency to be under-reported when, for one reason or another, there is a tendency for the acreage and production of that particular crop or particular group of crops to increase. Any measure of underestimation of crop acreage on the basis of the figures of a particular year is, therefore, not likely to provide one with a measure of underreporting that can be used for correcting the officially published figures for crop output.

Panse's explanation of the observed drop in the year to year fluctuations in crop yields also yields interesting conclusions. It will be noted that his observation on this point is reinforced by the conclusion he draws from the net effect of the gradual toning down of the standard yield figures which were initially pitched too high, as also the depressive effect, in so far as standard yield is concerned, of a general increase in acreage under any particular crop. The cumulative effect of all the three considerations certainly makes it plausible that the tendency to underestimate which is being observed and rectified in recent years is of a comparatively recent origin. It would perhaps not be unreasonable to suppose this tendency to have commenced during the late twenties. For the purpose of general comparison over a long period of fifty years or more, this element of underestimation is not likely to be of any great significance. On the whole, therefore, it would seem that working on the basis of agricultural output figures corrected for uniform coverage, subject to certain recognised shortcomings that have been already noted is justified. The reason why any considerable refinement cannot be attempted on the basis of the trend in yield figures would emerge when an attempt is made towards a final check-up of the available figures on the basis of their mutual comparability. It may, however, be noted in the present context that while, on the whole, Thorner's view on Blyn's work, namely, that further refinements would not lead to results different in major respects from his (Blyn's) may be substantially correct: the present investigations in the matter, however, seem to lead to the conclusion that the method adopted by Blyn has lead to a substantial overestimation of the agricultural production of pre-1921 and particularly of the pre-1911 periods. This would, of course, not show generally in the aggregate figures because it would be masked by a large body of figures where no

substantial marking-up is needed for undercoverage and also because the difference in the methods is likely to yield similar figures for certain years where the particular ratios actually hold good. Blyn's overestimate for the earlier years thus seems only significant in the case of rice. There will be occasion to comment on the magnitude of this overestimation as also its diagnostic implications in a different context. Methodologically also Blyn's effort does not appear to be a pioneer work because Rao[77] has adopted the identical method for establishing comparability in his figures. In the course of the present work, it has been possible to take advantage of the production figures for a later period when a far larger part of the country had come within the ambit of reporting, at least, for major crops, and thus to simplify the process of estimation very considerably.

[77] Rao, V. K. R. V., *op. cit.*

CHAPTER TWO

Agricultural Production—Estimation

The estimates for agricultural production for the years 1900-01 to 1952-53 made in the course of the present study have been attempted with a double purpose. In the first place, no estimate for the entire period is available. For the study of long-term trends a comparable series of agricultural production for the entire period was considered essential. Blyn's estimate is the only other that is available. For the purpose of the specific study undertaken, Blyn's series of agricultural production was, however, found insufficient on two counts. The study terminated with the year 1945-46. Moreover, its area coverage included the entire Indian Union and Pakistan territories. Blyn's figures being the first of their kind, particularly with respect to the first thirty years of the period, the second objective of the present study is to verify Blyn's findings. For the period 1931-32 to 1943-44 comparable estimates of area and yield of principal food crops are separately available from official sources. Sivasubramonian's[1] work on the subject became known to the author much later and even then the practical usefulness of his series is extremely limited for the purposes of the study because only the gross value of the aggregate agricultural output figures was available to start with. Unless the basis on which the aggregate has been made up is available it is not possible to examine his series critically. Moreover, from the point of view of the present study, Sivasubramonian's work suffers from both the limitations of Blyn's work, namely, that they extend only up to 1942-43 and relate to undivided India. Nevertheless, Sivasubramonian's work does provide another independent check of the accuracy of Blyn's work with which it is directly comparable and some use is made of these figures in an appropriate context.

The three available series of the value of agricultural production at the average 1924-29 prices are presented in Table I together with the estimates for the present Indian Union territory for the period 1900-01 to 1952-53. The basis of the calculations, in so far as they relate to the territory of undivided India, is the same as Blyn's except for one innovation that is tried out. The area for which acreage and output figures are available for later years but are not available for the earlier years have been written back not on the basis of an absolute figure based on the average of the first few years for which the figures were available, on the lines attempted by Rao and Blyn, but has been separated out from the corresponding figures for a comparable former British Indian provinces territory and written back as a

[1] Sivasubramonian, S., "Estimates of Gross Value of Output of Agriculture for Undivided India (1900-01 to 1942-43)", Paper presented to the Preliminary Conference on Research in National Income, Jan. 1957.

percentage of the same for the earlier years on the basis of the ratio of the first ten available years' figures. The underlying assumption obviously is that the changes in the non-reporting areas have been similar to the reporting areas. The procedure has its limitations, but it is expected that it masks the actual movements to a considerably lesser extent as compared to the other method. The other major difference in the procedure concerns the use by Blyn of acreage figures as available from *Agricultural Statistics* to complete the coverage where such figures are available in the *Agricultural Statistics* but not in the *Estimates*. It is not found necessary to make any considerable use of this method because this later work has the advantage of the use of figures for as recent a year as 1954-55, when by far the greater part of the country has been surveyed and brought under the ambit of reporting. Exact acreage figures for such territories as Garhwal in the Uttar Pradesh, Manipur, and Andaman and Nicobar Islands under various crops are available for the current years. The acreage figures as available from these sources have, none the less, been checked against such figures from the *Agricultural Statistics* in order to ascertain whether the estimates arrived at as above fall short of the area estimates of the *Agricultural Statistics* in any year. Finally, as the method adopted in the present work emphasises the need of some firm estimate in respect of a comparable territory of the former British provinces, it is found possible to draw more heavily on the basic statistics from K.L. Datta[2] in respect of the first eleven or twelve years when the figures available from the *Estimates of Area and Yield of Principal Crops in India* are, as pointed out by P.J. Thomas and N.S.R. Shastry,[3] known to be incomplete and unsatisfactory for want of adequate coverage even within the British provinces.

It has been pointed out by Sinha[4] that in view of the inaccuracy of the original data in respect of production, it would be unwise to rely entirely on any series of output figures alone. As a check on the output figures, therefore, the acreage figures have also been computed and presented in column 7 of Table 3. While the agricultural output series is based on a study of the output of sixteen major crops, the acreage data is based on relevant investigation about fourteen of them. The acreage figures for tea and coffee have been omitted from the acreage aggregate on the ground that there are no substantial alternatives to these products in the particular territories where they are grown. It is to be noted that the acreage under these fourteen crops cover a major portion of the gross area under cultivation but do not cover the whole of it. Without, therefore, arriving at some idea as regards the gross area under cultivation, it is not possible to come to any conclusion as to whether there has been any relative diminution in the proportion of land put under the fourteen major crops. In so far as it can be shown that such a proportional diminution has taken place, the relevance of the particular series based on the acreage and output

[2] Datta, K. L., *op. cit.*
[3] Thomas, P. J. and N. S. R. Shastry, *op. cit.*
[4] Sinha, A. R., *op. cit.*

of a limited number of crops would be of much lower order than it could otherwise be. For this purpose, an estimate of gross area under cultivation from year to year for the comparable areas of the present Indian Union territory has been prepared. The actual acreage figures for the gross area under cultivation together with its movements in the form of an index number is presented in TABLE II columns 3, 4 and 5. The expression "gross" in this context merely means that the area double or multiple cropped has not been considered as so many physical acres but has been added to the aggregate on the basis of acreage under all the multiple products. The figure would thus be larger than the actual land available for cultivation for these crops and would not coincide with the figures of "net area under cultivation" as shown in *Agricultural Statistics* which is arrived at by deducting the area under multiple cropping from the gross area cultivated. The results are clearly demonstrative of the fact that the residual acreage not accounted for in the estimates have not tended to increase relatively, and therefore, it would be more or less justified to accept the movements indicated by the series as representative.

A considerable part of the difficulties in the present estimates arises in the context of finding a satisfactory basis for separating the information relating to the present Indian Union territory from the aggregate of the information available for the whole of undivided India. It is possible, in this connection, to use a rough and ready division on the basis of 1946-47 percentages that are available as a part of the partition statistics. It seems, however, that the various parts that constituted India are too dissimilar to justify so simple a technique. Of the various territories that now constitute Pakistan, the former North Western Frontier Provinces and Baluchistan presented the least difficulties. Where the figures in respect of these territories are available they could be deducted in a straightforward manner. For a number of crops these territories, however, constituted non-reporting areas. This fact saves the trouble of accounting for the under-coverage in respect of this two territories, the bulk of which have not been surveyed for land utilisation purposes. Separate figures for Sind are available up to 1921 on the one hand and again from 1933 on the other. The production figures for the intervening twelve years have been interpolated on the basis of production trends for particular crops in undivided Punjab, separate figures for which are directly available, the assumption being that the conditions in Sind were akin to those in the Punjab rather than to those in Bombay with which it was politically integrated. The major problems confronting the study arise out of the partition of two erstwhile British provinces of the Punjab and Bengal. Separate figures for West Punjab or Punjab (Pakistan) cannot be built up without actually going into the figures at a district level, and due to the partition of the Gurudaspur district, not even then. Figures of acreage and output of principal crops for Western Punjab are available from K. L. Datta[5] up to the year 1911-12 but the territory accounted for in Datta's work does not coincide with the territory of West Punjab. The obvious difference

[5] Datta, K. L., *op. cit.*

is that Datta's West Punjab includes the North Western Frontier Provinces. These figures, while useful by themselves, cannot be directly used for the year to year estimates of acreage and output of crops in the territories now constituted into Pakistan. It has been found necessary, therefore, to fall back on an admittedly unsatisfactory make-shift of calculating the proportion of the post-partition acreage and output figures for Punjab (India) with those of the undivided Punjab and to split up the figures of acreage and output for the undivided Punjab before 1947 on that basis.

Eastern India presented a more formidable problem. The administrative province of Bengal comprised, up to the year 1911, the provinces of Bengal, Assam, Bihar and Orissa. Separate figures for such territories as Assam or Bihar and Orissa and undivided Bengal are only available from the year 1911-12. Out of these four provinces both Assam and Bengal have been split up to carve out the present territory of East Pakistan. The result is that a straightforward splitting up on the basis of post-partition figures is not possible as in the case of the Punjab, after the year 1911-12. Acreage and production figures for northern and eastern Bengal are, however, available separately from Datta's work referred to earlier. The territory demarcated by Datta as 'northern and eastern Bengal' does not, unfortunately, coincide exactly with the present territory of East Pakistan. It is therefore, found necessary to correct Datta's figures to make them comparable with the figures as available from the official sources for the subsequent years. Appropriate figures for the Sylhet district are arrived at on the basis of a comparison of the pre- and post-partition figures for the province of Assam in the same manner as in the case of the Punjab. Using these two proportions on Datta's figures, a tentative estimate is established for the present East Pakistan territory for the period prior to 1912-13. For the subsequent years, a straightforward splitting-up of the provincial figures on the same lines as in the case of the Punjab is found possible for all the crops except jute. There has been a sharp rise in the acreage and production of jute in the territory of West Bengal after the partition. It is felt that a straightforward splitting-up of the figures of jute acreage and output on the basis of several years average figures after the partition would give a completely misleading picture of the actual acreage of jute in that part of Bengal which has since been constituted as the State of West Bengal in Indian Union. Cultivation of jute is known to have been primarily concentrated in the present East Pakistan territory due to geographical and other factors. On all these counts, jute acreage and production figures have been split on the basis of the figures relating to the year 1946-47. Estimates of acreage and output of tea, coffee and tobacco are not seriously affected by the partition and present no major problems.

It has already been indicated that the trends in agricultural production emerging out of the estimates of Meek, Mukerjee, and Sinha, however incomplete, do not necessarily call for their outright rejection. Their failure to take into account the progressively rising coverage under reporting for the purposes of crop output is no doubt a serious handicap. In view, however, of the very serious shortcomings

of the basic statistics on which any estimate of the aggregate crop output must depend, a feature which has already been commented upon, one cannot be quite sure, at least, on a priori grounds, whether the trend in movements of agricultural production as observed from these incomplete figures does not give a true picture of the underlying conditions. The final judgement must remain a matter of fact and that of comparative studies rather than one of a priori methodological considerations. Nevertheless, it remains a moot point whether a sustained population growth would have been possible on the face of a continuous drop in cereal consumption from 600 to 400 lb. per year per capita as Blyn's or for that matter any other corrected figures reveal. The comparative position as between the different estimates has been brought into focus in Chart III where the indices based on the various production trends have been plotted within the same reference system. In order to facilitate comparison, the base of each of the series has been shifted to 1935-36=100. Reduced to indices with a common base, the differences in the actual levels of estimation do not manifest themselves. The anticipated overestimation of Blyn's series in respect of the years up to 1913-14, though small, is clearly brought to light in this chart. From an examination of the movements of Meek's index of agricultural production and Sinha's adjusted index linking the index of agricultural production with Meek's original series, it is noted that they do not, on the whole, exaggerate the rising trend. Meek's series seems generally to under-estimate the figures. It would thus seem likely that Meek had restricted his observations to the former British provinces only and was thus not bothered by the problem of under-coverage to any considerable extent. On the other hand, as a result of the fact that Sinha considered the output figures from the year 1921, his series was also free from any considerable under-coverage that would have been manifest if he had considered the pre-1921 years. Between Meek and Sinha the problem of under-coverage has been avoided to a considerable extent by unconsciously adopting some sort of a chain index number. The result is that while both the figures as presented by Meek and Sinha are inaccurate as estimates, their series, particularly that of Sinha, indicates the movements in agricultural production of the country fairly accurately.

It has been indicated at the outset that the available material does not permit any elaborate analysis. It would, however, be worthwhile to make a rough comparison of the available data, in order to check the consistency of the information. For this purpose the three available estimates of agricultural output have been tabulated and plotted together in Chart I. The quantity figures in terms of which the estimates have been built up have been reduced to a common denominator, value figures being derived on the basis of 1924-29 average prices used by Blyn. The specific levels of agricultural output as obtainable from the three estimates are, however, not exactly comparable even on the basis of identical prices. Blyn's estimate does not include the residuary 'other crops' included by Sivasubramonian; while the present estimates exclude both "other crops" and "other food crops," the latter of which is included in Blyn's. The consequences are as expected. Siva-

subramonian's estimates are the highest throughout, while the present ones are the lowest. In spite of a somewhat different technique being used in writing back the yield figures in respect of the earlier years the correspondence between the present figures and those of Blyn is surprisingly close. The correspondence is so close that except for a small drop in 1927-28 and a small rise in 1932-33 in Blyn's series there are no other movements in Blyn's figures that are not reflected in the present series. In respect of the drop in 1927-28 the correspondence is closer between Blyn's figures and those of Sivasubramonian. The original hypothesis that Blyn's method is likely to involve some overestimation of the earlier years is not very marked in respect of the overall figures. Considering the very close correspondence between the present series and Blyn's figures for the later years, the hypothesis can be tentatively held for the years 1903-04 to 1904-05 and 1909-10 to 1912-13 (all inclusive) when Blyn's series seems to overestimate the output slightly. Such discrepancies are exactly as one would expect on a priori grounds. Even if Blyn's method involved certain over-estimation it is not likely to produce a different estimate for every year. Only in certain selected years when the average and the ratio figures are somewhat divergent that Blyn's method would come to a result that is significantly different. Considering, however, the inaccuracy of the data, no great reliance can be placed on the particular finding.

While the correspondence between Sivasubramonian's series and that of Blyn as well as the present series, is reasonably close, because of the somewhat closer correspondence between Blyn's figures and the present estimates, Sivasubramonian's estimate may be considered to be slightly in error. The most conspicuous difference is the slow but continuous rise in agricultural output between 1929-30 and 1935-36 which is not corroborated by the other estimates. The same is true for the movement during the short period following 1939-40. The fact that Sivasubramonian's series reaches a trough in 1927-28 instead of in 1926-27 and that it fails to register the drops in 1917-18 and 1937-38 is also conspicuous. The only case in which Sivasubramonian's and Blyn's series correspond more closely to each other, as against the series in the present study, relates to the drop round the years 1926-27 and 1927-28. The present series fails to register the drop in 1926-27 which is reflected in the other two. But while the drop continues in Sivasubramonian's series and reaches a trough in 1927-28,[6] Blyn's figures show a recovery in 1927-28 itself. Going into the particular figures it is fond that there is a marked drop in the out-turn of rice and wheat; but jowar, gram and cotton show a more than compensating rise. These particulars seem to be true about Blyn's figures as in respect of the present estimates. There is, accordingly, no corroboration of the existence of this recession. Moreover, there is no reason to reject the present findings in spite of the fact that they disagree with those of Blyn and Sivasubramonian, particularly because of Anstey's findings as to a slow and continuous growth between 1923 and 1929.[7] It is unlikely that Anstey would have failed to

[6] This is on the basis of an original mimeographed version of Sivasubramonian's paper.

[7] Anstey, Vera, *Economic Development of India*, 3rd ed., 1949, pp. 460-1, etc.

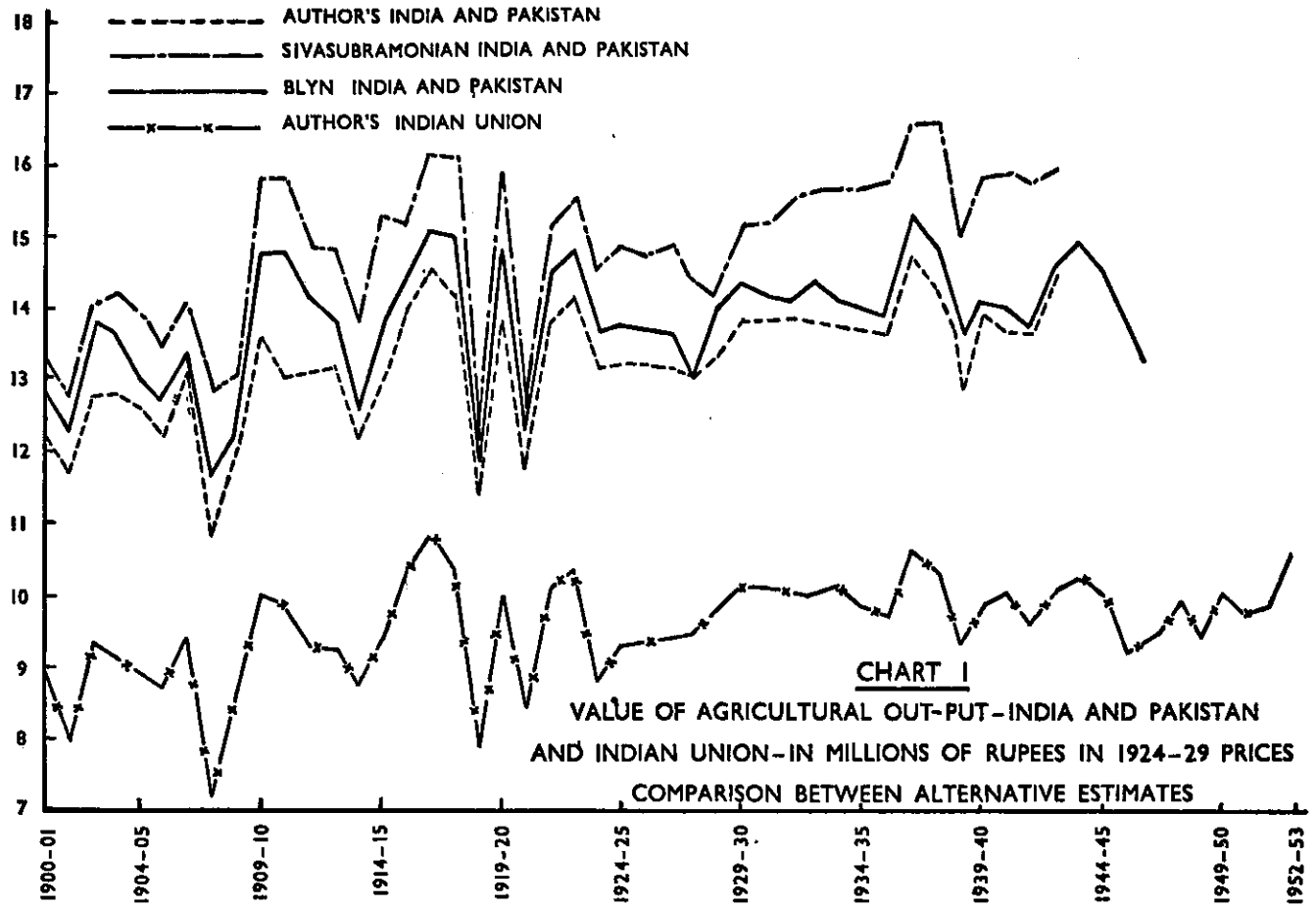


CHART I

VALUE OF AGRICULTURAL OUT-PUT - INDIA AND PAKISTAN AND INDIAN UNION - IN MILLIONS OF RUPEES IN 1924-29 PRICES

COMPARISON BETWEEN ALTERNATIVE ESTIMATES

notice a clear recession in 1926-27 or 1927-28. On the whole, Sivasubramonian's series appears to suffer from a certain amount of flattening out, due probably to his having included a larger number of crops including the residual "other crops" and "other food crops." The figures for "other crops" or even "other food crops" are likely to be more or less notional for the earlier years. In the present estimates these items have been left out because the available information on the basis of which any reliable output figures could be arrived at, could not be marshalled at the level of abstraction attempted in the present study. As it is, the present efforts to arrive at estimates for the output of castor seeds, for instance, for the first decade of the century produced figures that has every look of being purely conventional instead of being figures derived through objective measurements of an economic variable. It seems that it would be necessary to go into much greater details in order to be able to arrive at any reliable estimate of the yield of various minor crops. The logic of exclusion of minor crops is, therefore, justified and on the whole, it seems safer to rely on Blyn's estimate or on the present ones than on Sivasubramonian's estimates.

The figures representing the present estimates of agricultural production in the present Indian Union territory from 1900-01 to 1952-53 are plotted in the same chart. The results are satisfactory in the light of the movements as revealed by the various estimates for the territory of undivided India. It may, however, be noted that both in respect of the estimates for the territory of undivided India and that of the Indian Union territory, the year to year fluctuations up to the year 1920-21 are considerably greater than those after that year. This tendency is obviously indicative of a change in the method of estimation as indicated by Panse, due to experimentation with the 'normal yield' figures. Whether this should be taken to indicate that the figures for the earlier years are not quite as accurate as those of the later years is not quite so certain. But the fact does vitiate the direct comparability of the output figures in respect of the two periods and makes the figures less reliable in general. It would, under the circumstances, perhaps be safer to work on the basis of some sort of a moving average in respect of the period prior to the year 1920-21.

There is a tendency in recent years to brush aside any reference to trade cycles in respect of an underdeveloped economy. But as Gadgil[8] has pointed out 'There is a rhythm which might be compared to the analogous movements of trade cycles. India being a predominantly agricultural country, these movements are denoted by alternate periods of good seasons and famine years, rather than by years of trade booms and trade depressions.' An examination of our agricultural production figures reveal troughs in 1901-02, 1907-8 (6 years), 1913-14 (6 years), 1918-19 (5 years), 1920-21 (2 years), 1923-24 (3 years), 1935-36 (12 years), 1938-39 (3 years), 1941-42 (3 years), 1945-46 (4 years) and 1948-49 (3 years); while the peaks are 1902-03, 1906-07 (4 years), 1909-10 (3 years), 1916-17 (7 years), 1919-20 (3 years), 1922-23 (3 years), 1930-31 (8 years), 1936-37 (6 years), 1939-40 (3 years), 1943-44

[8] Gadgil, D. R., *Industrial Evolution of India in Recent Times*, p. 188, etc

CHART II

MOVEMENTS IN FOOD-CROP AND CASH-CROP PRODUCTION

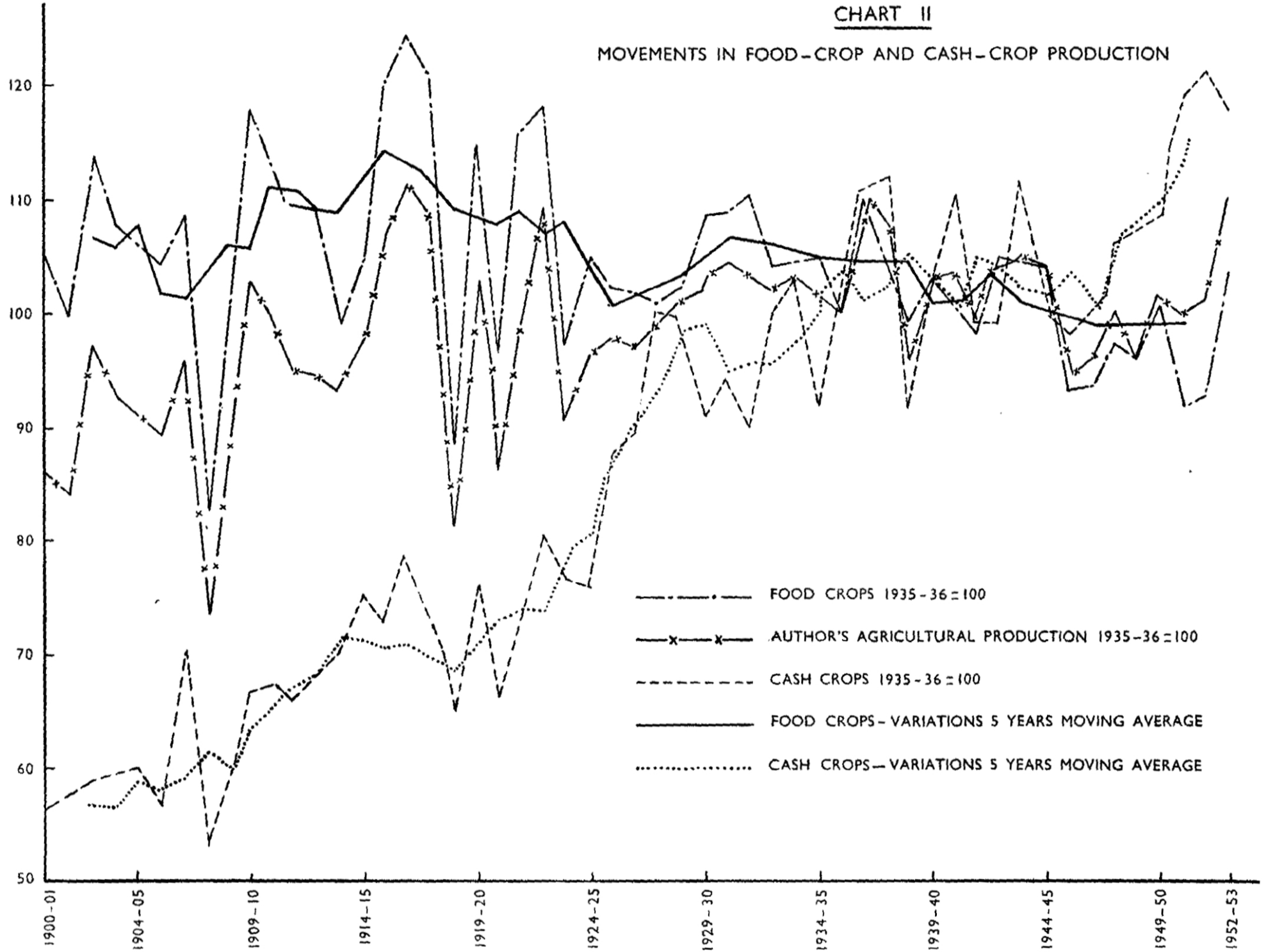
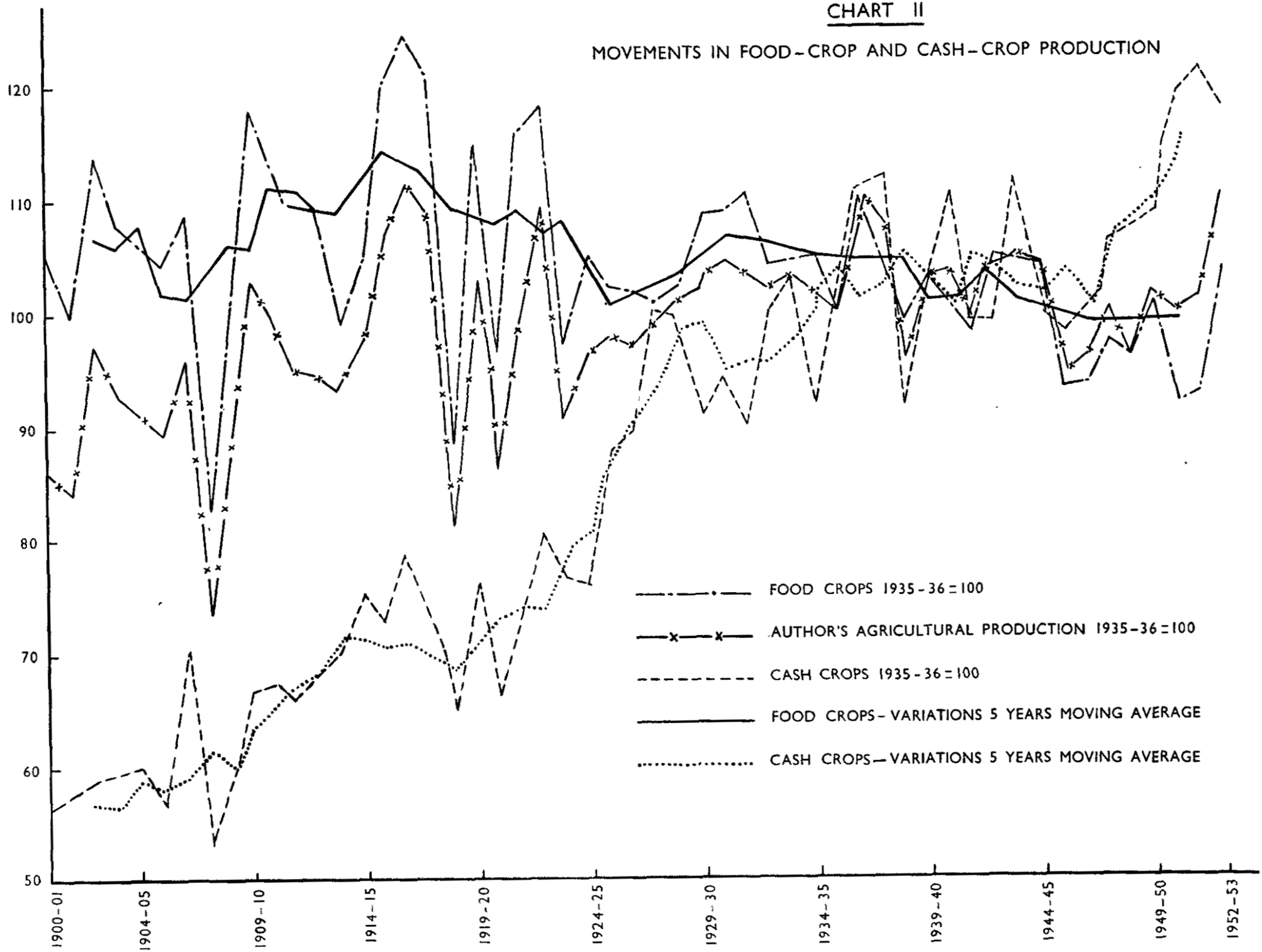


CHART II

MOVEMENTS IN FOOD-CROP AND CASH-CROP PRODUCTION



(4 years) and 1949-50 (6 years). From these observations it is possible to postulate tentatively the existence of a cycle with 6 years' periodicity.

A few other observations may also be made in respect of the figures presented. The figures for acreage, either on the whole or in respect of particular crops, do not seem to provide any accurate and satisfactory check on the production figures as indicated by Sinha. On the whole the movements in the acreage figures are entirely of a different order and they appear to fluctuate much less than the output figures. This tendency is probably accentuated by the fact that in India the average yield figures do not take into account even the total failure of the crops. The final output figures are divided by the figures of entire area sown in respect of a particular crop. This practice has the obvious effect of reducing the movements in the acreage of crops as reported. The figures of average yield, arrived at on the basis of aggregate figures would also suffer from the same limitation and thus fail to provide a satisfactory check on the output figures as indicated by Sinha.

The composition of the agricultural output is brought out in TABLE 3 and Chart II. It would be apparent from the examination of the chart that the bulk of the substitution of cash crops for food crops was completed by the year 1927-28. The next twenty years up to 1947-48 present a picture that is essentially featureless. The tendency for cash crops and food crops to alternate, while not entirely absent, does not come out clearly in this chart. The tendency is obviously to move to a new balance between cash crops and food crops. The same feature is brought out in TABLE 3. With periodic recessions that do not show noticeable uniformity, but in which the war periods are conspicuous, the production of the oil seeds group and the plantation crops group shows a more or less continuous rise, on the face of a relatively constant out-turn of food crops. Mukerjee's[9] hypothesis that there has been a considerable substitution of inferior foodgrains for rice and wheat does not become manifest in the figures.

This point is brought out quite clearly in Table A and Charts IV and V.

The indications, on the other hand, are that since the middle nineteen-twenties there has been, on the whole, a slight, but perceptible shift in favour of the superior food grains. This fact is no doubt marked by fairly large annual variations in the proportion between superior and inferior food grain production, but the slight downward linear trend in the ratio of inferior food grains consisting of barley, jowar, bajra, maize and gram to the superior food grains consisting of rice and wheat is unmistakable. For the period up to the middle nineteen-twenties, though the annual variations, as noticed in the total agricultural production series, are very large and larger relatively than in the subsequent period, the general linear trend is unmistakably horizontal to the X-axis, that is, the overall relations between the two types of food crops have been stable. The tendency for the index of inferior food crop production to fall in absolute terms from the early nineteen-thirties is easily discernible from these charts. It should be pointed out, however, that the data in respect of these comparisons are in real terms, in

[9] Mukerjee, R., *op. cit.*

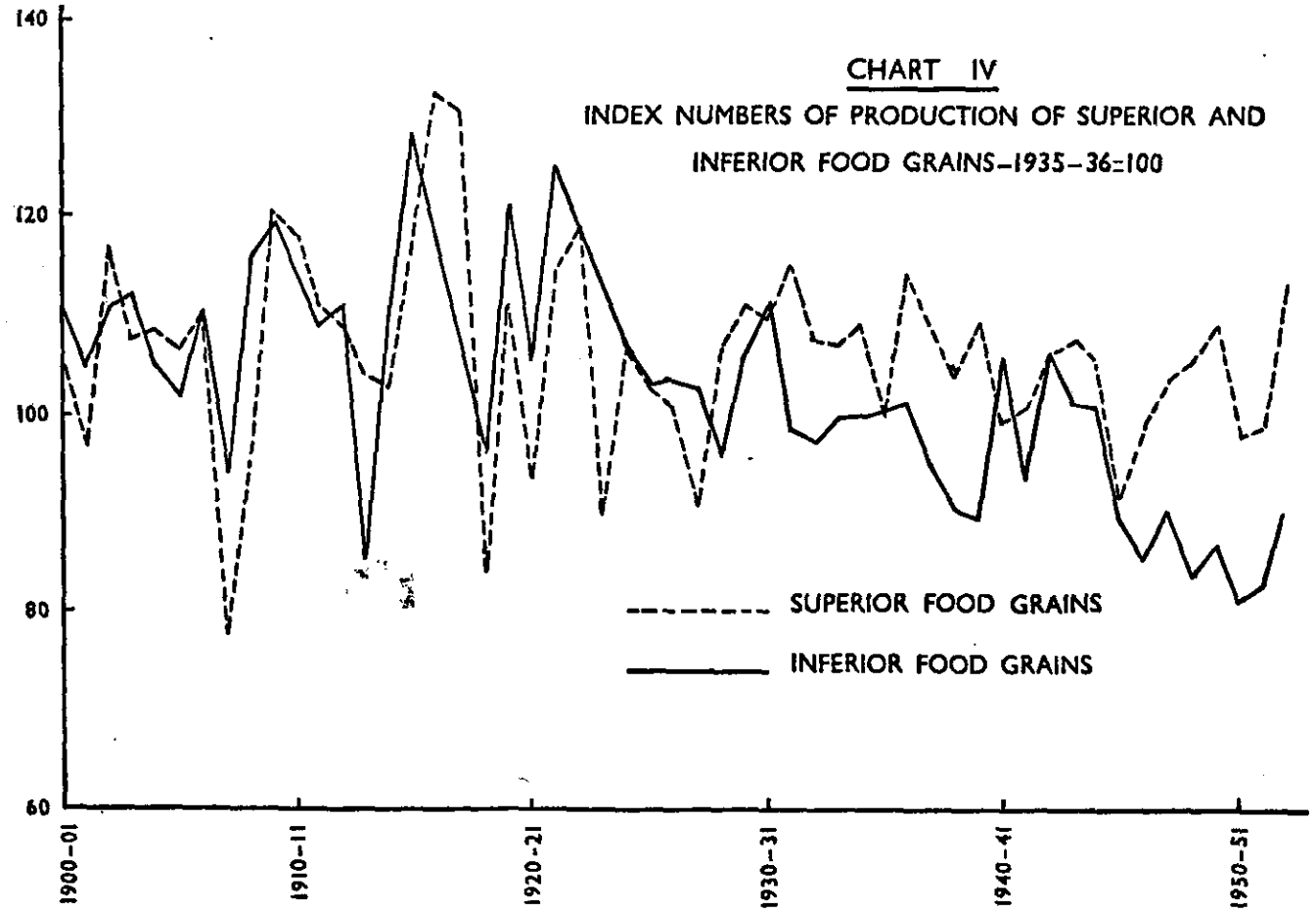
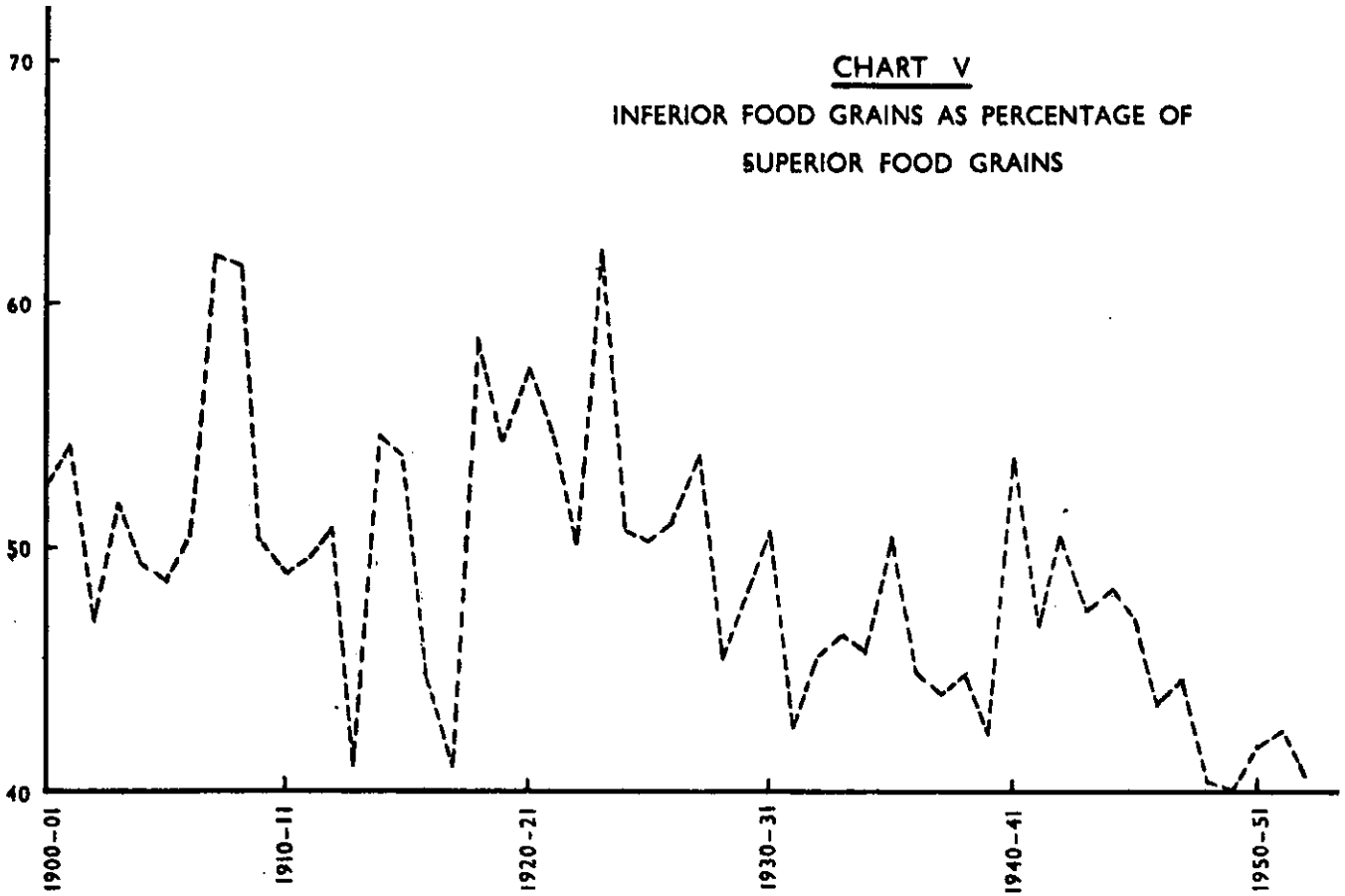


CHART IV
INDEX NUMBERS OF PRODUCTION OF SUPERIOR AND INFERIOR FOOD GRAINS–1935–36=100
140
120
100
80
60
SUPERIOR FOOD GRAINS
INFERIOR FOOD GRAINS
1900–01
1910–11
1920–21
1930–31
1940–41
1950–51

CHART V

INFERIOR FOOD GRAINS AS PERCENTAGE OF SUPERIOR FOOD GRAINS



the sense that the physical production is valued at constant 1924-28 average prices. In so far as there has been a persistent change in the ratio of prices between superior and inferior food grains, the results may be considerably different if the comparison is made in current value terms.

TABLE A

CHANGES IN THE PRODUCTION OF SUPERIOR[a] AND INFERIOR[b] FOODGRAINS IN INDIA FROM 1900-01 TO 1952-53

Year	*Production of superior foodgrains*[c]	*Production of inferior foodgrains*[c]	*Index of production of superior foodgrains* 1935-36=100	*Index of production of inferior foodgrains* 1935=100	*Column* (3) *as proportion of* (2) *per cent*
1	2	3	4	5	6
1900-01	4683.95	2467.80	104.8	109.6	52.7
1901-02	4305.03	2340.96	96.3	104.0	54.4
1902-03	5227.44	2471.55	116.9	109.8	34.7
1903-04	4819.00	2501.84	107.8	111.1	51.9
1904-05	4829.67	2375.60	108.0	105.5	49.2
1905-06	4741.51	2305.03	106.1	102.4	48.6
1906-07	4861.06	2453.08	108.7	108.9	50.5
1907-08	3429.52	2116.18	76.7	94.0	61.7
1908-09	4262.16	2613.96	95.3	116.1	61.3
1909-10	5265.53	2692.18	120.0	119.6	51.1
1910-11	5262.96	2570.07	117.7	114.1	48.8
1911-12	4972.59	2460.16	111.2	109.3	49.5
1912-13	4872.82	2478.16	109.0	110.1	50.9
1913-14	4632.66	1903.61	103.6	85.0	41.1
1914-15	4579.12	2549.12	102.4	113.2	55.7
1915-16	5311.17	2880.50	118.8	127.8	54.2
1916-17	5907.26	2614.88	132.1	117.3	44.3
1917-18	5855.70	2399.64	131.0	106.6	41.0
1918-19	3740.59	2190.26	83.7	97.3	58.6
1919-20	5002.75	2723.84	111.9	121.0	54.4
1920-21	4125.11	2405.38	93.2	106.8	58.3
1921-22	5106.01	2803.07	114.2	124.5	54.9
1922-23	5334.14	2668.45	119.3	118.5	50.0
1923-24	4016.79	2508.40	89.8	111.4	62.4
1924-25	4747.00	2392.09	106.2	106.2	50.4
1925-26	4627.05	2316.32	103.5	102.9	50.1
1926-27	4553.06	2324.74	101.8	103.2	51.1
1927-28	4282.05	2317.95	95.8	102.9	54.1

TABLE A—*Contd.*

Year	*Production of superior foodgrains*[c]	*Production of inferior foodgrains*[c]	*Index of production of superior foodgrains* 1935-36=100	*Index of production of inferior foodgrains* 1935=100	*Column* (3) *as proportion of* (2) *per cent*
1	2	3	4	5	6
1928-29	4770.52	2160.65	106.7	96.0	45.3
1929-30	4961.10	2384.33	111.0	105.9	48.1
1930-31	4898.06	2482.50	109.6	110.2	50.7
1931-32	5183.08	2215.78	115.9	98.4	42.8
1932-33	4821.26	2193.84	107.8	97.4	45.5
1933-34	4804.44	2248.96	107.5	99.9	46.8
1934-35	4884.31	2247.42	109.2	99.8	46.0
1935-36	4470.93	2251.84	100.0	100.0	50.4
1936-37	5106.56	2290.19	114.2	101.7	44.8
1937-38	4901.13	2139.74	109.6	95.0	43.7
1938-39	4647.77	2059.45	104.0	91.5	44.3
1939-40	4875.90	2138.64	109.1	95.0	43.9
1940-41	4408.43	2383.86	98.6	105.9	54.1
1941-42	4493.64	2098.23	100.5	93.2	46.7
1942-43	4747.54	2396.58	106.2	106.4	50.5
1943-44	4818.46	2279.70	107.8	101.2	47.3
1944-45	4718.96	2270.87	105.5	100.8	48.0
1945-46	4273.82	1992.46	95.6	88.5	46.6
1946-47	4424.43	1928.30	99.0	85.6	43.6
1947-48	4595.66	2035.81	102.8	90.4	44.3
1948-49	4678.34	1879.95	104.6	83.5	40.1
1949-50	4866.67	1948.58	108.8	86.5	40.0
1950-51	4385.18	1838.95	98.1	81.7	41.9
1951-52	4410.68	1872.03	98.7	83.1	42.4
1952-53	5041.71	2046.39	112.8	90.9	40.6

[a]Superior—rice and wheat.
[b]Inferior—barley, jowar, bajra, maize and gram
[c]In millions of rupees at constant 1924-28 prices

CHAPTER THREE

Industrial Production

A MORE or less accurate assessment of the agricultural production of the country forms the inner and substantial core of the economic life of an under-developed economy. Superficially, at least, it would seem that an overall picture of the rest of the economic life would be considerably easier to put together. A mass of figures is undoubtedly available for this country, which has to be utilised as best as possible for obtaining information about the movements in the so-called non-agricultural sector. But it does not take any elaborate argument to show that the bulk of the information available relates to the large-scale industries and governmental activities which constitute only a small part of the non-agricultural sector. It would thus be useful to note clearly how much of the economic activities of the country is obviously missed in the usual efforts at measuring the activities of what we have sought to designate as the "non-agricultural sector." Table A gives the proportionate contribution to the national income of the country of the various sectors that constitute the economy.

Of the above, the series of agricultural production that is available for the study covers only a part of the total agricultural production of the country. It is a substantial part, but it is fair to admit that it leaves out a considerable portion. As for the rest, the material that can be culled for any substantial number of years relates to, mining, factory establishments, communications (post and telegraphs), railways, organised banking and insurance and government activities, which together, formed, on the basis of 1950-51 figures, only about 14.8 per cent of the remaining 52.2 per cent. The others, of which "small enterprises", "other commerce" and "transport" and "domestic service" together constitute as much as 31.2 per cent of the economic life of the nation, are entirely left out of the ambit of available information. Even the current estimates of the National Income Committee list these as the most unreliable of its estimates, involving errors as high as between 25 to 33 per cent.[1] The state of knowledge about the employment offered in these sectors is extremely sketchy and there is no information on the basis of which even a hypothesis can be formed with any certainty that these sectors move generally in the same direction as their organised counterparts. As a matter of fact, it is generally believed that, on the whole, the growth of the organised sectors has been at the expense of the unorganised counterparts, and as such, the movements over long periods are in opposite rather than in the same directions. Nevertheless, an effort will be made to form some idea about the movement of these sectors on the basis of some assumptions about relations between these sectors and certain

[1] *Final Report of the National Income Committee*, Govt. of India, February 1954, p. 146.

TABLE A

Particulars	1948-49 %	1949-50 %	1950-51 %
1. Agriculture, animal husbandry and ancillary activities:	48.1	48.3	47.8
2. Forestry	0.7	0.8	0.8
3. Fishing	0.3	0.3	0.4
4. Mining	0.7	0.7	0.8
5. Factory establishments	6.4	6.1	6.1
	56.2	56.2	55.9
6. Small enterprises	10.0	9.8	9.8
7. Communications (Post & Telegraphs)	0.3	0.3	0.3
8. Railways	2.0	2.2	2.3
9. Organised banking and insurance	0.6	0.7	0.7
10. Other commerce and transport	15.6	15.4	15.5
11. Profession and liberal arts	5.0	5.2	5.1
12. Government services	4.6	4.6	4.9
13. Domestic services	1.4	1.4	1.3
14. House property	4.5	4.4	4.4
15. Earned income from abroad	— 0.2	— 0.2	— 0.2
	100.0	100.0	100.0
	=Rs. 9650 crores	Rs. 8850 crores =8820 crores	

SOURCE: *Final Report of the National Income Committee.*

The magnitude of the national income in crores of rupees is also indicated at the foot of the columns.

indicators that are likely to exist. The apprehension expressed about the lack of information in respect of very considerable portions of the economic life of the country would go to indicate that any effort to construct a decision model of the Tinbergen type, attempted by Narasimham[2] is likely to be comparatively futile. There would, however, be some occasion to draw on the information culled by Narasimham which has been found very useful.

[2] Narasimham, N. V. A., *A Short Term Planning Model for India*, 1956; Tinbergen, J., *On the Theory of Economic Policy*, 1952; Tinbergen, J., *Economic Policy, Principle and Design*, 1956.

As a general indicator of the activities of the organised sector, the most readily available of the indices is, of course, the "Capital Index of Industrial Activity". The weights of the Capital index are derived from diverse considerations but that may, perhaps, by the nature of the circumstances, be considered inevitable. Further, as Sinha[3] has pointed out, for an index of business activity, "consumption figures are clearly preferable to production data," particularly in the absence of all information on inventory accumulation. Nevertheless, in spite of these theoretical imperfections the "Capital Index of Business Activity" has worked well in practice and has generally come to be regarded as satisfactory.[4] The composition of the Capital index[5] has been noted hereunder. (Table B).

TABLE B

Items		*Weights assigned*
I. Industrial Production		43
Cotton manufactures	9	
Jute manufactures	6	
Steel ingots	5	
Pig iron	8	
Cement	5	
Paper	3	
Coal	7	
II. Internal Trade		
Wagons loaded (tons)		24
III. Financial Statistics		
Cheque clearances		20
IV. Foreign and Coastal Trade		7
Exports	4	
Imports	3	
V. Foreign and Coastal Shipping		6
Tonnage cleared	3	
Tonnage entered	3	
		100.0

NOTE: Capital Index of Industrial Activity is presented in APPENDIX III.

[3] Sinha, H., "Economic and Business Statistics in India", *Sankhya*, Vol. 5, Part 1, 1940

[4] *Ibid.*, p. 180. [5] *Capital*, March 17, 1938.

The next major effort that deserves attention is that of Meek.[6] Meek's index of industrial production covers the entire period and is accordingly of special value for the present study. The series, however, relates to physical output of large scale industries only, and is made up of: (1) cotton manufactures, (2) jute manufactures, (3) woollen manufactures, (4) paper, (5) breweries and (6) iron and steel.[7] The comparatively important omissions are thus the cement, sugar and the engineering industries.

Meek's final index of business activity in India as presented in the paper under consideration is built up as shown in Table C.

TABLE C

Components	*Weights assigned*
1. Agriculture	10
2. Minerals	1
3. Industries	1
4. Foreign trade	2
5. Railway traffic	3
6. Cheque clearance	3
	20

Of the component elements in Meek's index the series that calls for major corrections is the index of mineral production, which though considered "comprehensive for mineral production in India" is rendered less useful for the present study than it otherwise could be, because of the weight assigned to petroleum production, most of which relates to the territory of Burma. It is, nevertheless, interesting to note Meek's judgement that "all other minerals" (apart from coal, petroleum and manganese) "together have only a relatively slight effect on the variation of the combined index from year to year." Meek's combined index of business activity is presented in APPENDIX III.

For the years relating to the first quarter of the century, the alternative indices that are available for the study of business activity are those of Datta[8] and Shirras.[9] Both the indices commence from 1890 but while Datta's series terminates with 1911, Shirras' series is available up to 1918. Thus for the period covered by the present study, Datta's index is available for 11 years and Shirras' for 19 years out of the 53 years. The general indices worked out by Datta and Shirras are presented in APPENDIX III. Whether the movements revealed by these indices do, on the

[6] Meek, D. B., *op. cit.* [7] *Ibid.*, p. 373. [8] Datta, K. L., *op. cit.*, p. 93.
[9] Shirras, G. Findlay, *Indian Finance and Banking*, Table 3, p. 443, etc. seq.

whole, correspond to Meek's or such other indices of industrial activity that may be available, is discussed subsequently.

The other available indices of industrial activity are those of the *Eastern Economist* and the two interim indices of industrial production published by the Director of Industrial Statistics, Ministry of Commerce and Industry, and the Central Statistical Organization of the Government of India. The earlier index is available from 1939 up to 1948 and is made up of 17 items, while the latter commences only from 1947. This latter index is by far the most comprehensive in so far as actual industrial production is concerned; but it excludes commercial activities altogether and is, therefore, unsuited for the purpose of a general indicator. This consideration together with the relative shortness of the period for which it is available reduces the usefulness of this index for the immediate purpose at hand. The relevance of the *Eastern Economist* index will be commented upon in a different context.

For the purposes of having a continuous overall index of industrial activity, efforts have recently been made to link up the available indices with other indicators and thus patch together a series of indices that would reveal a continuous picture. Two such efforts have been noticed, namely, that of Narasimham[10] who links up Meek's index with that of the *Eastern Economist*[11] with a link constructed by himself with Meek's weights for the years 1936 to 1940 (both inclusive). The base year, of course, remains the same as Meek's, namely, the average for the years 1909-10 to 1913-14. Narasimham tries a further refinement of adjusting for the calendar year, which, however, without the relevant monthly figures seem comparatively useless. Efforts made in the course of this study for this correction in the shape of taking a fourth from the previous year and dropping the same for the current year do not produce results worth the trouble. There is no *a priori* reason why this type of correction should yield a more satisfactory result and it is considered desirable to leave the figures unadjusted. Narasimham's index terminates with 1918 which is the earliest year considered in his study. It would, however, be quite simple to push the index back to the beginning of the century and this has been done in APPENDIX III.

The other paper is that of Arora and Iyengar.[12] Arora and Iyengar link up Shirras' index with that of the the *Capital* and derive a uniform index for the entire period. Unfortunately, Shirras' index used by Arora and Iyengar is itself not a continuous one. The earlier and more comprehensive index is obtained from the author's (Shirras) Indian Finance and Banking with the average for 1890-94 as its base; while the other part is derived from the same author's *Poverty and Kindred Economic Problems in India.*[13] The composition of the *Capital* index with which

[10] Narasimham, N. V. A., *op. cit.*

[11] The weekly journal *Eastern Economist*, New Delhi, has been publishing an index of industrial activity from the year 1938-9.

[12] Arora, H. C. and K. R. R. Iyengar, "Long Term Growth of National Income in India, 1900-55", Paper submitted to the Preliminary Conference on Research on National Income, 1957.

[13] Shirras, G. Findlay, *Poverty and Kindred Economic Problems in India.*

these are linked up has already been commented upon. Arora and Iyengar's consolidated index is presented in APPENDIX III.

In Shirras' *Poverty and Kindred Economic Problems in India* the derivation of the index of industrial activity is not fully discussed. Since, however, it is meant to link up with his other index, it can be assumed that its composition is the same as the author's index as derived in his *Indian Finance and Banking*. On the whole, these indices are not fully representative of the industrial production of the country, as the only items of manufacture included in these indices are jute and cotton, while mineral production is represented only by coal and iron ore. Shirras' general index also includes a few items of agricultural production, while the items representing general commercial activity and foreign trade are given a very heavy significance. Financial statistics including government finance find important places in the general index. These limitations, together with the fact that none of the figures are corrected for the territory involved from period to period, leave no alternative but to come to the conclusion that an index based on Shirras' index is not likely to give a very satisfactory picture of the country's economic activity for the 53 years under review.

Meek's index is much more representative of the country's industrial activity as such. On the face of it, therefore, the linking up of Meek's index with that of either the *Capital* or the *Eastern Economist* seems to be more justified. Unfortunately, Meek's omission of the minor minerals and the preponderant weight given to petroleum in his index of mineral production are likely to vitiate its usefulness as a general index as applicable to the present Indian Union territory. Moreover, Meek's index excludes larger blocks of industries than is necessary for the purposes of ensuring comparability.

It has, therefore, been found desirable to work out an index of industrial activity. The composition of the index and the weights assigned to various industrial activities are discussed hereunder. Wherever possible and necessary, adjustments have been made by way of actual deductions from the yearly figures for the territorial areas involved. This has been done not only for the territory of Burma but for the present Pakistan territory as well. The one important mineral which has been left out is salt. The logic of the rejection is that the production figures are not published in a manner that enables one to disentangle the production of the Indian Union territory and the Pakistan territory. Moreover, though an important item of consumption, since salt is not an important industrial raw material, the exclusion is not likely to have any serious effects on the production trends as revealed by the index. What has been said above refers, obviously, to rock salt which is available as a mineral in northern India and not to salt manufactured by evaporation. For various reasons that would emerge later, it has also not been found either desirable or possible to split up the relatively homogeneous items like the value of imports of private merchandise and so on. A year to year division on the basis of estimated population of the territories involved suggests itself automatically. It is nevertheless felt that too little is known about

the movement and destination of such items as imports or government expenditure to justify such refinements. The accuracy involved is likely to be only formal. Figures of cheque clearances, however, have been corrected to exclude the centres like Rangoon, Karachi and Lahore which do not constitute Indian Union territory any longer, right from the beginning of the period of the study. For reasons that would be presented later, figures in money terms have not been corrected for price changes.

The composition of the index of industrial activity is as in Table D.

TABLE D

Items			*Weights assigned*
I. Industrial Production			53
Cotton manufacture		9	
Jute manufacture		6	
Steel ingot		5	
Pig iron		8	
Cement		5	
Paper		3	
Breweries		1	
Sugar		5	
Mining activities		11	
		53	
Mining activities (11) split up into :			
Coal	67		
Petroleum	10		
Manganese	4		
Mica	9		
Gold	8		
Iron ore	2		
	100		
II. Internal Trade			23
Ton-miles of goods carried			
III. Financial Statistics			14
Cheque clearances			
IV. Foreign Trade			6
V. Shipping			4
Tonnage entered and cleared			
			100

A word regarding the sources of the available material will not be irrelevant. Figures for mill manufactures of cotton yarn and cloth are available from the *Statistical Abstract*[14] as also the province-wise distribution of the output. The contribution of the provinces which have been constituted into Pakistan has been insignificant. In the case of the Punjab and Bengal, the only two provinces that come into the picture at all, the distribution of cotton mills between the present Indian Union territories and the present Pakistan territories is not readily available. The tentative list made available for partition adjustments is not reliable, as a number of units in the present Pakistan territory ceased to function after the partition because the ownership of the property vested with the migrants. The trend in production indicates that the cotton mill industry's loss in installed capacity due to the partition of the country has not been significant. Mill production of hessian is not available for the entire period from the same source. But there is a sufficient overlap in the figures of mill consumption of jute which is available for the earlier years, and the production of hessian which is available for approximately the second half of the period under consideration, to enable a transformation of the units being made. It may be noted in this connection that the transformation of units is quite accurate in terms of the units adopted, namely, mill-consumption of jute. Mill consumption of jute is, accordingly, taken as a fair indicator of the production trends of the jute manufacturing industry. Paper and brewery industries production figures are also available from the same source as are the production figures of the other industries used in the construction of the index, for the later part of the period under review.

Among the less familiar sources, production figures for sugar industry for the present Indian Union territory are worked out from the *Indian Sugar Manual*,[15] while those for cement production for the earlier years are available from the Report of the Indian Tariff Board regarding the grant of protection to the cement industry, 1925[16] and the *Annals of the Geological Survey of India*.[17] Production of pig iron and steel ingots separately have been culled from the historical records of the important production units. Production figures for minerals are directly available from the Statistical Abstract with adequate breakdowns to enable a reconstruction on the basis of present Indian Union territory for all major minerals. The exceptions are petroleum and salt; for the latter, the figures for the earlier years together make up the entire production of northern India, which it has not been possible to analyse territorywise. Salt production, has, therefore, been omitted. While the necessary territorial breakdowns are available in the case of petroleum, the production figures for this mineral were discontinued during the

[14] *Statistical Abstract of India*, Government of India, Annual (for earlier years *Statistical Abstract of British India*, Government of India and H.M.S.O., Annual).

[15] *Indian Sugar Manual*.

[16] *Report regarding Grant of Protection to the Cement Industry*, Indian Tariff Board, Government of India, 1925.

[17] *Annals of Geological Survey of India*, Geological Survey of India, Government of India.

Second World War years but not for the First World War period, and are thus not easily available. The figures up to 1949-50 are, however, available from the *Annals of the Geological Survey of India.*[18] The figures have been brought up to 1952-53 on the basis of the employment figures in petroleum industry. The procedure is not quite legitimate, particularly in a period when the industry is known to be going in for prospecting and heavy refinery constructions. The production figures for the last three years are, therefore, likely to have been arbitrarily inflated in the index.

The preliminary index of industrial activity worked out on the above basis is presented in TABLE 4 column 7. It is important for the present purposes to judge whether the index represents the actual conditions of the country any better than the other indices that are available. With this object in view the "Shirras-*Capital*" and the "Meek-*Eastern Economist*" indices are presented in parallel columns in the table and have also been adjusted for a common base year for direct comparability. The results are plotted in Chart VI.

There are no *a priori* reasons for suggesting that any of these indices are likely to present a better picture of the conditions as actually obtaining in the country. In so far as, therefore, any particular index lies above or below any other, there is no indication as to which represents the relatively correct position, and on the whole, if there is any considerable difference between all the available indices, the conclusions will have to be generally negative. On the other hand, if the various indices that can be assembled tend to cluster together and one or the other of the indices deviates from the cluster, it would be legitimate to conclude, that for one reason or other, the particular index does not give an accurate picture in respect of the period for which it deviates markedly; except, of course, in so far as it can be shown that due to the inclusion of special features which have particular relevance to the objective conditions which are being studied, such a deviation from all the other indices which do not include the special feature, was to be expected.

Interpreted on this basis, the points that emerge from the Chart IV are of considerable interest. It may be, with considerable certainty, noted that the "Shirras-*Capital*" index under-estimates the economic activity of the country for two periods covering 1900 to 1908-9 and 1941-42 to 1952-53. This depressive effect is apparently due to the inclusion of certain elements of agricultural production in Shirras' original index for the period up to 1908-9. The level of the *Capital* index is more difficult to explain. It seems to be partly due to the under-coverage in the *Capital* index of industrial activity in respect of mineral production noted earlier, and partly to the adoption of wagons loaded as an indicator of internal trade. It is noticed that "ton-miles of goods carried" which have been adopted as the indicator for inland trade in the index currently constructed shows a sharper rise as compared to wagons loaded in recent years. For the rest of the period studied, the "Shirras-*Capital*" index adheres very closely to the bunch of indices and does not, therefore, call for any comment.

[18] *Ibid.*

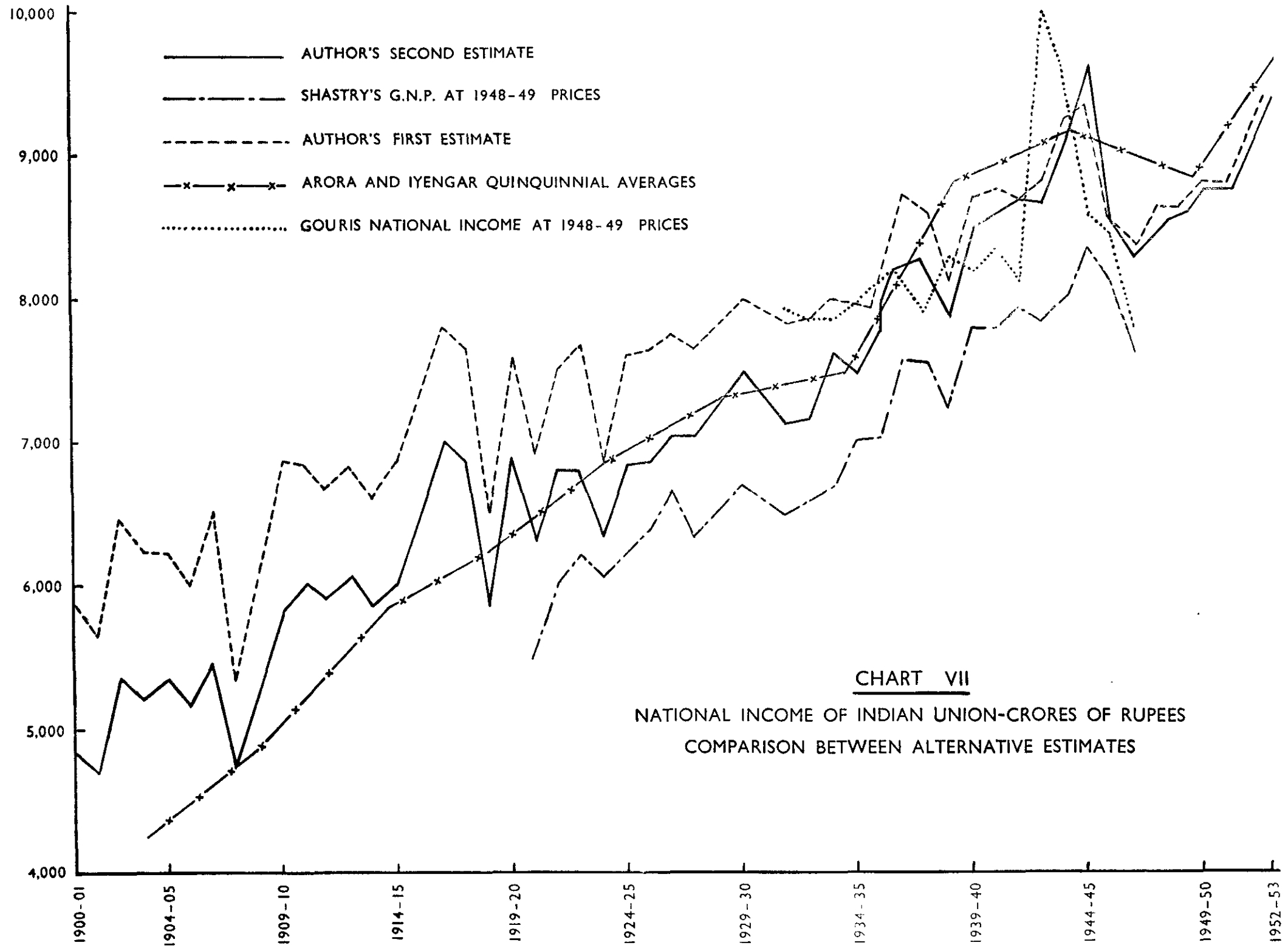


CHART VII

NATIONAL INCOME OF INDIAN UNION-CRORES OF RUPEES

COMPARISON BETWEEN ALTERNATIVE ESTIMATES

It has also to be noted in this connection that the "Meek-*Eastern Economist*" index apparently under-estimates the economic activity of the country from the period 1915-16 to 1934-35. This may be due to the fact that Meek's general index is not specifically an index of industrial activity but includes agricultural production as well. It may further be noted that Meek's general index shows a comparatively faster rise than such an inclusion would warrant in view of the known inelasticity of agricultural production, because of his failure to correct his agricultural production figures for the continuous increase in the reporting area for agricultural production. On the other hand, Meek's index of industrial activity as such, excludes mineral production and fails to take into account the introduction of new but important and rising industries like sugar and cement. If an entirely new index is constructed out of Meek's index of industrial production and mineral production, it would, no doubt show better results.

The next point to note is that the preliminary uncorrected index constructed by the author is seen to represent the other extreme in juxtaposition to the under-estimations of the "Meek-*Eastern Economist*" and the "Shirras-*Capital*" indices, lying considerably above the other indices for a short duration between 1918-19 and 1921-22 and again from 1944-45. This is obviously due to the influence of cheque clearances as a constituent element, which has been converted into an index on the basis of direct rupee value of the cheque clearances reported by the clearing houses. It is clear that the direct money value of cheque clearances does not represent the transactions in real terms which underlies the cheque payments, and there is thus a clear case for correcting the figures of cheque clearances for changes in price level from year to year. The experiment of not deflating the figure of cheque clearances by a price index was tried in order to bring out the import of rising prices on economic activity in general. It is generally believed that a slowly rising price stimulates economic activity. An index in real terms would contain no element that takes account of the potentialities of price-rise, It is, however, clear from the comparative figures and the study of the graph that the preliminary uncorrected index over-emphasises the growth of economic activity during periods of rising prices in general and for the period following 1944-45 in particular. It has, therefore, been found necessary to correct the preliminary index on the point by deflating the cheque clearances figures with a suitable price index which is presented elsewhere. It is somewhat gratifying to note that the corrected index occupies a central position in the cluster of indices almost all through the entire period of the study. There can therefore, be no hesitation in concluding that the index gives a more objective view of the country's industrial activity as compared to any others that are available.

As an additional check on the general indicators furnished by the four indices considered in the foregoing it is possible to work out a fifth, that is, on the basis of the average daily number of workers employed in factories inspected under the Factories Act. Two points should be noted in respect of the trend as shown by these employment figures. In the first place, the employment in question relates to

large-scale industries only and leaves out the unorganised part of the urban life, almost entirely. Considered as an index of general economic activity this omission is corrected by general indicators like cheque clearances and ton-miles of goods carried, which would indirectly give some recognition to the unorganised part of the country's economic life. The second point is that in so far as the industrial production of the country per se is concerned, the coverage of the employment figures is considerably more comprehensive, as it includes a large number of activities like engineering industries, rice milling, flour milling and etc., to name a few major items for which no production figures are available for the entire period, and which are of considerable significance in the economic life of the country. It is true that employment figures do not directly reflect production and in so far as it can be shown that there has been a continuous change in capital intensity per worker or rather of productivity of the working force, employment figures would give a biased estimate of the actual physical production. This is recognisedly a serious limitation. In view, however, of the very considerable under-coverage involved in all the other indices, it is to be doubted whether such a bias, if it exists, involves errors of parallel magnitude arising out of such incompleteness of coverage. The employment figures are also affected by changes in the definition of factories under the Indian Factories Act. Subject to these qualifications, therefore, the significance of the employment index as an indicator of the country's industrial activity cannot be discounted, and it is satisfying to find that a reasonably close correspondence exists between the cluster of the general indices and the index furnished by the employment figures. A point of considerable importance and one germane to the central thesis that is being investigated, is that for two periods between 1921-22 and 1928-29 and 1943-44 to 1951-52 the employment index lies above all the other indices after coming up from the bottom. It is to be seen whether this tendency can be attributed to some sort of a multiplier effect of the sustained war efforts immediately preceding the above periods. The correspondence and the lag are both significant and the hypothesis cannot be rejected outright. On the same logic the subsequent flagging of the economic activity is also likely to affect the economy with a considerable lag. It has been pointed out that the inclusion of certain items like cheque clearances, volume of trade, etc. makes it uncertain that the index would measure the industrial activity adequately because certain changes in such factors as monetization of parts of the economy will be reflected in the index. In view of the very close relation between the employment index and the index of industrial production and the recognised need for allowing for under-coverage in respect of certain activities, the apprehension does not seem to be entirely justified.

CHAPTER FOUR

Industrial Production—National Income

FOR the purpose of analysis it would have been better if it had been possible to commence the study on the basis of a comparable series of national income figures and its various components. It has been recognised for a considerable time now that the national level of consumption, savings and investment are vital determinants of the national economic life and without a more or less accurate estimates of these magnitudes no exact policy decision can be expected. It is true that national income of India has been calculated from time to time by various persons. The most significant set of calculations in this respect is, of course, the official calculations under the guidance of the National Income Committee,[1] which is available from 1948-49 onwards. This however, covers only the last five years of the period under study. The magnitude of the country's national income as available from the government white paper has been suitably utilised for constructing a national income series. The next in order of recognition and accuracy is probably that of Rao[2] who places the net national income of British India for the year 1931-32 at between Rs. 16,000 and Rs. 18,000 millions. The other primary work of major significance covering the latter half of the period under study is that of Desai.[3] The estimates of *Eastern Economist* and the official estimate of the Ministry of Commerce, Government of India, also relate to the same period but are of comparatively lesser significance because of a less intensive and less critical method of study. The *Eastern Economist's* calculations which cover by far the largest period for a single set of calculations are given in Table A.[4]

For the period prior to Rao's estimate for 1931-32 which may be taken as the starting point of the contemporary interest in national income estimation, and as such, of the subsequent crop of studies, there are a number of studies of a varying degree of accuracy and usefulness. Gouri[5] who has made an interesting effort to patch together a series of national income from 1931-32 onwards lists a number of efforts for the period concerned, as shown in Table B.

The sources from which the above estimates are taken may be briefly mentioned;

[1] *Estimates of National Income*, 1948-49 to 1954-55, Central Statistical Organization, Government of India.

[2] Rao, V. K. R. V., *The National Income of British India*, 1931-32, 1940.

[3] Desai, R. C., "Consumer Expenditure in India", *Journal of the Royal Statistical Society*, Series A, Part IV, 1948.

[4] *The Eastern Economist*, Annual Number 1950, Table 1, p. 1057.

[5] Gouri, G. S., "National Income Estimates in India", 1931-39, *Indian Economic Journal*, July 1954, p. 64, Table I.

TABLE A

NATIONAL INCOME AND PER CAPITA INCOME

(In millions of rupees)

Particulars	1939-40	1940-41	1941-42	1942-43	1943-44	1944-45	1945-46	1946-47	1947-48*	1948-49*	1949-50*
1. Income from agriculture and allied operations	11,059	11,627	12,845	20,566	25,679	26,782	26,649	29,242	25,075	29,037	28,855
2. Income from industry	3,609	4,176	6,191	9,701	13,019	11,654	10,696	9,586	9,933	12,041	11,650
3. Income from tertiary sector	6,274	6,386	6,722	7,325	9,717	10,153	11,181	11,313	9,313	10,558	13,296
4. Total Income	20,942	22,180	25,758	37,592	48,415	48,589	48,526	50,141	44,321	51,636	53,801
5. Population (in millions)	290	294	298	302	305	306.5	310	314	246	249	251.5
6. Per Capita Income (in Rs.)	72	75	86	124	159	159	157	160	180	207	214

* Relates to Indian Union provinces only.

TABLE B

	Author	*Year when attempted*	*Estimate for the year*	*Estimate per capita (in current Rs.)*
(*i*)	B. N. Sharma	1921	1911	50
(*ii*)	G. Findlay Shirras	1922	1921	107
(*iii*)	Shah and Khambatta	1924	1921	74
(*iv*)	Wadia & Joshi	1925	1913-14	14.3
(*v*)	Vakil & Muranjan	1926	1910-14	58.5
(*vi*)	V. K. R. V. Rao	1933	1925-29	78

(*i*) B. N. Sharma's[6] estimates appear in the *Proceedings of the Council of States.* (*ii*) Findlay Shirras' estimate appears in *Science of Public Finance,* G. Findlay Shirras,[7] 1924. (*iii*) Shah and Khambatta's well-known estimates are from *Wealth and Taxable Capacity of India,* 1924, K. T. Shah and K. J. Khambatta.[8] (*iv*) Wadia and Joshi's estimate appears in *The Wealth of India* by P. A. Wadia and G. N. Joshi.[9] (*v*) Vakil and Muranjan's estimates are from *Currency and Prices in India* by C. N. Vakil and S. Muranjan,[10] 1927, while (*vi*) Rao's estimates are quoted from *National Income of India,* 1940, V. K. R. V. Rao.[11]

Gouri's list, however, is not complete. It fails to include Vakil and Muranjan's estimates for the earlier periods relating to 1891-94 and 1901-04 which are of considerable significance because of their direct comparability with the same authors' figures for 1911-14. It is possible to add the following (Table C) as instances of national income estimates for the period under reference, including that of Vakil and Muranjan mentioned earlier.

Though it has not been possible to verify the accuracy or coverage of the calculations involved, three further studies can also be mentioned.

(*i*) Dr. G. Slater, *Madras Year Book,* 1923.[12] The study relates to the province of Madras and the per capita income is worked out at Rs. 112.

(*ii*) The *Simon Commission Report* estimated the per capita income of British India for the year 1921-22 at current prices at Rs. 116,[13] and

[6] *Proceedings of the Council of States,* Govt. of India, 6th March, 1921.
[7] Shirras, G. Findlay, *Science of Public Finance,* 1924.
[8] Shah, K. T. and K. J. Khambatta, *op. cit.*
[9] Wadia, P. A. and G. N. Joshi, *The Wealth of India.*
[10] Vakil, C. N. and S. Muranjan, *Currency and Prices in India,* 1927.
[11] Rao, V. K. R. V., *National Income of India,* 1940.
[12] *Madras Year Book,* 1923.
[13] *Simon Commission Report.*

TABLE C

	Author & Source	*Area*	*Year*	*National income in crores of rupees*	*Income per head in Rs.*	*(F) Firm (S) Summary*
(*i*)	Lord Curzon—*Budget Speech*	Br. India	1901	675	30	S
(*ii*)	Giffin R.—*Economic Enquiries and Studies*	Whole of India	1903	900	30	S
(*iii*)	Dr. Balakrishna—*Industrial Decline of India*, 1917	-do-	1911-12	539	21	S
(*iv*)	Vakil & Muranjan—*Currency & Prices in India*	-do-	1901-04	628.4	22	F
(*v*)	Horne E. A.—"*An Estimate of India's National Income*," *Bengal Economic Journal*	Br. India	1911	980	42	F
(*vi*)	Shirras G. F.—*Report on an Enquiry into Working class Budget in Bombay*	-do-	1911	1920	80	S
(*vii*)	Lupton A.—*Happy India*	-do-	1919-20	2854.6	114	S
(*viii*)	Shah K. T.—*Trade, Tariffs and Transport in India*	-do-	1921-22	1470	46	S

(*iii*) Sir James Grigg placed the per capita income of British India for 1937-38 at current prices at Rs. 56 (Quoted by Kingsley Davis in his *Population of India and Pakistan*).

Unfortunately, the various estimates form a very heterogeneous whole. They differ from each other not only in details but very widely both in respect of concepts used, the territory involved and the rigorousness with which the aggregates have been arrived at. For instance, the estimates of Shah and Khambatta, Vakil and Muranjan and Wadia and Joshi are probably the most accurate in so far as the assessment of the agricultural income is concerned. Shah and Khambatta allow for the under-reporting in agricultural statistics in a manner wholly commendable and unquestionably their estimates of yield are the most accurate for the period of their study from out of those that are available. Vakil and Muranjan on the other hand go in for a considerable detail in estimating the secondary incomes from the agricultural sector like the product of animal husbandry and so on. Unfortunately, all the three studies ignore the so-called tertiary sector and adhere more or less to the Soviet concept of National Income. On the other hand, the estimates of Lord Curzon and K. T. Shah in his *Trade, Tariffs and Transport in*

TABLE D

NATIONAL INCOME OF INDIA SINCE 1931
(Rupees in millions)

		Original values	*Corrected for coverage*	*Corrected for reliability*	*In real terms of 1938-39 prices*	*Real value index Calcutta wholesale prices*	*Index 1931-32 =100*	*Index*			
	1	2	3	4	5	6	7	8	9	10	11
I.	Rao's data at factor cost, 1931-32	17,664	16,473	—	—	16,102					100
II.	Desai's estimate of consumer-expenditure values										
	1931-32	20,088	16,473	16,473	20,139		100.0				
	1932-33	25,947	21,277	21,277	20,029		99.5				
	1933-34	24,849	20,377	20,377	20,104		99.8				
	1934-35	24,434	20,037	20,037	20,301		100.8				
	1935-36	24,135	19,791	19,791	20,529		101.9				
	1936-37	25,171	20,641	20,641	21,200		105.3				
	1937-38	25,756	21,121	21,121	20,209		105.3				
	1938-39	25,852	21,199	21,199	21,200		105.3				
	1939-40	26,761	21,945	21,945	20,988		104.2				
	1940-41	28,284	23,194	23,194	21,640		107.5				

TABLE D—*Contd.*

	Original values	*Corrected for coverage*	*Corrected for reliability*	*In real terms of 1938-39 prices*	*Real value index Calcutta wholesale price*	*Index 1931-32 =100*	*Index*			
1	2	3	4	5	6	7	8	9	10	11
III. Eastern Economists' values at factor cost							Col. 5	Col. 6		
1939-40	20,942	22,933	28,024	25,811	23,013	128.2	100.0	100.0	100.0	143
1940-41	22,189	24,298	29,692	24,941	23,368	123.8	96.6	101.5	99.9	145
1941-42	22,752	24,921	30,453	22,839	20,683	113.4	84.5	90.0	88.2	128
1942-43	37,592	41,166	50,304	24,344	25,656	120.8	94.3	111.5	110.6	159
1943-44	48,415	53,018	64,787	26,994	24,150	134.0	104.5	104.9	101.3	150
1944-45	48,589	53,209	65,021	25,958	21,907	128.9	100.6	95.2	85.3	136
1945-46	48,526	53,139	64,935	25,546	21,600	126.8	99.0	93.9	94.0	134
1946-47	50,141	54,908	65,875	21,819	20,081	108.3	84.5	87.3	87.5	124
1947-48	44,321	60,697	74,171	22,639	15,273	112.4	87.7	66.4	70.4	95
1948-49	52,027	71,250	87,067	22,270	19,287	130.4	101.8	83.8	89.2	120
IV. Official Estimate 1948-49	87,100	87,100	87,100	22,270	19,287	130.4 122.6				

NOTES :

Column 7 Index of real welfare with Desai's 1931-32 as base ; the last figure in the line i.e. 122.6 is consumer expenditure values obtained from official estimate and hence directly comparable with Desai's values.

Column 8 *Eastern Economist* deflated by Cost of Living Index with 1939 as base.

Column 9 *Eastern Economist* deflated by Wholesale Prices Index with 1939 as base.

Column 10 *Eastern Economist* deflated by split according to production goods and consumption goods and deflated as in columns 8 and 9 respectively.

Column 11 Rao's data in real terms for 1931-32=100.

India are of a most cursory nature and hardly deserve serious consideration as calculations of national income.

The results, in effect, are so heterogeneous that Anstey[14] who has studied the problem in detail, was obliged to come to the conclusion that "more light can be thrown on the problem whether there has been any tendency towards increased prosperity in India by an examination of prices and wages movement than by considering the innumerable estimates of per capita income on various dates,"[15] while Thorner[16] comes to the conclusion that the nine national income estimates that he considers are unlike each other in so many respects "that it would be futile to invest time and statistical ingenuity in an effort to put them into some sort of a series." "It is the cardinal weakness of the existing national income estimates," he continues, "that they are hopelessly inadequate to indicate these less drastic changes. We simply cannot tell from them whether total national income has increased proportionately with the rate of population growth, has slightly exceeded it, or has lagged somewhat behind."[17]

No effort has, accordingly, been made "to invest time or statistical ingenuity" in putting the available national income estimates into "some sort of a series." In recent years some interesting efforts have been made to go round the problem, as indicated by Thorner, by evolving a comparable series of national income, not so much by putting the various heterogeneous estimates into some sort of a series, but by seeking to extend the more comprehensive and comparable ones on some agreed basis. Reference has already been made to Gouri's work in this connection. His results are presented in Table D.[18]

Another interesting effort on parallel lines is that of Sastry.[19] Sastry has apparently extended Rao's estimates by the use of some suitable indices which is not, however, made quite explicit in the article under reference. His results cannot, therefore, be adequately verified. His results are presented in column 6 of the general comparison Table F.

Arora and Iyengar[20] have used a method very similar to that of Sastry. With Rao's 1931-32 estimates as their starting point, they have worked on the basis of per capita income to avoid the problem of area coverage. Having worked forward to a national income estimate at 1948-49 prices for that year, they have tallied it with the official estimate which is available for that year. For this purpose they have utilised Blyn's series of agricultural production and an index of business activity that has been referred to earlier as the "Shirras-*Capital*" index. Having established the correspondence, they have worked backwards on the basis of the same indices, to construct a national income series right from 1900 onwards. They have also tried an alternative method of working out a relationship between

[14] Anstey, Vera, *op. cit.* [15] *Ibid.*, p. 445.
[16] Thorner, D., *op. cit.* [17] *Ibid.*, p. 119.
[18] Gouri, G. S., *op. cit.*, Table 2.
[19] Sastry, V. K., "India's External Trade, Some Problems," *Indian Economic Journal*, July 1955.
[20] Arora, H. C. and K. R. R. Iyengar, *op. cit.*

growth of business activity and national income on the basis of the national income estimates as available from the government white paper for the years 1948-49 to 1954-55. They have found that the error in working back from an earlier estimate to a later one on the basis of such relations is reasonably small, and having distributed this difference proportionately, they have arrived at their alternative estimate on the basis of their index of business activity. Unfortunately, they have not cared to present a continuous set of yearly figures from 1900 onwards which is of relevance to the present study but have presented their figures in the form of quinquennial averages. The loss, however, cannot be considered very great because their methods can only be expected to yield considerably crude figures for annual national income and as such it is desirable that their estimates should be adequately checked before being put to analytical use. Arora and Iyengar's results are set forth in Table E.

TABLE E

QUINQUENNIAL AVERAGES OF NATIONAL INCOME ESTIMATES AT 1948-49 PRICES (1901-1955)

Year	*Population (in lakhs)*	*First Method*		*Second Method*	
		National income (Rs. crores)	*Per capita (Rs.)*	*National income (Rs. crores)*	*Per capita (Rs.)*
1901-02—1905-06	2417	4,384	181	3,978	165
1906-07—1910-11	2488	4,965	200	4,668	188
1911-12—1915-16	2518	5,870	233	5,567	221
1916-17—1920-21	2514	6,246	248	6,141	244
1921-22—1925-26	2579	(6,966)	(270)	(6,963)	(270)
1926-27—1930-31	2718	(7,378)	(271)	(7,484)	(275)
1931-32—1935-36	2884	7,546	262	(7,541)	(261)
1936-37—1940-41	3083	(8,906)	(289)	(8,805)	(286)
1941-42—1945-46	3288	(9,299)	(283)	(9,131)	(278)
1946-47—1950-51	3504	8,947	252	8,771	250
1951-52—1954-55	3710	9,692	261	9,692	261

In this connection it is important to note that in projecting the national income series Arora and Iyengar have found that the movements in the business activity indices are so large that during periods of upswing there is an apparent tendency,

when following their method of projection, to accentuate the national income figures; a fact that they have indicated by putting the suspected figures within brackets.

The principal concern while dealing with these figures is to be able to arrive at some sort of an estimate as to their reliability. It is, therefore, important to note that extrapolating national income estimates series on the basis of indices of sectional activities is a hazardous process. The use of such indices is less liable to lead into grave errors between two or more firm estimates. It is, accordingly, necessary to be very careful in interpreting and using these figures of national income, particularly those relating to the years earlier to 1931-32. The differences, both in respect of territories involved and in respect of intensiveness of the investigation, are so great between the official estimate of 1948-49 and Rao's estimate of 1931-32 that the extrapolation beyond 1948-49 can hardly be called an extrapolation between two firm estimates.

As regards the alternative sets of national income estimates for parallel years it may be noted that the series based on Desai's estimate of consumption may involve a considerable overestimation. Thorner,[21] for instance, finds it difficult to "believe (as Desai's assumptions imply) that the value per acre of the area under fruits and vegetables is more than 35 times as great as that of the area under food grains." Accordingly, the strikingly different results presented by Desai, who put per capita consumption expenditure alone for the year 1931-32 at about Rs. 82.5 as against Rao's per capita national income of about Rs. 62 should, as Thorner would have it, be discarded in favour of Rao's smaller figure.[22] It is, however, difficult to be quite sure on this point. For instance, it is not easy to justify Thorner's doubts as to Desai's conclusion to the effect that the per capita national income has not been rising, as against Rao's view that the available information reveal a slowly rising trend, on the face of the picture of complete stagnation of agricultural production as revealed by Blyn[23] and on which Thorner himself relies to a great extent. It is thus not entirely justified to discount readily any alternative particular views that may be available, for assessing the general movements in agricultural and industrial production, without a clearer demonstration of their lack of objectiveness.

Subject to the qualifications indicated in the foregoing paragraphs, it is possible to derive an independent and continuous series of national income from 1900-01 onwards. This task is specifically facilitated by the fact that a comparable series of agricultural production for the present Indian Union territory has emerged in the course of the present study. An index of industrial activity corrected for the present Indian Union territory as far as practicable, and which it may be trusted, represents the trends in the country's industrial activity better than any other index available has also been constructed. These indices can be utilised in extending the original estimate of national income of India for the year 1948-49 undertaken

[21] Thorner, D., *op. cit.*, p. 116.
[22] *Ibid.*, p. 115. [23] Blyn, G., *op. cit.*

by the National Income Committee. In actual practice, the crucial decision in this context is to be able to segregate with adequate objectivity the exact sectors to which the index of agricultural production and the index of industrial activity will be made to apply. The original assumption that the small enterprises including "other commerce and transport," to use the National Income Committee's classification, should be grouped with agriculture, tended to produce very higher estimates of national income. Yet, on *a priori* grounds, it seems likely that there has been an absolute stagnation in both these sectors and on that ground the assumption is justified. It is interesting, that this assumption leads to a national income series which for the thirties produce national income figures of Desai's order rather than Rao's. Arora and Iyengar's warning as regards the overestimation possibility of applying a business activity index to a comparatively larger sector of national income should also be recalled in this context. Yet, on other grounds, particularly of the constancy and, at places of decline of per capita income from 1900 onwards as is revealed by this series of national income, it becomes difficult to accept the particular series of estimates. Even with the restriction of applying the index of agricultural production to only 49.1 per cent of the country's national income, which is contributed directly by agriculture, animal husbandry and ancillary activities, according to the 1948-49 estimates of sectoral distribution, the current estimates of national income have tended to be higher than Arora and Iyengar's.

In spite of the fact that these estimates are higher than those of Arora and Iyengar for the first decade of the century, by the twenties the position is reversed. It would be seen, therefore, that the discrepancies are not entirely a matter of levels of estimation. The manner in which the estimates have been arrived at assures a correspondence for the year 1948-49 on the basis of the estimate available for that year. Since official estimates are available for the subsequent years a projection with the aid of the indices is not called for, except by way of a check. The issue is thus about the possible rate of growth of national income rather than one of an absolute level of estimation. It seems, however, that there are no simple ways by which an exact appraisal may be made. The greatest advantage that can be claimed for the present series is that it is built up round a series of agricultural production figures that is directly comparable from year to year for the entire period under reference. The currently constructed series, in consequence, escapes the reference to much statistical subtlety associated with the linking up of index numbers of different compositions and bases. Nevertheless, too much should not, obviously, be expected out of the accuracy of these estimates, because of the method employed, and the fact that the projection of the 1948-49 estimates on the basis of the indices reveal a considerable error as compared to the official estimates for the latter years at constant prices. As a matter of fact, the present estimates, in spite of being in real terms, correspond more closely to the estimates of the government white paper in current prices. Once again, it may be pointed out that the magnitude of error for the years 1948-49 onwards may be considerably minimised by including

"small enterprises" and "other commerce and transport" in agriculture and treating the aggregate with the index of agricultural production.

Unfortunately, it is not possible to check the present figures except in relation to the estimates of Arora and Iyengar, because Sastry's and Gouri's series, referred to earlier, are not available in 1948-49 prices. It is of course, possible to inflate or deflate a particular estimate to allow for price changes but as the process does not allow for the relative changes of prices that may have occurred between the years concerned, the application of this method from year to year is likely to produce fairly large errors. While, therefore, Sastry's and Gouri's series are available for a check on the movements of national income, they are not useful for comparison of levels of national income except on the basis of a rough and ready transformation. The currently constructed national income series from 1900-01 to 1952-53 is presented in Table F and the results have been plotted in Chart VII together with the other significant and comparable series to emphasise the differences.

TABLE F

NATIONAL INCOME OF PRESENT INDIAN UNION TERRITORY—1900-01 TO 1952-53 IN CRORES OF RUPEES AT 1948-49 PRICES

Year	*Arora & Iyengar's estimates for quinquennial average*	*1st estimate*	*2nd estimate*	*Per capita income in Rs. on the basis of 2nd estimate*	*Sastry's G. N. P. converted to 1948-49 prices*	*Gouri's national income converted to 1948-49 prices*
1	2	3	4	5	6	7
1900-01		5,895	4,923	215		
1901-02		5,621	4,773	207		
1902-03	4,384	6,405	5,400	233		
1903-04		6,245	5,312	228		
1904-05		6,248	5,361	228		
1905-06		6,021	5,147	218		
1906-07		6,576	5,660	238		
1907-08	4,965	5,273	4,709	197		
1908-09		6,126	5,323	221		
1909-10		6,860	5,816	240		
1910-11		7,007	6,075	250		
1911-12		6,772	5,962	244		
1912-13	5,850	6,871	6,110	250		
1913-14		6,458	5,816	237		
1914-15		6,837	6,037	246		
1915-16		7,481	6,584	268		
1916-17		7,914	7,007	285		
1917-18	6,246	7,691	6,886	280		
1918-19		6,302	5,895	239		
1919-20		7,705	6,974	283		

TABLE F—*Contd.*

Year	*Arora & Iyengar's estimates for quinquennial average*	*1st estimate*	*2nd estimate*	*Per capita income in Rs. on the basis of 2nd estimate*	*Sastry's G. N. P. converted to 1948-49 prices*	*Gouri's national income converted to 1948-49 prices*
1	2	3	4	5	6	7
1920-21		6,786	6,352	257	5,545	
1921-22		7,446	6,818	276	6,018	
1922-23	(6,966)	7,667	6,828	273	6,306	
1923-24		6,886	6,357	252	5,886	
1924-25		7,535	6,972	274	6,065	
1925-26		7,458	6,891	267	6,201	
1926-27		7,593	7,086	272	6,290	
1927-28	(7,378)	7,650	7,127	271	6,166	
1928-29		7,842	7,304	275	6,539	
1929-30		8,037	7,510	280	6,764	
1930-31		7,997	7,394	273	6,675	
1931-32		7,821	7,191	263	6,562	7,907
1932-33	7,546	7,806	7,187	259	6,675	7,864
1933-34		8,139	7,628	271	6,792	7,892
1934-35		8,010	7,548	264	7,017	7,970
1935-36		8,071	7,710	266	7,169	8,061
1936-37		8,792	8,338	284	7,736	8,324
1937-38	(8,900)	8,677	8,308	279	7,701	7,935
1938-39		8,115	7,866	260	7,305	8,324
1939-40		8,772	8,568	280	7,872	8,241
1940-41		8,824	8,645	279	7,856	8,497
1941-42		8,742	8,712	277	8,012	8,120
1942-43	(9,299)	8,901	8,752	276	7,922	10,075
1943-44		9,271	9,131	284	8,058	9,482
1944-45		9,481	9,798	302	8,229	8,602
1945-46		8,597	8,683	265	8,190	8,481
1946-47		8,355	8,251	250	7,790	7,884
1947-48	8,847	8,713	8,551	256		
1948-49		8,650	8,650	257		
1949-50		8,820	8,820	257		
		(9,178)	(9,168)			
1950-51		8,850	8,850	265		
		(9,142)	(9,265)			
1951-52	9,692	9,100	9,100	255		
		(9,389)	(9,526)			
1952-53		9,460	9,460	260		
		(10,079)	(10,245)			

NOTE : Figures in direct line in columns 3 and 4 are the official estimates at 1948-49 prices. Figures in brackets indicate the national income magnitudes calculated on the basis of the indices of agricultural production and industrial activity.

There are some problems associated with verifying the reliability of the second series of national income estimates, on which the subsequent analysis depends. The *Final Report of the National Income Committee* indicates that agriculture and large-scale industries sectors account for only about 56.2 per cent. of the total national income on the basis of the 1948-49 figures. The index of industrial activity used for the backward projection while purporting to cover no more than a mere 7.1 per cent. accounted for by large scale enterprise and mining, takes recourse to indices of economic activities which may not reflect only the variations in the underlying economic activities but may be affected by institutional changes like changes in habits of self-sufficiency, monetization and so on. The assumption that these indicators can stand for the uncovered sectors is recognisedly very tenuous. But it is not certain whether they are clearly misleading. An effort to marshall all the available, albeit, incomplete evidence, has been recently made.[24] In this study, the industrial production index has been broken down into industrial production proper, mining and commercial activities. Two further indices based on government activities and activities of the railways and post and telegraph departments have been used in addition. The actual coverage thus increases to 63.7 per cent. Moreover, the index of ton-miles of goods carried, ships loaded and cleared, and etc. do seem to reflect trade in a fairly satisfactory manner. The general coverage would thus be of the order of 75.0 per cent. The alternative estimate thus obtained yields an overall national income figure of Rs. 7,533 crores at constant 1948-9 prices as compared to Rs. 7,821 or Rs. 7,191 crores in the two earlier estimates for the year 1931-32. The per capita income on the basis of the second of the earlier estimates and the subsequent estimate work out to be Rs. 263 and Rs. 279 respectively at constant 1948-9 prices. Allowing, in a general way, for the change in the price level, the per capita income at current prices work out to be Rs. 67.7 and Rs. 69.4 respectively as against Rao's Rs. 62.0. While, therefore, it would seem that the national income series slightly under-estimates the national income of the country in the earlier years and thus exaggerates the growth, the discrepancy is not serious enough to invalidate the earlier estimates and the analysis based on it.

It will be noticed from the subjoined table that Desai's estimates of per capita expenditure are very closely corroborated when the per capita income on the basis of the second estimate is corrected for the relative general level of prices. A very rough indicator of the general change in price level can be obtained by dividing the 1948-9 price relative by the price relatives of the respective years from 1931-32 to 1940-1. This has been done in column 7 of Table G. When the per capita national income figures in columns 4 and 5 are divided by the corresponding price-level relatives, they give a rough dimension of the per capita national income at current prices, though undoubtedly in a very crude way. The correspondence between two sets of figures from 1934-5 onwards is very striking and can be con-

[24] Mukerji, K., A Note on the Long Term Growth of National Income in India—1900-01 to 1952-53", Second Indian Conference on Research in National Income, 1961.

TABLE G

Year	R. C. Desai's per capita expenditure		Per capita income on the basis of		Population in millions	Annual price relative on the basis of all-India wholesale prices index, 1948-9 price level	Per capita income figures corrected for changes in price level		Rao's per capita income
	At current prices	At constant 1938-39 prices	First series	Second series			First series	Second series	
	Rs.	Rs.	Rs.	Rs.			Rs.	Rs.	Rs.
1	2	3	4	5	6	7	8	9	10
1931-2	82.5	71.8	287	263	273.4	3.885	73.9	67.7	62.0
1932-3	75.1	70.9	281	259	277.5	4.098	68.6	63.2	
1933-4	71.0	70.0	289	271	281.4	4.287	67.4	63.2	
1934-5	68.8	69.7	280	264	285.9	4.191	66.8	63.0	
1935-6	67.0	69.5	279	266	289.8	4.098	68.1	64.9	
1936-7	68.9	70.8	306	284	293.6	4.098	74.7	69.3	
1937-8	69.5	69.8	291	279	297.8	3.656	79.6	76.3	
1938-9	68.8	68.8	270	260	302.5	3.926	68.8	66.2	
1939-40	70.2	67.2	287	280	305.6	3.453	83.1	81.1	
1940-1	73.2	68.3	285	279	309.9	3.108	91.6	89.8	

sidered to be a useful verification. Desai's figure of Rs. 82.5 per capita for 1931-2 stands out as being out of line in this context, not only with the present estimates but also with that of Rao's figure of Rs.62.0 per capita and the rest of his own series. All-India wholesale price index with 1914-5=100 changed from 96 to 91 between 1931-32 and 1932-3. Under the circumstances, the divergence between Desai's current and constant price estimates remains unaccounted for. On a closer examination of Desai's figures, it appears that his 1931-2 estimates, in particular, ascribe very high figures to "dairy products," "fruits and vegetables" and "spices." These figures are not only relatively too high in comparison with the value of "cereals and pulses," as pointed out by Thorner, but also entirely out of line with his own figures for the subsequent years. In other words, Desai's 1931-2 per capita expenditure figure indicates a very sharp drop in prices for the three categories of products, which in view of the large imputations that are necessary in these sectors, appear to be somewhat unrealistic. It will also be noticed that depression downturn as indicated by Desai's figures are not corroborated by the general analysis of either Anstey or Gadgil. The correct position thus seems to be that Desai's 1931-2 figures are wrong on account of some price components being too high. It must be noticed, however, that the same thing cannot be said for Desai's figures for the other years, which considering the greater details of his efforts, provides interesting corroboration for the present study.

From a scrutiny of the trends in the various national income estimates and particularly on the verification available from the calculation of per capita incomes from year to year, it seems fairly justified to accept that the second series worked out in the course of the present study, stand out as a reasonably accurate estimate of the national income of the country for the years under review. A few apparent points of disagreement may be noted. The rate of growth of national income as indicated by the series is not quite as rapid as indicated by the quinquennial average figures of Arora and Iyengar. There is, however, no indication for rejecting the smaller gradient of the series without further corroborative evidence. A peak in 1916-17 as indicated by the series may be expected on account of the culmination of the country's war effort, as would be the subsequent stagnation. The noticeable fall from 1929-30 is also not unexpected. But the comparatively high figures from 1936-37 onwards do not appear to be justified on the face of other available evidence. An absolute peak in 1944-45, if not entirely unjustified, appears too high, considering that the level has not been reached even as late as 1954-55. The failure of the indicator of the trend of agricultural production to register an expected drop in 1926-27 has already been noted in the context of the derivation of that index. The trend is also reflected in the national income figures.

It has already been indicated that very great reliance cannot be placed on these figures of national income for reasons indicated. It would not, therefore, be unjustified to verify how far the movements as indicated by the national income figures are corroborated by other independent observations and judgements.

For a verification along these lines the judgements of Anstey[26] and Gadgil[26] whose views may be considered the most mature, are drawn upon.

Anstey[27] who has evaluated the trend of events on the basis of prices and wages, concludes as under: "To summarize, it can be said that on the whole the increase in the general level of prices, and the relatively greater increase in internal prices between 1900 and 1914 reacted favourably on general prosperity and on the condition of the labouring classes in particular, whereas, after 1914—although other factors were at work economically favourable to India—the rise in prices accompanied by the relative increase in the price of imports tended to be unfavourable." "It must not, however, be assumed that because price changes since 1914 have been unfavourable, there has been on the balance, general economic deterioration over the period." "It appears, that on the whole uptil 1920-21, favourable influences predominated, but after that there was a set-back to prosperity, which after about 1923 was replaced by recovery until 1929. Conclusive evidence is lacking, but it is unlikely that at any time before 1929 the general economic condition of the people fell below the 1914 level, whilst by 1928 it had certainly improved considerably." "Allowing for the inaccuracy of the data, it does at least seem probable that at least up to 1932, or 1933 there has been no substantial decline in the general standard of life." "Since 1934, the suffering of the people may have become more severe."[28]

Gadgil, on the contrary, finds a somewhat different trend. "The next fourteen years or so, until the outbreak of the war," he writes[29] "were mildly prosperous." "No large change has, however, come about either in agricultural economy of the country or the economic position of the agriculturist, though the latter has undergone considerable fluctuations. The years immediately after 1914 were fairly propitious" (p. 200). "It seems, therefore, reasonable to argue that the comparative economic position of the large majority of agriculturists—especially outside the cotton tracts—worsened during the war years and the years 1918 to 1921 bringing, as they did, scarcity; and influenza still further depressed it. From about 1921-23 the agriculturist was slowly recovering the lost ground but the latest severe depression has reduced him to extreme straits" (p. 205).

There is a reasonably close correspondence between the national income series and the course of events as pictured by Anstey. The national income series, however, indicates a fall in income from 1929-30 onwards which is not reversed until 1933-34, whereas, Anstey finds that the sufferings of the people may have become more severe after 1934 and on that basis, one would be led to believe that the subsequent period leading to the war years were bad years generally in so far as the general prosperity of the country is concerned. The other major disagreement is, that while Anstey finds that the war and immediate post-war years were generally prosperous, the national income series indicates a complete stagnation interposed

[26] Anstey, Vera, *op. cit.* [26] Gadgil, D. R., *op. cit.*
[27] Anstey, Vera, *op. cit.*, pp. 460-1. [28] *Ibid.*, p. xxvii.
[29] Gadgil, D. R., *op. cit.* 3rd ed., 1933, p. 189.

with violent fluctuations. Incidentally, the picture as revealed by the national income series tallies almost exactly with Gadgil's description of the situation relating to the war years. Anstey's recession round 1923 is corroborated, as is the anticipated continuous growth thereafter until 1929. Anstey does not record any recession in 1926-27, a fact that justifies the present trend as against those of Blyn and Sivasubramonian referred to earlier. Gadgil's conclusions, except those relating to the war years are not quite so well corroborated by the national income series as Anstey's. For instance, Gadgil does not record the severe fluctuations before 1914. But what is of greater significance is that according to him the prosperity phase from 1924 to 1929 was merely one of recovering ground lost during the 1918-1921 recession. The national income series, however, reveals that the maximum level of 1916-17 was already recovered by 1925 and the gain, thereafter went to improve the situation somewhat. Gadgil's picture of the severity of the depression after 1929 is likewise not corroborated, though his timing of the onset of the recession tallies more exactly with that of the national income series.

CHAPTER FIVE

Public Expenditure

THIS is not a treatise on public finance. It is, nevertheless, tempting, for a number of reasons, to make a limited incursion into the field. Having fitted out certain preliminary measures for the movement of national income of the country for fifty odd years, it is difficult not to ask the complementary question as to how large a part the government activities have played in the matter. Such a temptation is difficult to resist because for a country like India the activities of the government sector are apparently very much easier to measure than its national income. The fact that it is not quite as easy as it seems is due to certain peculiar gaps in the data that do not become manifest until one gets into them. Moreover, if one looks into the history of budget-making in India one finds a very considerable concern with the effect of the government budget on the economy in many circles. The total effect of the government budget on the economy is admittedly a fairly complex phenomenon. As such any set of simple quantitative measures may not be considered adequate for the purpose. Nevertheless, it is intriguing to find that no effort whatsoever has been made, until quite recently, to measure the size of the government activities in terms of the national income of the country. Accordingly, the measurement of what has been called the public sector draft on the real resources of the country appears to be a tempting area of incursion.

Public finance has not been adequately studied in India. The studies that have been made are very largely qualitative and theoretical in a limited sort of way. The emphasis has very largely been on the justice and equity involved in taxation. There has been no major work on public expenditure as such. It has been argued, by Rolph,[1] for instance, that it is both possible and desirable that public expenditure be studied for its own sake. As he puts it, "We know that income in the present does not affect expenditure in the present. Taxes, viewed as present government revenue or income, are therefore also of no significance either to present private expenditures or to present government expenditures. This theory simplifies economic analysis. If correct, expenditures can be analysed without direct reference to the mutual causation between these expenditures and the incomes resulting from them."[2] Whatever be the appropriate mechanism through which public expenditure affects private expenditure, public expenditure in the present is not associated with private expenditure in the present but only with private expenditure in the future. While, therefore, an estimation of private expenditure in the present, as corrected by the revenue collections of the past, is of vital concern to the

[1] Rolph, Earl E., *Theory of Fiscal Economics*, p. 225.
[2] *Ibid.*

planners of public expenditure, the expenditure policy, as such, is not directly dependent on either the expenditure plan of the private sector or the current revenue budget of the public sector. In view of the state of the theory in this area the neglect of public expenditure studies becomes all the more difficult to understand.

Public expenditure considered as a part of public finance has also a multiplicity of aspects, some of which are not easily amenable to empirical verification. As a part of the empirically verifiable area of public expenditure studies, a quantitative assessment to the extent possible of the relative size of the public sector draft in terms of national income as also of its broad break-up by major economic categories seems interesting enough to be attempted in the present study. The size and the relative movements of the public sector draft of real resources over time appear prima facie to have considerable importance in the context of planning. Whatever be the qualitative nature of the impact of the state policies on the rest of the economy, they cannot be divorced from the quantity of the impact. The effectiveness with which the state can interfere with the allocation programme of the rest of the economy is, therefore, likely to be associated to a considerable degree with the size and composition of the public sector draft on real resources in any country. Estimation of the size and composition of the public sector draft of real resources even without a great deal of structural analysis of the pattern of public expenditure can, therefore, be of some analytical use.

That this line of study is considered analytically useful can perhaps be clinched by citing that a very large number of them have been attempted for a number of advanced countries. Several major studies have been attempted for the United States of America alone, for instance, those by Musgrave and Culbertson,[3] Colm,[4] Due[5] and Fabricant.[6] The fact that such studies can be attempted has, however, further important corollaries for countries where the available statistics must be considered inadequate for national income calculation in detail. The available statistics for the government activities in such circumstances are invariably better than those which are available for estimating the income of many other parts of the economy. Therefore, it is not only that government budget figures can be utilised for arriving at a fairly firm area of estimate for one sector but also that such an area of firm estimate can often be utilised to improve the estimates of other uncovered areas. In view of the preliminary nature of the estimates, no explicit use of the public sector figures for estimational purposes have been attempted in the present context. The figures made available have, however, been used implicitly and for comparison and verification. Further use of such sectoral

[3] Musgrave, R. A. and J. M. Culbertson, *National Tax Journal*, June 1953.

[4] Colm, Gerhard, "Public Expenditure and Economic Structure in the United States", *Social Research*, 1936.

[5] Due, John F., "Government Expenditure and their Significance for the Economy", *Fiscal Policies and American Economy*, Ed. Kenyon E. Poole, 1951.

[6] Fabricant, Solomon, *The Trend of Government Activity in the United States since* 1900, 1952.

figures where the statistical coverage is comparatively more adequate, is, however, obviously indicated.

In what follows, an attempt has been made to estimate the size of the public sector draft on real resources in India and to work out certain broad breakdowns by major economic categories. The limitation has always been the availability of comparable data for the period under review. The purpose has been to try and derive as exact a picture as possible of what was actually happening in the country in respect of that particular sector and of the relation the sector had with the rest of the economy during the period considered. No effort has been made to establish a theoretical link between aggregate economic activity and the activity of the public sector as such. This emphasis on the word "actual" is deliberate and is meant to bring about the difference between a fact and an opinion about a fact. It would, accordingly, be a part of the assignment to note as to what extent there was a correspondence between what was said about public expenditure policy and what actually happened. In the very first place, it is important to emphasize that the activities of the central government form only a part of the activities of the public sector. The distribution of public expenditure betwen the central, state and the local components of the aggregate public sector, accordingly, becomes the first object of the analysis. The results as presented in columns 2 to 8 of TABLE 5 may be summarised as shown in Table A.

A word about the build-up of these figures of government expenditure would not be out of place. Particulars about the expenditures of the central government, especially those relating to the expenditure on revenue account are available in a fairly summarised form from the Explanatory Memorandum attached to the annual budgets of the central government. It is not, however, easy to get a balanced statement of the capital account, if only because a deficit in the capital account "implies not what the Government expects to borrow, but rather what it expects not to be able to borrow through "normal channels," partly by reason of difficulties in the capital market; that amount must therefore be covered either by drawing down the balances, or retrenchment or some other way."[7]

Fortunately, a considerable amount of labour is saved on this account due to the material being available in a readily usable form in *Banking and Monetary Statistics in India*,[8] published by the Reserve Bank of India. The Reserve Bank summary has no behind the scene adjustments and the figures as available from this source can be reconciled with the detailed breakdowns of the budget statements. The figures as available from either of these sources are, however, deficient in one respect. The revenue from commercial activities is shown net in these figures. This summarisation has obvious relevance for certain purposes but it does have the effect of under-stating the absolute scale of public expenditure. In order to correct this feature, the aggregate expenditure of the commercial departments like the Railways, Posts and Telegraphs, Irrigation, Opium and Currency

[7] Hicks, Ursula, *Public Finance*, 1948.

[8] *Banking and Monetary Statistics in India*, Reserve Bank of India.

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TABLE A

ANALYSIS OF PUBLIC EXPENDITURE BY LEVELS OF EXPENDITURE AUTHORITIES

(Rs. crores)

	Revenue expenditure			*Capital expenditure*	*Total expenditure*
	Central	*State*	*Local*		
1901-02	95.94	10.48	13.15	12.95*	132.52
Percentage	(72.4)	(7.9)	(9.9)	(9.8)	(100.0)
1911-12	127.40	13.36	21.01	14.33[a]	176.10
Percentage	(72.3)	(7.7)	(11.9)	(8.1)	(100.0)
1921-22	201.78	106.02	46.40	31.62[a]	385.92
Percentage	(52.3)	(27.5)	(12.0)	(8.2)	(100.0)
1931-32	181.99	112.57	60.84	23.12[a]	378.52
Percentage	(48.1)	(29.7)	(16.1)	(6.1)	(100.0)
1941-42	229.10	139.37	67.23	99.57[a]	535.25
Percentage	(42.8)	(26.1)	(12.6)	(18.5)	(100.0)
1951-52	622.55	408.59	169.83	300.38	1501.35
Percentage	(41.5)	(27.2)	(11.3)	(20.0) 7.9 12.1	(100.0)
	PUBLIC EXPENDITURE IN REAL TERMS				
1901-02	127.92	13.97	17.53	17.26	176.69
1911-12	144.77	15.18	23.87	16.28	200.11
1921-22	112.72	59.23	25.92	17.66	215.60
1931-32	189.57	117.26	63.37	24.08	394.29
1941-42	172.26	104.79	50.54	74.86	402.44
1951-52	143.11	93.93	39.04	69.05	345.13

[a] Wholly Central—For 1951-52, 7.9 per cent represents capital expenditure by the State Governments.

and Mint (including the expenditure outlay of the Reserve Bank of India) has been collected and added to public expenditure, while the revenue from these departments has been considered gross and added to tax revenue in order to arrive at

the aggregate receipts of the government. The gross receipts and expenditures of all these departments are available either from the budget statements or from the Consolidated Statement of Accounts of the Central and State governments. Particulars relating to the Railways and Posts and Telegraphs are also available in consolidated form from the annual reports relating to these departments. The relevant information in respect of the Reserve Bank of India is available from the Report of the Central Board of Directors of the bank.

Particulars of the expenditures of the former British provinces are also available from the *Banking and Monetary Statistics in India*. The information available does not, however, fully cover the expenditure at the state level because no account is taken of the former princely States which came to be consolidated under Part B States. It was not found possible to undertake a complete compilation in respect of this item. Yet it is necessary for the purposes of the present study to obtain, at least, a rough magnitude of the revenue and expenditure of the Part B States and their predecessor political units. Information regarding the expenditure of Part B States for the years 1949-50 to 1953-54 has been compiled by the Central Statistical Organisation of the Government of India in connection with their estimates of government activity of the country as a whole. The information that is obtained from this source is presented in Table B.

TABLE B

REVENUE EXPENDITURE

(Rs. Crores)

	Centre	*States*			*Local bodies*	*Total*
		A	*B*	*C*		
1953-54	420.94	364.75	113.44 (80.95)[a]	14.83	132.93 (99.98)[b]	1046.89
1952-53	110.54	329.37	110.19 (82.72)[a]	13.17	118.06 (88.08)[b]	981.33
1951-52	403.89 .73					
	404.62[c]	309.11	105.63 (78.33)[a]	..[c]	155.96 (74.10)[b]	975.32
1950-51	375.84[c]	293.90	95.85 (69.98)[a]	..[c]	136.74 (73.64)[b]	902.38
1949-50	325.76[c]		77.10			

[a] The alternative totals are exclusive of capital transactions, expenditure of commercial enterprises and inter-government transfer payments.

[b] The difference is due to capital expenditure and outlay and enhancement of cash balances.

[c] Including Part C States.

In order to arrive at an estimate of the expenditure of the former Indian princely States the ratio of the expenditure of the Part B States to that of the central government and the governments of the Part A States for the years 1949-50 to 1953-54 is made use of. The estimated expenditures appear in column 3 of TABLE 5. Up to the year 1921-22 this is the only item under this head. After 1921-22, the part of the expenditure at the state level ascribable to the former princely states has been put in brackets. These figures are undoubtedly very rough. Unfortunately, only a minor check on these estimated figures can be provided. The particulars of revenue and expenditure of six important states, namely, Hyderabad, Mysore, Jammu and Kashmir, Cochin, Travancore and Baroda are given in Thomas's book.[9] The figures for these six states relating to the years 1921-22 to 1931-32 and up to something between one-half and one-third of our estimated figures for these years. Considering the fact that these six states were among the most important and by far the largest and most populous of the Indian states, the estimated figures may not be very greatly in error.

The only source of information regarding the various local bodies is the *Statistical Abstract*. The local bodies which seem worth taking into account are the municipalities, the district and union boards and the port commissioners. Of these the information available in respect of the port trusts are undoubtedly the most accurate. The available figures relating to the municipalities and the district and local boards are unsatisfactory on several counts. On the basis of the figures it would appear that the number of municipalities has increased from year to year. There are, however, no simple means of ascertaining whether this is due to such particulars being made available by the state governments concerned or whether they are new municipalities. There are reasons to believe that a considerable part of the apparent increase in municipal revenue and expenditure with the passage of years is due to increased coverage of already existing municipal activities. It is, however, not possible to indicate the approximate magnitude of the apparent increase that may be attributable to this source. How far the district and local board figures suffer from this consideration is not apparent because no breakdown of the provincial figures is published. The other major lacuna in respect of both these sets of figures is that the aggregate as published is arrived at irrespective of whether or not a reasonable coverage has been obtained in any particular year. For instance, if the figures for a particular town, say, Ahmedabad or Dacca are not available for a year, that particular figure would simply be excluded from the total with a note to that effect. For district and local boards, in great many cases, the figures for all such bodies in one state, say the Uttar Pradesh or Orissa may have been excluded in any particular year due to their non-availability. The particular nature of the error makes it inevitable that there would be no approximation to the magnitude of the error that may be involved in any particular year's figures. It has, therefore, been found necessary to correct

[9] Thomas, P. J., *The Growth of Federal Finance in India*, a survey of India's public finance from 1893 to 1939, 1939, pp. 532-8.

the figures as far as possible, on the basis of the previous years' figures either for the town or for the state concerned and in the case of considerable difference between the previous and succeeding figures, on the basis of an average of the two figures. The information is in many places incomplete and in spite of the correction carried out it is not easy to feel confident about the accuracy of the figures. The figures as worked out in the present study are, however, on the whole, in conformity with those worked out by Tinker[10] and the *Report of the Local Finance Enquiry Committee*,[11] (vide APPENDICES XVI, XVII, and XVIII of the *Report*). For ensuring comparability, the figures for the port trusts have, of course, to be added to the figures presented in these appendices.

It is now possible to note the special features as revealed by the analysis of the expenditure of the public sector. The major shift from the year 1921-22, of course, reflects the advent of provincial autonomy under the reforms of 1919. The financial adjustment takes the form of an approximately 20 per cent shift from the central to the state level of expenditure. From 1921-22 there has not, however, been any tendency towards increasing centralisation in so far as revenue expenditure is concerned, the centre's share having diminished from 52.3 per cent to 41.5 per cent in thirty years. The diminution is, however, only apparent, because these years were characterised by a gradual proportionate increase in capital expenditure mostly on account of the central government. The proportion of central government expenditure to the total public expenditure of the country would be as under:

1901-02	1911-12	1921-22	1931-32	1941-42	1951-52
82.2	80.4	60.5	54.2	61.4	61.4

The slight fall in the year 1931-32 is attributable to the abnormal condition of that year while the percentage for 1921-22 is on account of the undeveloped state of provincial finance. The figures for the two earlier years would need approximately a twenty per cent deduction on account of the shift of expenditure from the centre to the state level. There has thus been practically no change in the pattern of public expenditure as between the central, state and the local authorities. It would also become apparent that the magnitude of public expenditure outside the direct control of the central government is large enough to have a considerable influence on public policy and the level of economic activity in the country.

The second part of the analysis, the results of which are presented hereunder brings out the differences in public sector outlays in current and constant prices. While aggregate expenditure in current prices is seen to have increased almost continuously from Rs. 132.52 crores in 1901-02 to Rs. 1,501.35 crores in 1951-52, the expenditure in real terms is seen to have only approximately doubled from Rs. 176.69 crores to Rs. 345.13 crores in respect of the same years and that after reach-

[10] Tinker, Hugh, *The Foundations of Local Self Government in India, Pakistan and Burma*, 1954.
[11] *Report of the Local Finance Enquiry Committee*, Govt. of India, 1951.

ing higher levels in 1931-32 and 1941-42. The fall in the absolute level of public expenditure after 1931 is extremely revealing and would be commented upon later.

Further analysis of the country's public expenditure pattern has been carried out in columns 3 to 6 of TABLE 8. The results may be briefly summarised as shown in Table C.

TABLE C

	Public sector expenditure at constant prices per capita (*Rs.*)	*Central government expenditure at constant prices per capita* (*Rs.*)	*Public sector expenditure as percentage of national income*
1901-02	6.19	4.28	13.80
1911-12	6.60	4.78	12.53
1921-22	7.05	3.69	11.79
1931-32	11.66	5.60	20.44
1941-42	10.34	4.43	17.23
1951-52	9.67	4.01	14.14

It may be pointed out at this stage that the figures for public expenditure relate to the whole of India and in consequence the area coverage is somewhat uneven. For the local expenditure it was, of course, possible to adjust for the territories of Burma and Pakistan; but as it was not possible to devise a satisfactory procedure by which the central expenditure was to be divided between the respective areas, no efforts are made to adjust these figures. A possible method would be to divide the expenditure on the basis of population of the territories concerned. But there is no information as to whether any systematic effort is made to equate the per capita expenditure. It is not unlikely that there is a considerable amount of territorial transfer of expenditure activities through the operation of the state revenue and expenditure patterns. This transfer, however, cannot be detected except through further elaborate research. It has, accordingly, been thought best to leave all money figures unadjusted for territories. As a consequence of having adopted this procedure, it has been necessary for the purpose of deriving the per capita figures, to use the population figures for the entire country up to the year 1941. It would be noted that the census figures in respect of the first half of these forty years cannot be directly used for this purpose. This is due to a certain amount of under-coverage relating to the censuses of 1901 and 1911. Accordingly the figures as corrected by Davis[18] have been utilised for this purpose. The estimates for the

[18] Davis, Kingsley, *The Population of India and Pakistan*, 1951.

inter-censal years have been arrived at on the basis of simple interpolation, the decennial rise having been broken up into so many equal annual rises. One exception to this procedure is the case of the population estimates used for arriving at the per capita national income figures. The estimated national income figures relate to the Indian Union territory. It has, therefore, been necessary to derive the population in respect of the same territory in order to get meaningful per capita national income figures. This has been done by splitting up the population figures as given by Davis in accordance with the proportion of the population estimates for Indian Union and Pakistan for the year 1946-47. The procedure is admittedly crude.

An effort has also been made to estimate the public sector current expenditure on goods and services which is presented in column 6 of TABLE 8. This has been arrived at by deducting all the transfer expenditures from the aggregate outlay of the public sector. It is not quite certain as to how accurate these figures can be considered to be. The possible alternative, at this level of abstraction, is to use the proportion derived from the estimates of current expenditures of public authorities on goods and services by the Central Statistical Organisation, Government of India, with the aggregate outlay of the public sector. But the proportion as revealed by the government white paper on national income of April, 1956 is seen to vary from 63.9 per cent in 1951-52 to 91.9 per cent in 1948-49. It was felt that it would be quite meaningless to split up the figures on the basis of an average of so unstable a proportion. The figures derived in the present study are considerably in excess of the government estimates, as would be apparent from the figures in Table D.

TABLE D

PUBLIC SECTOR CURRENT EXPENDITURE ON GOODS AND SERVICES

(Rs. Crores)

	1953-54	1952-53	1951-52	1950-51	1949-50	1948-49
Government estimate	1,042	884	865	763	764	870
Present estimate	1,333	1,337	1,200	1,252	1,386	925

It would be noted, however, that the government estimates relate only to the public expenditure on current account while the present estimates relate to the aggregate public sector outlay. If allowance is made for the expenditure on capital account there would be a very close correspondence between the two sets of figures. A direct comparison is, however, not possible because the government consolidation of the capital accounts does not provide a suitable breakdown and it is not certain whether the entire amount shown as capital account transactions may be taken to be current outlays on goods and services.

It does not seem possible to split the figures further on the basis of wages and salaries and goods purchased. The government estimates do not furnish any information on this point in respect of the government administrative departments. For the Railways, the division of the expenditure figures on this basis is, however, available. It is, nevertheless, not quite certain whether the proportion of the expenditure of the railway authorities between salaries and wages on one side and goods purchased on the other will hold good for the public sector as a whole. It seems quite unlikely that it would. The wages and salaries component should be proportionately somewhat larger in most of the government departments. In the absence of some firm basis it seemed futile to try to obtain further breakdown of the figures on this basis.

It is, nevertheless, desirable that some idea should be formed about the public sector draft on manpower. This figure is not directly available. For the recent years figures for central government employment is, however, available from the publications of the Ministry of Labour, Government of India. Figures for government employees in some of the states and on the various central government projects, together with those of contract labour under the Public Works Department and the states are available scrappily for a few years. It does not seem possible to piece them together to arrive at any estimate of the aggregate employment in the public sector. The particulars about employment and the corresponding salaries and wages bill as available from the Report of the Indian Retrenchment Committee, 1922-23 are of considerable interest because an effort has been made in the Report to compare the employment and wage-bill position of the government relating to the years 1913-14 and 1922-23. The coverage of these figures is, however, uncertain; and both in view of the proportion of wages and salaries to the total expenditure of the central government as worked out by the Committee and the method employed in obtaining the figures, it seems that there is a considerable underestimation in these figures.

There does not, therefore, seem to be any other alternative but to fall back on the census figures. These figures are only approximate and comparability is partly vitiated by change of definition from one census to another. An attempt has been made in Table E to piece together such figures as are available in a manner that would give a general idea of the manpower utilization of the public sector.

In the 1951 census, only the number of self-supporting workers was separately ascertained for each occupation. In order to make the data comparable, it was necessary to estimate the number of workers in each occupation. The estimated figure of workers is presented within brackets and indicated with an asterisk. The figures as published in the census of 1901 to 1931 related to undivided India, including Burma. In order to separate the figures for the present Indian Union, it was necessary to make deductions for the figures of the former provinces of Burma, Kashmir, Baluchistan and North West Frontier Province, as also for the districts and parts of districts of Bengal, Bombay, Assam and the Punjab, which has been done in so far as possible.

TABLE E

	1901	1911	1921	1931	1941	1951
Police (other than village watchman)	2,41,892	2,39,319	2,22,529	2,40,532	..	3,79,721 (4,49,344)*
Percentage	10.2	9.6	8.9	8.7	..	12.6
Village officer and servants (including village watchmen)	7,73,397	6,89,828	5,31,400	3,84,177	..	2,37,180 (2,86,935)*
Percentage	32.8	27.6	21.4	13.9	..	8.0
Employees of municipalities and district boards	1,07,976	66,381	82,546	1,16,487	..	2,24,249 (2,69,560)*
Percentage	4.6	2.7	3.3	4.2	..	7.6
Army, Navy, Air Force, employees of state govt. and union govt. and non-Indian governments	7,95,651	7,17,430	7,93,890	7,07,140	..	13,20,967 (18,23,122)*
Percentage	33.7	28.7	31.9	25.7	..	51.3
Total	19,18,916	17,12,958	16,30,365	14,48,336	..	21,62,117 (28,28,961)

It is possible, in the light of these figures, to come to the conclusion that there has not been a continuous growth in the public sector in India during the fifty years from 1900-01. The public sector outlay in real terms has only approximately doubled so that the per capita public sector expenditure has tended to decline after reaching a plateau between 1931-32 and 1942-43. The aggregate manpower utilisation actually tended to decline during the first four decades but the trend has reversed itself in the last decade, as a result, presumably of the country's extended war effort which has not so far been adjusted by drastic retrenchment.

Fabricant[13] has tried to test the hypothesis that there is a consistent relation between public sector outlay on the one hand and per capita income, density of population and urbanization on the other. For this purpose he has utilised the information as available from the 48 states of the United States in respect of the four factors and has found that the 1942 parameters for the three independent variables give a close enough estimate for the per capita public sector outlay for the year 1903. In his own words, 'the data are not inconsistent with the hypothesis that the 1942 relationship is applicable to the 1903 data and the 1903-42

[13] Fabricant, Solomon, *op. cit.*

changes, subject only to a time or trend factor.[14] 'Like the efforts of the Red Queen' Fabricant comments, "changes in public administration may have succeeded only in preventing a decline in organizational efficiency, rather than in advancing it beyond the point it had reached at the opening of the century."

It is not possible to carry on a test on the lines attempted by Fabricant, primarily because state-wise national income figures are not available at any point of time for this country, not even for the latest years. Fabricant's method has the obvious advantage in so far as the pattern that he seeks is not derived from time-series data. It would, nevertheless, be interesting to try to obtain a rough indication of the influence of three factors, viz., per capita income, population and urbanization, for which an index of the ratio of urban population to total population has been utilised (column 7, TABLE 8), on per capita public sector outlay. For the purpose a multiple regression equation of the type,

$$y = a + b.x_1 + c.x_2 + d.x_3$$

has been fitted to the available data.

The estimation of the parameters gives an equation as under:

Per capita public sector outlay = —3414.0 + 19.7 per capita national income — 5.8 population + 4.8 urbanization.

The magnitudes of the parameters are satisfactory inasmuch as they bring out the relative influences of the factors concerned. The negative sign of the population factor seems, however, to call for an interpretation. It is a moot point whether it can be interpreted as the failure of per capita public sector outlay to keep up with the growth of population? As per capita national income has a tendency to fall off after reaching a plateau between 1936-37 and 1945-46 the trend of this item would be closer to the movement of per capita public sector outlay as compared to the trend of population which goes on increasing. Could it be that for all these fifty-three years the country has not been running fast enough even to stay in the same place? This may be so. Because according to Hicks[15] it seemed unlikely 'that in a country like India public finance can ever be a very powerful stabilising instrument'. The present analysis, however, shows that while, on the whole, there is not much of a close correspondence between movements in national income and the magnitude of government expenditure, the relative inelasticity of the public sector outlay in real terms from 1925-26 and particularly after 1928-29 had on the whole a favourable reaction on the national economy, whatever may be the particular repercussions of the other policies followed by the government, including its persistent efforts to balance the budget. Similarly, the steep rise in public sector outlay in real terms after 1941-42 had the effect of buoying up the national income.

A word about the derivation of the figures in column 5 of TABLE 8 which has been presented in summary form in Table C is now over due. These national income

[14] *Ibid.*, p. 136. [15] Hicks, Ursula, *op. cit.*, p. 12.

figures, it would be recalled, have been derived in constant 1948-49 prices. The figures of aggregate outlay of the public sector are, however, in current prices. In order to arrive at an estimate of aggregate public sector outlay in constant prices it is thus necessary to divide the figures by an index number of wholesale prices. The process seems somewhat dubious, but is the only one available. On the face of it, deflating the public expenditure figures by some sort of an index of wages would have been more logical. Conceptually, the procedure adopted in the study can be defended only in an involved sense that the public sector outlay on wages and salaries is ultimately a draft on real resources at one remove. In the second place, the index number of wholesale prices have a 1914-15 base. Deflating public expenditure figures by this index amounts to leaving the 1914-15 expenditures intact. This would imply that the corrected public expenditures are in constant 1914-15 prices. As, however, the 1948-49 prices are approximately 3.73 times higher than the 1914-15 prices, any figures derived from the relationship between the national income figures and the public expenditure figures would have to be multiplied by this factor of 3.73 in order to get the correct proportionality. The adopted procedure obviously leads to the same result as adjusting the base period of the two indices concerned in the two deflations and subject to the same limitations arising out of such shifting of base periods of index numbers. Conceptually, it would have, perhaps, been more logical to deflate the national income figures and present the national income series in constant 1914-15 prices, but as the concern in the present analysis is merely with the proportion between the public expenditures and the national income figures, deflating the public expenditure figures and adjusting the base periods of the indices used with a factor derived out of the differences between the two base periods would give the same results.

Another area where an incursion seems tempting and profitable is the relation between money supply and national income. As in the field of public finance, to proceed with a rigorous analysis of a limited sort seems to be of doubtful use, if only because of the absence of a non-controversial theoretical structure on the basis of which such a study can be meaningfully attempted. In so far as a rigorous model can be constructed in this context the available quantitative material would have to be considered hopelessly inadequate. Nevertheless, whatever be the theoretical position that one takes, an adequate measure of the money supply may be considered important. The fact that no complete long series of money supply is available for India makes the challenge all the more important. Once an adequate measure of the money supply is available it becomes tempting to work out the income velocity of money circulation and such other relationships between the measures of national income and its composition on the one hand and the money supply and its constituent units on the other. In the present case, these ratios can be worked out for the fifty odd years under review.

Before any effort can be made to measure the money supply in the country over the fifty odd years under reference it is necessary to arrive at an agreed definition of the money supply measure that can be used for the purpose.

In some of the studies on this subject, money supply has been taken to mean active money supply only. Income velocity of money so worked out would, of course, be the income velocity of active money supply alone. This course has certain obvious attractions. If a part of the money supply is hoarded at every turn, the stock of money which can have any relation with national income would be the stock of active money. On the other hand, it has been rightly pointed out that while this definition is convenient for certain purposes it has the effect of twisting the implications of the relationships that are implied to the point where it becomes tautologous. The controversy, however, need not be entered into in a country like India because absence of adequate quantitative material makes it impossible to distinguish clearly between active and passive money, particularly in respect of rupee coins in circulation. If one is to give any operational significance to the concept used there does not seem to be any alternative other than using the aggregate stock of money as the denominator.

There are no reliable estimates for the income velocity of circulation of money in India. One reason for this is that there are no reliable estimates of money supply for the country if a fairly long period is taken into consideration. Figures for note circulation are available from the publications of the Reserve Bank of India for the period after 1936 and from those of the Controller of Currency for the earlier period. Routine figures for absorption of currency are likewise available and are usually used as indicators for money circulation. Nevertheless, unlike the case of note circulation where positive and negative absorption figures add up to the circulation figures, those for rupee coins do not. This is because the published figures for absorption of rupee coins merely signify "the decline and rise respectively in the amount of rupee coin held in the Issue Department of the Bank"[16] and do not purport to make any statement about all the rupee coins that may have been issued. Rupee coins, however, form an important part of the circulating medium and no estimation of the stock of money can afford to omit this item. Subsequent to September, 1943, when the silver rupee was demonetised and the rupee coin in effect became one rupee notes, the absorption figures for rupee coins also assume a significance similar to the rest of the note issue. Estimates of rupee coins in circulation from the year 1900 to 1919 are available from Shirras.[17] After 1919 no effort seems to have been made to estimate the actual circulation of rupee coins on the basis of the rupee censuses until 1940-41. Estimates of circulation of rupee coins from the year 1912 to 1940 are, however, available from an estimate by Mahalanobis.[18] These two sets of estimates and also the official figures that are available for the years 1912 and 1920 do not however exactly tally, due presumably to the structural difference in the formula used. The Mahalanobis estimates are slightly higher than the Shirras estimates

[16] *Report on Currency and Finance*, 1935-36 and 1936-37, Reserve Bank of India, p. 29.

[17] Shirras, G. Findlay, *op. cit.*, Table 16, p. 462.

[18] Mahalanobis, P. C., "A Statistical Report on the Rupee Census", *Report on Currency and Finance*, 1940-41, Reserve Bank of India, pp. 49-54.

for the overlapping period. No other way of reconciling the difference has been found except through the measurement of the proportionate excess of the Mahalanobis estimates over the Shirras estimates for the overlapping years from 1912 to 1919, and to write up the Shirras, estimates for the earlier years by that percentage. There is still a two-year gap between the last year for which the Mahalanobis estimates are available and 1943 from when figures for rupee coins in circulation are directly available. This gap has been filled by interpolation on the basis of changes in note circulation. The idea of using the Mahalanobis formula on the rupee census figures had to be abandoned as it seems that rupee census was discontinued from 1941.

The next point is to decide whether bank deposits should be considered to be a part of money supply in the country. In the *Report on Currency and Finance* published by the Reserve Bank of India, demand liabilities of banks are shown to be a part of the money supply. This is in accord with the accepted ideas about the economic significance of money supply. There are, however, two considerations which would justify a case being made against this practice, particularly in so far as a long period analysis is concerned. In the first place, the breakdown between demand and time liabilities are not available for the entire period. This is a matter of availability of information. The other consideration arises from the fact that in actual practice the movements in bank deposits and the stock of currency has, for the entire period, been very close. At no stage, even when all other symptoms of an inflationary situation were present, have bank deposits tended to grow away from the movement of currency supply. The co-efficient of correlation between these two figures comes to +.97. It would, therefore, seem that the ability of banks to create credit in a country like India has been very limited and, on the whole, it would be justified to exclude bank deposits from the considerations about the available money supply. An endeavour has, nevertheless, been made to estimate the demand liabilities of the banks on the basis of the proportion between demand liabilities and total liabilities for the last twenty years. The estimate of the stock of money available as a medium of circulation has been set forth in columns 4, 7 and 8 of TABLE 7.

Some of the limitations of the figures relating to money supply and its relation to national income may be made clear at this stage. The magnitudes in column 3 of TABLE 8 are not figures of income velocity of money and are thus not comparable with similar figures for other countries. The figures represent the relationship between money supply at constant prices and national income in which the former is expressed as a percentage of the latter. But the figures do not reflect the actual proportion between these two magnitudes because the national income figures have been derived at constant 1948-49 prices while the money supply figures as adjusted for changes in price level are related to the constant 1914-15 prices. Since, however, the 1948-49 price level was about 3.73 times as high as the 1914-15 price level, an approximate proportionality will be restored if the magnitudes in column 2 of TABLE 8 are multiplied throughout by 3.73. This has been done in

column 8 of TABLE 8. Similar figures have also been worked out for the alternative definition of money supply which includes a part of bank deposits and presented in columns 3 and 4 of TABLE 9. Income velocity of money is simply derived by dividing the national income figures by the stock of money supply when the latter figure has been adjusted for the differences in the price level, namely those of 1914-15 and 1948-49. Figures of income velocity of money are also the reciprocals of the money proportion figures presented in columns 8 and 4 of TABLES 8 and 9 relating to the two different definitions of money supply. Figures of income velocity of money on the basis of the alternative definitions have been presented in column 6 of TABLE 10 and column 5 of TABLE 9. The magnitude varies from 4.1 to 8.6 for the first definition and 2.6 to 7.4 for the second definition. The fluctuations in the figures appear to be extremely revealing as regards the state of the Indian economy. For instance, one could, on the basis of these figures venture the hypothesis that the bottom of the depression in India came in 1934, while the impact of the war activity on the rest of the economy was much more significant during the First World War than during the Second. Since the activities of the Government form an important part of the monetised sector of the Indian economy it was considered interesting to work out the relationship between money supply and public expenditure. For the purposes of this comparison both the magnitudes have been considered at current prices. Figures of stock of money supply on the basis of the two alternative definitions divided by the respective years total public expenditure figures have been presented in columns 6 and 7 of TABLE 9. It is interesting to note that there is a secular decline in these figures.

A further hypothesis that can be tested in this context is whether money supply tended to bear a constant relation with the national income of the country. In this context the figures of proportionality between money supply and national income when suitable adjustments have been made for differences in the price levels of the originally derived figures are very interesting. These figures relating to the two alternative definitions of money supply have been presented in column 8 of TABLE 8 and column 4 of TABLE 9. The figures vary from 11.6 per cent to 23.9 per cent for one definition of money supply and 17.2 per cent to 38.4 per cent for the alternative definition. While nothing definite about the constancy of the relationship can be said on the basis of these figures in the absence of some suitable alternative hypothesis, an examination of the changes in these figures seems to indicate that they are very closely related to the state of the economy as modified by the method of financing and would bear further exploration. Such an examination cannot, however, be undertaken in the present context. The basic estimates and ratios have accordingly to be left to speak for themselves. By and large, however, the figures of income velocity of money as presented in column 5 of TABLE 9 and column 6 of TABLE 10 for the two alternative definitions of money supply are not inconsistent with the hypothesis that the income velocity of money is a constant over the more stable phases of the economy.

Tables

TABLE I

AGRICULTURAL PRODUCTION OF INDIA IN CONSTANT 1924-29 (AVERAGE) PRICES

THE INDICES ARE ON A 1935-36=100 BASE

(Rs. millions)

Year	*Blyn's estimate*		*Sivasubramonian's estimate*		*Author's estimate* (All India)		*Author's estimate* (Indian Union)	
	Actual	*Index*	*Actual*	*Index*	*Actual*	*Index*	*Actual*	*Index*
1	2	3	4	5	6	7	8	9
1900-01	12,816	92	13,346	85	12,350	91	8,807	91
1901-02	12,173	88	12,603	80	11,547	85	8,198	85
1902-03	13,821	100	14,170	91	12,892	96	9,440	98
1903-04	13,623	98	14,207	91	12,918	95	9,088	94
1904-05	13,038	94	13,919	89	12,669	94	8,982	93
1905-06	12,617	91	13,336	85	12,336	91	8,699	90
1906-07	13,403	97	14,155	91	13,196	98	9,406	97
1907-08	11,403	82	12,526	80	10,972	81	7,125	74
1908-09	12,212	88	13,092	84	12,136	90	8,640	89
1909-10	14,782	107	15,808	101	13,919	103	10,033	104
1910-11	14,794	107	15,813	101	13,835	102	9,918	103
1911-12	14,201	103	14,986	96	13,164	97	9,359	97
1912-13	13,803	100	14,928	95	13,253	98	9,347	97
1913-14	12,607	91	13,837	89	12,205	90	8,608	89
1914-15	13,599	98	15,378	98	13,340	99	9,406	97
1915-16	14,477	105	15,247	97	14,148	105	10,344	107
1916-17	15,280	111	15,169	104	14,677	109	10,838	112
1917-18	15,022	109	16,086	103	14,277	106	10,351	107
1918-19	10,864	78	11,229	72	11,261	83	7,857	81
1919-20	14,858	107	15,955	102	13,923	103	10,182	105
1920-21	11,881	86	12,473	79	11,875	88	8,452	87
1921-22	14,426	104	15,112	97	13,959	103	10,047	104
1922-23	14,890	108	15,696	101	14,278	106	10,406	108
1923-24	13,571	98	14,504	93	13,053	96	8,792	91
1924-25	13,678	99	14,966	96	13,212	98	9,582	99
1925-26	13,537	98	14,729	94	13,254	98	9,514	98
1926-27	13,535	98	14,768	94	13,127	97	9,530	99

TABLE 1—*Contd.*

Year	*Blyn's estimate*		*Sivasubramonian's estimate*		*Author's estimate* (All India)		*Author's estimate* (Indian Union)	
	Actual	*Index*	*Actual*	*Index*	*Actual*	*Index*	*Actual*	*Index*
1	2	3	4	5	6	7	8	9
1927-28	13,202	95	14,403	93	13,086	97	9,161	99
1928-29	13,941	101	14,137	91	13,403	99	9,856	102
1929-30	14,428	104	15,255	98	13,817	102	10,042	104
1930-31	14,309	103	15,288	98	13,932	103	10,183	105
1931-32	14,178	102	15,513	99	13,980	103	10,056	104
1932-33	14,378	104	15,686	100	13,838	102	10,018	104
1933-34	14,245	103	15,642	100	13,757	102	10,109	105
1934-35	14,034	101	15,645	100	13,617	101	9,851	102
1935-36	13,833	100	15,664	100	13,529	100	9,672	100
1936-37	15,285	111	16,668	107	14,877	110	10,684	110
1937-38	14,704	106	16,583	107	14,278	106	10,351	107
1938-39	13,507	97	14,886	95	12,999	96	9,443	98
1939-40	14,227	103	15,768	101	14,005	104	10,045	104
1940-41	13,927	101	15,801	101	13,778	102	10,042	104
1941-42	13,620	98	15,638	100	13,679	101	9,581	99
1942-43	14,596	106	15,920	102	14,103	104	10,053	104
1943-44	15,153	110					10,437	108
1944-45	14,533	105					9,968	103
1945-46	13,579	98					9,144	95
1946-47							9,346	97
1947-48							9,841	102
1948-49							9,413	97
1949-50							10,013	104
1950-51							9,642	100
1951-52							9,882	102
1952-53							10,559	109

TABLE 2

COMPARISON BETWEEN ALTERNATIVE ESTIMATES OF OUTPUT OF 5 PRINCIPAL CROPS IN UNDIVIDED INDIA

(In millions of tons)

Year	*Rice*			*Jawar*			*Bajra*			*Wheat*			*Gram*		
	Blyn	*Rao*	*Author's*	*Blyn*	*Rao*	*Author's*	*Blyn*	*Rao*	*Author's*	*Blyn*	*Rao*	*Author's*	*Blyn*	*Rao*	*Author's*
1900-01	30.2	30.8	27.2	7.9	7.0	7.6	3.6	4.0	3.8	7.6	7.3	7.9	4.2	4.5	4.7
1901-02	28.0	29.8	24.9	7.8	6.9	7.5	3.4	3.6	3.3	6.5	6.2	7.2	3.9	4.1	3.8
1902-03	34.4	33.5	30.0	8.2	7.2	8.1	3.5	3.7	3.5	8.6	8.2	9.0	4.0	4.3	4.3
1903-04	31.3	32.2	26.5	7.6	6.8	7.3	3.6	3.8	3.6	10.2	9.9	10.7	4.4	4.7	5.1
1904-05	32.8	33.3	28.2	8.0	7.2	8.0	2.8	3.0	2.6	8.1	7.8	8.8	4.3	4.5	4.2
1905-06	28.5	31.2	27.2	7.5	6.7	7.2	2.9	3.3	2.9	9.1	8.8	9.0	4.0	4.5	4.2
1906-07	28.9	31.1	27.4	7.7	6.7	7.1	3.6	4.0	3.7	8.9	8.7	9.3	4.8	5.2	4.8
1907-08	24.0	27.7	21.2	7.7	6.8	7.4	3.5	4.0	3.4	6.3	6.3	6.0	2.8	6.2	1.9
1908-09	24.5	27.3	24.5	8.3	7.6	8.5	3.8	4.3	3.8	7.8	7.8	7.8	4.3	4.5	4.1
1909-10	35.8	38.6	31.1	7.9	7.2	8.0	3.8	4.2	4.0	9.8	9.9	9.6	4.9	5.1	5.3
1910-11	36.1	39.0	30.3	7.7	7.0	7.4	3.6	4.1	3.7	10.4	10.3	9.8	5.1	5.4	5.4
1911-12	34.4	35.3	38.3	6.9	6.1	6.6	2.9	2.6	3.4	10.1	10.2	10.4	5.3	5.9	5.5
1912-13	29.7	33.6	28.2	7.5	7.1	8.2	3.9	3.4	3.4	10.1	9.9	9.8	4.7	4.7	4.3
1913-14	28.2	31.4	27.3	6.9	6.7	6.4	2.9	3.1	3.0	8.7	8.4	8.0	2.8	2.9	2.4
1914-15	26.8	29.4	25.4	8.9	7.9	8.4	3.8	3.7	3.7	10.3	10.2	9.9	5.3	5.3	4.8
1915-16	32.2	35.4	31.2	10.2	8.9	9.9	3.5	3.2	4.4	8.8	8.9	8.4	4.5	4.5	4.3
1916-17	34.2	37.7	33.3	8.9	8.1	8.2	4.2	4.1	3.2	10.3	10.4	10.0	5.7	5.7	5.3
1917-18	35.0	38.5	34.0	7.6	7.0	7.2	3.2	3.2	2.1	10.2	10.1	9.9	5.9	5.9	5.7
1918-19	22.9	26.0	22.2	6.0	6.6	7.5	2.0	2.3	4.3	7.8	7.6	7.4	2.6	2.6	2.4
1919-20	31.4	34.4	28.8	10.0	8.9	9.2	4.0	3.9	3.1	10.6	10.3	9.7	5.1	5.2	4.7
1920-21	26.2	29.5	25.5	6.1	7.0	7.9	2.9	3.0	4.0	7.1	6.8	6.6	3.1	3.4	3.0
1921-22	31.5	35.1	30.5	7.6	7.3	9.2	3.9	3.6	3.7	10.0	10.0	9.5	5.6	5.8	5.4
1922-23	32.1	*	31.3	7.3	*	8.2	3.6	*	3.4	10.2	*	9.6	6.8	*	6.6

* Figures for the years 1900-01 to 1921-22 in the second column headed "Rao" are Shah and Khambatta's estimates as given in their Wealth and Taxable Capacity in India. Shah and Khambatta's estimates are closer to the author's, a fact that would emphasise the over-estimate involved in Blyn's estimate. The figures in the second column of each set are official estimates. The publication from which they are quoted contained a note on accuracy of food statistics in India by Dr. V. K. R. V. Rao, hence the caption.

TABLE 2—*Contd.*

Year	*Rice*			*Jawar*			*Bajra*			*Wheat*			*Gram*		
	Blyn	*Rao*	*Author's*	*Blyn*	*Rao*	*Author's*	*Blyn*	*Rao*	*Author's*	*Blyn*	*Rao*	*Author's*	*Blyn*	*Rao*	*Author's*
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1923-24	26.5		25.8	6.4		7.1	3.3		3.4	9.8		9.4	5.9		5.5
1924-25	28.3		27.5	7.3		7.9	3.8		3.1	9.0		8.7	5.5		5.3
1925-26	28.6		27.6	6.4		6.9	3.3		3.9	8.9		8.4	5.0		4.8
1926-27	27.3		26.5	6.8		6.9	3.6		3.7	9.1		8.6	5.3		4.9
1927-28	25.9		25.0	8.0		8.1	3.6		3.2	7.9		7.4	4.3		4.1
1928-29	30.3		29.1	7.8		7.7	3.5		3.2	8.8		8.3	3.6		3.2
1929-30	29.1		28.3	7.8		8.4	3.2		3.1	10.7		9.9	3.9		4.2
1930-31	29.9		29.1	7.9		8.2	3.7		3.7	9.5		9.1	4.5		4.7
1931-32	31.6	30.8	30.9	7.0	6.9	6.9	3.8	3.5	3.3	9.2	9.2	9.0	4.9	3.9	4.2
1932-33	28.9	28.2	28.6	7.3	7.2	7.2	3.7	3.4	3.3	9.6	9.7	9.3	4.5	3.5	4.7
1933-34	28.5	27.8	27.8	7.1	7.1	7.1	3.2	3.2	3.1	9.5	9.6	9.9	4.9	3.9	4.3
1934-35	28.4	27.7	27.7	7.0	7.0	7.0	3.1	3.2	3.2	9.9	10.0	10.3	4.4	3.6	4.6
1935-36	25.4	25.2	25.2	7.0	6.9	7.0	3.3	3.3	3.3	9.6	9.7	9.9	4.7	3.8	4.8
1936-37	30.5	30.0	30.1	8.0	7.9	7.9	3.0	2.9	2.8	10.0	10.0	10.6	5.0	4.2	4.1
1937-38	29.3	28.8	28.8	7.3	7.2	7.2	3.2	3.1	3.0	11.0	11.7	10.3	4.3	3.4	3.5
1938-39	26.1	26.1	26.1	7.4	7.2	7.2	3.0	3.0	3.0	10.1	10.3	10.4	3.5	2.9	4.0
1939-40	27.4	27.5	27.5	7.4	7.3	7.3	2.9	2.9	2.8	11.0	11.0	11.1	3.9	3.2	4.1
1940-41	23.6	23.8	23.8	8.0	7.9	7.8	3.7	3.7	3.6	11.2	11.3	10.4	4.1	3.4	3.7
1941-42	26.8	27.0	26.9	7.1	7.0	7.0	3.7	3.7	3.5	10.2	10.3	10.3	3.9	3.1	4.7
1942-43	26.8	26.6	26.2	7.6	7.4	7.3	4.9	4.7	4.5	11.2	11.2	11.3	5.1	4.1	3.8
1943-44	32.5	32.4	32.5	7.5	7.4	7.5	4.3	4.2	4.2	9.9	10.1	10.1	4.0	3.4	4.2
1944-45	30.2			7.3		7.2	3.9		3.8	10.8		10.8	4.6	3.8	
1945-46	28.6			5.9			3.3			9.2			4.4		

TABLE 3
MAJOR COMPONENTS OF AGRICULTURAL PRODUCTION
(In millions of rupees)

Year	*Major food crops*	*Minor food crops*	*Oil seeds*	*Other commercial crops*	*Total*	*Acreage under 14 principal crops*
1	2	3	4	5	6	7
1900-01	4,684	2,468	408	1,247	8,807	192.6
1901-02	4,305	2,341	397	1,155	8,198	187.7
1902-03	5,227	2,472	507	1,235	9,440	198.0
1903-04	4,819	2,502	573	1,193	9,088	205.1
1904-05	4,830	2,376	398	1,379	8,982	202.6
1905-06	4,742	2,305	413	1,239	8,699	195.2
1906-07	4,861	2,453	485	1,606	9,406	204.7
1907-08	3,430	2,116	322	1,257	7,125	191.3
1908-09	4,262	2,614	460	1,304	8,640	203.4
1909-10	5,366	2,692	539	1,436	10,028	211.9
1910-11	5,263	2,570	587	1,498	9,918	215.7
1911-12	4,973	2,460	621	1,305	9,359	211.0
1912-13	4,873	2,478	579	1,417	9,347	209.3
1913-14	4,633	1,904	556	1,516	8,608	201.2
1914-15	4,579	2,549	761	1,517	9,406	213.2
1915-16	5,311	2,881	676	1,477	10,344	209.1
1916-17	5,907	2,615	736	1,580	10,838	216.8
1917-18	5,856	2,400	581	1,515	10,351	217.4
1918-19	3,741	2,190	444	1,483	7,857	182.4
1919-20	5,003	2,724	615	1,840	10,182	208.1
1920-21	4,125	2,405	545	1,376	8,452	190.0
1921-22	5,106	2,803	661	1,477	10,047	206.4
1922-23	5,334	2,668	748	1,655	10,406	212.4
1923-24	4,017	2,508	594	1,673	8,792	204.5
1924-25	4,747	2,392	747	1,695	9,382	210.3
1925-26	4,627	2,316	782	1,788	9,514	208.6
1926-27	4,553	2,325	787	1,865	9,530	204.2
1927-28	4,282	2,318	920	2,090	9,610	202.7
1928-29	4,771	2,161	1,028	1,896	9,856	211.5
1929-30	4,961	2,384	942	1,754	10,042	209.4
1930-31	4,898	2,483	1,040	1,763	10,183	211.8
1931-32	5,183	2,216	867	1,791	10,056	214.3
1932-33	4,821	2,194	1,052	1,951	10,018	210.2
1933-34	4,804	2,249	1,074	1,982	10,109	216.4
1934-35	4,884	2,247	734	1,986	9,851	208.5
1935-36	4,471	2,252	840	2,109	9,672	208.9
1936-37	5,107	2,290	982	2,306	10,684	216.9
1937-38	4,901	2,140	1,183	2,127	10,351	215.0
1938-39	4,648	2,059	1,088	1,648	9,443	212.9
1939-40	4,876	2,139	1,111	1,919	10,045	210.5
1940-41	4,408	2,384	1,195	2,054	10,042	210.5
1941-42	4,494	2,098	950	2,040	9,581	216.3
1942-43	4,748	2,397	1,001	1,908	10,052	215.5
1943-44	4,818	2,280	1,185	2,155	10,437	214.5
1944-45	4,719	2,271	1,191	1,787	9,968	212.9
1945-46	4,274	1,992	1,076	1,802	9,144	211.8
1946-47	4,424	1,928	1,105	1,888	9,346	211.6
1947-48	4,596	2,036	1,098	2,112	9,841	211.6
1948-49	4,673	1,880	968	1,887	9,413	226.1
1949-50	4,867	1,949	1,112	2,086	10,013	237.4
1950-51	4,385	1 838	1,095	2,323	9,642	240.1
1951-52	4,411	1,872	1,044	2,555	9,882	239.9
1952-53	5,042	2,046	1,039	2,431	10,559	244.3

TABLE 4
COMPARISON BETWEEN AVAILABLE INDICES OF INDUSTRIAL ACTIVITY
INDICES

	Shirras-- 'Capital' 1900—100	*Meek— 'Eastern Economist'*	*Employment in large scale factories —millions*	*Shirras— 'Capital' 1935-36 —100*	*Meek— 'Eastern Economist' 1935-36 —100*	*Employment index 1935-36 —100*	*Author's index 1935-100*	*Authors' index 1935-100 corrected for deflated cheques clearance*
	1	2	3	4	5	6	7	8
1900-01	100	26.6	·47	24	30	29	28	29
1901-02	106	27.4	·51	25	31	32	32	33
1902-03	112	28.3	·53	26	32	33	34	35
1903-04	120	29.4	·55	28	33	34	36	37
1904-05	129	31.2	·59	30	35	37	39	40
1905-06	136	32.8	·63	32	37	39	36	37
1906-07	147	34.0	·69	35	38	43	42	43
1907-08	153	35.5	·73	36	40	45	45	45
1908-09	157	35.8	·76	37	40	47	43	43
1909-10	171	39.3	·79	40	44	49	38	39
1910-11	175	38.1	·79	41	43	49	48	48
1911-12	196	38.6	·79	46	43	49	53	53
1912-13	229	43.2	·87	54	48	54	57	57
1913-14	225	42.7	·94	53	48	58	59	59
1914-15	224	44.0	·95	53	49	59	55	54
1915-16	234	51.5	1.00	55	58	62	59	58
1916-17	247	51.9	1.06	58	58	66	66	64
1917-18	251	50.6	1.08	59	57	67	69	67
1918-19	260	47.3	1.12	61	53	70	76	71
1919-20	274	49.8	1.17	65	56	73	79	72
1920-21	289	50.6	1.23	68	57	76	90	77
1921-22	305	48.1	1.27	72	54	79	71	64
1922-23	323	49.8	1.36	76	56	84	72	65
1923-24	326	49.8	1.41	77	56	88	79	72
1924-25	354	56.9	1.56	84	64	97	86	80
1925-26	351	56.4	1.50	83	63	93	84	79
1926-27	360	61.8	1.52	85	69	94	84	80
1927-28	372	64.7	1.53	88	72	95	89	85
1928-29	375	56.9	1.52	89	64	94	91	87
1929-30	393	67.2	1.55	93	75	96	96	90
1930-31	392	61.8	1.53	93	69	95	87	85
1931-32	345	66.4	1.43	82	74	89	81	80
1932-33	342	66.4	1.42	81	74	88	81	81
1933-34	368	72.0	1.41	87	81	88	92	93
1934-35	408	82.9	1.49	97	93	93	94	94
1935-36	423	89.4	1.61	100	100	100	101	101
1936-37	441	94.6	1.65	104	106	102	106	107
1937-38	468	102.1	1.68	111	114	104	112	110
1938-39	466	101.7	1.74	110	114	108	110	109
1939-40	479	110.3	1.75	113	123	109	125	122
1940-41	492	114.2	1.84	116	128	114	129	125
1941-42	515	123.2	2.16	122	138	134	139	133
1942-43	457	125.5	2.28	108	140	142	136	128
1943-44	459	126.8	2.44	109	142	152	151	134
1944-45	507	121.7	2.52	120	136	157	179	155
1945-46	535	120.0	2.64	126	134	164	166	138
1946-47	483	105.0	2.26	114	117	140	156	122
1947-48	449	105.9	2.27	106	118	141	155	125
1948-49	452	115.9	2.36	107	129	147	170	133
1949-50	459	113.0	2.43	109	126	151	175	141
1950-51	465	112.2	2.50	110	126	135	183	149
1951-52	527	125.3	2.54	125	140	158	198	154
1952-53	555	137.8	2.44	131	154	152	208	166

TABLE 5

ANALYSIS OF PUBLIC EXPENDITURE

Rs. Crores

	Central Govt. expenditure on revenue account	*State Govt. expenditure on revenue account*	*Local expenditure on revenue account*	*Total expenditure of Central & State Govts. on capital account*	*Miscellaneous expenditure of Central Govt.*	*Aggregate outlay on revenue account*	*Aggregate outlay of the public sector*
1	2	3	4	5	6	7	8
1900-01	93.72	11.31	12.56	21.39	1.55	117.59	140.53
1901-02	95.94	10.48	13.15	12.95	—	119.57	132.52
1902-03	99.09	10.93	14.06	12.38	1.46	124.08	137.92
1903-04	112.86	12.13	15.15	11.98	—	140.14	152.12
1904-05	108.18	12.01	14.98	12.92	.34	135.14	148.43
1905-06	110.72	12.10	15.68	36.06	.56	138.50	175.12
1906-07	117.53	12.68	15.47	17.90	1.04	135.68	154.62
1907-08	119.52	12.49	16.75	24.91	—	148.76	173.67
1908-09	110.98	12.50	18.03	17.43	—	141.51	158.94
1909-10	120.27	12.49	19.32	14.33	.78	152.28	167.39
1910-11	124.54	13.01	20.56	21.97	—	158.11	180.08
1911-12	127.40	13.36	21.01	14.33	—	161.77	176.10
1912-13	135.99	14.28	26.14	17.34	1.15	176.41	194.90
1913-14	136.35	14.02	28.66	22.62	.89	179.03	202.54
1914-15	134.97	13.86	30.50	20.53	.25	169.33	190.11
1915-16	139.57	14.42	27.57	10.12	2.15	181.56	193.83
1916-17	146.86	15.37	27.76	8.72	8.32	189.99	207.03
1917-18	167.74	18.23	29.31	157.06	11.02	215.18	383.36
1918-19	207.57	22.79	31.72	33.47	19.03	262.08	314.58
1919-20	241.59	26.76	36.64	16.79	—	304.99	321.78
1920-21	265.49	28.10	44.26	53.02	—	337.85	390.87
1921-22	201.78	106.02 (26.86)	46.40	31.62	—	354.20	385.92
1922-23	193.32	103.16 (25.93)	55.97	57.89	—	352.45	411.34
1923-24	189.12	101.11 (25.02)	62.36	39.24	—	352.59	391.83
1924-25	193.65	103.33 (25.05)	65.37	26.79	—	362.35	389.14
1925-26	186.95	111.96 (26.19)	62.78	40.48	—	361.67	402.15
1926-27	181.80	116.89 (26.85)	60.65	37.55	—	359.34	396.89
1927-28	180.30	117.65 (26.27)	60.74	42.83	—	358.69	401.52
1928-29	187.93	119.29 (26.51)	58.26	43.61	2.91	365.48	412.00

TABLE 5—*Contd.*

	Central Govt. expenditure on revenue account	*State Govt. expenditure on revenue account*	*Local expenditure on revenue account*	*Total expenditure of Central & State Govts. on capital account*	*Miscellaneous expenditure of Central Govt.*	*Aggregate outlay on revenue account*	*Aggregate outlay of the public sector*
1	2	3	4	5	6	7	8
1929-30	200.64	120.82 (27.17)	63.11	39.22	3.37	384.57	427.16
1930-31	206.32	121.51 (27.42)	61.78	38.99	6.00	389.61	434.60
1931-32	181.99	112.57 (26.00)	60.84	21.66	1.46	355.40	378.52
1932-33	155.46	110.04 (24.51)	60.20	36.10	—	325.70	361.80
1933-34	148.83	109.46 (23.70)	59.52	7.15	2.97	317.81	327.93
1934-35	154.76	109.32 (24.07)	61.43	4.54	15.01	325.51	345.06
1935-36	151.20	113.08 (24.52)	64.15	40.36	—	328.23	368.59
1936-37	157.10	116.01 (24.61)	60.63	16.17	7.11	333.74	357.02
1937-38	155.36	107.35 (24.24)	61.74	13.30	1.21	324.45	338.96
1938-39	155.80	110.17 (24.41)	63.93	27.09	1.30	329.90	358.29
1939-40	166.28	114.21 (26.10)	68.50	20.94	4.97	348.99	374.90
1940-41	187.64	125.19 (29.92)	67.90	8.53	45.66	380.73	434.92
1941-42	229.10	139.37 (35.83)	67.23	99.57	—	435.70	535.25
1942-43	379.65	176.69 (58.20)	72.59	80.39	43.44	628.93	752.76
1943-44	556.46	238.20 (84.76)	79.03	121.57	—	873.69	995.26
1944-45	650.10	304.44 (100.09)	83.54	81.93	—	1038.08	1120.01
1945-46	663.50	317.86 (100.31)	86.76	57.46	—	1068.12	1125.58
1946-47	539.51	326.64 (83.77)	90.35	227.48	53.99	956.50	1237.97
1947-48	430.79	267.23 (73.04)	124.07	151.41	—	822.09	973.50
1948-49	519.43	332.49 (81.67)	133.77	510.49	—	985.69	1496.18
1949-50	547.47	363.85 (86.37)	147.20	276.11	—	1068.52	1344.63
1950-51	595.13	385.16 (92.08)	151.36	191.79	—	1131.65	1323.44
1951-52	622.55	408.59 (99.48)	169.83	297.59	2.79	1200.97	1501.35
1952-53	614.40	442.83 (102.77)	133.86	254.25	8.23	1191.09	1453.57

TABLE 6
ANALYSIS OF PUBLIC SECTOR ACTIVITIES
Rs. Crores

	Aggregate receipts of the public sector	*Net income generating activity*	*Net income generating activity excluding other debts of a temporary nature*	*Total deficit or surplus in revenue account of Central and State Govt.*	*Net income generating activity at constant prices*	*Aggregate expenditure of the public sector at constant prices*	*Central Govt. expenditure at constant prices*
1	2	3	4	5	6	7	8
1900-01	152.50	— 11.97	— 7.01	+ 2.51	— 8.87	177.88	118.63
1901-02	138.88	— 6.36	— 6.36	+ 7.43	— 8.48	176.69	127.92
1902-03	138.90	— 0.98	+ 0.20	+ 4.60	+ 0.27	189.53	137.63
1903-04	151.32	— 0.20	+ 2.38	+ 4.49	+ 3.55	227.04	168.45
1904-05	153.64	— 5.21	— 4.96	+ 5.18	— 7.19	215.12	156.77
1905-06	175.82	— 0.70	+ 0.94	+ 3.14	+ 1.25	233.49	147.62
1906-07	162.29	— 7.67	— 4.71	+ 2.38	— 5.35	175.70	133.55
1907-08	179.94	— 6.27	— 3.21	+ 0.45	— 3.45	186.74	128.52
1908-09	174.25	— 15.31	— 9.52	— 5.61	— 10.13	169.09	118.06
1909-10	184.06	— 16.67	— 9.06	+ 0.91	— 10.79	199.24	143.18
1910-11	190.96	— 10.88	— 8.50	+ 5.90	— 10.24	216.96	150.04
1911-12	182.99	— 6.89	— 2.37	+ 5.91	— 2.69	200.11	144.77
1912-13	198.53	— 3.63	+ 0.92	+ 4.66	+ 0.93	209.57	146.23
1913-14	202.33	— 0.21	+ 4.23	+ 3.47	+ 4.36	208.80	140.57
1914-15	207.09	— 16.98	— 5.86	— 2.68	— 5.86	190.11	134.97
1915-16	204.25	— 10.42	— 3.73	— 1.78	— 3.33	173.06	124.62
1916-17	217.37	— 10.34	— 10.34	+ 11.22	— 8.08	161.74	114.73
1917-18	392.33	— 8.97	+ 50.30	+ 12.13	+ 34.69	264.39	115.68
1918-19	309.38	+ 5.20	+ 63.29	— 5.73	+ 35.96	178.74	117.94
1919-20	321.10	+ 0.68	+ 24.26	— 23.65	+ 12.38	164.17	123.26
1920-21	363.56	+ 27.31	+ 27.31	— 26.01	+ 13.52	193.50	131.43
1921-22	392.76	— 6.84	+ 16.40	— 36.38	+ 9.16	215.60	112.72
1922-23	419.17	— 7.83	— 7.83	— 16.52	— 4.45	233.72	109.84
1923-24	402.09	— 10.26	— 10.26	+ 5.15	— 5.97	227.81	109.95
1924-25	396.27	— 7.13	+ 4.60	+ 8.54	+ 2.66	224.94	111.94
1925-26	402.91	— 0.76	+ 19.82	+ 1.70	+ 12.47	252.93	117.56
1926-27	403.12	— 6.23	+ 17.76	— 3.74	+ 12.00	268.27	122.84
1927-28	410.57	— 9.05	+ 13.74	+ 1.78	+ 9.28	271.30	121.82
1928-29	439.58	— 27.58	— 9.27	— 1.76	— 6.39	284.14	129.61
1929-30	450.41	— 23.25	+ 16.73	+ 1.04	+ 11.87	302.95	142.30
1930-31	404.54	+ 30.06	+ 30.06	— 22.71	+ 25.91	374.66	177.86
1931-32	401.27	— 22.75	+ 21.28	— 15.27	+ 21.71	394.29	189.57
1932-33	382.08	— 20.28	— 20.28	+ 0.25	— 22.28	397.58	170.83
1933-34	357.68	— 29.75	— 15.07	— 3.03	— 17.32	376.93	171.06
1934-35	381.99	— 36.93	— 17.11	+ 1.29	— 19.22	387.71	173.89
1935-36	385.03	— 16.04	— 15.26	+ 0.36	— 16.77	405.04	166.15
1936-37	405.97	— 48.95	— 18.04	— 0.97	— 19.82	392.33	172.63
1937-38	383.91	— 44.95	— 35.90	+ 2.56	— 34.40	332.31	152.31
1938-39	384.98	— 26.69	— 12.00	— 1.46	— 12.63	377.15	164.00
1939-40	420.90	— 46.00	— 21.05	— 4.41	— 19.49	347.13	153.96
1940-41	477.94	— 43.02	— 14.47	— 9.57	— 12.06	362.43	156.37
1941-42	589.23	— 53.96	+ 35.59	—106.79	+ 27.03	402.45	172.26
1942-43	823.16	— 70.40	+148.75	—182.07	+ 91.83	464.67	234.35
1943-44	1105.39	—110.13	— 53.59	—145.70	— 24.13	448.31	250.66
1944-45	1383.39	—263.38	— 56.27	—113.75	— 22.96	457.15	265.34
1945-46	1461.43	—235.85	— 89.72	+ 15.90	— 36.18	453.86	267.54
1946-47	1141.16	+ 96.81	+228.34	+ 1.93	+ 84.28	456.82	199.08
1947-48	904.57	+ 68.93	+103.16	+ 59.42	+ 34.16	332.35	142.64
1948-49	1559.30	— 63.12	+307.82	+ 37.35	+ 82.53	401.12	139.26
1949-50	1324.22	+ 20.41	+197.54	+ 60.51	+ 51.04	347.45	141.46
1950-51	1370.88	— 47.44	+ 70.61	+134.58	+ 17.35	325.17	146.22
1951-52	1495.29	+ 6.06	+112.66	+ 35.83	+ 23.90	345.13	143.11
1952-53	1458.66	— 4.09	+ 42.05	— 29.38	+ 10.92	377.58	159.58

TABLE 7

ANALYSIS OF MONEY SUPPLY

Rs. Crores

	Circulation of notes	*Circulation of rupee coins*	*Circulation of currency*	*Bank deposits*	*Demand deposits*	*Total money supply*	*Circulation of currency at constant prices (4)÷ Index of price*
1	2	3	4	5	6	7	8
1900-01	22	175	197	44	28	225	249
1901-02	22	169	191	49	31	222	255
1902-03	25	167	192	57	36	228	267
1903-04	28	177	205	60	38	243	306
1904-05	28	186	214	66	42	256	310
1905-06	33	201	234	68	43	277	312
1906-07	36	218	254	75	47	301	289
1907-08	32	234	266	80	50	316	286
1908-09	35	229	264	83	52	316	281
1909-10	40	228	268	93	59	327	319
1910-11	40	226	266	104	66	332	320
1911-12	44	223	267	111	70	337	303
1912-13	47	230	277	117	74	351	298
1913-14	50	238	288	121	76	364	297
1914-15	44	231	275	112	71	345	275
1915-16	53	226	279	115	72	351	249
1916-17	67	267	334	134	78	412	261
1917-18	84	277	361	182	115	476	249
1918-19	134	338	472	188	119	591	268
1919-20	154	362	516	244	154	670	263
1920-21	148	364	512	266	168	680	253
1921-22	157	360	517	262	165	682	289
1922-23	161	356	517	247	155	672	294
1923-24	169	356	525	240	151	676	305
1924-25	167	350	517	255	161	678	299
1925-26	168	345	513	262	165	678	323
1926-27	164	329	493	272	172	665	333
1927-28	175	327	502	278	176	678	339
1928-29	178	316	494	289	182	678	341
1929-30	149	282	441	290	183	634	313
1930-31	148	260	408	300	189	597	352
1931-32	165	241	406	288	182	588	423
1932-33	150	226	376	313	198	574	413
1933-34	164	213	377	328	207	584	433
1934 35	164	180	344	340	215	559	387
1935-36	169	158	327	359	227	554	359
1936-37	194	166	360	380	240	600	396
1937-38	178	173	351	389	246	597	344
1938-39	178	131	309	386	244	553	325
1939-40	225	125	350	407	256	606	324
1940-41	241	105	346	422	266	612	288
1941-42	382	115	497	473	298	795	374
1942-43	644	124	768	611	385	1153	474
1943-44	882	137	1019	854	476	1495	495
1944-45	1085	147	1232	1066	673	1905	502
1945-46	1219	166	1385	1293	815	2200	558
1946-47	1242	168	1410	1422	897	2307	520
1947-48	1304	155	1459	1380	871	2330	483
1948-49	1212	144	1356	1361	859	2225	364
1949-50	1120	133	1253	1288	813	2066	324
1950-51	1204	138	1342	1304	823	2165	330
1951-52	1098	125	1223	1325	835	2059	281
1952-53	1090	120	1210	957	604	1814	314

TABLE 8
PUBLIC SECTOR ACTIVITIES IN REAL TERMS
Rs. Crores

Year	*Money supply at constant 1914-15 prices as percentage of national income*	*Public sector expenditure at constant prices per capita*	*Central Government expenditure at constant prices per capita*	*Public sector expenditure as percentage of national income*	*Current expenditure on goods and services of the public sector*	*Index of urbanization (1900-01 =100)*	*Money supply as percentage of national income*
1	2	3	4	5	6	7	8
1900-01	5.1	6.27	4.18	13.46	113.08	100	19.0
1901-02	5.3	6.19	4.28	13.80	108.81	99	19.8
1902-03	4.9	6.60	4.79	13.09	115.49	99	18.3
1903-04	5.8	7.86	5.83	15.93	122.20	98	21.6
1904-05	5.8	7.40	5.39	14.96	119.99	98	21.6
1905-06	6.1	7.99	5.05	16.93	147.70	98	22.8
1906-07	5.1	5.97	4.54	11.56	124.47	96	19.0
1907-08	6.1	6.31	4.34	14.81	145.80	99	22.8
1908-09	5.3	5.68	3.97	11.86	135.79	99	19.8
1909-10	5.5	6.65	4.78	12.79	140.69	98	20.5
1910-11	5.3	7.20	4.98	13.32	147.46	98	19.8
1911-12	5.1	6.60	4.78	12.53	142.16	97	19.0
1912-13	4.9	6.91	4.82	12.79	159.73	97	18.3
1913-14	5.3	6.88	4.63	13.39	172.57	96	21.6
1914-15	4.6	6.26	4.44	11.75	165.96	96	17.2
1915-16	3.8	5.69	4.10	9.81	165.27	100	14.2
1916-17	3.7	5.31	3.77	8.62	168.77	100	13.8
1917-18	3.6	8.68	3.80	14.32	324.89	90	13.4
1918-19	4.5	5.87	3.87	11.30	253.73	90	16.8
1919-20	3.8	5.38	4.04	8.87	274.78	102	14.2
1920-21	4.0	6.34	4.30	11.38	345.61	102	14.9
1921-22	4.2	7.05	3.69	11.79	348.07	103	15.7
1922-23	4.3	7.56	3.56	12.76	371.40	101	16.0
1923-24	4.8	7.30	3.52	13.35	339.75	103	17.9
1924-25	4.3	7.13	3.55	12.05	324.33	105	16.0
1925-26	4.7	7.94	3.69	13.69	340.37	108	17.5
1926-27	4.7	8.33	3.82	14.10	339.30	106	17.5
1927-28	4.8	8.34	3.75	14.21	350.24	109	17.9
1928-29	4.7	8.65	3.95	14.51	363.89	110	17.5
1929-30	4.2	9.14	4.29	15.03	371.32	109	15.7
1930-31	4.8	11.19	5.31	18.91	385.85	111	17.9
1931-32	5.9	11.66	5.60	20.44	331.99	111	22.0
1932-33	5.7	11.58	4.98	20.63	319.09	111	21.3
1933-34	5.7	10.82	4.91	18.63	292.24	113	21.3
1934-35	5.1	10.97	4.92	19.17	310.63	114	19.0
1935-36	4.7	11.29	4.63	19.58	335.84	115	17.5
1936-37	4.7	10.79	4.75	17.57	327.91	119	17.5
1937-38	4.1	9.01	4.13	14.92	298.03	120	15.3
1938-39	4.1	9.02	4.39	16.00	319.23	123	15.3
1939-40	3.8	9.16	4.06	15.11	334.44	125	14.2
1940-41	3.3	9.44	4.07	15.63	376.07	125	12.3
1941-42	4.3	10.34	4.43	17.23	473.82	126	16.0
1942-43	5.4	11.82	5.96	19.81	674.96	126	20.1
1943-44	5.4	11.29	6.31	18.31	883.81	128	20.1
1944-45	5.1	11.40	6.62	17.42	995.14	129	19.0
1945-46	6.4	11.21	6.61	19.51	991.46	130	23.9
1946-47	6.3	11.16	4.87	20.66	1110.82	134	23.5
1947-48	5.7	8.05	3.45	14.51	925.41	135	21.3
1948-49	4.2	11.90	4.13	17.31	1386.38	172	15.7
1949-50	3.6	10.11	4.12	14.70	1251.87	171	13.4
1950-51	3.7	9.28	4.17	13.69	1200.11	171	13.8
1951-52	3.1	9.67	4.01	14.14	1373.03	171	11.6
1952-53	3.3	10.39	4.30	14.88	1333.87	170	12.3

TABLE 9

MONEY SUPPLY IN REAL TERMS

Year	*Money supply (including part of bank deposits) at constant prices*	*Money supply (including part of bank deposits) at constant 1914-15 prices as proportion of national income*	*Money supply as proportion of national income*	*Income velocity of money (including a part of bank deposits)*	*Money supply divided by public expenditure, at current prices*	*Money supply (including part of bank deposits) divided by public expenditure at current prices*
1	2	3	4	5	6	7
1900-01	284	5.8	21.6	4.6	1.7	2.0
1901-02	296	6.2	23.1	4.3	1.8	2.0
1902-03	317	5.9	22.0	4.6	1.7	2.0
1903-04	363	6.8	25.3	3.9	1.7	2.0
1904-05	371	6.9	25.7	3.9	1.8	2.1
1905-06	369	6.8	25.3	3.7	1.6	1.9
1906-07	342	6.0	22.4	4.4	2.0	2.4
1907-08	340	7.2	26.8	3.7	1.8	2.2
1908-09	336	6.3	23.5	4.2	1.9	2.3
1909-10	389	6.7	25.0	4.0	1.9	2.3
1910-11	400	6.6	24.6	4.0	1.8	2.3
1911-12	382	6.4	23.9	4.2	1.9	2.4
1912-13	377	6.2	23.1	4.3	1.7	2.2
1913-14	375	6.4	23.9	4.2	1.7	2.1
1914-15	345	5.7	21.3	4.7	1.7	2.1
1915-16	313	4.8	17.9	5.6	1.7	2.1
1916-17	322	4.6	17.2	5.8	2.0	2.4
1917-18	328	4.8	17.9	5.6	1.1	1.5
1918-19	336	5.7	21.3	4.7	1.9	2.3
1919-20	342	4.9	18.3	5.4	1.9	2.4
1920-21	337	5.3	19.8	5.0	1.5	2.0
1921-22	381	5.6	20.9	4.8	1.5	2.0
1922-23	382	5.6	20.9	4.8	1.4	1.8
1923-24	393	6.2	23.1	4.3	1.5	2.0
1924-25	392	5.6	21.0	4.8	1.6	2.1
1925-26	426	6.2	23.6	4.3	1.5	2.0
1926-27	449	6.3	23.5	4.2	1.5	2.0
1927-28	458	6.4	23.9	4.2	1.4	1.9
1928-29	468	6.4	23.9	4.2	1.4	1.9
1929-30	450	6.0	22.4	4.5	1.2	1.7
1930-31	515	7.0	26.1	3.8	1.1	1.5
1931-32	613	8.5	31.7	3.1	1.2	1.8
1932-33	631	8.8	32.8	3.1	1.2	1.8
1933-34	671	8.8	32.8	3.0	1.3	2.0
1934-35	628	8.3	31.0	3.2	1.1	1.8
1935-36	609	7.9	29.5	3.4	.9	1.6
1936-37	659	7.9	29.5	3.4	1.1	1.8
1937-38	585	7.0	26.1	3.8	1.2	2.0
1938-39	582	7.3	27.2	3.6	1.0	1.7
1939-40	561	6.5	24.4	4.1	1.0	1.8
1940-41	510	5.9	22.0	4.5	.9	1.6
1941-42	598	6.9	25.7	3.9	1.0	1.7
1942-43	712	8.1	30.2	3.3	1.1	1.7
1943-44	673	7.4	27.6	3.6	1.2	1.7
1944-45	778	7.9	29.5	3.4	1.2	1.9
1945-46	887	10.2	38.0	2.6	1.4	2.2
1946-47	851	10.3	38.4	2.6	1.2	2.1
1947-48	772	9.0	33.7	3.0	1.6	2.5
1948-49	597	6.9	25.7	3.9	1.0	1.6
1949-50	534	6.1	22.8	7.4	1.0	1.7
1950-51	532	6.0	22.4	4.5	1.1	1.8
1951-52	473	5.2	19.4	5.2	.9	1.5
1952-53	471	5.0	18.7	5.4	.9	1.4

TABLE 10
INDICES OF INDUSTRIAL ACTIVITY

Year	*Index of food crop production* (1935-36=100)	*Index of commercial crop-production* (1935-36=100)	*Index of industrial activity* (1935=100)	*Index No. of prices* (1914-15=100)	*Income velocity of money*
1	2	3	4	5	6
1900-01	106	56	29	79	5.3
1901-02	99	53	33	75	5.0
1902-03	115	59	35	72	5.5
1903-04	109	60	37	67	4.6
1904-05	107	60	40	69	4.6
1905-06	105	56	37	75	4.4
1906-07	109	71	43	88	5.3
1907-08	82	54	45	93	4.4
1908-09	102	60	43	94	5.1
1909-10	120	67	39	84	4.9
1910-11	117	71	48	83	5.1
1911-12	111	65	53	88	5.3
1912-13	109	68	57	93	5.5
1913-14	97	70	59	97	5.1
1914-15	106	75	54	100	5.8
1915-16	122	73	58	112	7.1
1916-17	127	79	64	128	7.2
1917-18	123	71	67	145	7.4
1918-19	88	65	71	176	6.0
1919-20	115	83	72	196	7.1
1920-21	97	65	77	202	6.7
1921-22	118	73	64	179	6.4
1922-23	119	81	65	176	6.2
1923-24	97	77	72	172	5.6
1924-25	106	83	80	173	6.2
1925-26	103	87	79	159	5.7
1926-27	102	90	80	148	5.7
1927-28	98	102	85	148	5.6
1928-29	103	99	87	145	5.7
1929-30	109	91	96	141	6.4
1930-31	110	95	87	116	5.6
1931-32	110	90	81	96	4.5
1932-33	104	102	81	91	4.7
1933-34	105	104	92	87	4.7
1934-35	106	92	94	89	5.3
1935-36	100	100	101	91	5.7
1936-37	110	111	106	91	5.7
1937-38	105	112	112	102	6.5
1938-39	100	93	110	95	6.5
1939-40	104	103	125	108	7.1
1940-41	101	110	129	120	8.1
1941-42	98	101	139	133	6.2
1942-43	106	99	136	162	5.0
1943-44	106	113	151	222	5.0
1944-45	104	101	179	245	5.3
1945-46	93	98	166	248	4.1
1946-47	95	102	156	271	4.2
1947-48	99	109	155	302	4.7
1948-49	98	97	170	373	6.4
1949-50	101	108	175	387	7.4
1950-51	93	116	183	407	7.2
1951-52	93	122	198	435	8.6
1952-53	105	118	203	385	8.1

TABLE 11

AREA UNDER AGRICULTURAL PRODUCTION

Year	*General index (Agricultural production 1935-36=100)*	*Gross acreage under cultivation (millions of acres)*			*Population of present Indian Union territory (in millions)*
		All- India	*Indian Union*	*Index*	
1	2	3	4	5	6
1900-01	91	226.0	192.6	92	229.0
1901-02	85	220.6	187.7	90	231.0
1902-03	98	228.7	198.0	95	232.1
1903-04	94	235.5	205.1	98	233.0
1904-05	93	235.3	202.6	97	235.1
1905-06	90	230.7	195.2	93	236.1
1906-07	97	229.1	204.7	98	237.9
1907-08	74	235.2	191.3	92	239.0
1908-09	89	247.5	203.4	97	240.8
1909-10	104	253.9	211.9	101	242.2
1910-11	103	255.1	215.7	103	243.4
1911-12	97	246.3	211.0	101	244.3
1912-13	97	253.2	209.3	100	244.4
1913-14	89	244.9	201.2	96	245.4
1914-15	97	259.5	213.3	102	245.8
1915-16	107	249.7	209.1	100	245.8
1916-17	112	262.8	216.8	104	245.9
1917-18	107	264.6	217.4	104	245.9
1918-19	81	220.2	182.4	87	246.7
1919-20	105	251.0	208.1	100	246.3
1920-21	87	229.3	190.0	91	246.8
1921-22	104	246.6	204.4	99	247.0
1922-23	108	251.7	212.4	102	250.1
1923-24	91	248.4	204.5	98	252.2
1924-25	99	253.6	210.3	101	254.8
1925-26	98	215.5	208.6	100	257.8
1926-27	99	250.1	204.2	98	260.5
1927-28	99	249.2	202.7	97	263.0
1928-29	102	255.4	211.5	101	265.0
1929-30	104	254.6	209.4	100	268.2
1930-31	105	262.0	211.8	101	270.8
1931-32	104	265.4	214.3	103	273.4
1932-33	104	262.2	210.2	101	277.4
1933-34	105	268.1	216.8	104	281.5
1934-35	102	258.8	208.5	100	285.9
1935-36	100	261.9	208.9	100	289.8
1936-37	110	264.8	216.9	104	293.6
1937-38	107	265.6	215.0	103	297.8
1938-39	98	263.1	212.9	102	302.5
1939-40	104	266.4	210.5	101	305.6
1940-41	104	268.9	210.5	101	309.9
1941-42	99	267.8	216.3	104	314.5
1942-43	104	273.9	215.5	103	317.1
1943-44	108		214.5	103	321.5
1944-45	103		212.9	102	324.4
1945-46	95		211.8	101	327.8
1946-47	97		211.6	101	330.0
1947-48	102		211.6	101	333.6
1948-49	97		226.1	108	336.6
1949-50	104		237.1	114	343.2
1950-51	100		240.1	115	349.8
1951-52	102		239.9	115	356.8
1952-53	109		244.3	117	363.8

TABLE 12
COMPONENTS OF TOTAL AGRICULTURAL PRODUCTION
AREA AND YIELD OF SELECTED CROPS
(Unit—Area in millions of acres. Yield in Million of tons)

Year	Rice				Wheat				Jawar			
	Area		Yield		Area		Yield		Area		Yield	
	I & P*	I U†	I & P	I U	I & P	I U	I & P	I U	I & P	I U	I & P	I U
1	2	3	4	5	6	7	8	9	10	11	12	13
1900-01	67.7	54.8	27.2	22.8	27.7	21.3	7.9	5.5	36.9	35.8	7.6	7.4
1901-02	69.1	56.0	24.9	20.5	26.4	20.1	7.2	5.6	36.4	35.7	7.3	7.4
1902-03	70.8	57.7	30.0	24.7	26.4	20.4	9.0	7.1	38.8	37.9	8.1	7.9
1903-04	68.1	54.9	26.5	21.5	32.8	25.8	10.7	8.0	35.0	34.0	7.3	7.1
1904-05	71.8	58.4	28.2	22.9	33.2	26.5	8.8	6.4	38.7	38.0	8.0	7.9
1905-06	71.7	58.2	27.2	22.6	30.1	22.5	9.0	6.1	34.0	33.9	7.2	7.0
1906-07	71.6	57.8	27.4	23.0	33.5	25.4	9.3	6.5	34.4	33.5	7.1	6.9
1907-08	73.8	60.9	21.2	16.8	26.4	19.2	6.0	3.9	35.5	34.7	7.4	7.2
1908-09	70.1	57.9	24.5	20.5	30.4	22.8	7.8	5.3	41.0	39.8	8.5	8.3
1909-10	74.3	61.1	31.1	25.7	32.8	24.4	9.6	6.8	38.4	37.6	8.0	7.8
1910-11	78.0	64.5	30.3	25.1	35.6	26.5	9.8	6.8	35.7	34.8	7.4	7.2
1911-12	73.9	60.4	28.3	22.9	35.6	27.5	10.4	7.4	31.4	30.9	6.6	6.4
1912-13	76.6	61.8	28.2	22.4	30.2	21.3	9.8	7.3	35.8	34.9	8.2	7.9
1913-14	74.3	60.0	27.3	22.5	27.9	19.9	8.0	5.5	36.5	35.4	6.4	6.1
1914-15	74.6	59.3	25.4	21.1	32.6	23.3	9.9	6.8	36.0	35.0	8.4	8.1
1915-16	76.1	60.4	31.2	25.8	29.7	21.3	8.4	6.3	39.1	38.3	9.9	9.7
1916-17	77.6	62.1	33.3	28.2	32.3	23.4	10.0	7.6	36.8	35.7	8.2	7.8
1917-18	78.1	62.5	34.0	28.4	34.7	25.4	9.9	7.0	35.6	35.0	7.2	6.9
1918-19	74.9	59.5	22.2	17.7	23.0	16.9	7.4	5.0	34.9	34.5	7.5	7.3
1919-20	76.0	60.6	28.8	25.5	29.5	22.2	9.7	6.6	38.2	37.4	9.2	9.1
1920-21	75.6	59.7	25.5	20.2	25.6	18.2	6.6	4.7	38.4	37.7	7.9	7.2
1921-22	76.6	60.8	30.5	24.6	35.7	18.5	9.5	6.3	40.6	39.7	9.2	8.9
1922-23	77.4	62.4	31.3	25.6	30.3	21.5	9.6	6.7	38.2	37.4	8.2	7.6
1923-24	73.5	58.1	25.8	19.9	30.7	21.7	9.4	6.4	35.6	34.8	7.1	6.8
1924-25	75.0	59.5	27.5	22.5	31.3	22.3	8.7	6.3	37.8	37.0	7.9	7.6
1925-26	76.9	62.3	27.6	22.3	30.2	21.4	8.4	5.7	34.7	34.0	6.9	6.6
1926-27	73.7	57.7	26.5	21.7	30.8	22.0	8.6	5.9	35.6	34.8	6.9	6.6
1927-28	66.9	51.3	25.0	20.7	31.5	23.0	7.4	5.2	36.1	35.3	8.1	7.8
1928-29	76.2	61.1	29.1	24.0	31.3	22.1	8.3	5.3	34.9	34.2	7.7	7.4
1929-30	74.3	59.1	28.3	23.0	31.0	21.1	9.9	7.2	40.6	39.8	8.4	8.1
1930-31	73.4	59.1	29.1	23.3	31.5	22.1	9.1	6.4	38.9	38.2	8.2	7.9
1931-32	76.7	60.7	30.1	24.8	31.9	23.7	9.0	6.6	37.2	36.4	6.9	6.6
1932-33	74.9	59.0	28.6	22.6	31.2	22.8	9.3	6.7	36.7	35.9	7.2	6.9
1933-34	75.2	59.9	27.8	22.6	33.9	24.3	9.9	7.3	36.3	35.6	7.1	6.9
1934-35	74.6	59.1	27.7	22.3	32.6	23.8	10.3	7.5	36.7	36.1	7.0	6.8
1935-36	75.4	59.2	25.2	20.3	31.7	22.6	9.9	7.0	36.1	35.5	7.0	6.8
1936-37	78.3	61.8	30.1	23.6	31.2	22.3	10.6	7.5	40.6	39.8	7.9	7.7
1937-38	77.8	60.6	28.8	22.9	33.5	23.8	10.3	6.9	36.3	35.7	7.2	7.0
1938-39	78.3	61.7	26.1	21.0	33.3	24.1	10.4	7.4	36.9	36.2	7.2	7.0
1939-40	77.2	62.5	27.5	22.0	31.9	22.5	11.1	7.8	36.7	36.1	7.3	7.1
1940-41	77.0	59.4	23.8	19.6	32.7	22.9	10.4	7.4	36.6	35.9	7.8	7.6
1941-42	79.5	65.4	26.9	20.6	31.8	22.2	10.3	6.8	37.5	36.8	7.0	6.8
1942-43	79.2	62.1	26.2	21.5	31.9	21.8	11.3	7.5	38.8	38.1	7.3	7.0
1943-44	77.5	58.9	28.8	22.5	31.6	21.8	10.1	6.8	37.8	37.2	7.5	7.2
1944-45	79.3	60.1	26.4	21.5	33.2	23.1	10.8	7.3	37.2	36.6	7.2	6.9
1945-46		57.9		19.9		22.9		6.1		35.4		5.5
1946-47		61.7		21.7		23.0		5.0		34.7		5.3
1947-48		63.2		22.2		19.4		5.6		34.3		6.0
1948-49		72.5		22.6		22.3		5.7		36.8		5.0
1949-50		75.4		23.2		24.1		6.3		38.3		5.8
1950-51		76.1		20.3		24.1		6.4		38.4		5.4
1951-52		73.7		20.7		23.4		6.1		38.4		6.0
1952-53		74.7		21.8		24.0		7.8		41.9		6.0

* I & P=India and Pakistan † I U=Indian Union

TABLE 12

COMPONENTS OF TOTAL AGRICULTURAL PRODUCTION

AREA AND YIELD OF SELECTED CROPS

(Unit—Area in millions of acres. Yield in Million of tons)

Year	Bajra				Maize				Gram*			
	Area		Yield		Area		Yield		Area		Yield	
	I&P	IU	I&P	IU	I&P	IU	I&P	IU	I&P	IU	I&P	IU
1	2	3	4	5	6	7	8	9	10	11	12	13
1900-01	23.1	21.3	3.8	3.5	7.8	7.1	2.8	2.5	14.8 (19.0)	12.8 (17.0)	4.7	3·3 (4·0)
1901-02	20.5	19.1	3.3	3.1	8.3	7.6	3.0	2.7	14.1 (15.7)	12.3 (13.9)	3.8	3·1 (3.6)
1902-03	21.0	19.4	3.5	3.2	8.4	7.6	3.0	2.7	14.2 (17.4)	12.3 (15.5)	4.3	3.1 (4.0)
1903-04	21.8	20.1	3.6	3.3	8.2	7.5	3.0	2.7	15.8 (20.6)	13.8 (18.6)	5.1	3.6 (4.8)
1904-05	16.0	14.7	2.6	2.4	7.9	7.2	2.8	2.5	14.8 (17.1)	12.8 (15.1)	4.2	3.3 (3.9)
1905-06	17.9	16.6	2.9	2.7	7.8	7.1	2.8	2.5	14.9 (17.1)	12.9 (15.1)	4.2	3.4 (3.9)
1906-07	22.4	20.8	3.7	3.4	7.8	7.1	2.8	2.5	16.9 (17.0)	14.6 (14.7)	4.8	3.8 (4.5)
1907-08	20.8	19.4	3.4	3.2	7.8	7.1	2.8	2.5	8.4	7.3	1.9	1.9 (1.8)
1908-09	23.4	21.5	3.8	3.5	8.2	7.4	2.9	2.6	13.9	12.0	4.1	3.1 (3.8)
1909-10	24.1	22.3	4.0	3.7	8.3	7.5	3.0	2.7	16.9 (16.7)	14.9 (14.7)	5.3	3.8 (5.0)
1910-11	22.5	20.8	3.7	3.4	7.8	7.1	2.8	2.5	17.9	15.5	5.4	4.0 (5.1)
1911-12	20.2	19.1	3.4	3.2	7.4	6.7	2.7	2.4	19.4	17.5	5.5	5.2
1912-13	24.6	22.0	3.4	3.0	8.2	7.6	3.0	2.7	17.1	15.4	4.3	4.1
1913-14	23.1	20.5	3.0	2.7	8.1	7.5	2.7	2.4	12.7	11.3	2.4	2.1
1914-15	24.3	21.8	3.7	3.5	8.1	7.5	2.7	2.4	19.5	17.1	4.8	4.4
1915-16	22.2	20.5	4.4	4.0	8.9	8.2	3.3	3.0	18.6	16.8	4.3	4.2
1916-17	23.1	20.4	3.2	3.0	8.7	7.8	5.2	2.9	21.3	18.9	5.3	5.0
1917-18	19.2	16.9	2.1	1.9	8.6	7.8	3.3	3.0	22.8	20.0	5.7	5.2
1918-19	17.3	15.8	4.3	4.0	8.0	7.2	2.3	2.0	10.4	9.2	2.4	2.2
1919-20	22.3	20.0	3.1	2.9	8.9	8.1	3.6	3.3	17.5	15.5	4.7	4.4
1920-21	18.6	16.8	4.0	3.8	8.2	7.5	2.9	2.6	13.2	11.7	3.0	2.9

* Figures outside brackets for yields are on basis of acreage figures while those within brackets under acreage are on the basis of yields.

TABLE 12—*Contd.*

Year	Bajra				Maize				Gram*			
	Area		Yield		Area		Yield		Area		Yield	
	I&P	IU	I&P	IU	I&P	IU	I&P	IU	I&P	IU	I&P	IU
1	2	3	4	5	6	7	8	9	10	11	12	13
1921-22	24.1	21.3	3.7	3.5	8.3	7.5	3.3	3.0	20.4	18.0	5.4	5.0
1922-23	21.1	18.7	3.4	3.2	7.7	6.9	2.6	2.3	22.5	20.1	6.6	6.2
1923-24	20.7	18.2	3.4	3.2	7.8	7.1	3.0	2.7	19.6	17.5	5.5	5.1
1924-25	18.2	16.0	3.1	2.9	7.1	6.4	2.3	2.0	22.4	19.7	5.3	4.9
1925-26	18.6	16.4	3.9	3.7	7.2	6.5	2.3	2.0	19.7	17.8	4.8	4.5
1926-27	21.1	18.9	3.7	3.5	7.4	6.7	2.3	2.3	19.7	17.4	4.9	4.5
1927-28	21.6	19.4	3.2	3.0	7.7	6.9	3.0	2.7	18.8	16.7	4.1	3.8
1928-29	19.9	17.8	3.2	3.0	7.8	7.1	2.7	2.4	18.4	16.2	3.2	2.9
1929-30	20.0	17.3	3.1	2.9	8.6	7.8	3.3	3.0	15.5	13.7	3.9	3.7
1930-31	20.7	18.2	3.7	3.5	8.5	7.7	3.3	3.0	18.4	16.3	4.2	4.0
1931-32	20.9	18.3	3.3	3.0	8.2	7.5	3.0	2.7	21.5	18.7	4.7	4.3
1932-33	21.2	18.5	3.3	3.0	8.2	7.4	2.9	2.6	19.1	16.9	4.2	3.9
1933-34	19.9	17.2	3.1	2.8	8.1	7.3	2.7	2.4	22.5	20.4	4.7	4.3
1934-35	19.4	17.0	3.2	2.9	8.1	7.3	2.9	2.6	18.9	17.0	4.3	4.0
1935-36	19.3	16.9	3.3	2.9	8.2	7.4	2.9	2.6	20.2	17.8	4.6	4.3
1936-37	18.3	16.0	2.8	2.6	7.8	7.0	2.5	2.2	21.3	18.8	4.8	4.5
1937-38	19.3	17.2	3.0	2.8	7.7	6.9	2.6	2.3	19.1	17.1	4.1	3.8
1938-39	19.6	17.5	3.0	2.8	7.9	7.1	2.5	2.2	16.7	15.4	3.5	3.3
1939-40	20.5	18.4	2.8	2.6	8.0	7.2	2.8	2.5	16.6	15.1	4.0	3.8
1940-41	19.9	17.3	3.6	3.3	7.7	6.9	2.8	2.5	17.7	15.8	4.1	3.8
1941-42	21.7	18.9	3.5	3.2	7.6	6.8	2.5	2.2	17.3	15.5	3.7	3.4
1942-43	24.5	21.3	4.5	4.0	8.4	7.6	2.9	2.6	19.9	17.4	4.7	4.3
1943-44	24.3	21.6	4.2	3.8	8.4	7.5	2.8	2.5	19.5	16.9	3.8	3.5
1944-45	23.3	20.5	3.8	3.4		8.7	2.9	2.6	21.7	19.0	4.2	3.9
1945-46		23.1		2.9		8.6	2.7	2.4		19.5		3.8
1946-47		21.6		2.7		8.7	2.6	2.3		17.0		3.6
1947-48		20.8		2.8		8.5	2.7	2.4		19.3		3.5
1948-49		19.8		2.2		8.4	2.4	2.1		20.5		4.5
1949-50		22.9		2.8		8.1	2.3	2.0		20.5		3.7
1950-51		22.3		2.6		7.8	2.0	1.7		18.7		3.6
1951-52		22.8		2.3		7.1	2.3	2.0		16.9		3.3
1952-53				2.9			2.9	2.6		17.3		3.2

TABLE 12—(*Contd.*)

COMPONENTS OF TOTAL AGRICULTURAL PRODUCTION

AREA AND YIELD OF SELECTED CROPS

(Unit—Area in millions of acres. Yield in Million of tons)

Year	*Barley*				*Sugarcane*				*Jute*			
	Area		*Yield*		*Area*		*Yield*		*Area*		*Yield*	
	I & P	*I U*	*I & P*	*I U*	*I & P*	*I U*	*I & P*	*I U*	*I & P*	*I U*	*I & P*	*I U*
1	2	3	4	5	6	7	8	9	10	11	12	13
1900-01	8.5	8.0	3.8	3.6	2.6	2.2	2.5	2.3	2.1	.5	6.7	1.3
1901-02	7.1	6.9	3.2	3.1	2.6	2.2	2.3	2.0	2.2	.5	7.8	1.5
1902-03	7.4	7.2	3.3	3.2	2.4	2.0	2.2	1.9	2.1	.5	6.7	1.3
1903-04	8.1	7.7	3.6	3.4	2.3	1.9	2.2	1.9	2.5	.6	9.0	1.8
1904-05	8.4	8.0	3.8	3.6	2.4	2.0	2.5	2.2	2.9	.7	7.8	1.5
1905-06	8.3	7.9	3.8	3.6	2.3	1.9	2.0	1.7	3.1	.8	9.0	1.8
1906-07	8.3	7.9	3.8	3.6	2.6	2.2	2.4	2.1	3.5	.9	9.5	1.9
1907-08	7.7	7.4	3.5	3.3	2.8	2.4	2.3	2.0	3.9	1.0	11.2	2.2
1908-09	8.4	8.1	3.9	3.7	2.4	2.0	2.2	1.9	2.8	.7	6.7	1.3
1909-10	8.6	8.2	3.9	3.7	2.3	1.9	2.4	2.1	2.8	.7	6.7	1.3
1910-11	8.5	8.2	3.9	3.7	2.3	1.9	2.8	2.5	2.8	.7	7.3	1.4
1911-12	9.2	8.3	4.0	3.8	2.6	2.2	2.7	2.4	3.1	.8	9.0	1.8
1912-13	8.4	7.9	3.6	3.4	2.7	2.3	2.9	2.6	3.4	.8	6.2	1.2
1913-14	8.0	7.2	3.0	2.9	2.7	2.3	2.7	2.4	3.2	.8	11.2	2.2
1914-15	8.8	7.8	3.4	3.2	2.5	2.1	2.6	2.3	3.4	.8	9.5	1.9
1915-16	8.9	8.1	3.6	3.5	2.6	2.2	2.8	2.5	2.4	.6	10.6	2.1
1916-17	8.9	8.2	3.8	3.6	2.8	2.4	3.0	2.7	2.7	.7	7.3	1.4
1917-18	9.5	8.5	3.8	3.6	3.0	2.6	3.7	3.4	2.7	.7	6.2	1.2
1918-19	7.2	6.5	3.1	3.0	3.0	2.6	2.8	2.5	2.5	.6	9.0	1.8
1919-20	8.5	7.7	3.7	3.5	2.9	2.4	3.3	3.0	2.8	.7	6.7	1.3
1920-21	7.0	6.5	4.0	4.0	2.8	2.3	2.8	2.5	2.5	.6	8.4	1.6
1921-22	8.2	7.4	3.6	3.4	2.5	2.1	2.8	2.5	1.5	.4	6.2	1.2
1922-23	8.2	7.4	3.6	3.4	2.9	2.4	3.3	3.0	1.5	.3	3.9	.8
1923-24	8.0	7.3	3.8	3.6	3.1	2.6	3.5	3.2	2.4	.6	4.5	.9
1924-25	7.8	7.2	3.0	2.9	2.7	2.2	2.9	2.6	2.8	.7	7.3	1.4
1925-26	7.5	6.9	2.9	2.8	2.8	2.3	3.3	3.0	3.0	.7	7.8	1.5
1926-27	7.1	6.5	2.9	2.8	3.1	2.6	3.6	3.2	3.7	.9	8.4	1.6
1927-28	7.7	7.1	2.4	2.3	3.1	3.6	3.5	3.1	3.4	.8	11.8	2.3
1928-29	8.5	7.7	2.8	2.6	2.7	2.2	3.0	2.7	3.1	.8	10.1	2.0
1929-30	8.4	7.8	2.6	2.5	2.6	2.1	2.9	2.6	3.3	.8	10.1	2.0
1930-31	7.5	7.0	2.7	2.6	3.0	2.5	3.4	3.1	3.5	.9	10.1	2.0
1931-32	7.6	7.1	2.7	2.5	3.1	2.7	4.3	3.8	1.9	.5	11.2	2.2
1932-33	7.2	6.8	2.7	2.5	3.6	3.0	5.1	4.4	1.9	.5	5.6	1.1
1933-34	7.5	7.1	2.8	2.7	3.6	3.0	5.3	4.6	2.5	.6	6.2	1.2
1934-35	7.4	7.0	2.9	2.8	3.8	3.2	5.5	4.8	2.5	.6	7.8	1.5
1935-36	7.0	6.5	2.7	2.5	4.3	3.7	6.4	5.4	2.0	.5	6.2	1.2
1936-37	7.3	6.8	2 6	2.4	4.8	4.1	6.8	5.9	2.6	.6	9.0	1.8
1937-38	7.0	6.4	2.4	2.2	4.2	3.7	5.8	5.0	2.8	.7	8.4	1.6
1938-39	7.0	6.6	2 2	2.1	3.3	2.8	3.7	3.1	3.2	.8	6.7	1.3
1939-40	6.8	6.4	2 2	2.2	3.8	3.2	4.9	4.2	3.2	.8	9.5	1.9
1940-41	7.0	6.4	2 3	2.4	4.7	4.1	5.0	4.2	4.4	1.2	10.1	2.8
1941-42	7.3	6.7	2 2	2.1	3.6	3.0	4.9	4.1	2.2	.8	6.2	1.6
1942-43	7.8	7.2	2 5	2.3	3.7	3.2	5.0	4.4	3.4	.8	9.0	1.6
1943-44		7.0		2.2	4.2	3.6	5.8	5.1		.7		1.4
1944-45		6.8		2.4		3.5		4.7		.6		1.1
1945-46		7.1		2.3		3.2		4.6		.6		1.5
1946-47		7.1		2.5		3.5		4.9		.5		1.3
1947-48		7.6		2.6		4.1		5.8		.7		1.7
1948-49		7.7		2.2		3.8		4.9		.8		2.1
1949-50		7.9		2.2		3.6		4.9		1.2		3.1
1950-51		7.7		2.3		4.2		5.6		1.4		3.3
1951-52		7.8		2.3		4.8		6.1		2.0		4.7
1952-53				2.7		4.4		5.3		1.8		4.7

TABLE 12—(*Contd.*)
COMPONENTS OF TOTAL AGRICULTURAL PRODUCTION
AREA AND YIELD OF SELECTED CROPS
(Unit—Area in millions of acres. Yield in Million of tons)

Year	*Cotton*				*Linseed*			
	Area		*Yield*		*Area*		*Yield*	
	I & P	*IU*	*I & P*	*IU*	*I & P*	*IU*	*I & P*	*IU*
1	2	3	4	5	6	7	8	9
1900-01	13.8	12.6	3.5	3.2		3.1		.38
1901-02	14.2	12.9	3.3	3.0		3.4		.31
1902-03	17.3	16.0	4.0	3.7		3.5		.48
1903-04	20.0	18.6	3.7	3.2		4.6		.68
1904-05	19.3	17.4	4.6	4.0		4.5		.41
1905-06	20.4	18.3	4.0	3.7		3.3		.42
1906-07	21.6	20.4	5.9	5.3		3.8		.52
1907-08	21.4	19.8	3.8	3.2		2.2		.20
1908-09	19.4	17.6	4.3	3.9		3.0		.36
1909-10	20.0	18.5	5.0	4.4		3.2		.52
1910-11	22.1	20.6	4.6	4.2		3.8		.67
1911-12	22.0	20.2	3.4	3.0		5.6		.74
1912-13	21.0	19.4	4.0	3.5		4.7		.67
1913-14	23.7	21.1	4.7	4.0		3.1		.44
1914-15	23.6	21.6	4.8	4.2		3.8		.46
1915-16	17.9	16.9	3.7	3.4		3.8		.57
1916-17	21.5	20.2	4.4	4.0		4.0		.60
1917-18	23.5	21.8	3.4	3.1		4.3		.60
1918-19	20.2	18.3	4.1	3.5		2.1		.25
1919-20	22.7	20.3	5.6	5.2		3.5		.50
1920-21	18.6	16.3	3.4	2.7		2.4		.32
1921-22	17.4	15.8	4.5	4.1		3.4		.50
1922-23	21.2	19.6	5.1	4.5		3.8		.61
1923-24	23.0	21.0	5.2	4.1		4.1		.51
1924-25	25.9	23.4	6.0	4.8		4.0		.55
1925-26	27.2	24.3	6.1	4.9		4.0		.44
1926-27	23.7	20.9	5.6	4.9		3.7		.45
1927-28	24.1	22.0	6.7	6.0		3.5		.38
1928-29	26.1	23.4	6.3	5.6		3.2		.36
1929-30	25.3	22.9	5.6	4.7		3.0		.41
1930-31	23.1	20.7	5.2	4.3		3.2		.42
1931-32	23.1	20.7	4.2	3.5		3.4		.43
1932-33	21.8	19.6	4.7	3.9		3.4		.42
1933-34	23.2	20.4	5.1	4.0		3.5		.39
1934-35	23.0	20.3	5.0	3.6		3.6		.43
1935-36	24.7	21.4	6.1	4.3		3.7		.40
1936-37	23.9	20.3	6.3	4.0		3.9		.43
1937-38	24.9	21.1	5.8	4.0		4.0		.50
1938-39	22.7	19.2	5.2	3.6		4.1		.45
1939-40	20.9	17.6	5.1	3.6		3.9		.48
1940-41	22.6	19.1	6.1	4.1		3.8		.34
1941-42	23.9	20.4	6.4	4.4		3.5		.37
1942-43	18.9	16.1	4.7	3.0		3.3		.39
1943-44		17.5		3.7		3.4		.37
1944-45		11.4		2.2		3.4		.38
1945-46		11.3		2.2		3.3		.35
1946-47		11.6		2.2		3.3		.33
1947-48		10.7		2.2		4.0		.43
1948-49		11.3		1.8		3.8		.42
1949-50		12.2		2.6		3.8		.41
1950-51		14.6		2.9		3.5		.36
1951-52		16.2		3.1		3.4		.32
1952-53		16.5		3.0				.38

TABLE 12—(*Contd.*)
COMPONENTS OF TOTAL AGRICULTURAL PRODUCTION
AREA AND YIELD OF SELECTED CROPS
(Unit—Area in millions of acres. Yield in Million of tons)

Year	*Sesamum*				*Rape & Mustard*			
	Area		*Yield*		*Area*		*Yield*	
	I & P	*IU*	*I & P*	*IU*	*I & P*	*IU*	*I & P*	*IU*
1	2	3	4	5	6	7	8	9
1900-01	4.71	4.31	.50	.47	5.75	4.21	1.08	.79
1901-02	5.36	4.98	.40	.36	4.70	3.79	1.02	.84
1902-03	5.20	4.75	.63	.58	5.96	4.79	1.10	.89
1903-04	5.63	5.15	.68	.63	6.21	4.95	1.14	.96
1904-05	4.82	4.46	.40	.36	6.36	5.04	.93	.72
1905-06	4.65	4.30	.43	.39	6.22	4.64	1.02	.76
1906-07	4.68	4.35	.40	.57	6.59	4.96	1.22	.96
1907-08	4.97	4.62	.34	.31	5.38	4.30	.73	.55
1908-09	5.04	4.66	.51	.46	6.16	4.73	1.05	.76
1909-10	5.47	5.12	.62	.58	6.85	5.43	1.13	.81
1910-11	5.26	4.89	.57	.53	6.54	5.24	1.29	.90
1911-12	4.86	4.55	.44	.39	7.19	5.73	1.38	1.05
1912-13	5.04	4.69	.52	.48	6.15	5.02	1.31	1.00
1913-14	5.13	4.79	.42	.40	6.48	4.80	1.25	.87
1914-15	5.62	5.25	.84	.79	6.72	5.10	1.40	1.05
1915-16	5.16	4.90	.54	.52	6.66	5.22	1.15	.85
1916-17	5.25	4.92	.57	.54	6.71	5.19	1.26	.93
1917-18	4.32	4.05	.42	.38	7.28	5.45	1.12	.87
1918-19	4.00	3.77	.31	.27	5.02	3.94	.80	.58
1919-20	4.29	4.06	.50	.46	6.03	3.91	1.21	.97
1920-21	4.49	4.27	.42	.38	5.12	3.35	.90	.69
1921-22	4.76	4.52	.58	.54	6.51	4.84	1.13	.96
1922-23	4.17	3.97	.48	.45	6.13	5.07	1.27	1.07
1923-24	4.16	3.97	.43	.40	6.35	5.10	1.21	.98
1924-25	4.28	4.10	.49	.46	6.65	5.30	1.27	1.04
1925-26	3.96	3.79	.41	.38	5.66	4.70	1.04	.80
1926-27	3.78	3.58	.42	.39	5.70	4.66	1.00	.84
1927-28	4.49	4.36	.55	.52	5.97	4.83	.89	.68
1928-29	4.50	4.36	.50	.47	7.22	5.45	.96	.75
1929-30	4.16	4.04	.45	.42	5.97	4.77	1.16	.95
1930-31	4.31	4.19	.50	.47	6.74	5.68	1.04	.82
1931-32	4.37	4.20	.50	.48	6.37	5.21	1.08	.83
1932-33	4.70	4.52	.55	.52	6.16	4.99	1.09	.86
1933-34	4.74	4.56	.52	.49	6.16	4.92	.99	.77
1934-35	3.83	3.68	.39	.36	5.45	4.57	.95	.75
1935-36	4.18	4.00	.46	.43	5.45	4.51	1.01	.82
1936-37	4.18	3.97	.49	.45	6.06	4.80	1.01	.82
1937-38	4.50	4.24	.52	.48	5.65	4.66	1.07	.87
1938-39	4.37	4.16	.45	.41	5.65	4.71	.97	.80
1939-40	4.05	3.85	.43	.39	5.66	4.38	1.18	.99
1940-41	4.10	3.92	.44	.40	6.37	5.04	1.16	.97
1941-42	4.15	3.94	.44	.40	6.38	5.28	1.15	.95
1942-43	4.26	4.08	.47	.43	6.06	(4.76)	1.12	(.84)
						4.08		.76
1943-44	4.25	4.03	.46	.41	5.51	(4.60)	.97	(.77)
						4.03		.69
1944-45		4.27		.35		4.27		.83
1945-46		4.34		.35		4.34		.72
1946-47		4.32		.32		4.32		.79
1947-48		4.62		.35		4.62		.81
1948-49		4.63		.34		4.63		.74
1949-50		4.78		.43		4.78		.79
1950-51		5.12		.44		5.12		.75
1951-52		5.85		.44		5.71		.92
1952-53				.50				.93

TABLE 12—(*Contd.*)
COMPONENTS OF TOTAL AGRICULTURAL PRODUCTION
AREA AND YIELD OF SELECTED CROPS
(Unit—Area in millions of acres. Yield in Million of tons)

Year	*Groundnut*				*Tea*	*Coffee*
	Area		*Yield*		(*Millions of lbs.*)	(*Millions of lbs.*)
	I & P	*I U*	*I & P*	*I U*		
1	2	3	4	5	6	7
1900-01		.40		.13	184.18	46.9
1901-02		.59		.22	178.39	44.1
1902-03		.68		.27	175.87	40.5
1903-04		.64		.27	195.02	41.2
1904-05		.63		.25	206.69	37.6
1905-06		.67		.24	206.69	37.1
1906-07		.76		.31	225.09	36.7
1907-08		1.04		.32	228.08	36.5
1908-09		1.23		.43	230.61	37.1
1909-10		1.29		.44	241.07	36.2
1910-11		1.21		.52	245.83	36.4
1911-12		1.52		.63	250.78	38.7
1912-13		1.66		.65	278.15	38.9
1913-14		2.47		.75	286.83	36.7
1914-15		2.84		.97	292.43	39.6
1915-16		1.85		1.06	347.45	37.6
1916-17		2.85		1.24	347.77	36.2
1917-18		2.26		1.08	269.46	37.8
1918-19		1.54		.63	355.20	38.5
1919-20		1.73		.82	352.02	37.5
1920-21		2.43		1.03	322.42	37.1
1921-22		2.23		.95	256.29	33.3
1922-23		2.79		1.25	291.03	39.8
1923-24		2.44		.77	350.62	27.6
1924-25		2.47		1.32	350.53	42.0
1925-26		3.50		1.83	339.51	29.8
1926-27		3.83		1.88	366.97	45.9
1927-28		4.92		2.57	405.07	46.5
1928-29		5.78		3.05	377.52	34.7
1929-30		5.21		2.46	404.24	50.1
1930-31		6.04		2.98	365.29	41.8
1931-32		5.21		2.15	368.09	38.1
1932-33		6.92		2.85	405.08	37.0
1933-34		7.61		3.19	358.47	37.0
1934-35		5.17		1.74	372.95	36.1
1935-36		5.23		2.11	368.37	46.7
1936-37		6.69		2.71	369.12	38.7
1937-38		8.93		3.50	410.90	38.5
1938-39		8.54		3.22	422.07	38.5
1939-40		8.47		3.17	422.73	45.2
1940-41		8.84		3.70	433.19	38.9
1941-42		7.11		2.59	468.03	35.3
1942-43		7.70		2.86	514.78	38.0
1943-44		9.81		3.82	504.98	37.8
1944-45		10.57		3.86	575.64	39.7
1945-46		10.27		3.47	491.64	46.0
1946-47		10.27		3.59	534.85	49.7
1947-48		10.08		3.41	561.74	35.0
1948-49		9.17		2.90	577.81	34.9
1949-50		9.83		3.41	585.03	48.4
1950-51		11.11		3.43	607.32	54.3
1951-52		11.80		3.05	641.18	54.5
1952-53		11.86		2.89	733.54	50.8

TABLE

VALUE OF AGRICULTURAL

[Value—Millions of rupees at constant

Agricultural Product	1900-01	1901-02
Rice (170.96)	4650.11	4256.90
Wheat (142.92)	1129.07	1029.02
Barley (102.63)	389.99	328.42
Jawar (121.14)	920.66	884.32
Bajra (128.22)	487.24	423.13
Maize (113.52)	317.86	340.56
Gram (117.33)	551.45	445.85
Linseed (195.46)	74.27	60.59
Sesamum (250.72)	125.36	100.29
Rape & Mustard (214.12)	231.25	218.40
Sugarcane (213.42)	578.55	532.27
*Cotton (164.79)	576.77	543.81
*Jute (54.40)	364.48	424.30
Ragi (121.14)	266.51	278.62
Groundnut (214.12)	27.84	47.11
Castor (190.26)	19.02	19.02
*Indigo (241.55)	36.47	28.50
*Coffee (594.94)	27.90	26.24
*Tea (708.57)	139.66	135.34
Tobacco (543.90)	271.95	271.95
Other foodgrains & pulses (116.37)	1163.70	1152.06
Food	9876.59	9138.88
Oilseeds	477.74	445.41
Jute etc.	1519.80	1500.38
Tea etc.	475.98	462.03
TOTAL	12350.11	11546.70

NOTE: Figures in brackets indicate prices per unit, tons in most cases. The items in respect of which the unit is not ton are marked with an asterisk. For relevant units see Table 11.

13

PRODUCTION

(1924-25—1928-29 average) prices]

1902-03	1903-04	1904-05	1905-06	1906-07	1907-08
5175.47	4530.44	4821.07	4668.11	4684.30	3834.35
1286.28	1529.24	1257.70	1286.28	1329.16	857.52
338.68	369.47	389.99	389.99	389.99	359.21
981.23	884.32	969.12	872.21	860.09	896.44
448.77	461.59	333.37	371.84	474.41	435.95
340.56	340.56	317.86	317.86	317.86	317.86
504.52	598.38	492.79	492.79	563.18	222.93
93.82	132.91	80.14	82.09	101.64	39.09
157.95	170.49	100.29	107.81	100.29	85.24
235.53	244.10	199.13	218.40	261.23	156.31
509.12	509.12	578.58	462.84	555.41	532.27
659.16	609.72	758.03	659.16	972.26	626.20
364.48	489.60	424.30	489.60	516.80	609.28
278.62	266.51	266.51	266.51	278.62	278.62
57.81	57.81	53.53	51.39	66.38	68.52
19.02	19.02	19.02	19.02	19.02	19.02
20.29	26.09	16.18	13.04	18.84	14.01
24.10	24.51	22.37	22.07	21.83	21.72
133.42	147.95	156.81	156.81	170.77	173.03
271.95	271.95	271.95	271.95	271.95	271.95
1186.97	1233.52	1140.43	1052.06	1221.89	1152.06
10435.76	10214.03	9988.84	9681.65	10119.50	8354.94
564.13	624.33	452.11	478.71	548.56	368.18
1532.76	1608.44	1760.91	1611.60	2044.47	1767.75
449.76	470.50	467.31	463.87	483.39	480.71
12982.41	12917.30	12669.17	12235.83	13195.92	10971.58

TABLE

Agricultural Product	1908-09	1909-10
Rice (170.96)	4188.52	5316.86
Wheat (142.92)	1114.78	1372.03
Barley (102.63)	400.26	400.26
Jawar (121.14)	1029.69	969.12
Bajra (128.22)	487.24	512.88
Maize (113.52)	329.21	340.56
Gram (117.33)	481.05	621.85
Linseed (195.46)	70.37	101.64
Sesamum (250.72)	127.87	155.45
Rape & Mustard (214.12)	244.83	241.36
Sugarcane (213.42)	509.12	555.41
*Cotton (164.79)	708.59	823.95
*Jute (54.40)	364.48	364.48
Ragi (121.14)	278.62	278.62
Groundnut (214.12)	92.07	94.21
Castor (190.26)	19.02	19.02
*Indigo (241.55)	10.63	10.39
*Coffee (594.94)	22.07	21.94
*Tea (708.57)	175.02	182.88
Tobacco (543.90)	271.95	326.34
Other foodgrains & pulses (116.37)	1210.25	1210.25
Food Crops	9519.62	11022.43
Oilseeds	554.16	611.68
Jute etc.	1582.19	1743.84
Tea etc.	479.67	541.15
TOTAL	12135.64	13919.50

13—(*Contd.*)

1910-11	1911-12	1912-13	1913-14	1914-15	1915-16
5180.09	4838.17	4821.07	4667.21	4342.38	5333.95
1400.62	1486.37	1400.62	1143.36	1414.91	1200.53
400.26	410.52	369.47	307.89	348.94	369.47
896.44	799.52	993.35	775.30	1017.58	1199.28
474.41	435.95	435.95	384.66	474.41	564.17
317.86	306.50	340.56	306.50	306.50	374.62
633.58	645.32	504.52	281.59	563.18	504.52
130.96	144.64	86.00	89.91	111.41	117.28
142.91	110.32	130.37	110.32	210.60	135.38
276.21	295.49	280.50	267.65	299.77	246.24
647.98	624.83	671.12	624.83	601.63	647.98
758.03	560.29	659.16	774.51	790.99	609.72
397.12	489.60	337.28	609.28	516.80	576.64
278.62	266.51	278.62	278.62	266.51	266.61
111.34	134.89	139.18	160.59	207.70	226.97
19.02	19.02	19.02	19.02	19.02	19.02
13.04	13.53	11.35	7.73	7.49	14.49
21.66	23.02	23.14	21.83	23.56	22.37
186.49	190.61	211.01	218.24	221.85	263.59
326.34	271.95	271.95	271.95	326.34	326.34
1221.89	1117.15	1268.43	884.41	1268.43	1128.80
10803.77	10306.01	10412.59	9029.54	10002.84	10941.95
680.44	684.36	655.07	2008.62	848.50	744.89
1803.13	1674.72	1667.56	647.49	1909.42	1834.34
547.55	499.11	517.45	519.75	579.24	626.79
13834.89	13164.20	13252.67	12205.40	13340.00	14147.87

TABLE

Agricultural Product	1916-17	1917-18
Rice (170.96)	5692.30	5812.64
Wheat (142.92)	1429.20	1414.91
Barley (102.63)	389.99	389.99
Jawar (121.14)	993.35	872.21
Bajra (128.22)	410.30	269.26
Maize (113.52)	363.26	374.62
Gram (117.33)	621.85	668.78
Linseed (195.46)	117.28	48.87
Sesamum (250.72)	142.91	105.30
Rape & Mustard (214.12)	269.79	239.81
Sugarcane (213.42)	694.26	856.25
Cotton (164.79)	725.08	560.29
Jute (54.40)	397.12	337.28
Ragi (121.14)	266.51	254.39
Groundnut (214.12)	265.51	231.25
Castor (190.26)	19.02	19.02
Indigo (241.55)	24.40	31.16
Coffee (594.94)	21.54	22.49
Tea (708.57)	262.24	263.02
Tobacco (543.90)	326.34	271.95
Other foodgrains & pulses (116.37)	1245.16	1233.52
Food Crops	11411.92	11290.32
Oilseeds	814.51	644.25
Jute etc.	1816.46	1753.82
Tea etc.	634.52	588.62
TOTAL	14677.41	14277.01

13—(*Contd.*)

1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
3795.31	4923.65	4359.48	5214.28	5351.05	4410.77
1057.61	1386.32	943.72	1357.74	1372.03	1343.45
318.15	379.73	410.52	369.47	369.47	389.99
908.55	1114.49	957.00	1114.49	993.35	860.09
551.35	397.48	512.88	474.41	435.95	435.95
261.10	408.67	329.21	374.62	295.15	340.56
281.59	551.45	351.99	633.58	774.38	645.32
97.73	97.73	62.55	97.73	119.23	99.69
77.72	125.36	105.30	145.42	120.35	107.81
171.30	259.09	192.71	241.96	271.93	259.09
647.98	704.29	597.58	597.58	704.29	746.97
675.64	922.82	560.29	741.56	840.43	856.91
489.60	364.48	456.96	337.28	212.16	244.80
242.28	278.62	266.51	254.39	266.51	266.51
134.90	175.58	220.54	203.41	267.65	164.87
19.02	19.02	19.02	19.02	19.02	19.02
13.04	11.83	12.56	19.32	13.77	9.18
22.91	22.31	22.07	19.81	23.68	16.42
269.47	267.06	244.60	194.36	220.79	265.92
271.95	326.34	271.95	326.34	326.34	326.34
954.23	1186.97	977.49	1221.89	1280.07	1245.16
8370.17	10627.38	9108.80	11014.87	11137.96	9937.80
500.67	676.78	600.12	707.54	798.18	650.48
1813.22	1991.59	1614.83	1676.42	1756.88	1848.68
577.37	627.54	551.18	559.83	584.58	617.86
11261.43	13923.29	11874.95	13958.66	14277.60	13054.82

TABLE

Agricultural Product	1924-25	1925-26
Rice (170.96)	4701.40	4718.50
Wheat (142.92)	1243.40	1200.53
Barley (102.63)	307.89	297.63
Jawar (121.14)	957.01	835.87
Bajra (128.22)	397.48	500.06
Maize (113.52)	261.10	261.10
Gram (117.33)	621.85	563.18
Linseed (195.46)	107.50	86.00
Sesamum (250.72)	122.85	102.80
Rape & Mustard (214.12)	271.93	222.68
Sugarcane (213.42)	618.92	704.29
Cotton (164.79)	988.74	1005.22
Jute (54.40)	397.12	424.32
Ragi (121.14)	266.51	254.39
Groundnut (214.12)	282.64	391.84
Castor (190.26)	19.02	38.05
Indigo (241.55)	5.31	6.76
Coffee (594.94)	24.99	17.73
Tea (708.57)	265.86	257.57
Tobacco (543.90)	326.34	271.95
Other foodgrains & pulses (116.37)	1024.06	1093.88
Food Crops	9780.70	9725.14
Oilseeds	803.94	841.37
Jute etc.	2004.78	2133.83
Tea etc.	622.50	554.01
TOTAL	13211.92	13254.35

13—(*Contd.*)

1926-27	1927-28	1928-29	1929-30	1930-31	1931-32
4530.44	4274.00	4974.94	4838.17	4974.94	5282.66
1229.11	1057.61	1186.24	1414.91	1300.57	1286.28
297.63	246.31	287.36	266.84	277.10	277.10
835.87	944.89	932.78	1017.58	993.35	835.87
474.41	410.30	410.30	397.48	474.41	423.13
261.10	340.56	306.50	374.62	374.62	340.56
574.92	481.05	375.45	457.59	492.79	551.45
87.96	74.27	70.37	80.14	82.09	84.05
105.30	137.90	125.36	112.28	125.36	125.36
214.00	190.57	205.56	248.38	222.68	231.25
768.31	746.97	640.26	618.92	725.63	917.71
922.82	1004.09	1038.18	922.82	856.91	692.12
456.96	641.92	549.44	549.44	549.44	609.28
266.51	254.39	254.39	266.51	266.51	266.50
402.54	550.29	653.07	526.73	638.08	460.36
19.02	19.02	19.02	19.02	19.02	19.02
4.59	3.38	3.62	3.38	3.14	2.42
27.13	27.66	20.64	29.81	24.87	22.67
278.40	276.98	286.40	306.67	277.12	279.25
271.56	326.34	271.95	271.95	217.56	271.95
1152.06	977.51	791.31	1093.88	1035.69	1000.78
9622.05	8986.62	9519.27	10127.58	10189.98	10264.33
828.82	972.05	1073.38	986.55	1087.23	920.04
2148.09	2392.98	2272.88	2091.18	2131.98	2219.11
581.68	634.36	582.61	611.81	522.69	576.29
13180.64	12986.01	13403.14	13817.12	13931.88	13979.77

TABLE

Agricultural Product	1932-33	1933-34
Rice (170.96)	4889.46	4752.69
Wheat (142.92)	1329.16	1414.91
Barley (102.63)	277.10	287.36
Jawar (121.14)	872.21	860.01
Bajra (128.22)	423.13	397.48
Maize (113.52)	329.21	306.50
Gram (117.33)	492.79	551.45
Linseed (195.46)	82.09	76.23
Sesamum (250.72)	137.90	130.37
Rape & Mustard (214.12)	233.39	211.98
Sugarcane (213.42)	1088.44	1131.13
Cotton (164.79)	774.51	840.43
Jute (54.40)	304.64	337.28
Ragi (121.14)	290.73	278.62
Groundnut (214.12)	610.24	683.04
Castor (190.26)	38.05	19.02
Indigo (241.55)	2.66	1.93
Coffee (594.94)	22.01	22.01
Tea (708.57)	309.43	271.88
Tobacco (543.90)	271.95	217.56
Other foodgrains & pulses (116.37)	1058.97	965.87
Food Crops	9962.76	9814.89
Oilseeds	1101.67	1120.64
Jute etc.	2167.59	2388.84
Tea etc.	606.05	513.38
TOTAL	13838.07	13757.75

13—(*Contd.*)

1934-35	1935-36	1936-37	1937-38	1938-39	1939-40	1940-41
4735.59	4308.19	5145.90	4923.65	4462.06	4701.40	4068.85
1472.08	1414.91	1514.95	1472.08	1486.37	1586.41	1486.37
297.63	277.10	266.84	246.31	225.79	225.79	256.58
847.98	847.98	957.00	872.21	872.21	884.32	944.89
410.30	423.13	359.02	384.66	384.66	359.02	461.59
329.21	329.21	283.80	295.15	283.80	317.86	317.86
504.52	539.72	563.18	481.05	410.66	469.32	481.05
84.05	78.18	84.05	97.73	87.96	93.82	66.46
97.78	115.33	122.85	130.37	112.82	107.81	110.32
203.41	216.26	216.26	229.11	207.70	252.66	248.38
1173.81	1365.89	1451.26	1237.84	789.65	1045.75	1067.10
823.95	1005.22	1038.18	955.78	856.91	840.43	1005.22
424.32	337.28	489.60	456.96	364.48	516.80	549.44
230.17	230.17	242.28	218.05	193.82	218.05	242.28
372.57	451.79	580.27	749.42	669.47	678.76	792.24
19.02	19.02	19.02	19.02	19.02	19.02	19.02
2.42	1.69	1.69	1.69	1.45	1.21	2.66
21.48	27.78	23.02	22.90	26.89	23.14	21.00
282.86	279.46	280.03	304.83	320.20	320.70	328.71
271.95	271.96	271.95	271.95	271.95	271.95	271.95
1012.42	989.15	965.87	907.69	930.96	1070.60	1035.69
9839.90	9359.56	10298.84	9800.85	9250.33	9832.77	9295.16
776.83	880.58	1022.46	1225.65	1116.97	1152.07	1236.42
2422.08	2708.39	2979.04	2650.58	2011.04	2402.98	2621.76
578.71	580.89	576.69	601.37	620.49	617.00	624.32
13617.52	13529.42	14877.02	14278.45	12998.83	14004.82	13777.66

TABLE 13—(*Contd.*)

Agricultural Product	1941-42	1942-43	1943-44	1944-45	1945-46	1946-47	1947-48
Rice (170.96)	4598.82	4479.15	4923.65	4513.34			
Wheat (142.92)	1472.08	1615.00	1443.49	1543.54			
Barley (102.63)	225.79	256.58					
Jawar (121.14)	847.98	884.32	908.55	872.21			
Bajra (128.22)	448.77	576.99	538.52	487.24			
Maize (113.52)	283.80	329.21	311.86	329.21			
Gram (117.33)	434.12	551.45	445.85	492.79			
Linseed (195.46)	72.32	76.23	72.32	74.27			
Sesamum (250.72)	110.32	117.84	115.33				
R & M (214.12)	246.24	239.81	207.90				
Sugarcane (213.42)	1045.75	1067.10	1237.84				
Cotton (164.79)	1054.66	774.51					
Jute (54.40)	337.28	489.60					
Ragi (121.14)	242.28	218.05					
Groundnut (214.12)	554.57	612.38	817.93				
Castor (190.26)	19.02	19.02	19.02				
Indigo (241.55)	1.93	2.42					
Coffee (594.94)	24.75	21.89					
Tea (708.57)	355.06	399.70					
Tobacco (543.90)	326.34	271.95					
Other food-grains & Pulses (116.37)	977.51	1098.61	942.60				
Food Crops	9531.15	10010.36					
Oilseeds	1002.47	1065.28					
Jute etc.	2437.69	2331.21					
Tea etc.	708.08	695.76					
TOTAL	13679.39	14102.81					

TABLE 14

VALUE OF AGRICULTURAL OUTPUT OF THE INDIAN UNION

(In millions of rupees)

Agricultural Output	1900-01	1901-02	1902-03	1903-04
1. Rice (170.96)	3,897.89	3,504.68	4,222.71	3,675.64
2. Wheat (142.92)	786.06	800.35	1004.73	1143.36
SUB-TOTAL	4683.95	4305.03	5227.44	4819.00
3. Barley (102.63)	369.47	318.15	328.42	348.94
4. Jawar (121.14)	896.44	896.44	957.01	860.09
5. Bajra (128.22)	448.77	397.48	410.30	423.13
6. Maize (113.52)	283.80	306.50	306.50	306.50
7. Gram (117.33)	469.32	422.39	469.32	563.18
SUB-TOTAL	2467.80	2340.96	2471.55	2501.84
8. Linseed (195.46)	74.27	60.59	93.82	132.91
9. Sesamum (250.72)	117.83	90.26	145.42	157.95
10. Rape & Mustard (214.12)	169.15	179.86	190.57	205.56
11. Groundnut (214.12)	27.84	47.11	57.81	57.81
12. Castor (190.26)	19.02	19.02	19.02	19.02
SUB-TOTAL	408.11	396.84	506.64	573.25
13. Cotton (164.79)*	527.33	494.37	609.72	527.33
14. Jute (54.40)*	70.72	81.60	70.72	97.92
15. Sugarcane (213.42)	490.87	426.84	405.50	405.50
16. Tea (708.57)*	130.50	126.40	124.61	138.19
17. Coffee (594.94)*	27.90	26.24	24.10	24.51
SUB-TOTAL	1247.32	1155.45	1234.65	1193.45
18. TOTAL	8807.18	8198.28	9440.28	9087.54
19. Food Crops	7151.75	6645.99	7698.99	7320.84
20. Cash Crops	1655.43	1552.29	1741.29	1766.70
21. Index of Food Crops	106.38	98.86	114.52	108.90
22. Index of Cash Crops	56.14	52.64	59.05	59.91
23. Index of Agricultural Production	91.06	84.77	97.61	93 97

* NOTE—Figures in brackets 1924-28—average prices per ton except in the cases marked with an asterisk. For the relevant mints in such cases see table 11.

TABLE

Agricultural Output	1904-05	1905-06	1906-07	1907-08	1908-09
1. Rice (170.96)	3914.98	3869.70	3932.08	2872.13	3504.68
2. Wheat (142.92)	914.69	871.81	928.98	557.39	757.48
SUB-TOTAL	4829.67	4741.51	4861.06	3429.52	4262.16
3. Barley (102.63)	369.47	369.47	369.47	338.68	379.73
4. Jawar (121.14)	957.01	847.98	835.87	872.21	1005.46
5. Bajra (128.22)	307.73	346.19	435.95	410.30	487.77
6. Maize (113.52)	283.80	283.80	283.80	283.80	295.15
7. Gram (117.33)	457.59	457.59	527.99	211.19	445.85
SUB-TOTAL	2375.60	2305.03	2453.08	2116.18	2613.96
8. Linseed (195.46)	80.14	82.09	101.64	39.09	70.37
9. Sesamum (250.72)	90.26	97.78	92.77	77.92	115.33
10. Rape & Mustard (214.12)	154.67	162.73	205.56	117.77	162.73
11. Groundnuts (214.12)	53.53	51.39	66.38	68.52	92.07
12. Castor (190.26)	19.02	19.02	19.02	19.02	19.02
SUB-TOTAL	397.62	413.01	485.37	322.32	459.52
13. Cotton (164.79)*	659.16	609.72	873.39	527.33	642.68
14. Jute (54.40)*	81.60	97.92	103.36	119.68	70.72
15. Sugarcane (213.42)	469.52	362.81	448.16	426.84	405.50
16. Tea (708.57)*	146.45	146.45	159.49	161.61	163.40
17. Coffee (594.94)*	22.37	22.07	21.83	21.72	22.07
SUB-TOTAL	1379.10	1238.97	1606.25	1257.18	1304.37
18. TOTAL	8981.99	8698.52	9405.76	7125.20	8640.01
19. Food Crops	7205.27	7046.54	7314.14	5545.70	6876.12
20. Cash Crops	1776.72	1651.98	2091.62	1579.50	1763.89
21. Index of Food Crops Production	107.18	104.82	108.95	82.49	102.28
22. Index of Cash Crops Production	60.25	56.02	70.93	53.57	59.82
23. Index of Agricultural Production	92.87	89.94	97.25	73.67	89.34

14—(*Contd.*)

1909-10	1910-11	1911-12	1912-13	1913-14	1914-15
4393.67	4291.10	3914.98	3829.50	3846.60	3607.26
971.86	971.86	1057.61	1043.32	786.06	971.86
5365.53	5262.96	4972.59	4872.82	4632.66	4579.12
379.73	379.73	389.99	348.94	297.63	328.42
944.89	872.21	775.30	957.01	738.95	981.23
474.41	435.95	410.30	384.66	346.19	448.77
306.50	283.80	274.45	306.50	274.45	274.45
586.65	598.38	610.12	481.05	246.39	516.25
2692.18	2570.07	2460.16	2478.16	1903.61	2549.12
106.64	130.96	144.64	86.00	89.91	111.41
145.42	132.88	97.78	120.35	100.29	198.06
173.44	192.71	224.83	214.12	186.28	224.83
94.21	111.34	134.89	139.18	160.59	207.70
19.02	19.02	19.02	19.02	19.02	19.02
538.73	586.91	621.16	578.67	556.09	761.02
725.01	692.12	494.37	576.77	659.16	692.12
70.72	76.16	97.92	65.28	119.68	103.36
448.18	533.55	512.21	554.89	512.21	490.87
170.81	174.19	177.70	197.09	203.24	207.21
21.54	21.66	23.02	23.14	21.83	23.56
1436.26	1447.68	1305.22	1417.17	1516.12	1517.12
10032.70	9917.62	9359.13	9346.82	8608.48	9406.38
8057.71	7833.03	7432.75	7350.98	6536.27	7128.24
1974.99	2084.59	1926.38	1995.84	2072.21	2278.14
119.86	116.52	110.65	109.35	97.23	106.03
66.98	70.69	65.33	67.68	70.27	75.26
103.73	102.54	96.77	96.65	89.01	97.26

TABLE

Agricultural Output	1915-16	1916-17	1917-18	1918-19	1919-20	1920-21
1. Rice (170.96)	4410.77	4821.07	4855.26	3025.99	4359.48	3453.39
2. Wheat (142.92)	900.40	1086.19	1000.44	714.60	643.27	671.72
SUB-TOTAL	5311.17	5907.26	5855.70	3740.59	5002.75	4125.11
3. Barley (102.63)	359.21	369.47	369.47	307.89	359.21	410.52
4. Jawar (121.14)	1175.06	944.89	835.87	884.32	1102.37	872.21
5. Bajra (128.22)	512.88	384.66	243.62	512.88	371.84	487.24
6. Maize (113.52)	340.56	329.21	340.56	227.04	374.17	295.15
7. Gram (117.33)	492.79	586.65	610.12	258.13	516.25	340.26
SUB-TOTAL	2880.50	2614.88	2399.64	2190.26	2723.84	2405.38
8. Linseed (195.46)	117.28	117.28	48.87	97.73	97.73	62.55
9. Sesamum (250.72)	130.37	135.39	95.27	67.69	115.33	95.27
10. Rape & Mustard (214.12)	182.00	199.13	186.28	124.19	207.70	147.74
11. Groundnuts (214.12)	226.97	265.51	231.25	134.90	175.58	220.54
12. Castor (190.26)	19.02	19.02	19.02	19.02	19.02	19.02
SUB-TOTAL	675.64	736.33	580.69	443.53	615.36	545.12
13. Cotton (164.79)*	560.29	659.16	510.85	576.77	856.91	444.93
14. Jute (54.40)*	114.24	76.16	65.28	97.92	70.72	87.04
15. Sugarcane (213.42)	533.55	576.23	725.63	533.55	640.26	533.55
16. Tea (708.57)*	246.19	246.42	190.93	251.68	249.43	288.46
17. Coffee (594.94)*	22.37	21.54	22.49	22.91	22.31	22.07
SUB-TOTAL	1476.64	1579.51	1515.18	1482.83	1839.63	1376.05
18. TOTAL	10343.95	10837.98	10351.21	7857.21	10181.58	8451.66
19. Food Crops	8191.67	8522.14	8255.34	5930.85	7726.59	6530.49
20. Cash Crops	2152.28	2315.84	2095.87	1926.36	2454.99	1921.17
21. Index of Food Crops Production	121.85	126.77	122.80	88.22	114.93	97.14
22. Index of Cash Crops Production	72.99	78.54	71.08	65.33	83.26	65.15
23. Index of Agricultural Production	106.96	112.06	107.03	81.24	105.27	87.38

14—(*Contd.*)

1921-22	1922-23	1923-24	1924-25	1925-26	1926-27
4205.61	4376.58	3402.10	3846.60	3812.41	3709.83
900.40	957.56	614.69	900.40	814.64	843.23
5106.01	5334.14	4016.79	4747.00	4627.05	4553.06
348.94	348.94	369.47	297.63	287.36	287.36
1078.15	920.66	823.75	920.66	799.52	799.52
448.77	410.30	410.30	371.84	474.41	448.77
340.56	261.10	306.50	227.04	227.04	261.10
586.65	727.45	598.38	574.92	527.99	527.99
2803.07	2668.45	2508.40	2392.09	2316.32	2324.74
97.73	119.23	99.69	107.50	86.00	87.96
135.39	112.82	100.29	115.33	95.27	97.78
205.56	229.11	209.83	222.68	171.30	179.86
203.41	267.65	164.87	282.64	391.84	402.54
19.02	19.02	19.02	19.02	38.05	19.02
661.11	747.83	593.70	747.17	782.46	787.16
676.64	741.56	676.64	790.99	807.47	807.47
65.28	43.52	48.96	76.16	81.60	87.04
533.55	640.26	682.94	554.89	640.26	682.94
181.60	206.22	248.44	248.38	240.57	260.02
19.81	23.68	16.42	24.99	17.83	27.13
1476.88	1655.24	1673.40	1695.41	1787.73	1864.60
10047.07	10405.66	8792.29	9581.67	9513.66	9529.56
7909.08	8002.59	6525.19	7139.09	6943.37	6877.80
2137.99	2403.07	2267.10	2442.58	2570.29	2651.76
117.65	119.04	97.06	106.19	103.28	102.30
72.50	81.49	76.88	82.83	87.17	89.93
103.89	107.59	90.91	99.07	98.37	98.53

TABLE

Agricultural Output	1927-28	1928-29	1929-30	1930-31	1931-32	1932-33
1. Rice (170.96)	3538.87	4013.04	3932.08	3983.37	4239.81	3863.70
2. Wheat (142.92)	743.18	757.48	1029.02	914.69	943.27	957.56
SUB-TOTAL	4282.05	4770.52	4961.10	4898.06	5183.08	4821.26
3. Barley (102.63)	236.05	266.84	256.58	266.84	256.58	256.58
4. Jawar (121.14)	944.89	896.44	981.23	957.01	799.52	835.87
5. Bajra (128.22)	384.66	384.66	371.84	448.77	348.66	348.66
6. Maize (113.52)	306.50	272.45	340.56	340.56	306.50	295.15
7. Gram (117.33)	445.85	340.26	434.12	469.32	504.52	457.58
SUB-TOTAL	2317.95	2160.65	2384.33	2482.50	2215.78	2193.84
8. Linseed (195.46)	74.27	70.37	80.14	82.09	84.05	82.06
9. Sesamum (250.72)	130.37	125.36	112.82	125.36	125.36	137.90
10. Rape & Mustard (214.12)	145.60	160.59	203.41	175.58	177.72	184.14
11. Groundnut (214.12)	550.29	653.07	526.73	638.08	460.36	610.24
12. Castor (190.26)	19.02	19.02	19.02	19.02	19.02	38.05
SUB-TOTAL	919.55	1028.41	942.12	1040.13	866.51	1052.42
13. Cotton (164.79)*	988.74	922.82	774.51	708.60	576.76	642.68
14. Jute (54.40)*	125.12	108.80	108.80	108.80	119.68	59.84
15. Sugarcane (213.42)	661.64	576.23	554.89	661.60	811.00	939.05
16. Tea (708.57)*	287.02	267.50	286.43	258.83	260.82	287.03
17. Coffee (594.94)*	27.66	20.64	29.81	24.87	22.67	22.01
SUB-TOTAL	2090.18	1895.99	1754.44	1762.70	1790.93	1950.61
18. TOTAL	9609.73	9855.57	10041.99	10183.39	10056.30	10018.13
19. Food Crops	6600.00	6931.17	7345.43	7380.56	7398.86	7015.10
20. Cash Crops	3009.73	2924.40	2696.56	2802.83	2657.44	3003.03
21. Index of Food Crops Production	98.18	103.10	109.26	109.79	110.06	104.35
22. Index of Cash Crops Production	102.07	99.18	91.45	95.05	90.12	101.84
23. Index of Agricultural Production	99.36	101.91	103.83	105.30	103.98	103.59

14—(*Contd.*)

1933-34	1934-35	1935-36	1936-37	1937-38	1938-39
3761.12	3812.41	3470.49	4034.66	3914.98	3590.16
1043.32	1071.90.	1000.44	1071.90	986.15	1057.61
4804.44	4884.31	4470.93	5106.56	4901.13	4647.77
277.10	287.36	256.58	246.31	225.79	215.52
835.87	823.75	823.75	932.78	847.98	847.98
359.02	371.84	371.84	333.37	359.02	359.02
272.45	295.15	295.15	249.74	261.10	249.74
504.52	469.32	504.52	527.99	445.85	387.19
2248.96	2247.42	2251.84	2290.19	2139.74	2059.45
76.23	84.05	78.18	84.05	97.73	87.96
130.37	97.28	115.33	122.85	130.37	120.35
164.87	160.59	175.58	175.58	186.28	171.30
683.04	372.57	451.79	580.27	749.42	689.47
19.02	19.02	19.02	19.02	19.02	19.02
1073.53	733.51	839.90	981.77	1182.82	1088.10
659.16	593.24	708.60	659.16	659.16	593.24
65.28	81.60	65.28	97.92	87.04	70.72
981.73	1024.42	1052.47	1259.18	1067.10	661.60
254.00	264.26	261.02	261.55	291.15	299.07
22.01	22.01	21.48	27.78	23.02	22.90
1982.18	1985.53	2108.85	2305.59	2127.47	1647.53
10109.11	9850.77	9671.52	10684.11	10351.16	9442.85
7053.40	7131.73	6722.77	7396.75	7040.87	6707.22
3055.71	2719.04	2948.75	3287.36	3310.29	2735.63
104.92	106.08	100.00	110.03	104.73	99.77
103.62	92.21	100.00	111.48	112.26	92.77
104.53	101.86	100.00	110.47	107.03	97.64

TABLE

Agricultural Output	1939-40	1940-41	1941-42	1942-43	1943-44	1944-45	1945-46
1. Rice (170.96)	3761.12	3350.82	3521.78	3675.64	3846.60	3675.64	3402.01
2. Wheat (142.92)	1114.78	1057.61	971.86	1071.90	971.86	1043.32	871.81
SUB-TOTAL	4875.90	4408.43	4493.64	4747.54	4818.46	4718.96	4273.82
3. Barley (102.63)	215.52	246.37	215.52	236.05	225.79	246.31	236.05
4. Jawar (121.14)	860.10	920.66	823.75	847.98	872.21	835.87	666.27
5. Bajra (128.22)	333.37	487.24	410.30	512.88	487.24	435.95	371.84
6. Maize (113.52)	383.80	283.80	249.74	295.15	283.80	295.15	272.45
7. Gram (117.33)	445.85	445.85	398.92	504.52	410.66	457.59	445.85
SUB-TOTAL	2138.64	2383.86	2098.23	2396.58	2279.70	2270.87	1992.46
8. Linseed (195.46)	93.82	66.46	72.32	72.32	72.32	74.27	68.41
9. Sesamum (250.72)	107.81	110.32	100.29	107.81	102.80	87.75	87.75
10. Rape & Mustard (214.12)	211.98	207.70	203.41	179.86	164.87	177.72	154.17
11. Groundnut (214.12)	678.76	792.24	554.57	612.38	817.94	826.50	743.00
12. Castor (190.26)	19.02	19.02	19.02	28.53	26.63	24.73	22.83
SUB-TOTAL	1111.39	1195.74	949.61	1000.90	1184.56	1190.97	1076.16
13. Cotton (164.79)*	593.24	675.64	725.08	494.37	609.72	362.54	362.54
14. Jute (54.40)*	101.36	152.32	87.04	87.04	76.16	59.84	81.60
15. Sugarcane (213.42)	896.36	896.36	875.02	939.05	1088.44	1003.74	981.73
16. Tea (708.57)*	299.53	306.95	331.63	364.76	357.81	337.02	348.36
17. Coffee (594.94)*	26.89	23.14	21.00	22.62	22.49	23.61	27.36
SUB-TOTAL	1919.38	2054.41	2039.77	1907.84	2154.62	1786.75	1801.59
18. TOTAL	10045.31	10042.44	9581.25	10052.86	10437.34	9967.55	9144.03
19. Food Crops	7014.54	6792.29	6591.87	7144.12	7098.16	6989.83	6266.28
20. Cash Crops	3030.77	3250.15	2989.38	2908.74	3339.18	2977.72	2877.75
21. Index of Food Crops Production	104.34	101.04	98.05	106.27	105.59	103.97	93.21
22. Index of Cash Crops Production	102.78	110.22	101.37	98.64	113.24	100.98	97.59
23. Index of Agricultural Production	103.86	103.84	99.08	103.95	107.92	103.06	94.55

14—(*Contd.*)

1946-47	1947-48	1948-49	1949-50	1950-51	1951-52	1952-53
3709.83	3795.31	3863.70	3966.27	3470.49	3538.87	3926.93
714.60	800.35	814.64	900.40	914.69	871.81	1114.78
4424.43	4595.66	4678.34	4866.67	4385.18	4410.68	5041.71
256.58	266.84	225.79	225.79	236.05	236.05	277.10
642.04	726.84	605.70	702.61	654.16	726.84	726.84
346.19	359.02	282.08	359.02	333.37	294.91	371.84
261.10	272.45	238.39	227.04	192.98	227.04	295.15
422.39	410.66	527.99	434.12	422.39	387.19	375.46
1928.30	2035.81	1879.95	1948.58	1838.95	1872.03	2046.39
64.50	84.05	82.09	80.14	70.36	62.55	74.27
80.23	87.75	85.24	107.81	110.32	110.32	125.36
169.15	173.43	158.45	169.15	160.59	196.99	199.13
768.69	730.15	620.95	730.15	734.43	653.07	618.81
22.83	22.83	20.93	24.73	19.03	20.93	21.65
1105.40	1098.21	967.66	1111.98	1094.73	1043.86	1039.22
362.54	362.54	296.62	428.45	477.89	510.85	494.37
70.72	92.48	114.24	168.64	179.52	255.68	255.68
1045.76	1237.83	1045.76	1045.76	1195.15	1301.86	1131.26
378.98	398.03	409.42	414.53	430.33	454.32	519.76
29.54	20.81	20.77	28.77	32.32	32.45	30.24
1887.54	2111.69	1886.81	2086.15	2323.21	2555.16	2431.31
9345.67	9841.37	9412.76	10013.38	9642.07	9881.73	10558.63
6352.73	6631.47	6558.29	6815.25	6224.13	6282.71	7088.10
2992.94	3209.90	2854.47	3198.13	3417.94	3599.02	3470.53
94.50	98.64	97.55	101.38	92.58	93.45	105.43
101.50	108.86	96.80	108.46	115.91	122.05	117.70
96.63	101.76	97.33	103.54	99.70	102.18	109.18

TABLE 15

ESTIMATES OF YIELD PER ACRE OBTAINED FROM CROP-CUTTING EXPERIMENTS BY RANDOM SAMPLING AND THE CORRESPONDING OFFICIAL ESTIMATES

Crop	*Province/State*	*Year*	*No. of districts covered*	*Total No. of experiments*	*Estimated yield per acre (in lb.)*	*Corresponding official estimate (in lb. per acre)*	*Difference (column 6—column 7)*
1	2	3	4	5	6	7	8
Jute	Bengal	1942	9	1,127	1,522	N.A.	—
		1943	15	1,832	1,251	1,136	+ 115
		1944	25	300	1,267	1,465	— 198
		1945	25	1,254	1,234	1,251	— 17
		1946	25	1,159	930	1,210	— 280
Wheat	Punjab	1943-4	27	2,164	829	795	+ 34
		1944-5	28	1,599	917	867	+ 50
		1945-6	28	2,267	851	709	+ 142
	U.P.	1943-4	45	3,444	569	734	— 162
		1944-5	46	3,081	681	750	— 69
		1945-6	46	3,900	635	639	— 4
	C.P. & Berar	1944-5	19	944	388	403	— 15
		1945-6	19	1,434	418	365	+ 53
	Sind*	1944-5	8	648	(538)	(556)	— 18
		1945-6	8	1,013	(696)	(675)	+ 21
	N.W.F.P.*	1944-5	7	600	(619)	(547)	+ 72
		1945-6	7	719	(586)	(526)	+ 60
Autumn Rice	Bengal	1944-5	25	430	773	732	+ 41
		1945-6	25	2,129	617	691	— 74
		1946-7	25	2,584	576	658	— 82
	Bihar	1945-6	6	414	403	N.A.	— —
		1946-7	11	1,103	450	N.A.	— —
	Orissa	1945-6	2	595	435	403	+ 32
		1946-7	3	452	412	480	— 68
Winter Rice	Bengal	1943-4	25	2,722	732	815	— 83
		1944-5	25	N.A.	708	839	— 131
		1945-6	25	N.A.	N.A.	856	—
	U.P.	1945-6	35	3,434	530	(576)	— 36
		1946-7	35	N.A.	487	513	— 26
	Bihar	1945-6	16	1,724	712	N.A.	—
		1946-7	13	1,691	726	N.A.	—
	Orissa	1944-5	6	1,188	743	551	+ 192
		1945-6	6	762	785	571	+ 214
		1946-7	6	859	700	579	+ 121
	Bombay	1944-5	1	223	1080	1043	+ 37
		1945-6	15	717	934	938	— 4
		1946-7	15	1,316	938	835	+ 103
Winter Rice	C. P. & Berar	1944-5	1	410	713	650	+ 63
		1945-6	10	882	676	615	+ 61
		1946-7	10	2,051	638	518	+ 120
	Madras	1944-5	1	395	907	N.A.	—
		1945-6	7	1,054	939	918	+ 21
		1946-7	14	2,189	950	1,003	— 53

NOTE: (1) Results for Bengal supplied by the Indian Statistical Institute.
(2) Results for all the other Provinces/States supplied by the Statistical Adviser, Indian Council of Agricultural Research.
(3) Yield of Jute in terms of dry fibre and rice in terms of cleaned rice.
(4) Adopted principally from Table 9 of R.C. Desai's paper on Consumer Expenditure in India 1931-2 to 1940-1, J.R.S.S. 1948, Part IV.
(5) Independent comparison of crop cutting experiments and official estimates not possible after 1949 for lack of data. The crop-cutting experiments of the Indian Council of Agricultural Research were stopped in 1950.
(6) Province/State marked with asterisk (*) not included in the Indian Union.
(7) N.A. stands for "not available."

APPENDIX 1

Year	*Rice*	*Wheat*	*Barley*	*Maize*	*Gram*	*Sugar Raw*	*Tea*	*Linseed*	*Rape seed*	*Sesamum*	*Groundnut*	*Jute*	*Cotton*	*General index*	*Trend*
1915	273	101	31	21	39	24	313	4	12	6	9	104	52	105	102.6
1916	327	87	32	25	34	26	372	5	11	5	11	73	37	106	103.3
1917	351	102	33	23	42	28	370	5	12	5	12	83	45	117	104.0
1918	360	90	33	24	44	35	371	5	12	4	11	89	41	118	104.6
1919	243	75	28	18	19	25	380	2	8	3	6	70	40	84	105.3
1920	320	101	32	26	37	30	377	4	12	4	8	85	58	113	106.0
1921	277	67	25	21	24	25	345	3	9	4	10	59	36	90	106.7
1922	331	98	31	25	44	26	274	4	13	5	10	40	45	108	107.4
1923	337	100	31	19	52	30	312	5	12	5	12	54	51	114	108.1
1924	282	97	29	22	45	33	375	5	11	4	11	84	52	107	108.8
1925	311	89	26	17	42	25	375	5	12	5	15	81	61	111	109.5
1926	307	87	26	19	39	30	363	4	9	4	20	89	62	112	110.2
1927	297	90	26	19	40	33	393	4	10	4	20	121	50	112	110.9
1928	282	78	21	23	32	32	391	3	8	5	27	120	60	109	111.6
1929	321	86	25	20	27	27	404	3	9	5	32	99	58	116	112.3
1930	311	105	23	24	28	28	433	4	11	5	27	103	52	117	113.1
1931	320	93	24	24	32	32	391	4	10	5	31	133	49	118	113.8
1932	330	90	24	22	40	40	394	4	10	5	23	65	40	112	114.6
1933	311	95	23	21	34	47	434	4	10	5	30	71	46	116	115.3
1934	309	94	24	19	37	51	383	4	9	5	33	80	50	119	116.0
1935	303	97	..	..	..	51	400	4	9	4	19	64	57	105	116.8
1936	277	94	..	..	..	59	396	4	10	5	22	72	60	116	117.5

NOTE: The actual production figures of crops for the basic period as well as for other years expressed in lakhs of tons except in the case of cotton, jute and tea. In the case of cotton and jute the production is expressed in lakhs of bales of 400 lbs each, while in case of tea it is expressed in millions of lbs.

SOURCE: *D. B. Meek*, "Some Measures of Economic Activity in India," *Journal of Royal Statistical Society*, cIII, 1937, Table 1 p. 365-66 In Column I 1915 refers to 1914-15 and so on.

APPENDIX II(*a*)

INDEX NUMBER OF AGRICULTURAL PRODUCTION IN THE INDIAN UNION FROM 1920-21 TO 1950-51

(Base average of three years ending 1938-39=100)

Years	*Index of production of food crops*		*Index of production of non-food crops*		*General Index of agricultural production*		*Population* (Millions)	*Index*	*Index of agricultural production adjusted for population*		
	Meek's series	*Adjusted*	*Meek's series*	*Adjusted*	*Meek's series*	*Adjusted*			*Food crops* (3÷9)	*Non-food crops* (5÷9)	*General* (7÷9)
1	2	3	4	5	6	7	8	9	10	11	12
1921-22	113.6	100.0	91.5	63.5	107.7	88.4	250.7	82.9	120.6	76.6	106.6
1922-23	117.0	103.0	105.3	73.1	113.8	93.4	253.3	83.8	122.9	87.2	111.5
1923-24	104.8	92.3	114.1	79.2	107.3	88.1	256.0	84.7	109.0	93.5	104.0
1924-25	105.1	92.5	126.7	88.0	110.9	91.1	258.7	85.5	108.2	102.9	106.5
1925-26	104.8	92.3	130.0	90.3	111.6	91.6	261.4	86.4	106.8	104.5	106.6
1926-27	104.6	92.1	132.2	91.8	112.0	92.0	264.1	87.3	105.5	105.2	105.4
1927-28	97.2	85.6	141.0	97.9	109.0	89.5	266.9	88.3	96.5	110.9	101.4
1928-29	104.6	92.1	146.0	101.4	115.8	95.1	269.7	89.2	103.5	113.7	106.6
1929-30	107.9	85.6	140.6	97.6	116.7	95.8	272.5	90.1	105.4	108.3	106.3
1930-31	109.0	92.1	143.6	99.7	118.4	97.2	275.4	91.1	105.4	109.4	106.7
1031-32	113.1	95.0	109.2	75.8	112.1	92.0	279.1	92.3	107.9	82.1	99.4
1932-33	111.5	96.0	129.0	89.7	116.2	95.4	282.9	93.6	104.9	95.8	101.9
1933-34	112.4	99.6	135.9	94.4	118.7	97.5	286.8	94.8	104.3	99.6	102.8
1934-35	112.2	98.2	118.9	82.6	114.0	93.6	290.5	96.7	102.8	86.0	97.4
1935-36	108.5	95.5	128.7	89.4	113.9	93.5	294.4	97.4	98.0	91.8	96.0
1936-37	121.2	106.7	145.2	100.8	127.7	104.8	298.4	98.7	108.1	102.1	106.2
1037-38	116.3	102.4	151.3	105.1	125.7	103.2	302.4	100.0	102.4	105.1	103.2
1938-39	103.3	90.9	135.5	94.1	112.0	92.0	306.5	101.4	89.6	92.8	90.7
1939-40		96.4		98.8		96.9	310.6	102.7	98.9	96.2	94.4
1940-41		97.3		112.7		100.5	314.8	104.1	93.5	108.3	96.5
1941-42		91.3		97.4		92.6	318.1	105.2	86.8	92.6	88.0
1942-43		99.9		92.3		98.3	321.4	106.3	94.0	86.8	92.5
1943-44		104.7		105.4		104.8	324.8	107.4	97.5	98.1	97.6
1944-45		102.2		93.3		100.4	328.2	108.5	94.2	86.0	92.5
1945-46		92.6		89.0		91.8	331.6	109.7	84.4	81.1	83.7
1946-47		94.8		90.5		93.9	335.1	110.8	85.6	81.7	84.7
1947-48		99.1		91.4		97.5	338.6	112.0	88.5	81.6	87.1
1948-49		97.2		84.4		94.5	342.2	113.2	85.9	74.6	83.5
1949-50		99.8		99.5		99.7	349.8	115.7	86.3	86.0	86.2
1950-51		94.9		102.8		96.6	356.9	118.0	80.4	89.1	81.9

SOURCE: A. R. Sinha, "The Trend of Agricultural Production in India during the last thirty years—A preliminary study with some observations on the food situation of the country." International Statistical Conference, December, 1951, India, *Bulletin of the International Statistical Institute*, Vol. XXXIII, Part V., pp. 219.

APPENDIX II(*b*)

Year	*Rice* (00,000 omitted)	*Wheat* (0,000 omitted)	*Barley* (0,000 omitted)	*Maize** (0,000 omitted)	*Gram* (0,000 omitted)	*Sugar* (0,000 omitted)	*Tea* (000,000 omitted)	*Linseed* (000 omitted)	*Rapeseed* (000 omitted)	*Sesa-mum* (000 omitted)	*Ground-nut* (0,000 omitted)	*Jute* (*bales*) (00,000 omitted)	*Cotton* (*bales*) (0,000 omitted)
1925-26	260	870	258	184	385	298	364	402	909	376	161	89	613
1926-27	246	897	255	183	394	327	393	406	1004	384	165	121	495
1927-28	233	779	209	222	318	322	391	348	840	498	227	102	590
1928-29	273	859	252	195	266	270	404	322	910	455	262	99	574
1929-30	261	1047	229	241	305	275	433	380	1095	405	218	103	520
1930-31	271	931	239	236	340	323	391	377	988	451	259	112	519
1931-32	288	902	239	223	377	398	394	416	1025	446	215	55	400
1932-33	262	946	235	211	344	468	434	406	1042	486	285	71	462
1933-34	257	937	241	187	374	490	384	376	943	474	319	80	505
1934-35	257	973	251	225	363	514	399	420	900	352	174	85	480
1935-36	232	943	233	223	384	593	394	388	957	413	211	72	587
1936-37	278	975	231	195	412	648	395	420	964	439	271	96	618
1937-38	268	1076	209	212	353	540	430	461	1024	465	350	87	578

SOURCE : The Trend of Agricultural Production in India during the last thirty years—A preliminary study, with some observations on the food situation of the country. A. R. Sinha, International Statistical Conference, December 1951, India Bulletin of the International Statistical Institute Vol. XXXIII, Part V, pp. 207-8, Table 7.

* 120,000 tons out of the increase from 1,870,000 tons to 2,250,000 is due to additional acreage. Units tons except in case of tea (where it is lbs.) and jute and cotton (where it is bales of 400 lbs. each).

APPENDIX II(*b*)—(*Contd.*)

Year	*Rice*	*Wheat*	*Barley*	*Maize*	*Gram*	*Sugar*	*Tea*	*Linseed*	*Rapeseed*	*Sesa-mum*	*Ground-nut*	*Jute*	*Cotton*
1941-42	89.2	91.8	93.9	102.3	86.0	83.4	119.2	80.8	114.2	97.4	80.9	86.8	109.1
1942-43	93.4	97.7	105.9	117.4	111.1	99.8	132.8	91.8	103.3	108.2	91.1	86.3	76.1
1943-44	106.1	90.0	98.6	116.4	89.4	113.9	134.7	85.3	94.4	104.8	121.7	76.8	89.4
1944-45	101.4	97.3	109.5	118.3	102.1	106.5	121.4	88.8	113.0	90.1	122.9	61.1	53.7
1945-46	93.9	84.2	101.4	108.7	99.5	102.2	136.0	82.0	98.1	90.3	110.5	76.8	52.2
1946-47	102.4	68.3	110.4	107.3	93.3	110.3	146.0	76.6	108.0	77.3	114.3	69.5	51.2
1947-48	100.0	76.5	113.5	110.5	111.7	130.3	153.3	85.0	106.7	79.8	109.9	87.4	52.7
1948-49	106.6	77.6	99.5	94.5	117.4	109.4	154.7	98.8	100.3	85.5	92.4	107.9	45.3
1949-50	108.5	85.6	96.8	91.8	94.3	110.1	157.2	96.0	108.2	95.7	107.6	162.6	63.63
1950-51	95.8	91.8	101.8	76.7	97.4	122.7	162.9	90.0	112.7	107.4	106.1	173.2	70.7

SOURCE: Tables 1 and 7. A. R. Sinha, "The Trend of Agricultural Production in India during the last thirty years—A preliminary study, with some observations on the food situation of the country," International Statistical Conference, December 1951, India, *Bulletin of the International Statistical Institute*, Vol. XXXIII, Part V, pp. 207-8.

To ensure comparability the figures prior to 1934-35 were computed on the basis of 2,060,000 tons as 100 that being the average for the years 1925-26 to 1929-30, but the figures subsequent to 1934-35 were calculated on the basis of 2,250,000 tons as 103.

APPENDIX II(c)

INDEX NUMBER OF THE VOLUME OF AGRICULTURAL PRODUCTION—INDIA (1925-26 to 1937-38) AND INDIAN UNION (1939-40 TO 1950-51)

Year Average 1925-26 to	*Rice* (2,55,-00,000 tons)	*Wheat* (89,00,-000 tons)	*Barley* (24,10,-000 tons)	*Maize* (20,60,-000 tons)	*Gram* (33,40,-000 tons)	*Sugar* (29,80,-000 tons)	*Tea* (39,70-00,000 lbs)	*Linseed* (3,72,-000 tons)	*Rape-seed* (9,52,-000 tons)	*Sesa-mum* (4,24,-000 tons)	*Ground-nut* (20,70,-000 tons)	*Jute* (1,03,-00,000 bales)	*Cotton* (55,80,-000 bales)
1929-30	100	100	100	100	100	100	100	100	100	100	100	100	100
1925-26	102	98	107	89	116	100	92	108	95	89	78	87	110
1926-27	97	101	106	91	118	110	99	109	106	91	80	118	80
1927-28	91	87	87	108	95	108	98	94	88	117	110	99	106
1928-29	107	96	105	95	80	90	102	87	96	107	127	96	103
1929-30	103	118	95	117	91	92	109	102	115	96	105	100	93
1930-31	106	105	99	115	102	108	99	101	104	106	125	109	93
1931-32	113	101	99	108	113	134	99	112	108	105	104	53	72
1932-33	103	106	98	102	103	157	109	109	110	115	138	69	83
1933-34	101	105	100	91	112	164	97	101	99	112	154	78	91
1934-35	101	109	104	103	103	173	101	113	95	83	84	83	86
1935-36	91	106	96	102	109	199	99	104	101	97	102	70	105
1936-37	109	110	97	90	117	218	100	113	101	104	131	93	111
1937-38	105	121	87	97	—	181	108	124	108	110	169	85	104
Average production 1936-37 to	(212,-00,000 tons)	(72,80,-000 tons)	(22,20,-000 tons)	(21,90,-000 tons)	(38,60,-000 tons)	(44,50,-000 tons)	(36,90,-00,000 lbs)	(428,-000 tons)	(733,-000 tons)	(392,000 tons)	(31,40,-000 tons)	(19,00,-000 bales)	(40,60,-000 bales)
1938-39	100	100	100	100	100	100	100	100	100	100	100	100	100
1939-40	94.8	103.3	95.0	112.8	94.0	90.1	104.9	105.8	119.0	97.7	100.6	97.9	89.7
1940-41	85.8	98.1	109.0	112.8	95.1	113.5	108.7	98.6	115.4	102.3	117.8	145.8	107.6

APPENDIX III

Year	*Capital Index of industrial activity (base 1935-100)*	*Meek's index of industrial production (base—1909-10 1913-14 av=100)*	*Meek's index of industrial production (base-average of 1911-12—1913-14=100)*	*K. L. Datta's index of industrial activity (base—1890-94 =100)*	*Findlay, Shirras index of industrial activity (base 1890-94 =100)*	*Extended Meek index**	*Arora & Iyengar's index (1900=100)*	*"Eastern Economists" (August 1939=100)*
1	2	3	4	5	6	7	8	9
1900-01			51	128	146	26.6	100	
1901-02			65	136	155	27.4	106	
1902-03			67	140	169	28.3	112	
1903-04			70	148	184	29.4	120	
1904-05			73	160	198	31.2	129	
1905-06			80	163	217	32.8	136	
1906-07			81	179	230	34.0	147	
1907-08			85	168	237	35.5	153	
1908-09			85	185	246	35.8	157	
1909-10			95	193	278	39.3	171	
1910-11			92	202	278	38.1	175	
1911-12			93	222	316	38.6	196	
1912-13			104		369	43.2	229	
1913-14			103		362	42.7	225	
1914-15		106	108		360	44.0	224	
1915-16		124	127		376	51.5	234	
1916-17		125	127		397	51.9	247	
1917-18		122	125		403	50.6	251	
1918-19		114	117		417	47.3	260	
1919-20		120	123			49.8	274	
1920-21		122	125			50.6	289	
1921-22		116	118		(100)	48.1	305	
1922-23		120	122		(106)	49.8	323	

APPENDIX III—(*Contd.*)

Year	*Capital Index of industrial activity (base 1935-100)*	*Meek's index of industrial production (base—1909-10 1913-14 av=100)*	*Meek's index of industrial production (base-average of 1911-12—1913-14=100)*	*K.L. Datta's index of industrial activity (base—1890-94 =100)*	*Findlay, Shirras index of industrial activity (base 1890-94 =100)*	*Extended Meek index**	*Arora & Iyengar's index (1900=100)*	*"Eastern Economists" (August 1939=100)*
1	2	3	4	5	6	7	8	9
1923-24		120	127		(107)	49.8	326	
1924-25		137	147		(116)	56.9	354	
1925-26		136	148		(115)	56.4	351	
1926-27		149	161		(118)	61.8	360	
1927-28		156	172		(122)	64.7	372	
1928-29		137	151		(123)	56.9	375	
1929-30		162	180		(129)	67.2	393	
1930-31		149	163		(117)	61.8	392	
1931-32		160	148		(103)	66.4	345	
1932-33	81.4	160	157		(102)	66.4	342	
1933-34	87.7					77.2	368	
1934-35	97.3					82.9	408	
1935-36	100.7					89.4	423	
1936-37	105.0					94.6	441	
1937-38	111.5					102.1	468	
1938-39	111.1					101.7	466	
1939-40	114.0					110.3	479	105.2
1940-41	117.3					114.2	492	105.7
1941-42	122.7					123.2	515	113.5
1942-43	108.8					125.5	457	108.0
1943-44	109.2					126.8	459	111.5
1944-45	120.7					121.7	507	117.0
1945-46	127.5					120.0	535	119.7
1946-47	115.0					105.0	483	111.9
1947-48	107.0					105.9	449	104.0
1948-49	107.6					115.9	452	107.3
1949-50	109.4						459	104.3
1950-51	110.8						465	104.9
1951-52	125.7							
1952-53	132.4							

* The *Eastern Economist* index has been carried back to 1932-33 and has been linked with Meek's index (base 1911-12 to 1913-14-100) up to 1911-12. Figures before 1911-12 has been calculated with base 1905-6 and linked with 1911-12.

APPENDIX

ESTIMATES OF CONSUMER EXPENDITURE BY R. C. DESAI* IN CURRENT

(Rs.

		1931-2[a]		1932-3[a]	
1	Food-				
	(*a*) Cereals and pulses				
	(1) Rice	3,310	3,419	2,819	3,136
	(2) Wheat	644	725	663	701
	(3) Jawar & bajra	603	708	669	721
	(4) Gram & pulses	568	608	535	655
	(5) Others	640	695	678	698
	Total (*a*):	5,765	6,155	5,364	5,911
	(*b*) Meat & fish	889	841	944	843
	(*c*) Oils & fats	2,012	1,572	1,727	1,446
	(*d*) Sugar	721	853	781	937
	(*e*) Dairy products	2,576	1,872	2,345	1,852
	(*f*) Fruits & vegetables	4,836	2,724	3,799	2,745
	(*g*) Spices	1,767	1,125	1,533	1,225
	(*h*) Salt etc.	151	153	140	133
	(*i*) Non-alcoholic beverages	82	56	71	54
	(*j*) Miscellaneous	37	36	37	38
	Total Food	18,836	15,386	16,741	15,184
2	Total narcotic & drugs	289	287	279	260
3	Tobacco	1,127	1,102	1,057	1,123
4	Dress (textiles)	2,036	2,105	2,139	2,276
5	Footwear	203	125	202	124
6	Housing	1,473	1,473	1,457	1,457
7	Fuel, lighting & power	551	515	508	496
8	Household goods	553	577	550	579
9	Personal effects	197	160	208	174
10	Amusements	53	55	53	60
11	Reading matter	101	95	98	95
12	Transport	520	519	520	517
13	Communications	58	60	59	59
14	Services	2,091	1,999	2,080	2,021
	Grand total:	28,088	24,458	25,947	24,425
	Expenditure per capita†	82.5	71.8	75.1	70.9
	Population	340.5		345.3	

* Adopted and consolidated from 'Consumer Expenditure in India, 1931-2 to 1940-1, R. C. Desai, Journal of Royal Statistical Society, Series 4 (General), Part IV, 1948, Tables 1 and 6.

† In rupees.

[a] Figures in the second column under each year represents the corresponding figures in constant 1938-9 prices as given in Table 6 of the paper.

IV

IN INDIA AND PAKISTAN AS DERIVED
AND CONSTANT 1938-9 PRICES

Millions)

1933-4[a]		1934-5[a]		1935-6[a]		1936-7[a]	
2,679	3,184	3,065	3,235	2,837	2,853	3,309	3,382
821	732	702	725	745	766	739	713
608	715	684	696	657	699	765	737
517	605	560	661	515	608	611	629
625	675	647	644	684	681	671	651
5,250	5,911	5,658	5,981	5,438	5,607	6,095	6,112
837	854	853	872	833	878	842	875
1,471	1,493	1,565	1,495	1,511	1,376	1,511	1,429
796	1,055	888	1,126	834	1,175	713	1,235
2,182	1,853	2,066	1,873	1,997	1,894	1,951	1,953
3,592	2,659	2,948	2,796	2,507	2,795	2,984	2,825
1,495	1,215	1,208	1,152	1,448	1,380	1,435	1,358
152	148	142	140	150	149	157	156
65	54	73	64	74	68	76	74
34	35	36	36	39	39	40	40
15,874	15,277	15,437	15,535	14,831	15,361	15,804	16,057
275	264	277	275	290	283	292	290
1,033	1,138	907	1,021	1,062	1,217	999	1,143
1,961	2,169	2,051	2,162	2,046	2,238	2,121	2,354
173	126	132	121	125	126	135	139
1,503	1,503	1,539	1,539	1,514	1,514	1,512	1,512
499	492	518	520	503	514	509	528
567	623	603	632	648	696	641	677
210	198	202	187	222	209	224	216
58	65	58	65	69	72	73	73
105	100	120	115	125	117	22	125
527	528	556	560	565	565	571	572
60	60	61	61	63	63	63	63
2,004	1,973	1,972	1,963	2,072	2,060	2,105	2,104
24,849	24,516	24,434	24,756	24,135	25,035	25,171	25,853
71.0	70.0	68.8	69.7	67.0	69.5	68.9	70.8
352.2		355.1		360.2		365.3	

APPENDIX IV—(*Contd.*)

	1937-8[a]		1938-9[a]		1939-40[a]		1940-1[a]	
1. Food—								
(*a*) Cereals and pulses:								
(1) Rice	3,201	3,234	2,940	2,940	3,187	3,013	3,581	2,841
(2) Wheat	891	714	849	849	828	794	1,006	842
(3) Jawar & bajra	732	713	711	711	833	706	860	807
(4) Gram & pulses	579	614	585	585	650	524	678	544
(5) Others	665	645	619	619	754	614	792	668
TOTAL (*a*)	6,068	5,920	5,704	5,704	6,882	5,651	6,917	5,702
(*b*) Meat & fish	881	875	890	890	892	905	945	942
(*c*) Oils & fats	1,542	1,459	1,508	1,508	1,487	1,454	1,702	1,519
(*d*) Sugar	950	1,413	1,267	1,267	821	808	751	963
(*e*) Dairy products	2,014	2,033	1,994	1,994	2,070	2,055	2,193	2,092
(*f*) Fruits & vegetables	2,916	2,767	2,784	2,784	2,649	2,834	2,839	2,816
(*g*) Spices	1,301	1,222	1,199	1,199	1,211	1,271	1,358	1,319
(*h*) Salt etc.	155	156	150	150	169	165	170	160
(*i*) Non-alcoholic beverages	79	78	76	76	73	72	83	68
(*j*) Miscellaneous	44	44	44	44	45	44	48	43
TOTAL FOOD	15,950	15,948	15,616	15,616	16,299	15,259	17,006	15,606
2. Total narcotic & drugs	310	305	286	286	259	259	273	272
3. Tobacco	974	1,085	1,203	1,203	1,178	1,193	1,270	1,206
4. Dress (textiles)	2,323	2,296	2,476	2,476	2,481	2,415	2,729	2,610
5. Footwear	162	167	168	168	213	193	334	237
6. Housing	1,530	1,530	1,561	1,561	1,601	1,601	1,636	1,636
7. Fuel, lighting & power	568	569	548	548	556	550	602	554
8. Household goods	669	686	677	677	701	684	765	724
9. Personal effects	246	235	241	241	248	240	244	219
10. Amusements	80	80	81	81	97	95	101	97
11. Reading matter	125	140	150	150	156	156	168	168
12. Transport	595	595	573	573	586	571	621	575
13. Communications	67	67	66	66	69	69	73	73
14. Services	1,257	2,160	2,206	2,206	2,317	2,308	2,462	2,412
GRAND TOTAL	25,756	25,863	25,852	25,852	26,761	25,953	28,284	26,389
Expenditure per capita†	69.5	69.8	68.8	68.8	70.2	67.2	73.2	68.3
Population	370.4		375.7		381.0		386.3	

Index