



REPORT
OF
THE COMMITTEE ON KEY VILLAGES

MINISTRY OF FOOD & AGRICULTURE
(DEPARTMENT OF AGRICULTURE)
GOVERNMENT OF INDIA

No. 520/61-AHC
KEY VILLAGE EXPERT COMMITTEE
MINISTRY OF FOOD AND AGRICULTURE
(DEPARTMENT OF AGRICULTURE)
GOVERNMENT OF INDIA.

New Delhi, February 21, 1961
Phalguna 2, 1882 Saka

To

The Secretary to the Government of India,
Ministry of Food & Agriculture,
(Department of Agriculture),
New Delhi.

Dear Sir,

The report of the Key Village Expert Committee, appointed by the Government of India in Department of Agriculture letter No. 13-155/59-LD, dated the 8th December, 1959, is submitted herewith.

One of our colleagues, Shri N. Sri Rama Reddy, who has been unable to come to Delhi has not signed the report.

Yours sincerely,

L. SAHAI—*Chairman*

Y.M. PARNARKER—*Member*

A.C. MATHUR—*Member Secretary*

S. KRISHNAMURTHY—*Jt. Secy.*

PREFACE

A suggestion was made to the Government of India to set up an Expert Committee to review and evaluate the work done under the All-India Key Village Scheme and to utilize the findings and recommendations of such a Committee both for the purpose of framing proposals for the Third Plan and also for the successful implementation of other cattle development programmes during the Third Five Year Plan. The Government of India accepted this suggestion and constituted an Expert Committee with the following terms of reference, vide their letter No. 13-155/59-LD, dated the 5th December, 1959—(Appendix I)—

- I. (a) To review the working of the Key Village Scheme and to evaluate the progress made thereunder ;
 - (b) to examine the progress made in regard to the adoption of artificial insemination technique for breeding cattle and its economics and usefulness in relation to natural breeding;
 - (c) to examine the programme and progress under the calf subsidy scheme and its achievements;
 - (d) to examine the programme for development of feed and fodder resources in Key village blocks and suggest suitable measures and modifications for implementation of the scheme;
 - (e) to suggest a suitable programme for the organisation of marketing facilities for livestock and livestock products in the Key village areas; and
 - (f) to make suitable recommendations for formulating future programme of work under the Key Village scheme.
- II. (a) to study the importance of cows and buffaloes in the farmers' economy in the different regions of the country;
 - (b) to demarcate—
 - (i) areas and tracts where the cow has been quite popular with the villagers and has served as an economic and useful animal;
 - (ii) areas where only cows are being maintained, for example, Eastern States like Orissa, West Bengal, etc.;
 - (iii) areas where both cows and buffaloes are maintained by villagers, eg., Punjab, Western U.P.;

(ii)

- (c) to evolve a policy for development of cows and buffaloes in the different areas detailed above and examine the advisability or otherwise of introducing buffalo breeding indiscriminately in areas where cows have been kept mainly so far by the farmer.

According to the Government notification, the Committee was to decide its own working procedure and programme of visits to the states. The Committee held its first meeting at Delhi on 21st December 1959 to consider the procedure to be adopted for obtaining information on the various points included in its terms of reference. It was decided by the Committee that notes on the various terms of reference should be got prepared and also that a questionnaire should be drawn up and circulated to the States for eliciting information on the various points included in its terms of reference. In accordance with this decision a questionnaire (Appendix II) was drawn up and circulated to the States on 16th January, 1960.

The Committee met again on 25th January, 1960 and it was decided that in order to study the working of the Key village centres which were located under a variety of conditions prevailing in this country, it was necessary to visit some of the selected ones so as to obtain first-hand knowledge about the progress made in these centres on the various items of work included in the technical programme as well as for studying local problems and difficulties experienced by the workers in the implementation of the programme of work. The States visited by the Committee were Assam, Bihar, Bengal, Orissa, Madras, Andhra Pradesh, Kerala, Mysore, Rajasthan, Gujarat and Maharashtra.

In the course of its visits to the States the Committee took the opportunity of not only visiting the key village centres to examine their working and evaluate their progress, but it also met the staff employed at all levels in the Animal Husbandry Departments, particularly those connected with key village and other cattle development work. In certain States the Committee also met the Secretaries to the Departments of Animal Husbandry and certain prominent private cattle breeders in order to know their viewpoint in regard to the key village programme and any suggestions that they might have to make with reference to the work assigned to the Committee. At all places free and frank discussions were held, as a result of which the Committee was able to collect much valuable information in regard to the working of the scheme.

As the Committee consisted of members who had to attend to multifarious duties in addition to the work assigned to the Committee, it was not possible for the Committee to visit all the States in the country nor all the key villages located within the States visited.

The Committee had to remain content with visiting only a few selected key village blocks in the various States, but, as far as possible, it was assured that the group of key village blocks visited in the States included apparently all types, good, bad and indifferent. As a result of that the committee has been able to get a fairly good idea of the working of the scheme as a whole, on which to base its recommendations.

However, it may be mentioned that the Committee could not visit States like the Punjab and the U.P., in which some important breeding tracts are located. Nor could the Committee visit certain hilly areas like the States of Jammu and Kashmir and Himachal Pradesh.

Originally, the Committee was required by the Government of India to submit its report by the end of March, 1960. However, due to the pre-occupation of the members with other work, the Committee had to ask for extension of time limit for submission of its report until the end of January, 1961.

The Committee would like to record its deep appreciation of the co-operation received by it from the State Directors of Animal Husbandry, who were co-opted as members by the Committee during its visits to the States, the Deputy Directors incharge of the key village scheme and other staff employed under the key village scheme. The information and facilities provided by these officers helped the committee considerably in making an on the spot study of the problem and evaluating the progress of key village work. All States, except two, sent replies to the questionnaire. The Committee is also grateful to those non-officials who participated in the discussions and placed their points of view before the Committee in regard to its various terms of reference.

The report has been divided into seven chapters. The first chapter introduces the problem. In chapters II and III the working of the key village scheme together with the shortcomings observed have been discussed. As items I (a), I (c), I (d) and I (e) of the terms of reference of the Committee deal with the Key Village scheme as a whole, they have been examined and discussed together in these chapters. Chapter IV deals exclusively with artificial insemination. Recommendations regarding the future programme of work under the Key Village Scheme have been dealt with in Chapter V. Items II(a), (b), and (c) of the terms of reference have been dealt with together in Chapter VI. In Chapter VII a summary of the main recommendations has been given. The numbers shown against the recommendations in parenthesis refer to the relevant paragraphs in which the respective recommendations have been dealt with.

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CHAPTER I

INTRODUCTION

Origin and History of the Key Village Scheme

India possesses over 200 million cattle and buffaloes, i.e., about a quarter of the world's bovine population. Notwithstanding this there is extreme shortage of milk, the major source of animal protein in the diet of human beings in this country. The working efficiency of bullocks, on which the entire agricultural economy of the country depends, is also low. Of the total cattle, 47·25 million are adult cows and 21·67 million buffaloes, which are kept for breeding or milk production. The total annual milk production in the country is estimated at 477 million mds., which works out at about 5 oz. per capita per day as against the 10 ozs. considered essential by nutritionists for a balanced diet. A pair of bullocks, on an average, is capable of tilling only about 10·2 acres of land. In order to increase the country's food production, both of plant and animal origin, it is imperative that the quality of our cattle be improved.

2. The improvement of such a large bovine population is, however, a colossal task. Past efforts which consisted largely in the distribution of bulls from Government Farms or those purchased from the breeding tracts did not make any great impact, as the distribution was carried out without any definite plan, the continuity of work was not maintained and any slight improvement effected later got diluted through breeding with scrub bulls, for the systematic elimination of which no serious efforts were or could be made. Besides, the problem was generally tackled only from one aspect, i.e., the breeding aspect, and other aspects such as the proper feeding of the animals, their planned protection against contagious diseases, etc., were over-looked or did not receive much attention. However, these efforts at livestock improvement served one useful purpose in that they brought to light the lacunae in our approach and suggested the line of action required for tackling the problem in a really effective manner. The result of this experience was the formulation of the Key Farm Scheme which later developed into the Key Village Scheme.

3. The Key Village Scheme is a scheme for the development of cattle in selected compact areas and provides for a multifaceted approach to the problem by simultaneous attention to breeding, feeding, disease control, marketing, etc. The basic objective of the scheme is the rapid multiplication of farm bred bulls in the breeding tracts for meeting the acute shortage of high quality bulls required for the grading up of the country's large cattle population.

4. The All-India Key Village Scheme was initiated in August, 1952, under the First Five-Year Plan and was a continuation of the Key Farm Scheme financed from the Grow More Food Funds. In the beginning it was administered by the Indian Council of Agricultural Research, but later in 1953, for administrative convenience, it was transferred to the Ministry of Food and Agriculture (Department of Agriculture).

5. At the time the scheme was launched, it was estimated that the Government Farms in the country were producing only about 750 bulls annually as against 250 times that number actually required. The Key Village Scheme, therefore, provided for the multiplication of farm-bred bulls in a systematic

manner in selected areas and utilisation of their male progeny for the up-grading of animals in other areas. Consistently with the estimated availability of superior bulls a total of 600 Key villages with 150 Artificial Insemination centres was proposed to be set up in the first instance. All the 600 Key villages were not to be started together. Depending upon the availability of superior bulls only 150 were to be started per year, all the 600 being established by the 4th year of the Scheme. It was expected that in the 5th year bulls from the first year's 150 villages would be ready for issue, the second year's production would be ready for issue in the 6th year and so on, the full quota of bulls from all the 600 Key Villages becoming available in the 8th year of the scheme. To ensure maximum utilisation of the superior germ plasm, artificial insemination was made an essential part of the Key Village Scheme and though natural breeding was provided, it was intended that it would be gradually reduced and ultimately altogether done away with. In addition to the rapid multiplication of farm-bred bulls under village conditions other measures for intensive cattle development were to be simultaneously taken and the scheme thus included all the important aspects of breeding, feeding, disease control and management. It was visualised that the Government staff and the villagers would work together with a view to eventually developing the Key Village area into, so to say, a cattle breeding farm. Among the objectives was to demonstrate to the villagers under their own conditions modern scientific methods of breeding and rearing cattle. Encouragement was, thus, to be provided to the villager to do the work himself on his own land and under his own conditions.

6. In the original Key Village Plan the broad outline of a Key Village is given as under—

“The Key Village has been described and defined as a compact area consisting of one village or a group of contiguous villages having a total population of about 500 cows. It is selected in a breeding tract and seven to eight bulls of known breeding value are located there. All the other bulls in the area are castrated or removed and no bull other than the selected seven or eight is allowed in the area at any time. A Livestock Improvement Act similar to that passed in Bombay, Madras, Uttar Pradesh, Punjab and other States, is enacted and enforced in the area. When these bulls become too old to be of service, they are replaced by an equal number of equally good or better bulls, so that in the course of four or five generations the entire stock of the key village is of a superior strain. The bulls from the key village are then available for distribution in other areas. Each key village with a population of 500 cows should produce about 100 bulls annually in addition to a similar number of improved heifers which can be used for replacement or further improvement in other areas. The farm-bred bull is thus multiplied 10 to 15 times. By planned distribution, the area of location of bulls sent out from key villages can also be denfied so that the improvement proceeds in accordance with a pre-planned programme. Bulls are thus produced on the farms, multiplied in key villages and distributed in other well-defined areas”*.

* A hand-book on the key village scheme for cattle improvement in India, issued by the Ministry of Food and Agriculture (Agriculture), Government of India, New Delhi (1954).

7. The various references on the subject of this scheme in the Indian Council of Agricultural Research and the Department of Agriculture records and communications sent to the States indicate that originally the intention was that the scheme would be taken up only in the pure breeding tracts so that the pedigree bulls obtained from the farms might be multiplied rapidly on a large scale and their progeny distributed to other areas for developmental work. In the actual implementation of the scheme this condition does not seem to have been adhered to and from the very beginning Key Village blocks have also been sanctioned for the States having non-descript animals. Thus the Government of India have from the very beginning agreed to the establishment of Key Village blocks, both in areas of pure-bred cattle as well as non-descript cattle. The scheme has, in essence, therefore, functioned from the very beginning not only as one for breeding superior bulls in the breeding tracts but also as one for the development of cattle in areas of non-descript cattle.

Technical Programme

8. Before the scheme was launched its programme of work was considered in detail and duly approved at a special meeting of the State Directors of Animal Husbandry in 1951. This was essential as the scheme envisaged pooling of all the resources so far as bull production in the various States was concerned in the interest of the larger development of the country. The programme as approved at this conference is given in Appendix IV. The Government of India agreed to provide financial assistance on 50 : 50 basis to the State Governments for the implementation of the scheme.

9. The progress made with the implementation of the scheme was discussed at the Animal Husbandry Wing of the Board of Agriculture and Animal Husbandry in India at its meetings held at Poona (1953), Ranchi (1955), Simla (1957) and Bombay (1959). At these meetings important recommendations were made for effecting improvements in the working of the scheme. The progress of the scheme was also discussed at three Regional Key Village Seminars held at Coimbatore (1957), Darjeeling (1959) and Mount Abu (1960).

10. In 1953 the Government of India, obtained the services of a team of three F.A.O. Experts on Animal Gynaecology and Artificial Insemination with Professor Nils Lagerlof at its head to advise them on various problems connected with animal production, particularly with reference to the Key Village Scheme and Artificial Insemination. These experts visited various Key Villages, artificial insemination centres and cattle breeding farms in the States to study their working and also conducted training courses at different centres in the country and at the Indian Veterinary Research Institute, Izatnagar. The team submitted a very valuable report which has influenced materially the organisation of artificial insemination work and the working of the Key Village Scheme.

11. In 1957-58 the Government of India obtained the services of Dr. T. W. Gullickson, an Expert on Animal nutrition, under the technical Co-operation Mission Programme. Several important suggestions were made by him for the development of the feed and fodder resources in the Key Village areas.

12. In 1959 the services of Mr. Ralph E. Fisher, an Expert on Livestock Marketing, were obtained under the Technical Cooperation Mission Programme and he is advising the Department of Agriculture and the States on problems connected with livestock marketing in the country including the Key Village blocks.

Modifications made in the Scheme

13. From time to time several modifications have been made in the scheme. The major ones among these are—

- (a) At the inception of the scheme each Key Village block consisted of 4 sub-centres with a total population of 2,000 to 2,500 adult cows/buffaloes, but the F.A.O. team expressed the view that with the facilities available it should be possible to cover a much larger population. Accordingly, in the Second Five-Year Plan the size of the Key Village blocks was enlarged so as to cover an adult cow buffalo population of 5,000. The expanded block now consists of 6 key village units instead of 4 as was the case in the First Five Year Plan, each Key Village unit having about 800 cows. Provision was also made for expanding the blocks established in the First Five Year Plan so that they might also cover a population of 5,000 animals.
- (b) To ensure quick supply of semen to sub-centres and for the proper execution and supervision of the work of the scheme, a jeep has been sanctioned by the Government of India for each Key Village block during the Second Plan.
- (c) In order to cope with the extra work, additional staff has also been provided in each Key Village block. A stockman has also been provided at the headquarters of the block to assist the Officer-in-charge in the work of collection and despatch of semen, etc.
- (d) To enable milk recording in the key village blocks to be carried out on systematic lines a milk recorder has been sanctioned for each block.
- (e) To compensate the staff for the arduous nature of key village work a special allowance equivalent to $33\frac{1}{3}$ per cent of the pay subject to a maximum of Rs. 50 for each officer-in-charge and Rs. 20 for each Stockman has been sanctioned.
- (f) For proper guidance and supervision at the State level, a Deputy Director in Class I scale exclusively for looking after the Key Village work has been provided.
- (g) As per the recommendations made by the F.A.O. team certain changes have been made in the technique etc., of artificial insemination.
- (h) The subsidy scheme as originally sanctioned has undergone considerable modifications. The quantum of subsidy per month has been raised from Rs. 5 to Rs. 10. A model plan has been drawn up for the rearing of calves at the State Government Farms from the age of weaning to maturity, as well as for the grant of subsidy to a certain proportion of female calves (see Appendix XX).

- (i) In 1958, a model scheme on feed and fodder was drawn up by the Ministry of Food and Agriculture (Department of Agriculture) and circulated to the States. The States were also asked to set up Fodder and Grazing Committees to advise them and to coordinate the work of feed and fodder development throughout the State (see Appendix XV).
- (j) In the field of marketing, although nothing was done in the First Five Year Plan, the Second Plan provides for adoption of suitable measures in 20 selected villages on a pilot basis as a preliminary to extension of such work to other key village blocks in the Third Five Year Plan.

Physical Targets

14. In the First Five Year Plan a target of 150 artificial insemination centres and 600 key village blocks had been laid down and this was nearly achieved. As regards the Second Plan, the targets for various items initially fixed were based mostly on the requirements and the anticipated achievement during the plan and an allocation of about Rs. 8 crores was made for the scheme as a whole, but subsequently at the annual plan discussions, in consultation with the State Governments, the Planning Commission and the Central Ministry of Agriculture, was reduced to nearly half—i.e. about Rs. 4.0 crores. The target originally laid down had, therefore, to be scaled down, and the States had to limit their activities in the sphere of Key Village Scheme to the funds made available to them. These revised targets were nearly achieved (see Appendix VII).

CHAPTER II

REVIEW AND EVALUATION OF THE WORKING OF THE KEY VILLAGE SCHEME

15. In this chapter the progress of the Key Village scheme is briefly discussed. As the scheme has several facets, in order to present an over-all picture of the progress, the subjects included under items 1(a), (c), (d) and (e) of the terms of reference of the Committee are discussed together. Artificial Insemination, which is also an integral part of the scheme, has been dealt with separately in Chapter IV.

16. The working of the Key Village scheme can be conveniently reviewed under the following broad headings—

- (a) Establishment of Key Village blocks in the rural areas.
- (b) Expansion of the Key Village blocks set up in the First Five-Year Plan.
- (c) Establishment of Key Village blocks in conjunction with dairy schemes.
- (d) Establishment of urban Artificial Insemination Centres.
- (e) Establishment of Extension Centres.
- (f) Subsidized rearing of superior calves.
- (g) Development of feed and fodder resources.
- (h) Organisation of marketing facilities on a pilot basis.

(a) Establishment of Key Village blocks in the rural areas

17. In the First Five-Year Plan it was proposed to set-up 150 Key Village blocks, each consisting of 4 Key Village units. This target was more or less achieved. In the Second Plan, a target of 124 Key Village blocks in the rural areas was laid down. This was later raised to 157. Against this, by the end of 1959-60, 145 blocks had been set-up. The target has, therefore, been more or less achieved.

18. Practically all the States in the country were able to achieve the individual targets allotted to them in so far as the establishment of new Key Village blocks in the rural areas was concerned (Appendix VIII).

19. The Key Villages established in the rural areas in the First and Second Plans are broadly of two types, viz., those located in areas of well-defined breeds and those located in areas where the cattle are non-descript (including hilly areas). The former type of blocks are expected to multiply farm-bred superior bulls for utilization of the progeny in other areas, while in the blocks in the non-descript areas the work is supposed to progress for 4 to 5 generations before bulls fit for breeding can be produced. Of the total number of Key Villages established in the First and until the fourth year of the Second Plan nearly 58 to 60 per cent have been located in areas of non-descript cattle. Depending upon several factors there has been considerable variation in the measure of success achieved in the various Key Village blocks.

(b) Expansion of Key Village blocks set-up in the First Five-Year Plan

20. In the original Key Village scheme it was envisaged that each Key Village block would consist of four units, each with a population of about 500 adult cows/buffaloes. Subsequently, the F.A.O. Team recommended as under:

“Most of the areas served by artificial insemination Centres are relatively small having 1,500 to 2,500 adult females, only some of which can be included in the artificial insemination work for some years to come. These units did not allow the different bulls to be fully utilized, and further, such small units are not economical. Therefore, in the future, the areas should be organised or enlarged so that atleast 5,000 or 6,000 adult females are available in each or that one artificial insemination Centre should serve two or so similar units.”

This recommendation was accepted by the Government of India, and, accordingly, in the Second Five Year-Plan it was decided to expand 108 of the Key Village blocks already established so as to cover a population of about 5,000 cows. Based on actual allocation this target was revised to 117. As against this by the end of 1959-60, 109 blocks had been expanded, and it is expected that by the end of the Second Plan the remaining Key Village blocks would also have been enlarged.

21. It was however, observed by us that as the Ministry of Food and Agriculture (Department of Agriculture) had not laid down any special criteria for expansion of the Key Village blocks, in their desire to achieve the targets laid down, the States have expanded all types of Key Villages, good, bad and indifferent.

(c) Establishment of Key Village blocks in conjunction with Dairy Schemes

22. The Second Plan provided for the starting of a number of milk supply schemes for meeting the requirements of large towns and cities in the different States. In order to improve the milk supply position, it was considered essential that simultaneously improvement of livestock should also be taken up in areas of milk collection schemes. Accordingly, it was proposed to set-up in such areas 51 Key Village blocks. Based on availability of funds, this target was reduced to 21. Of these, by end of 1959-60, 16 had been set-up. Although the target looks small, it is not exactly so because it so happened that in many areas selected for taking up milk collection schemes, Key Village blocks had already been established. As such the number of Key Village blocks set-up in conjunction with dairy schemes is actually more than 16. Key Village blocks in conjunction with dairy schemes have been set-up in the States of Bihar, Orissa, Andhra Pradesh, Madhya Pradesh, Madras and Uttar Pradesh.

(d) Establishment of Urban Artificial Insemination Centres

23. As a large number of milch cattle (cows and buffaloes) are kept in cities by Gowalas and other people, their proper breeding for producing better progeny was considered essential. In order to provide necessary facilities for the breeding of city animals and creating a zone of milch animals around large cities and towns, at the beginning of the Second Five-Year Plan it was tentatively proposed to set-up 10 Urban Artificial Insemination Centres under the Key

Village scheme. The idea was to locate bulls of milch breeds at the centres and provide free artificial insemination service to cattle-owners. However, at the annual Plan discussions, based upon the allocations made for the various States, the target for these centres until the end of 1959-60 was reduced to 54. As against this target, 53 Centres had been established by the end of 1959-60. It is expected that perhaps another 7 to 10 Centres would be established during the current year.

24. Since the animals kept in towns are largely for milk production, in Urban Artificial Insemination Centres mostly milch type breeds like Red Sindhi, Sahiwal, Gir, Tharparkar and Hariana are being used. For upgrading buffaloes, the Murrah breed is used practically in all the States. In the Punjab, in addition to the Murrah, Nili breed is also used. There is one exception to this as in Madras State, in one of the Urban Artificial Insemination Centres, the Kangayan breed, which is a draught breed, is being used. Enquiries from the State officials reveal that although this is not a milch breed, in this particular case an exception had to be made because the local population kept mostly Kangayan cows and they prefer their cows to be bred to Kangayan bulls only.

25. The progress of work in these Urban Centres has, been very promising. Although figures for inseminations performed during various years could not be had, the number of inseminations performed at these Centres during 1959-60 was 24,575. Actually in addition to the Urban Artificial Centres established under the Key Village scheme, of the 172 Centres set-up by the State Governments themselves some cater to large urban areas. The location of Urban A. I. Centres under the Key Village Scheme is indicated in the list of Key Villages appended to the report (Appendix X).

26. The Urban Centres are comparatively cheap as they are located in Veterinary hospitals and no-separate officer-in-charge is provided. For looking after the bulls and inseminating the cows 2 stockmen and two bull attendants are provided in each Centre. The annual recurring cost of each such Centre comes to about Rs. 6,500.

(e) *Establishment of Extension Centres*

27. The main objective of the Key Village is that it should serve as a seed multiplication farm for multiplying the superior bulls produced at the Government Farms. The bulls thus produced in the Key Village have to be utilized in a systematic manner in other areas for development work. In order to ensure utilization of the bulls produced in the Key Villages and to effect continuous development of cattle and buffaloes in the country at large, it was decided that 254 Extension Centres should be established outside the Key Village areas during the Second Five-Year Plan. It was envisaged that each Extension Centre would have a population of 5,000 adult cows where 50 bulls would be located and that a Supervisor and two Stockmen would be appointed to look after these bulls. The number of bulls was kept large, because it was felt that the Extension Centres would be located in rather out of the way or inaccessible areas where breeding would be done by natural service alone. Later, however, it was found difficult to get the required number of bulls. For this and certain other reasons it was decided that the number of bulls per Extension Centre should be reduced to 25.

28. The original target of 254 was, however, later reduced as a result of Plan discussions. For the first four years it was fixed at 51 only. Against this target, 48 centres had been established by the end of 1959-60. The States which have set-up Extension Centres are Andhra Pradesh, Bihar, Madhya Pradesh, Madras, Orissa and Uttar Pradesh.

29. No Extension Centres have been established in the States of Assam, Maharashtra, Gujarat, Kerala, Mysore, Punjab, Jammu and Kashmir, Rajasthan and West Bengal.

30. It appears that the chief reason for the inability of the State Governments to set-up a larger number of Extension Centres is lack of forward planning in the utilization of bulls produced in the Key Villages. The bull production and utilization programmes were not properly coordinated. Adequate funds for the purchase of bulls were not provided. Although repeatedly urged by the Central Agriculture Ministry, the States did not assess the number of breeding bulls that could be made available from the Key Village blocks nor did they work out their over-all requirements of bulls in the Key Village blocks, N.E.S. blocks and in other cattle development schemes in advance. In some States, it was observed that the bulls were obtained for use in Extension Centres from areas outside the State.

(f) Subsidized rearing of superior calves

31. As the main objective of the Key Village scheme is to produce a sufficient number of superior breeding bulls, the original Key Village Plan had *inter-alia* provided for the establishment of 540 Bull Rearing Farms, at which the bulls produced in the Key Villages were to be reared to maturity before being distributed for further development work in the country. It was reckoned that it would be possible to produce nearly 54,000 bulls in a year which is about 1/3rd of the country's total requirement. However, as establishment of these Farms was found expensive, after further discussion the idea of setting up these Farms was abandoned. As an alternative it was decided that selected male calves might be reared in the villages themselves by the owners and that for this purpose they should be given a suitable subsidy. Accordingly, in 1954-55 a subsidy of Rs. 5 p.m. was sanctioned for payment to the owner of each selected calf till the calf attained maturity or an age of 3 years, whichever was earlier. In the First Plan, only about 3,675 calves were taken up for subsidy.

32. As the subsidy of Rs. 5 p.m. per calf did not evoke the desired response from the cattle-owners, the amount was raised to Rs. 10 p.m.

33. As the States having no well-defined breeds could not use the graded male calves produced in the Key Villages as breeding bulls, it was argued by the Directors of Animal Husbandry in those States that subsidy should also be given to female calves so as to encourage their rearing and retention in the area as it was the graded female progeny which would ultimately help in the production of better types of animals. Similarly, in the case of certain breeding tracks such as the Ongole, it was pointed out that the male calves were being sold as bullocks as they fetched high prices even when they were very young, while the cows giving birth to female calves were sold to big cities where after completion of lactation, the majority were slaughtered and only about 10 per cent returned.

to the breeding tracts for further breeding. There was, thus, it was argued, a rapid depletion of basic stock with the attendant risk of the breed becoming extinct. To obviate this, a demand for payment of subsidy to Ongole female calves also was made. In view of this, the Government of India agreed to include the female calves under the subsidy scheme. Initially it was laid down that of the subsidized calves the percentage of female calves would not exceed 10. This decision has, however, further been revised and now it has been left to the discretion of the State Governments to decide the proportion of male and female calves to be taken under the subsidy scheme. This is subject to the condition that the targets for bull production laid down for the different States would not be affected.

34. In the Second Five-Year Plan, a target for the production of 22,000 bulls from the Key Village blocks was laid down. With this end in view to and allow for mortality, rejections, etc., the number of calves for subsidy was fixed at 35,000.

35. The question of targets for bull production was further discussed at the 12th meeting of the Animal Husbandry Wing of the Board of Agriculture and Animal Husbandry in India, when it was recommended that the target of 22,000 should be retained and that the female calves should be subsidized only after it had been ensured that this number would become available. With this object in view it was suggested that targets in the Key Village blocks located in areas of well-defined breeds should be raised. This recommendation is being implemented by the Ministry of Food and Agriculture (Department of Agriculture) in consultation with the States concerned.

36. Against a target of 35,000 bull calves, by the end of 1959-60 about 20,054 calves had been taken up for subsidy. This includes about 4,000 female calves. Excluding these and allowing for losses due to mortality, rejections etc. it is estimated that about 10,000 subsidized male calves would ultimately become available for use as breeding bulls. Adding another 3,000 bulls that might be produced in the current year, the total bull production figure from Key Villages by the end of the Second Plan would be about 13,000 as against a target of 22,000.

37. There is a consolidated budget for the entire Key Village scheme and item-wise provisions are not indicated. It was, thus, not possible for us to find out what has been the actual expenditure on the calf subsidy part of the scheme. Attempts were made to work out some approximate figure, but as the calves in the different areas were taken up for subsidy at different times of the year and at different ages, and as information about the exact period for which subsidy was given to the calves could not be had, it was not possible to arrive at even a tentative figure. In any case, the amount spent must be quite large and it is essential that maximum benefit should be obtained from this by ensuring purchase of all the suitable subsidized calves for further breeding work.

(g) Development of Feed and Fodder resources

38. The weakest link in the chain of livestock development in the country has been the lack of availability of adequate amount of feed and fodder for sustaining the large cattle population. From the very beginning attempts at the development of cattle and buffaloes in this country have been largely directed

towards improvement by breeding. Though breeding is essential, the gain obtained by genetic improvement cannot be expressed by the animal unless adequate nutrition is provided. It is also well-known that the Indian cattle possess intrinsic ability to produce more provided they are adequately fed. It has been estimated that provision of adequate feed alone can raise milk production by about 50 per cent.

39. Realizing the importance of proper feeding, the Key Village programme from its very beginning has included proper attention to this aspect of work also. In order to provide necessary guidance and to ensure steady and uniform development of feed and fodder resources in the Key Village blocks, a model feed and fodder development scheme was drawn up by the Ministry of Food and Agriculture (Department of Agriculture), Government of India in 1956-57. This scheme received the approval of the Planning Commission and the Ministry of Finance towards the latter part of 1957-58. The scheme provided for financial assistance in respect of various items and was circulated to the States duly sanctioned in January, 1958.

40. The scheme as drawn up by the Central Ministry of Agriculture includes the following seven items (see Appendix XV):—

1. Appointment of a Fodder Development Officer.
2. Establishment of 10 acre pasture demonstration plots in the Key Village blocks.
3. Feeding of selected cattle on balanced ration in the Key Village blocks.
4. Distribution to cultivators of fodder seeds, roots, etc., produced at the State Livestock/Agricultural Farms.
5. Distribution to cultivators of quality seeds of pasture grasses produced by the Military Grass Farms, Forest Departments, etc.
6. Establishment and improvement of pastures in the State Government Farms.
7. Construction of silo-pits for conservation of fodder.

41. It is observed that in spite of the fact that a comprehensive programme was drawn up, the scheme has not been implemented to the desired extent. Though the scheme was sanctioned with central subsidy in early 1958, a number of States did not implement it until 1959-60. By the end of 1959-60, the programme under the Feed and Fodder Development scheme had been taken up only in 11 States and that also not in its entirety. Bihar, Kerala, Punjab, West Bengal, Jammu and Kashmir, Delhi and Himachal Pradesh still remain to take up this work. Some of these States, however, expect to implement the scheme in 1960-61.

42. Of the various items included in the feed and fodder development scheme, Fodder Development Officers have been appointed only in the States of Madras, Uttar Pradesh, Assam, Madhya Pradesh, Mysore, Rajasthan and Maharashtra and a total of 75 pasture demonstration plots, each of about 10 acres, have been established in the Key Village blocks in the States of Andhra Pradesh, Assam, Bombay, Madhya Pradesh, Madras, Mysore, Rajasthan,

Uttar Pradesh, Tripura and Manipur. In addition, pasture development work was taken up on 21 Government Farms in the States of Andhra Pradesh, Maharashtra, Madhya Pradesh, Madras, Mysore, Rajasthan and Uttar Pradesh. The programme for distribution of fodder seeds, roots, cuttings, etc., produced at the Government Farms has also not been taken up to any appreciable extent. In all at about 29 farms located in the States of Andhra Pradesh, Assam, Bombay (Maharashtra and Gujarat), Madhya Pradesh, Madras, Mysore, Orissa and Rajasthan this work was taken up. In some cases, however, the seeds, roots, cuttings, etc. were not actually produced at the farms but were obtained from elsewhere for distribution. Although it was not possible for us to obtain precise information about the quantity of fodder seeds, roots, slips, etc., actually distributed from the farms, such information as is available indicates that in Andhra Pradesh, Assam, Bombay (Maharashtra and Gujarat), Madhya Pradesh and Tripura, substantial quantities of roots were distributed. In addition in Bombay (Maharashtra and Gujarat) 5,208 Lbs. and in Assam 280 Lbs. of seeds of fodder grasses were distributed. The resources of the Military Farms and Forest Departments for procuring quality seeds of pasture grasses are not being utilised properly.

43. Provision for subsidy for distribution of concentrates to milch cows for ensuring their balanced feeding has not been utilized except in Assam, Andhra Pradesh and Tripura, where about 855 cows were given a concentrate mixture consisting of groundnut cake and mineral mixture out of the scheme funds. The animals were inspected periodically to ensure proper utilization of the concentrate mixture.

44. Subsidy under the feed and fodder development scheme has been sanctioned for popularizing construction of silo-pits for demonstrating the method of ensiling fodder. This work has, however, been taken up on a small scale only in the States of Andhra Pradesh, Assam, Bombay (Maharashtra and Gujarat), Mysore, Orissa, Rajasthan, Tripura and Manipur. The total number of silo-pits constructed in the Key Villages by the end of 1959-60 was only 49.

45. Since the production of fodder, development of pastures, etc., is the responsibility of several Departments, the Government of India had advised the States to set-up Fodder and Grazing Committees on which the Departments of Agriculture, Forests, Animal Husbandry, Irrigation and Revenue were to be represented, for developing and coordinating programmes for the development of feed and fodder resources in the States including the Key Village blocks. These Committees have been set-up only in the States of Rajasthan, Madras, Mysore, Andhra Pradesh and Uttar Pradesh. The remaining States have yet to set-up these Committees.

(h) *Organisation of the Marketing Facilities*

46. Right from the inception of the Key Village scheme the necessity and importance of organizing proper marketing facilities in the Key Village blocks has been emphasised. It has been recognised that adequate marketing facilities are of vital importance for the successful implementation of the Key Village work. However, the progress in this direction has been extremely slow. Except in a couple of States where a few Cooperative Societies or Cattle Breeders'

Associations have been set-up for improving marketing facilities, very little has been done in the other States in this direction. In order to provide the necessary stimulus for the development of a marketing programme, it was proposed to take up this work in 20 selected Key Village blocks on a pilot basis during the Second Five-Year Plan period and it had been planned to draw up a model scheme for this purpose. This has, however, not been done as, in the meantime, the Government of India have obtained the services of a Livestock Marketing Expert. He has been entrusted with the task of drawing up a model scheme for taking up marketing of livestock and livestock products in selected Key Village blocks.

47. In those blocks which have been located in conjunction with milk supply schemes some progress has, however, been made with regard to collection of milk. By and large, however, this programme has remained in the background and hardly anything worthwhile has been done in this direction.

CHAPTER III

SHORTCOMINGS OF THE KEY VILLAGE SCHEME AND THE REASONS THEREFOR TOGETHER WITH RECOMMENDATIONS FOR OVERCOMING THEM

48. Having briefly reviewed the progress achieved in respect of the various items of the Key Village programme vis-a-vis the targets laid down, in this chapter we deal with the various deficiencies which we have observed in the working of the Key Village scheme. The probable reasons for such deficiencies are also indicated and suitable recommendations made for overcoming them so that the objective of the scheme may be achieved.

49. At the outset it may be mentioned that while visiting the various States we observed that the Key Village scheme has to an appreciable extent succeeded in securing the cooperation in the scheme work of a large number of farmers and cattle owners scattered all over the country. It has carried to the villagers even in remote places information of educational value in regard to livestock development. There is now a good deal of realisation on the part of farmers of the need for adopting better animal husbandry practices for the improvement of their livestock. The Key Village scheme has, therefore, served a definite purpose in that it has created this awakening. This was evident from the demand made by the farmers in many States for starting more key villages in their areas. In some States like those of Madras and Andhra Pradesh the farmers' enthusiasm for the programme has been so great that they have voluntarily offered land, buildings and sometimes even medicines and equipment for the Key Village blocks established in their areas. All this indeed is a healthy sign and augurs well for the future development of India's large cattle population.

Background against which the working of the Key Village scheme has to be reviewed

50. From what we could see during our rather limited tour of the Key Village blocks and from a scrutiny of the information furnished in reply to the questionnaire issued by us, we have come to the conclusion that though the Key Village scheme has, on the whole, made steady progress—and this success has been more marked in some areas than in others—a great deal still remains to be done to improve its working, at least in regard to the implementation of some of the items of the programme. It must be realised that cattle improvement work is, by its very nature, slow and, therefore, any assessment of the Key Village scheme must be made keeping in view certain basic factors operating in the country today and the conditions under which the work has to be carried out. Some of these factors are—

- (a) The general backwardness of our livestock owners and their orthodox beliefs.
- (b) The steady increase in human population and the gradual disappearance of grazing lands.
- (c) The uneconomic size of land holdings, and imposition of land ceilings.
- (d) Excessive emphasis on the production of cereal and cash crops and inadequate attention to fodder cultivation.

- (e) The increasing trend towards the shifting of milch animals from rural to urban areas resulting in the depletion of breeding areas of valuable breeding stock (e.g., Haryana and Murrah tracts in the Punjab and the Ongole tract in Andhra Pradesh).

Defective basic approach

51. Although in the country as a whole the scheme may be said to have made steady progress, the approach had one shortcoming in that a standard pattern has been sought to be followed in all parts of the country regardless of the special conditions prevailing in the different areas or the needs of the people. Every key village block was expected to take up the 'model scheme' all at once irrespective of the fact whether the conditions for this were ripe or not. For instance, it was not realised that in some places it might just be possible to start with an average type of bull and then use progressively better bulls as and when replacement became due and that other items of the programme like milk recording, artificial insemination, etc., could be introduced after the confidence of the villagers had been won. The approach in the scheme should have been flexible allowing for adjustment to suit local conditions within a State and in the different areas in the same State. The establishment of Key Village blocks should have been preceded by a very careful and painstaking study not only of the livestock numbers, the availability of feeds and fodders, etc., in the area, but also of the various animal husbandry practices and the needs of the people. We would especially emphasise animal husbandry practices and the needs of the people because inadequate attention to these has been largely responsible for the lack of success in many cases.

52. Broadly, the Key Village blocks can be divided into two groups depending upon their location. The first group comprises blocks which have been set up in areas where well-defined breeds exist and the second these which have been set up in areas where cattle are non-descript. As the conditions differ widely in the two areas, it would be desirable to consider the progress of each of these two types of blocks separately.

Key Villages in the breeding tracts

53. As the Government farms were producing only a small number of bulls when the scheme was framed, the intention was that the available superior bulls would be rapidly multiplied in the Key Villages, as the first generation bulls produced in these tracts could be used for development work elsewhere. The breeding tracts have conditions specially favourable for cattle development. The animals generally conform to a recognised breed. The people in the breeding tracts are generally interested in cattle breeding and have for generations been keeping and rearing animals of good quality. In the majority of these tracts, the farmers actually make a living from the sale of cattle and to some extent milk. They possess a keen eye for selection of good animals, particularly bulls. Our visits to some of the key villages located in areas of pure breeds have, however, given us a picture generally the reverse of what we had expected. In the majority of the breeding tracts visited by us, in spite of the favourable circumstances enumerated above, the impression formed was that the success achieved had been much below expectations, that the cooperation of the

cattle owners was lacking and that the results obtained had been rather poor. There were, of course, certain exceptions which will be mentioned later. The reasons for this unsatisfactory progress are:

- (1) The bulls supplied under the Key Village scheme are generally inferior to those which the cattle owners themselves possess or the dedicated 'Brahmini bulls'. In the Ongole tract, for instance, the male calves fetch very high prices and are thus a source of very great income to the cattle owners. Consequently, they take their cows for breeding only to good high class bulls, paying stud fees of upto Rs. 10 to 25. They look after the male calves very well and at times the entire milk of the mother is allowed to be fed to these calves, which helps their proper growth and development. The female calves are neglected and so are their mothers. Since the male calves provide a very important source of income to the owners, they are naturally keen on having their cows bred to the best bulls available. The Key Village bulls, therefore, do not satisfy their requirements. This is a very important factor working against the entire scheme, because once bulls of inferior quality are located in the villages, the cooperation of the villagers in respect of even other items of work cannot be obtained.
- (2) The male calves fetch very high prices even at an early age and as such owners are keen to sell them off either as bulls or for use as bullocks. They are, therefore, not attracted by the subsidy of Rs. 10 per month provided under the Key Village scheme.
- (3) Though the objective in the breeding tracts is to produce superior bulls, in many cases there appears to be no definite programme for their purchase by the State Departments from the key village areas with the result that at times the owners do not know what to do with the male calves and hence they are obliged to get them castrated and sell them off as bullocks.

54. From the above, however, it should not be inferred that the key village scheme in all the cattle breeding tracts has failed to produce the desired results. There are, as already pointed out above, exceptions. In the Kangayam tract in Madras State, for instance, the success achieved has been remarkable. There is more or less complete breeding control, the number of inseminations performed is very high and where natural service is done it is from bulls located under the key village scheme. A large number of high class bulls have been produced in the key villages and there is a good deal of uniformity in their size and shape, which is an indication of the work having been done on systematic lines. The success of the scheme in this area is largely attributable to the bulls having been obtained from the herd belonging to the Pattagar of Pallayakotai and they are outstanding. We should be failing in our duty if we did not pay our meed of praise to the outstanding contribution which this breeder has made to the improvement of the Kangayam breed. Another favourable factor is the enthusiasm of the people themselves. They keep their animals on their own land which is generally fenced and there is plenty of grazing land with rich nutritious grass on which the animals are allowed to graze. The cattle owners understand the basic principles of animal husbandry. They take the cows for

breeding always to a good bull usually located in the key village even during the cultivation season or even when they have to walk long distances. As the scheme provides several benefits, they fully cooperate with the Government in the work of the scheme. Contrary to general practice, there are no Brahmini bulls in this area. The technique of artificial insemination is extremely popular in this tract and in some of the key villages breeding is done almost entirely by artificial insemination. In one of the centres with a population of over 10,000 cows the inseminations performed during 1958-59 totalled over 8,000 as against only 250 natural services. (This includes also some inseminations done on non-scheme cows).

Key Villages in the non-descript areas

55. The object of the key village scheme in areas of non-descript cattle like Orissa, Madhya Pradesh, Assam, Kerala and parts of Bihar is to gradually upgrade the cattle so as to effect genetic improvement in the progeny and raise the general standard of cattle. It was observed that on the whole the success achieved under the key village scheme in areas of non-descript cattle is far more marked than in areas of well-defined breeds. This is so because in these areas the basic material is so inferior that any bull, even a mediocre one, brings about an immediate improvement in the progeny. The graded progeny is larger in size, gives more milk and is an alround better animal. In some of such underdeveloped areas, outstanding results have been obtained (Hooghly and Beldanga tracts in West Bengal, the Hanana Key Village blocks in Orissa etc.). In others due to lack of interest and cooperation on the part of the owners, the results have not been so marked.

Key Villages in hilly areas

56. Though their number is small, key village blocks have also been established in certain hilly areas in the country. Among these blocks there are some which are located in areas populated by tribal people who are little interested in the breeding of cattle. By and large the progress of work in these areas has been extremely poor. There is difficulty about the transport of semen, the cattle population is sparse, there is apathy on the part of cattle owners towards any developmental programme and they have their traditional sentiments against castration, etc. The Key Villages in the tribal areas appear to have been set up with a view to ameliorating the lot of the local people. Though it is appreciated and it is desirable that measures should be taken to develop these areas, generally we feel that they are unsuitable for the type of work envisaged under the Key Village scheme. In our view those key villages in the hills in which progress has not been satisfactory should be closed down and instead facilities provided for natural breeding by locating bulls at convenient places.

Lacunae in Key Village Scheme

57. The obvious shortcomings and handicaps in the working of the Key Village scheme are many and we would like to draw attention to the principal ones among these—

Familiarity with the scheme

58. In many of the States visited by us it was noticed that by and large the objectives and purpose of the key village scheme had not been correctly

understood by the staff connected with the execution of the scheme. The main mis-conception appears to be that it is the old bull distribution scheme which has been embellished by the addition of artificial insemination. The staff generally appears to be under the impression that all that has to be done is to set up an artificial insemination unit and to carry out artificial insemination. It is often not realised that this is an intensive cattle improvement scheme which aims at tackling all the problems of breeding, feeding, disease control management and marketing in order that the areas taken up may eventually develop into intensive breeding tracts. Generally, discussions with the staff employed revealed that they did not have any definite idea as to how improvement was to be measured. The progress is gauged by the number of inseminations performed in a particular centre or sub-centre and the number of bulls distributed for natural service.

59. In order to achieve what is desired under the scheme it is essential that the scheme and its objectives are clearly understood by all concerned with the implementation of the scheme. It is strongly urged that the controlling officers should explain in detail the objectives of the scheme to the key village staff so that while executing the work they are clear in their minds about the ultimate aim and are able to look at the problem in its proper perspective. It is also necessary that frequent meetings are called by the controlling officers of the officers incharge of the key village blocks so that any shortcomings detected are immediately corrected, and the progress of work watched.

Selection of areas

60. In the handbook on Key villages issued by the Ministry of Food and Agriculture (Department of Agriculture) the following has been mentioned about the selection of centres for the establishment of key villages and artificial insemination centres—

“The area for the location of a Key Village will be selected by the department. The following points to be noted in making the selection are, however, mentioned here for general information:—

- “(1) The first essential is that Key Villages should have a stationary cattle population. By ‘stationary’ population is meant that most of the animals in the area should be the progeny of animals that were in the same area and that there is reasonable chance of the progeny of existing animals remaining in the same area. Key Village should not be located in an area inhabited by nomadic tribes or cattle breeders who own no land and who migrate from place to place in search of fodder. Only under these conditions will it be possible to effect permanent improvement and to study the results of measures taken for the improvement of animals from generation to generation. The effect of locating a Key Village in area which does not have a stationary population is similar to changing the location of the Key Village from time to time. It is of course not visualised that there will be no transfers and sales of livestock from the area, particularly after their improvement. What is intended is that an adequate number of animals should be available in the same area from generation to generation

and the changes of ownership should represent a small proportion only of the total population. Only such movements of animals should take place as happen in the normal course of the business of breeding and trading.

- “(2) It will be an advantage if the owners of cattle are cattle breeders and are not interested merely in milk production. Where cattle owners are interested only in market milk, they generally use the bulls for bringing the cows into production and are not interested in the progeny of the cows. It is not very easy in such cases to induce them to put in extra effort for getting the animals bred by a ‘better’ bull. Area wherefrom milk is collected for sale to cities may, however, be provided with artificial insemination facilities as extension to the activities in the regular centre.
- “(3) Preference should be given to areas which have facilities for the cultivation of fodder and cattle feeds or where such facilities can be developed easily. Areas which are devoted mainly or entirely to the production of cash crops such as tobacco, sugarcane, jute etc., should be avoided, because in such areas it is very difficult to interest the villagers in cattle improvement or to induce them to grow the fodder requirements of their livestock on their own lands.
- “(4) The Key Villages should be located so that they may be easily serviced from an artificial insemination centre. The distance should not be more than 5 miles. It should be connected to the A.I. centre with a good road that can be used all the year round.
- “(5) The area should have a population of about 500 adult females in a compact group. If the area is separated (from other animals) by a natural boundary such as river, forest, or mountain range it will be an advantage because then it will be possible to segregate more easily these animals from other animals and to concentrate on their improvement. The population should not be very much more or less than 500 because the facilities provided in the Key Village are adequate for that population. If more animals exist in that area the facilities may be inadequate and proper concentration may not be possible. If the population is less, the facilities may be wasted.
- “(6) Preference should be given to villages which have facilities for education and the population of which is rather progressive and not much prejudiced so that their cooperation can be easily obtained. Areas where cattle improvement schemes have operated in the past with success should be preferred and areas where cattle improvement schemes have not been popular should be avoided.
- “(7) Location of centres in homes of definite breeds or where cows of high merit exist will be advantageous as the resulting bulls will also then be of good merit as stud animals for other areas.
- “(8) Areas where other development activities are being undertaken offer advantages which are evident.”

61. It is observed that in several cases due care has not been exercised and the above mentioned criteria ignored while selecting areas for the location of key village blocks. This had led to unsatisfactory progress of the scheme in those particular cases. Among the various factors responsible for wrong selection of areas have been lack of proper understanding of the scheme, indifference on the part of the technical staff responsible for selection, defective survey and sometimes political pressure.

62. In the key villages located in areas where people are not interested in cattle development, generally cooperation is lacking and the key village work is looked upon mainly as a Governmental activity of not much interest to the local people.

63. It should be realised while selecting areas for establishment of new Key Village blocks that all types of areas are not fit for cattle development, and as such in future only those places where people are interested in cattle breeding should be chosen for locating a Key Village block.

64. In establishing future Key Village blocks an important consideration which should be kept in mind is the need for contiguity so that any improvement effected would cover a solid block of sizeable proportion instead of small pockets here and there.

65. In future before any new Key Villages are established, a proper detailed survey keeping all the essential requirements in view should be carried out. Moreover, if any of the existing key villages are to be transferred, then these should be re-located preferably in close proximity to the existing blocks. This policy in certain States, we observed, has paid rich dividends in that non-descript areas of fairly large size have been converted into tracts with a large population of animals of improved type. We have already mentioned the case of Kangayam tract where solid improvement has been effected almost throughout the tract.

Preliminary Survey

66. Detailed instructions in this connection were given in the 'Handbook on Key Village scheme' issued by the Ministry of Food and Agriculture (Department of Agriculture), Government of India in 1954.

67. In several cases, unfortunately, these instructions do not seem to have been observed in practice with the result that sometimes Key Village blocks have been set up in areas which are not suitable.

Transfer of centres

68. The net result of wrong selection of areas for the location of the key village blocks has been that certain centres had to be transferred from one place to another. On many occasions only readjustment in the main and sub-centres were made while at other times the artificial insemination centres had to be shifted. The number of centres which had to be transferred in the various States is in all about 25 to 30.

69. But more than this it is found that though in some blocks the progress has been extremely unsatisfactory and there are other reasons which justify transfer, it is difficult for the department to shift them to more suitable locations because of resistance from cattle owners and other prominent people in the locality. The result is that several centres in the various States are per force being continued in areas which have proved unsatisfactory and unsuitable for the key village scheme.

70. Another major defect observed is that in some cases the sub-centres and the main centre have been located too far away from one another. It need hardly be emphasised that the more compact the area covered, the better is the output of work, as it is possible not only to transport semen for artificial insemination quickly but it also helps the stockman-in-charge to move about in the area more frequently. The Officer-in-charge is also able to pay frequent visits to the sub-centres, efficiently check the work of the stockmen as well as give necessary guidance and conduct propaganda in respect of the working of the scheme.

Village contacts

71. The Key Village scheme envisaged intensifying village contact with a view to popularising the scheme among the cattle owners and generally to educate them in the principles of scientific improvement of livestock. This, it was observed, has not received as much attention as it should have. In many cases the Officers-in-charge have performed their functions in a routine manner without mixing with the cattle owners and without making much effort to win their confidence and enlist their support in the working of the scheme. It is only by a proper understanding of their problems that the confidence of the villagers can be won and contacts with them made effective. The Key Village scheme provides a great opportunity to the field workers to know the cattle owners, their problems, their attitude and above all their aspirations. We, therefore, suggest that the Key Village staff should intensify their efforts in this direction.

Supply of bulls

72. The basic objective of the Key Village scheme is to rapidly multiply the superior bulls produced at the Government farms in the scheme areas and to distribute the bulls produced for improvement of other areas. It was estimated at the beginning of the scheme that the Government farms produced annually about 750 bulls. Based on this number targets for artificial insemination centres and key village blocks were fixed at 150 and 600 respectively in the first Five Year Plan. It is observed that the farms have generally been unable to play their proper role in the development of cattle in the country, particularly in respect of supply of bulls to the key village blocks. From the replies received to the questionnaire it appears that except in the States of Madras, Uttar Pradesh, West Bengal and Rajasthan, the Government farms have generally not been able to meet the requirements of bulls for the key village areas. In Madras all the Red Sindhi and a good proportion of Kangayam bulls are obtained from the farms while in West Bengal all the Haryana bulls required for the Key Village scheme are supplied by the Haringhata farm. In U.P. and Rajasthan, the farms meet 60% and 50% respectively of the requirements of the bulls for Key Village blocks. In Orissa and Jammu & Kashmir

nearly one-third of the requirements are met from the Government farms while in Mysore and Punjab only a quarter of the supplies come from the farms. In other States (except Bihar about which information is not available), the bulls are purchased from outside. In Kerala, though the production from the farms is adequate to meet the requirements of the Key Village scheme, the quality of the bulls is far from satisfactory. The State, therefore, occasionally gets bulls for replacement from outside. This would indicate that in the majority of cases the farms have failed to play their proper role, which is unfortunate, as these farms have been established primarily for the maintenance of nucleus herds of the various breeds and to produce bulls of known parentage and performance for use in the villages for effecting rapid improvement of the village stock. In the case of some farms it is found that though they have been in existence for a very long time, they have not produced even a few bulls for use in the breeding tracts. (In the States of Andhra Pradesh, Maharashtra and Gujerat, it appears that so far no bulls have been issued to the key villages from the Government farms). It is essential that these farms, on which considerable sums are being spent by the State Governments, are put on a proper basis and reorganised so that they are able to discharge the function for which they have been established. They should maintain a proper link with the key village blocks and take full responsibility for supplying to artificial insemination centres high class bulls, preferably progeny tested. The State Governments should make liberal provision for the farms so that they are able to maintain the requisite number of animals and undertake scientific breeding for evolving superior strains.

73. An interesting example of the inability of a farm to supply bulls and its effect on the key village scheme came to light in one State. Here according to the breeding policy Red Sindhi bulls were being used for the upgrading of local stock in the key villages. The State Government also runs a farm where the Red Sindhi breed is maintained. This farm has been in existence for more than two decades but Sindhi bulls of the desired quality are not produced with the result that in one of the artificial insemination centres, when a bull was required for replacement, the State Government had to change the breeding policy as the farm could not supply a bull of the desired quality and none could be had from outside.

74. In this connection it will be recalled that based on the recommendations of the meeting of the State Directors of Animal Husbandry held at Poona (1953), the Indian Council of Agricultural Research had asked the State Governments to set up Farms Reorganisation Committees to examine the working of the State farms and to suggest measures for their reorganisation. It appears that none of the States except the erstwhile Hyderabad and Orissa States implemented this recommendation. As the farms have an important role to play in the State's livestock development work, State Governments should give serious consideration to this matter, and if necessary, set up Reorganisation Committees to look into the working of their cattle breeding farms and suggest measures for their reorganisation.

75. As the farms in the States are unable to meet the entire requirements of the Key Villages for bulls, a large number of breeding bulls have to be purchased from the breeding tracts located within or outside the State. The pur-

chase of these bulls is largely based on conformation without reference to their pedigree. This has to be done because at present there is no system of milk recording in the villages. As the demand for high class bulls is progressively increasing, it is necessary that steps are taken to ensure that in future only high class bulls from high yielding dams would be obtained. For this purpose it is suggested that in the Third Five Year Plan programmes for the registration of animals in the breeding tracts be taken up. In selected areas in the breeding tracts superior animals should be located and their milk yield recorded on scientific lines. Thereafter as and when adequate data become available, suitable animals should be registered in the herd books. Also, Breed Societies should be formed which should keep the essential records about the registered animals so that it may be possible to utilize these at the time of purchase of bulls from the breeding tracts, programme for the registration of animals should be taken up initially for the more important breeds under the technical control of the Indian Council of Agricultural Research which has already an organisation for herd book registration. The Central Government should provide the necessary financial assistance for the work.

76. It is also necessary that progeny testing programmes are taken up on a large scale, as this is the only scientific method by which the transmitting ability of the sires can be determined and this will ultimately help in effecting genetic improvement in the animals to which they are bred. We, therefore, recommend that for the more important breeds progeny testing schemes should be taken up at as many Government farms as possible. For progeny testing a certain minimum number of cows and other facilities are essential and it is, therefore, recommended that for progeny testing programmes to be taken up the necessary facilities should be provided by the Central and State Governments. Private farms and institutions like Goshalas, which have suitable facilities, should also be encouraged to take up progeny testing.

77. In order to overcome the present shortage of bulls the State Governments should formulate well thought out purchase programmes in advance. In purchasing bulls, preference should be given to those which come from high yielding dams, information about which would be available on account of introduction of milk recording in the Key Village blocks.

78. In some of the States it is observed that the bulls for key villages are purchased from the breeding tracts by tender system. This procedure is adopted to avoid audit objections and to satisfy financial rules. However, this method is not considered to be a very satisfactory one for the purchase of breeding animals. These animals should only be purchased after making a careful selection on the basis of pheno-typic characters as well as on the basis of evidence about their productivity.

79. In States having extensive breeding tracts from where every year large numbers of bulls are purchased by the various States for use in the Key Village blocks and other cattle development projects, there is need to ensure supply of bulls at reasonable prices. To enable this being done it is suggested that the States concerned should set up an agency for organising the sale of bulls in the breeding tracts.

Breeding control

80. In the first 4 years of the Second Five Year Plan the number of castrations done in the Key Village areas was as under—

1956-57	..	..	..	..	..	50,114
1957-58	.	..	..	..	..	82,323
1958-59	..	..	..	..	..	106,089
1959-60	...	..	..	..	...	136,801

These figures indicate that there has been a steady increase in the number of castrations over the four years period. The increase is partly due to the increase in the number of Key Village blocks from year to year. Even so the figures give an idea about the trend of castration work. However, there are still large numbers of scrub bulls in certain Key Village blocks which are a great impediment to effective breeding control. This is due to the fact that there is still unwillingness on the part of the villagers to get their male stock and Brahmini bulls castrated, particularly so in the backward areas. In certain areas like the Kutch district in Gujerat State, this feeling is very pronounced and castration is considered sinful. Consequently, in this area the male calves are sold by the cattle breeders at very cheap prices to certain communities who castrate them generally by primitive methods and sell them back to the cattle breeders charging them high prices. In certain gowshalas in Kutch, we saw large numbers of uncastrated males, for which there was no use.

81. The age at which castration is carried out in various areas differs widely. In some tracts like the Khillar and Ongole tracts, the practice is not to castrate animals until they are 3—4 years of age. These animals are, however, not used for breeding for which purpose separate bulls are kept. Thus so far as these tracts are concerned, generally the entire males are not a problem.

82. On the contrary in some of the centres it was our feeling that the scheme staff is not putting in the same amount of effort in pushing ahead the castration work or bringing home to the villagers the advantages of early castration as it should. It is necessary that the Stockmen and other staff when they visit the villages carry with them castrators and perform the operation at the door of the owner whenever necessary. Again, so far the castration work has been done by persuasion only. It is felt that though persuasion may be an ideal method to convert the villagers, it is essential that the staff should be equipped with powers to resort to compulsion where persuasion fails.

83. Powers for carrying out compulsory castration are provided under the Livestock Improvement Act. This Act has been enacted in most of the States and some of them have also framed rules thereunder. In the majority of States, however, the Act has not been extended to the Key Village blocks. Unless this is done, it is of no help to the staff. We, therefore, suggest that the States concerned might take early action to extend the provisions of this Act to all the Key Village blocks. A word of caution has, however, to be sounded to the staff concerned. It should be clearly understood that persuasion and educative propaganda are the only real means of achieving the objective. The powers provided under the Act should be utilised, if at all, only in very rare cases. Appendix XIX gives the Statewise position with regard to the enactment of the Livestock Improvement Act.

84. In connection with the castration of animals, as mentioned in preceding paragraphs, there is a very wide variation in the age at which cattle owners normally accept castration. Unfortunately, no scientific investigations have been carried out to find out the effect of castration at different ages on the draughtability of the animals. Such studies are urgently called for. It is, therefore, suggested that controlled experiments should be taken up to study the effect of castration of male animals at different ages on their draughtability.

Maintenance of breeding bulls

85. The Key Village scheme provides for the location of bulls in the Key Villages for natural service side by side with artificial insemination. Each State has usually its own system for locating bulls. The various systems followed can be broadly classified as:—

- (1) Location of bulls in the custody of villagers or local bodies with subsidy for maintenance, and
- (2) Location under direct supervision of the key village staff.

86. It is found that the rules governing the maintenance of bulls vary from State to State as regards the amount of subsidy, charging of service fees, recording the services, etc. This will be clear from the account given below. The various systems for distribution of bulls under custody of the villagers are:—

- (a) The bull is handed over to either the village panchayat or some prominent cattle breeder (custodian) who is paid about Rs. 30 p.m. towards the feeding charges. The cost above this is met by the Panchayat or from the village funds or by the custodian.
- (b) In one State the Gram Panchayat is paid a premium of Rs. 10 p.m. In this case the bull naturally does not receive the same attention as bulls in other areas or the artificial insemination bulls.
- (c) In Orissa, the custodian is paid Rs. 45 p.m. and the owner is expected to keep a record of the services performed by the bull.
- (d) In Madras bulls are distributed to custodians. They are paid Rs. 30 as feeding charges (as no service fee is charged in Key Villages) and the ownership is transferred to the custodian after the completion of 5 years or 300 services whichever is later.
- (e) In Mysore the key village bulls for natural service are located in selected villages with approved custodians. The custodians have to maintain the bulls satisfactorily at their own cost for four years according to the terms and conditions imposed by the Government. After that period the proprietorship is transferred to the custodian.

87. When bulls are maintained by the Key Village staff directly, generally one Bull Attendant is provided to look after 2 bulls and a subsidy of Rs. 30 p.m. is paid for feeding the bull. Alternatively, while the bull attendant is responsible for looking after the bull, the feeding of bulls is made the responsibility of the Village Panchayat, which is paid Rs. 30 p.m. The additional cost of feeding the bull is met by the panchayat from its own funds. The latter

arrangement we found to work fairly well because the additional amount required for feeding the bulls is met from the Panchayat funds, the bull attendant being responsible only for the maintenance and upkeep of the bull.

88. In the Key Villages located in the Khillar tract in addition to the bulls located by the Department for natural service, the Animal Husbandry Department has given recognition to certain other bulls which are the property of the private cattle breeders. In such cases the Government pays Rs. 200 towards the cost of purchase of the bull and a monthly subsidy of Rs. 12 towards the feeding charges of the bull. The owner is permitted to charge service fees from the owners of cows served by the bull.

89. The various systems followed have got their own advantages and disadvantages, but the most satisfactory system appears to be the one in which the bull is looked after by the bull attendant in so far as its daily routine is concerned while its feeding is made the responsibility of the village panchayat. In such cases, it was observed that the bulls were healthy and strong. Contrary to this, where the bull is handed over to a private breeder, we found that unless the latter is permitted to charge service fees, it is not looked after well.

90. It is essential that wherever bulls are located for natural service they should not be allowed to go with the herd for grazing as in that case there is no breeding control and it becomes difficult to know which cow has been served by the bull. We find that this system of allowing the bulls to go out with the cows for grazing is being followed in Kutch. Although there is a bull attendant provided to look after the bull, still the bulls are let loose with the village herd. We were informed that the services performed by these bulls are recorded on the basis of the information supplied by the herd boy every evening. Such system is far from satisfactory and is bound to result in wrong and incomplete recording of services performed by the bulls. It is, therefore, necessary to insist that the Key Village bulls are not allowed to go out with the herd for grazing.

Key Village Bulls

91. In the breeding tracts, where the population consists largely of pure-bred animals, it was observed that sometimes the bulls located for natural service were not popular and the villagers were inclined to use either their own bulls or get their cows served by bulls elsewhere. This happens because very often the bulls located in the Key Villages are inferior to those maintained by the villagers themselves. This is a very important matter since once bulls of inferior quality are located in a Key Village block the entire work suffers.

92. The main reason for providing inferior bulls in the Key Village areas is inadequate provision made in the scheme for purchase of bulls. The model scheme provides Rs. 600 only for the purchase of bulls for natural service, while in a breeding tract a good bull costs anything from Rs. 800 to Rs. 2,000. In the Ongole tract in Andhra Pradesh, for instance, it was noticed that young bulls at the age of 9 to 12 months were offered as much as Rs. 1,500. The same holds good of other breeding tracts like the Khillar and Deoni areas in the Maharashtra State and the Hallikar tract in the Mysore State. For the success of the scheme, therefore, it is essential that only bulls of high quality, which are in no way inferior to the bulls maintained by the villagers, are used.

for artificial insemination or for natural service. For this purpose the Government should make provision for the purchase of bulls more flexible and in breeding tracts like Ongole, Deoni, Khillar, Haryana etc., where high prices for bulls prevail, the provision for the purchase of bulls for Key Villages should be raised to Rs. 1,200 to 1,500. The ceiling should, however, be fixed in consultation with the concerned State Director of Animal Husbandry. Although at present in the non-descript areas people do not object to even a mediocre bull, it is certain that even in these areas in course of time after one or two generations have been bred a demand will arise for superior bulls, for which again high prices will have to be paid.

93. As the Key Village scheme has now been in operation for many years and in several States already considerable genetic improvement has taken place it is necessary that if any further improvement is to be effected, the quality of bulls for replacement should be superior. This can be assured only if the farms are able to provide better and if possible progeny tested bulls. The farms should, therefore, take up systematic work in regard to testing of bulls immediately. Unless this is done a situation may arise when bulls from high yielding strains would not be available and the cattle improvement programme would suffer a serious setback.

94. The bulls used for the key village work should be tested before being located for natural or artificial service. Their sexual health control is essential not only to test their fertility but also to see that they are free from disease. Bulls should be tested annually and those which are found to give low conception rate should be removed. Their examination should also include testing for brucellosis, trichomoniasis, etc.

Breeding policy

95. The Animal Husbandry Departments in the States have laid down a certain breeding policy for the various tracts in their States, which is based broadly on the policy recommended by the Indian Council of Agricultural Research. This policy is adopted so far as the Key Village areas are concerned. However, in regard to N.E.S. Blocks, the policy does not seem to be decided always in consultation with the Animal Husbandry Departments, for in some N.E.S. blocks the breed used was different from the one being used in the Key Village blocks in adjoining areas. Such a policy is detrimental to the cattle improvement work in the area. It is, therefore, imperative that so far as the choice of the breed to be used is concerned, it should always be decided in consultation with the State Director of Animal Husbandry irrespective of whether a certain developmental project has been taken up under the National Extension Service Block or any other scheme.

96. It was also observed that in certain Key Village blocks there has been a change in the breeding policy with the result that whatever results had been achieved in the first few years of the working of the scheme were lost because a new breed was introduced in the area. A number of factors have contributed to this. The inadequate supply of bulls of certain breeds, particularly the breeds which have their home in Pakistan, has been the major factor. In one instance, in a certain Key Village block it was observed that for the

first several years or so the policy was to upgrade the non-descript animals with Red Sindhi bulls. Later on as Sindhi bulls could not be obtained, the breed was substituted by Tharparkar. In another State at first the Tharparkar breed was being used in the Key Village blocks but later when it was found that this breed was not popular with the people, as they were more interested in draught than in milk, the breed was changed to Kankrej. This change has also upset the normal working of the scheme, as it has not been possible to withdraw all the Tharparkar bulls at once and both Tharparkar and Kankrej bulls are being used side by side. The harmful effects of such shifts in policy are obvious. In another State it was found that in one part the Hariana breed was being used, while in another Sindhi bulls had been located. Though the latter had produced good progeny, the people demanded Hariana and the Department seemed inclined to change the policy.

97. We realise that while such changes in policy are to some extent inevitable as the reaction of the villagers to a particular breed cannot always be foreseen, to a great extent, such shifts in policy can be avoided if before the work is started a proper survey is carried out, the needs of the people studied and the availability of the type of bulls required ascertained. In this connection we would like to observe that of all the milch breeds the Sindhi is being most widely used and is in the greatest demand. However, bulls of this breed in the required numbers are not always available. While the situation can to some extent be relieved by proper control over the distribution of bulls from the farms and making the maximum possible use of those available by artificial insemination, the serious shortage of bulls of this breed would persist and there is, therefore, urgent need to augment the stock at the existing farms and/or open new farms so that the work does not suffer for want of bulls of this valuable breed.

97(a). It is also necessary that the breeding policy for the border district, is decided by mutual consultations with the adjoining State so that there is no conflict in the breeding policy in contiguous areas of two States.

Equipment

98. In addition to the equipment required for the work of actual insemination in the Key Village blocks, there are a few important items of equipment like refrigerators, castrators, tattooing forceps and syringes which have also to be provided. Though most of the Key Villages appear to be well-equipped in this regard, there are two items which were often found wanting. One of these is the kerosene refrigerator. There is an acute shortage of such refrigerators in the country and most of the centres, particularly those which have been recently set up, had difficulty in carrying on day to day work because of the absence of a kerosene refrigerator. This item of equipment is very essential for the satisfactory working of the Key Village scheme. It is understood that these refrigerators are not freely available in the market although certain firms within the country have taken up their manufacture. We, therefore, suggest that the Central Ministry of Agriculture should obtain the requirements of this item of equipment from the States and place a bulk order through the Department concerned for these refrigerators. This will also help the supplying agencies in making a bulk supply. Till such time as the

required number of refrigerators cannot be had within the country; we recommend that adequate foreign exchange should be made available to the States concerned to import this essential item of equipment.

99. The other item of equipment which is found lacking is tattooing forceps. Though most of the centres have been in operation for a number of years, this small equipment had not been supplied to many. For lack of tattooing forceps the work has naturally suffered. Basic stock included in the Key Village block was not marked for identification with the result that the entire data in respect of services, artificial insemination, milk recording, birth of calves, follow-up work; etc., were vitiated. There were no convincing reasons for not obtaining these forceps in time. Adequate numbers of these are available in the country and should have been obtained a long time ago. In some of the centres where this piece of equipment had been obtained it was observed that it was kept unused. At one place, the Officer-in-charge was not sure of the type of ink that had to be used with the tattooing forceps. One reason given for not using the forceps was that people objected to tattooing but marking of animals is essential for purposes of identification, as on this depends the success of many of the items of the programme. We got the impression that not carrying out tattooing is either due to lethargy or unwillingness on the part of the staff to convince the farmers of the need for this for the proper execution of the Key Village programme.

Procedure for purchase

100. Another matter to which we would like to refer is delay in the purchase of equipment for which the current administrative procedure is responsible. The sanction for the purchase has to be issued by the Head of the Department and not by the Deputy Director in charge of the Key Village scheme. Then again this Deputy Director is not authorised to make the purchases. These have to be made by the Deputy Director who is in charge of the entire range or circle in which the particular Key Village block falls. All this results in delay in the purchase of equipment. We suggest that the authority for the purchase of equipment and other minor items for the key village blocks should be completely vested in the Deputy Director in charge of the Key Village scheme, so that delay is prevented and equipment provided in time for proper execution of work.

Staff-shortage of trained personnel

101. Most of the major States have got adequate staff to man the key-village blocks but in some of the States it was found that there is great shortage of trained personnel for manning the key village blocks. Many a time a block had been started without an officer-in-charge. Similarly, sub-centres were established but no stockmen or livestock Inspectors could be provided for a long time. This naturally results in unsatisfactory work. Because of the importance of the Key Village scheme we suggest that in making appointments preference should be given to Key Village blocks. Where the number of available Veterinary graduates falls short of the requirements, it would be advisable to withdraw experienced Veterinary Assistant Surgeons from comparatively less important schemes or Veterinary Hospitals and put them in charge of the Key Village work.

Frequent transfers and change of staff

102. It is quite common to find that a trained officer-in-charge working a Key Village scheme is transferred and shifted to work on an altogether different type of job. A proper substitute is not provided for varying periods with the result that the scheme work comes to a stand-still or goes on in a routine or in an indifferent manner. These transfers are not always made in consultation with the Deputy Director, Key Village scheme, who is responsible for the proper working of the scheme.

103. It is very important for the progress of the scheme to have suitable personnel in charge of the work and it is even more important to retain their services for many years so that the confidence reposed by the villagers in the work is not lost. The key village work has many facets and it takes some time for an officer to understand what is required of him and once he has familiarised himself with the working of the scheme, it is not desirable to disturb him unless he has put in some years of service. In view of this it is suggested that transfers of the staff should be avoided. If transfer of an officer is considered essential then he should either be transferred to some other key village or to some other area for doing similar type of work so that his knowledge and experience of the key village work are not lost.

104. The Officers selected for running the scheme should, as far as possible have adequate field experience of livestock development work. Raw veterinary graduates should be allowed to acquire field experience before they are posted as officers-in-charge of the key village scheme, unless, of course, a particular officer is considered exceptionally suitable for handling the work because of his special qualifications.

Supervision at State level

105. At present in the States there is only one Deputy Director to supervise the working of the scheme and to provide guidance to the Officers-in-charge and the other staff employed under the key village scheme. As, in the States more blocks are being opened, the work-load is increasing and it is becoming difficult for the Deputy Director to do his job single-handed efficiently. It is felt that a stage has been reached when he should be provided with some Junior officers to assist him in carrying out inspection of the blocks and providing guidance to the field staff in the day-to-day execution of the work. In Madras and Andhra Pradesh supervisors for looking after a group of key villages have been appointed. These officers carry on routine inspection work and it was found that there was definitely better supervision in these States than in others. Appointment of similar officers in the other States would greatly improve the working of the scheme. We, therefore, recommend that the Central Government should agree to provide Key Village Supervisors of Class II status to each State, their number depending upon the number of Key Village blocks to be supervised. The officers selected for these posts should preferably be from among the senior key village officers, who already possess working knowledge and experience of the scheme and who would thus be better suited for the job.

Supervision and Guidance from the centre

106. As the Key Village scheme is an All-India scheme and the Central Government shares expenditure thereon with the State Governments, the Central Ministry of Food and Agriculture (Department of Agriculture) is also responsible for its technical supervision along with the State Governments. The centre also coordinates and, wherever necessary, lays down the broad policy in respect of various items included in the technical programme. For this purpose there is a Livestock Development Adviser who is assisted by a number of other Officers. These Officers are expected to visit the States, examine the progress of Key Village work in the field and point out any lacunae or defects in its working as well as suggest measures for remedying these defects. Unfortunately, we find that this supervision is extremely weak and some of the States are not visited even once in a year by any Officer from the centre. The Central staff do not perhaps have the time to inspect the working of the scheme as often as they should with the result that several small things that could be promptly remedied by advice on the spot have remained unattended to for years leading to unsatisfactory progress of work and at times maintenance of inaccurate and unauthentic records. The reasons for inadequate inspection of the scheme from the Centre appear to be mainly:—

- (a) Inadequacy of the staff, and
- (b) their having been entrusted with many other types of work.

107. We feel that there is an urgent need for strengthening the staff under the Livestock Development Adviser so as to ensure more frequent inspection and timely application of corrective measures.

Compensatory allowance

108. Realising the difficult and arduous nature of the key village work and because the Key Village Officer is deprived of certain privileges which he would have enjoyed had he been posted in a Veterinary Hospital, the Government of India had sanctioned a special compensatory allowance equivalent to 33½% of pay with a maximum of Rs. 50 p.m. for the Veterinary Assistant Surgeon in charge of a block. A similar allowance subject to a maximum of Rs. 20 p.m. was also sanctioned for the stockman working in the scheme. 50% of the cost of these allowances is borne by the Government of India. Some of the States have sanctioned the allowance but others have not done so. This has led to considerable dissatisfaction and at times to lack of interest on the part of the officers in the work. We are convinced that payment of such an allowance is absolutely essential. We, therefore, recommend that those States which have not so far sanctioned the compensatory allowances may reconsider the matter and sanction it as early as possible.

Veterinary aid

109. The provision of veterinary aid (prophylactic vaccination and treatment of animals) in the key village blocks is an essential part of the key village work. In places where the main centre is located on the premises of the veterinary hospital this work is attended to well. But in other places where the

the work done in relation to non-scheme animals. Even in the annual reports it is found that these two figures are sometimes mixed up with the result that a correct appraisal of the work done in the Key Village blocks becomes difficult. We, therefore, suggest that for future instructions should be issued that records of work done in relation to scheme and non-scheme animals are maintained and reported separately.

Milk recording

117. Right from the inception of the scheme it has been realised that one of the most important yard-sticks for estimating the progress of work under this scheme is the assessment of the milk yield of the stock under improvement from generation to generation. For this purpose it is essential to secure an objective and precise estimate of milk production in the various Key Village Units. Recognising the importance of obtaining such essential data, the technical programme of the Key Village scheme laid stress on the recording of milk yield of a randomly selected representative group of cows in each Key Village block. Although this item was included from the very beginning yet no separate staff was provided for this purpose. Not much attention was, therefore, paid to this item of work until recently when a separate milk recorder for each Key Village block was sanctioned. As the objective was to obtain an over-all estimate of actual production of milk as well as the average lactation yield of animals, in the various blocks, the Statistical Wing of the Indian Council of Agricultural Research drew up a procedure for selection of animals and provided other details for recording the milk yield of the selected animals. This plan has been commended to the States for adoption.

118. The plan provides for the recording of the milk yield of a representative sample of animal and each selected animal has to be milk recorded on selected days. According to the prescribed procedure each milk recorder has to record 4 animals every day for 6 days in a week in each Key Village Unit by turn. After completing one Unit he moves to the next Key Village Unit in the next week and in this way he covers all the Key Village Units turn by turn. Thus in a Key Village block of six Units in a 6 week period he records 144 animals. The recording is done both in the morning and in the evening. In addition to the milk recorder each Stockman is required to record the milk yield of 2 animals per day from among the animals within his jurisdiction in such a way that each selected animal is recorded at intervals of 8 weeks during her lactation. 96 animals are, thus, recorded by each Stockman.

119. According to the suggested plan of work, the milk recording work involves—

- (a) Determination of the number of animals to be recorded in proportion to the total adult cow and buffalo population;
- (b) The actual selection of animals for milk recording;
- (c) The selection of days on which each selected animal is to be milk recorded; and
- (d) The actual recording of milk and collection of other relevant data.

120. A formula for calculating the number of animals to be recorded has been provided which takes into consideration the average calving interval in days, the total number of breeding cows/buffaloes and mature heifers which are likely to calve in the next calving interval and the number of animals to be milk recorded in a week. This gives the value of Pth cow. For selecting the animals to be milk recorded a list of the animals which would have calved during the previous weeks according to the dates of calving had to be prepared. From this list every Pth cow or buffalo is chosen for milk recording. If the same animal happens to get selected for milk recording both by the Stockman and the Milk Recorder then this animal has to be left out by Stockman who is required to choose the next animal in the list. Another precaution that has to be taken in selection of days for milk recording is to ensure that each selected animal is first milk recorded within the first 6 or 7 weeks of the calving.

121. The data to be collected in respect of each selected animal include the name and the number of animal, the name and the number of owner, the date of calving, calving order, date of each recording, time of milking recorded yield at each time of milking, etc. In addition to this the Milk Recorder, Stockman is also required to obtain general information such as the amount of feed and fodder given to the animal, its price, disposal of milk, etc. During our visit to the various Key Village blocks, we observed that the position about milk recording under the key villages is far from satisfactory. There are various difficulties met with in the field and the staff has actually got to do much more than merely record the yields of animals, if any degree of success has to be achieved. The main difficulties encountered in proper milk-recording are—

- (1) In the majority of the States the full complement of staff, namely milk recorders has not been appointed and such as have been appointed do not appear to have had any special training.
- (2) The plan for selection of animals for milk recording as drawn up is far too complicated and normally it is difficult for the staff to understand it. Even some supervising officers responsible for the execution of the Key Village Scheme do not quite clearly understand it. This point has been discussed with the Statistical Division of the I.C.A.R. and it is intended to make the plan more practicable.
- (3) The villager is superstitious and even in advanced areas suspicious of milk recording. He thinks that if people see his cow or buffalo being milked, it will go off milk. Very often many of the breeders who possess first-class cows would resent anybody seeing their cows being milked. This may be sentimental.
- (4) The milk recorders have not been explained the programme by their officers.
- (5) In certain places milking is done in the very early hours of the morning and it is not possible for the recorder to reach the villages in time, especially if the cows to be recorded happen to be in different villages.

122. Recording of milk yield of a representative sample of animals in a Key Village block is considered essential as this is the only yard-stick, by which improvement in the genetic make up of animals under the scheme from generation to generation can be measured. We, therefore, agree with the desirability of taking up milk recording on systematic lines in Key Village blocks. One important point, however, which we would like to mention in this regard is about the advisability of taking up milk recording in all the Key Village blocks in the country. For instance, we feel that it is not necessary to insist on milk recording at this stage in the Key Village blocks which have been located in tracts where draught breeds exist. In the Amrit-Mahal and Hallikar tracts, for example, we do not think that any results which would yield information of significant value can be derived by milk recording of the animals. Though according to the breeding policy, in these breeds also the intention is to put as much milk as possible by selective breeding, we feel that the rate of increase of milk yield will be so small that it would hardly be possible to measure it and derive any significant conclusions therefrom. In view of this, we recommend that in future in the key villages which are being developed purely for draught breeds milk recording should not be insisted upon. In regard to Key Villages located in the non-descript areas it is not necessary to take up milk recording in all the blocks. In these blocks recording in only about 15 to 20 per cent Key Village blocks should suffice. As regards blocks where milch or dual purpose breeds are being used, milk recording is essential to measure the progress achieved from generation to generation. Milk recording should, therefore, be carried out in all such blocks.

123. A minor but important point observed was that while in certain places milk is recorded by volume, in others, recording is done by weighment. As the data which are now being obtained will be ultimately put to statistical analysis for finding out the improvement in the stock, it is desirable that there should be a uniform method for recording yield. We recommend that measurement should be done by weight in all the Key Villages. For this purpose adequate number of Herd-Recorders should be provided.

124. The milk yield figures obtained by the staff on many occasions appear to have been written down without actually seeing or recording the milk. For obvious reasons these data are of no value. Such a practice should, therefore, be discouraged and the supervising officer should also try to make surprise checks of the milk recording work and try to improve the position wherever necessary.

125. In order to obtain satisfactory results it is essential that the milk recorder should be adequately trained. Such training should be organised by the Deputy Director Incharge Key Village scheme in each State.

Propaganda and Calf Rallies

126. In the model scheme a provision of Rs. 500 per centre has been made for arranging cattle shows and calf rallies and distribution of prizes to encourage the breeders in the area. Every year a calf rally is supposed to be arranged in each block where some amount is distributed to the owners of the selected calves, mostly those which are born as a result of artificial insemination. Besides this there is practically nothing else done to make the scheme popular and to

explain to the cattle owners the essential features of the scheme such as the need for adopting artificial insemination, proper feeding of animals, timely protection against common diseases, proper method of milking the cows, rearing of calves, etc. This is so because the provision of Rs. 500 is inadequate and with that amount it is not possible to do anything more than what is being done.

127. We feel that this amount should be raised from Rs. 500 to Rs. 1,000 per annum per centre and calf rallies should be made more popular by inclusion of other activities of the Animal Husbandry Departments such as demonstration of proper methods of feeding, disease control, etc. It is also desirable that the prize money is increased so as to make the prizes really attractive and provide a better spirit of competition among the owners. At the time of these shows there should be charts, photographs, diagrams, etc., exhibited and other audio-visual aids should be utilised for explaining the objectives of the Key Village scheme.

128. Although it is essential that the prize money for the calf rallies arranged in the Key Village blocks should be provided by the Government, it is also necessary that the people in the area fully participate in the rallies. For this purpose the prominent village people should be encouraged to make contributions in cash or kind towards the holding of calf rallies and distribution of prizes. Wherever they exist the Livestock and other Associations and Panchayats should be asked to make contributions so that it becomes their own show and does not remain a merely Governmental activity. The contributions from the villagers should be obtained, to begin with, at least in the areas of pure breeding tracts, where great value is attached to the animals by the owners themselves.

129. In one State Key Village Cattle-owners' Associations consisting of breeders with a prominent farmer as Chairman have been set up. Each member contributes Re. 1 p.m. towards the expenses of the Association. The Key Village Officer works as Secretary to the Association. All key village work is carried out in consultation with the Association. The cooperation of the Association is sought in the selection of bulls for the key village areas, arranging meetings in the villages for explaining the programme of the Key Village scheme such as the advantages of better breeding, feeding, etc. and in organising calf rallies and giving away prizes. The breeders' interest is further evoked by associating them with the purchase of bulls from the key village areas by the Government agencies. The Association generally has a voice in fixing the price of bull and other livestock purchased in the area. These Associations have been of great help to the staff in the organisation of the key village work and have contributed in no small measure to the success of the scheme in this State. In some places these Associations have even donated land, put up buildings and supplied medicines and equipment for the centres and sub-centres. We strongly commend the setting up of such Associations to other States.

130. In the Animal Husbandry Departments as a whole at present there is no separate staff for undertaking propaganda and publicity in regard to the various activities of the Department. Publicity and propaganda are the responsibility of the Information Departments in the States. However, in the day-to-day working it is observed that as the Information Departments have

to cater to the requirements of several other Departments, it is not possible for them to undertake propaganda and publicity for the Animal Husbandry Departments to the desired extent. The result is that the officers responsible for a particular scheme are expected to go about and do as much propaganda and publicity as they can. While it is always desirable that these officers should continue to do their best, it has to be realized that publicity and propaganda work of a technical Department like that of Animal Husbandry is a specialised subject. In other countries various extension techniques have been developed for putting across scientific information in suitable form to the farmers and the cattle owners. These techniques involve not only publication of a few pamphlets or papers but include use of audio-visual aids, preparation of exhibits, organisation of livestock exhibitions which need specialised knowledge and specialised technique. In view of this and because the activities of the Animal Husbandry Departments have expanded considerably not only in respect of cattle and buffalo development, but also in regard to other species of livestock such as sheep, goats, pigs and poultry, it is felt that the time has now come when there should be an independent Section for purposes of propaganda and publicity in the Animal Husbandry Department. We, therefore, strongly recommend that a separate Section should be created in each Animal Husbandry Department for propagating and publicising the latest information on various aspects of animal husbandry including breeding, feeding, disease control, management, dairying, etc. It is further recommended that this Section should be under the charge of a senior and experienced officer with the requisite specialist staff for carrying out the work in a satisfactory manner.

Calf Subsidy Scheme

131. As has been mentioned in the previous chapter, the number of calves subsidized in the first four years of the Second Plan has been far below the target fixed. This is so because there are many practical difficulties in getting adequate numbers of calves for subsidy. In several States, it was found that the cattle owners are not interested in the subsidy programme because they do not have adequate accommodation for maintaining a bull calf during the period of subsidy. The animals are usually looked after by the women-folk who are unable to control the bull calves as they grow up. There is delay in the purchase of the animals and over and above that the owner is not sure whether the Government would buy the bull at all when it matures. If on the termination of subsidy the calves are not purchased by the Government, then per-force the owner have to castrate them at that late age, and the animal does not fetch the usual price with ultimate disadvantage to the owner. This is particularly so in the tracts where early castration is practised. In the tracts, where pure breeds exist, the amount of subsidy is too small to provide an incentive to any cattle owner to bind himself to rear the animal for a period of two to two and a half years. This is particularly so in the Ongole and Khillar tracts, where high prices are paid for the animals even when they are very young. At several places, young bull calves ranging from eight to twelve months in age were found to have been offered as much as Rs. 1,000 to Rs. 1,500. Naturally, therefore, the subsidy of Rs. 10 paid by the Government offers little attraction to the owners of such animals.

132. Although large sums of money are spent on the calf subsidy scheme, the key village staff generally does not make frequent inspections of these animals. Such an inspection is absolutely essential to ensure that the subsidy is utilised properly and that the owner looks after the animal well.

133. In order to overcome this difficulty we recommend that the States concerned should be urged to take up the modified calf subsidy scheme, under which calves have to be purchased and reared at the State Government farms. Unless this is done, under village conditions the superior male calves are likely to be castrated and disposed of by the breeders to cattle dealers on account of their need for ready money. In addition, the State Governments should be asked to make sufficient provision for the purchase of all selected male calves reared in the key villages.

134. A suggestion was made in one State that the amount of calf subsidy should be increased. We do not commend this.

Feed and Fodder Development.

135. The feed and fodder development programme in the key villages has suffered for want of adequate attention and understanding of the items of work on which action was necessary for bringing about an integrated development of fodder resources in the State. The position in this regard has to be examined keeping in view the following basic facts in regard to land and fodder development in this country—

- (a) Apart from a few exceptions, there are no sown pastures of indigenous or exotic grasses or grass/legume mixture, under Indian conditions;
- (b) There is no evidence that it is possible to incorporate legumes, resistant to grazing, in the existing grasslands in the country;
- (c) Natural grasslands provide grazing only for about four to five months in the year and that also at an approximate rate of only one cattle head per 3 acres;
- (d) Under existing economic conditions, it is difficult to induce the cultivators to grow grasses and legumes for fodder purposes in preference to food and cash crops;
- (e) The development of village pastures and grazing grounds in this country is an uphill task until the intensity of grazing can be controlled and reduced.

136. With this background the progress of feed and fodder development work in the Key Village Blocks was examined by the Committee. It is observed that the work has lagged behind, mainly because of the following reasons—

- (i) At the time of selecting area for a Key Village block, a preliminary survey was to have been carried out. This survey had included *inter alia* agricultural and over-all surveys to determine the existing position about the requirements and availability of feeds and concentrates in the State and in the area where the scheme was to be located. As mentioned earlier, it is observed that this item was not given much attention in the majority of the States while carrying out surveys for the establishment of Key Village blocks.

- (ii) There was considerable lag between the time the scheme was sanctioned and the time staff in the States was recruited for executing the feed and fodder development programme. In some States we were informed that this was largely due to the fact that there was paucity of trained personnel for the work envisaged in the scheme. In one State it was found that a request was made to the Department of Agriculture for releasing one of their trained officers for looking after the fodder development work in the Animal Husbandry Department, but the Agriculture Department could not spare an officer. Suitable officers for undertaking the feed and fodder development work are available in the State Agriculture Departments and the services of these should be made available to the Animal Husbandry Departments.
- (iii) One aspect of the feed and fodder development work is multiplication of seed and its large scale production on the Government farms. This would require time as this was not already being done on the farms and had to be started anew.
- (iv) The key village staff have not given much attention to propaganda in respect of the advantages of fodder cultivation and adoption of improved feeding practices. In future this should be intensified.
- (v) In some of the States, adequate and timely financial provision for doing this work had not been made. In future this should be done.
- (vi) In a State like Assam where there are extensive areas available for taking up the fodder production programme the main handicap has been lack of irrigation facilities. This has to be examined seriously in consultation with the Irrigation Department, and some means of providing cheap irrigation introduced in the Key Village blocks. It is suggested that in order to initiate the work in suitable areas where lack of irrigation is the main obstacle in undertaking fodder development, the Government should provide hand-pumps so that at least a beginning could be made.

137. An important drawback observed in the feed and fodder development programme was that the States concerned had not drawn up an integrated plan of work. This is largely due to the fact that the States have not yet appointed Fodder Development Officers who could look to the execution of the programmes in the desired manner. Failure to set up Fodder and Grazing Committees in the States has also been responsible for lack of interest in the fodder development work. We, therefore, recommend that those States which have not so far appointed Fodder Development Officers (and other staff) or set up Fodder and Grazing Committees may be asked to do so urgently.

138. At present colossal waste of fodder like kadbi straw takes place while feeding the animals mainly because of the improper method of chaffing and cutting adopted. We suggest that at each centre and sub-centre a chaff-cutter should be provided out of the scheme funds. This should be made available to the cattle owners in the area for chaffing their fodder. Once the advantages of properly chaffing the fodder are seen by the farmers, we hope the practice would be adopted widely.

139. Development of pastures in the Key Village blocks is provided under the feed and fodder development programme. Wherever such pastures are developed it is essential that grazing in these places should be properly controlled with a view to maintaining the productivity of the pastures.

140. Growing of fodder on the marginal and sub-marginal lands which at present lie fallow should be encouraged.

141. Another step which should be taken to increase fodder production is introduction of suitable legume crops such as Berseem, lucerne etc. in rotation to paddy crops. This practice has already been found to be extremely useful in a number of States like Assam, where large scale paddy cultivation is taken up.

142. The Key Village scheme provides for payment of a subsidy for constructing silo-pits for demonstrating to the farmers the advantages of conservation of fodder. Since in certain parts of the country large surpluses of monsoon grasses are available and go waste year after year silage making in these areas should be popularized.

143. Popularisation of economic balanced rations is an important item included in the feed and fodder development programme of the Key Village scheme. This has, however, not received enough attention of the staff as only three States have taken up this work. We recommend that this item of work should also be intensified so that the idea becomes popular all over the country.

144. In order to encourage feeding of balanced rations to the animals full assistance should be provided by the key village staff to the cattle owners. They should formulate balanced rations based on the common available feeds in the area and popularise them among the cattle owners.

145. At present of the key village funds only a small fraction is utilised for developing the feed and fodder resources in the blocks. In order to focus attention of the key village staff on this important aspect of work we suggest that, so far as this item of work is concerned, separate funds should be provided so that due importance to this item of work is given by the staff.

146. For overcoming the existing shortage in feed and fodder: another important source which can be tapped is the leaves of certain fodder trees which have been found to be suitable as animal feed. There are several varieties of trees found in various parts of the country, the leaves of which can be easily collected and fed to animals to overcome the shortage of food. We, therefore, recommend that wherever possible, growing of fodder trees should be encouraged. A list of some of the important fodder trees is given in Appendix XIV. This list is by no means exhaustive and includes only some of the more important ones.

147. Over and above these factors, it is observed there was lack of cooperation from the cattle owners so far as their participation in the fodder development programme is concerned as the idea of balanced feeding is generally absent or the pressure on land for growing of food or cash crops is too great. Moreover it is difficult to get adequate land for the establishment of 10 acre pasture plots in most of the Key Village blocks mainly due to the lack of cooperation from the

cattle owners in this part of the programme of the Key Village scheme. To partly overcome this, it is suggested that subsidy for establishment of pasture demonstration plots should be made available even if the area included under this programme is less than 10 acres.

Marketing

148. It is well-known that cattle development starts from the marketing end. Unless suitable facilities for this are provided, the owners do not get the necessary incentive to adopt better methods of cattle husbandry. Organisation of proper marketing facilities is, therefore, of vital importance for the successful implementation of the Key Village scheme. In the beginning of the Second Five Year Plan although it was proposed to take up marketing of livestock and livestock products in 20 selected Key Village blocks, this has not so far been done because a model scheme has yet to be drawn up. As the work under the Key Village scheme is progressing, a stage appears to have been reached when this aspect should be given urgent attention, as otherwise, the progress would be hampered. Originally, it was suggested that in each Key Village block or a group of Key Village blocks, Owners' Cooperative Societies should be established. However, due to several difficulties, much attention was not paid to this aspect of work. The Government of India have now obtained the services of an Expert for advising them on the marketing of livestock and livestock products in the States, including the Key Village blocks. He is studying the problem and would submit his report in due course. While his suggestions might be examined, we feel it is necessary that immediate steps should be taken for the organisation of Cooperative Marketing Societies of cattle owners in Key Village blocks. These Societies should arrange for the marketing of fluid milk in those areas which are located near-about towns, where there is demand for milk while in other areas located in the interior, the Societies should help in the processing of milk and marketing of milk products.

149. Government should extend financial assistance by subsidising the share capital of the Societies.

150. There is a large number of livestock markets all over the country. Some of these are located in or nearabout the Key Village blocks. In order to improve the facilities for marketing of livestock, it is essential that such markets should be improved by providing better housing facilities for the animals and their owners, and by provision of other facilities.

151. It is also necessary that intensive propaganda is carried out for educating cattle owners in the advantages of cooperative marketing. As the marketing of livestock and livestock products is an important item of work, it is necessary that in the State Animal Husbandry Departments, a separate marketing cell is established to look after this work as also to organise cattle fairs and markets.

Key Villages in the Central Institutes

152. Some years ago the Ministry of Agriculture desired that the Central Institutes should take up some extension work in the surrounding areas in addition to research work conducted within the premises of the Institutes.

Accordingly, Key Village blocks were sanctioned for the three Central Institutes viz. the Indian Veterinary Research Institute (one centre), the Indian Agricultural Research Institute (one centre) and the National Dairy Research Institute (two centres—one at Karnal and one at Bangalore). We looked into the working of these blocks and found that there was a definite handicap in the proper execution of the programme in these blocks. The progress of work in some of these blocks in so far as the insemination of animals is concerned is quite satisfactory, but there are several disadvantages which over-shadow this aspect of the work and as such the working of the scheme as a whole appears unsatisfactory. The main difficulty in the proper execution of the programme is that in the areas of operation which are necessarily located outside the jurisdictions of the Institutes, a parallel State organisation of Animal Husbandry functions. It is, therefore, imperative that to achieve the desired success, there should be very close coordination between the activities of the Institute and those of the State Department of Animal Husbandry. This coordination is, to a very great extent, unfortunately, found lacking. The net result is failure to attain the objectives of the Key Village scheme. In the centres attached to the National Dairy Research Institute, Karnal and Bangalore, for instance, it is found that though these blocks are located in pure breeding tracts, none of the male calves born in the Key Village blocks have so far been disposed of for use as breeding bulls, because the State Departments of Animal Husbandry, which are normally the purchasers of such animals, prefer to purchase the male stock from other areas. For instance, although the animals in the Karnal area are perhaps in no way inferior to the Harianas found in the Rohtak district, we were informed that there is a general tendency on the part of other States, which require Haryana (and Murrah) animals, to go to the Rohtak district, which alone is considered to be the main breeding tract. The same appears to hold good in regard to the block attached to the sub-station of National Dairy Research Institute at Bangalore. As a result of this, the cattle owners in the Key Village blocks at Karnal and Bangalore do not receive enough encouragement, as they are not able to get reasonable prices for the animals reared by them. Another serious difficulty encountered in Karnal is lack of breeding control. This is largely due to the fact that the Department of Animal Husbandry, Punjab, which is responsible for the development of livestock in the State as a whole, under its own scheme has let loose premium bulls in the villages in close proximity to the areas under the Key Village blocks. These bulls are allowed to move about with the herds and sometimes trespass into the key village areas and also cover the scheme cows. The Livestock Improvement Act which has been enacted in the Punjab has not been extended to the Karnal district and as such the key village staff cannot take any action to ensure better breeding control. In addition to this, there is considerable difficulty in implementation of the programme for feed and fodder development in the Key Village blocks, which are under the administrative control of the Central Institutes. This is due to the fact that the staff sanctioned for feed and fodder development programme has been given to the States and the Central Institutes do not have any separate staff for this purpose. The State staff, unfortunately, look upon the area of operation of the Key Village blocks under the Central Institutes as not their responsibility and do not devote any attention to the feed and fodder development programme in these areas. As a result of this, nothing is being done in

regard to this important item of the programme of the Key Village scheme. Whatever little is done is the result of the initiative shown by the cattle owners themselves. But that is not enough. There is also some confusion and difficulty in regard to the disease control programme. No clear-cut orders seem to exist as to who should be responsible for undertaking the disease control work in the Key Village blocks attached to the Central Institutes. The staff in the Key Village scheme does, to some extent, attend to prophylactic vaccination and treatment work, but the normal Departmental staff is also supposed to perform routine prophylactic vaccination as well as provide veterinary aid. The jurisdiction of the area of the Key Village block, Karnal, it is understood, extends within the jurisdiction of three Veterinary dispensaries of the Animal Husbandry Department, Punjab. Naturally, therefore, most of the prophylactic vaccination and other veterinary work in the area is performed by the Departmental staff. The scheme staff only assists the Departmental staff in the vaccination programme. There being no separate provision for the purchase of vaccines and sera in the key village budget, these are provided by the State Department of Animal Husbandry. There is, thus, an over-lapping of responsibility which is not in the interest of satisfactory execution of work.

153. In view of the reasons given above we do not see any distinct advantage in continuing these blocks under the Central Institutes and, therefore, recommend that these should be transferred to the State Departments of Animal Husbandry.

154. Special mention about the Key Village block, Nangloi, which is operating under the administrative control of the Indian Agricultural Research Institute has to be made. This centre was started in April, 1954, and its operational area extends over 19 villages with headquarters at Nangloi—a village about 10 miles from Delhi. The centre is thus away from the main Institute and for all practical purposes works as an independent Unit. The Head of the Division of Agronomy is responsible for providing guidance and technical supervision. Under this centre there are 1,106 adult cows and 2,561 adult buffaloes besides other livestock. On reviewing the progress of work in the block, we were struck by the extremely poor achievement recorded so far. There are 2 Zebu bulls and 2 Murrah bulls maintained at the Artificial Insemination centre. With these bulls the following inseminations have been performed during the last 4 years—

	Year					Cows	buffaloes
1956-57	4	<i>Nil</i>
1957-58	4	27
1958-59	4	50
1959-60	6	65

155 In addition to the bulls for artificial insemination, one Haryana and one Murrah bull are kept in each of the Key Village centres for natural service. The performance of these animals was also very poor as, on an average, only 28 natural services were performed annually by each of the Zebu bulls. In the case of buffaloes, however, the position was satisfactory as the number of services worked out to about 95. The progress under other items of work is equally poor as can be seen from the fact that the total number of castrations performed in 1959-60 was 148, while the number of cow and buffalo calves born as a result of artificial insemination was 3 and 33, respectively. The calf subsidy scheme was taken up only in 1959 and so far 38 calves are reported to have been selected for subsidy. These do not all appear to have been born to key village bulls. Milk recording has not been taken up systematically and the Stockmen employed are not trained in artificial insemination work, although the Veterinary Assistant Surgeon has been trained. As in the case of the other centres under the Central Institutes, there is difficulty about maintaining proper breeding control as the bulls let loose by the Delhi Animal Husbandry Department operate in the scheme area and as such there is haphazard breeding without any control. On a very careful examination of the working of this centre we are led to the conclusion that though the centre has been in existence for about 6 years, there is not much change of any improvement. We, therefore, recommend that this centre should be closed down immediately.

CHAPTER IV

ARTIFICIAL INSEMINATION

156. As in other countries of the world, so in India artificial insemination has a short history. In many of the more developed countries in the world, artificial insemination is used on an extensive scale for the breeding of livestock. In England 57 per cent of all dairy cattle are bred by artificial insemination. In Denmark this figure is 98 per cent. The special advantage of artificial insemination lies in the means it offers for the wide utilisation of semen from superior sires. By this technique female animals even in distant areas can be bred and the incidence of genital infections is reduced. The method can also be used for the quick proving of sires and their planned utilisation on an extensive scale later on. It is, therefore, a very valuable tool in the breeding of livestock.

157. In this country though one or two isolated attempts had been made earlier to breed animals by artificial insemination, systematic studies on this method of breeding under Indian conditions were taken up only in 1942 at the Indian Veterinary Research Institute under a scheme sponsored by the Indian Council of Agricultural Research. Under this scheme various aspects of artificial insemination such as training of bulls, collection and preservation of semen, the technique of insemination itself, transport of semen over long distances, etc., were studied. The results obtained clearly indicated that not much difficulty need be anticipated in introducing this method of breeding under Indian conditions. Therefore during 1945-47 four regional artificial insemination centres were established at Calcutta, Patna, Bangalore and Montgomery (Pakistan) under the Indian Veterinary Research Institute to study the problem and to obtain necessary information for further extension of artificial insemination under field conditions. These centres showed a progressive increase in the number of inseminations from year to year, thus proving the practicability of its utilisation under field conditions despite many handicaps.

158. While reviewing the work done at Izatnagar and at the Regional Artificial Insemination Stations, the Animal Husbandry Wing of the Board of Agriculture and Animal Husbandry in India at its Eighth Meeting held at Mysore in 1949, *inter-alia* recommended:—

“The Committee in reviewing the experience gained on artificial insemination in the sub-stations run by the Indian Veterinary Research Institute in collaboration with the respective provinces considered that the progress made has been highly encouraging and that the work has amply demonstrated the practicability of utilisation of artificial insemination in spite of the many difficulties encountered. It also recognised that with the extended use of artificial insemination the inadequate number of superior sires available in the country for the genetical improvement in productive capacity of Indian Livestock can be promptly overcome. In view of the desirability of the expansion of this method of breeding the Committee recommends that (i) the Provincial and State Governments be requested to open Artificial Insemination Centres in selected areas having a dense cattle population and fairly good transport facilities”.

159. There was prompt response to the above recommendation and the technique of artificial insemination was taken up by the majority of the States.

In the All-India Key Village scheme from the very inception, artificial insemination has been included as an important method of breeding. Thus an artificial insemination unit serving 4 Key Village units has been made an integral part of the Key Village block. Since in the beginning, progress with this method was expected to be slow, bulls for natural service were also located in the Key Village units.

160. There are several types of artificial insemination centres set-up in the field, viz., (a) Centres run by the State Governments on their own, (b) Centres established as part of the Key Village scheme, (c) Centres established in the Community Development and National Extension Service blocks and (d) Centres set-up by private institutions. There is also a Central Artificial Insemination centre at Bangalore set-up by the Indian Council of Agricultural Research. Our observations largely relate to the artificial insemination work under the key village scheme, though broadly these observations also hold good for other type of centres.

Artificial Insemination Centres in Key Villages

161. The Key Village scheme was started with the object of multiplying the farm bred bulls. Initially the idea was that each Key Village would be linked to particular farms and would receive regularly bulls from these farms. Since the number of bulls was limited, artificial insemination was made an essential part of the Key Village scheme. Under the First Five-Year Plan 146 Artificial Insemination centres were established along with 555 Key Village units. Each Artificial Insemination centre was linked to four Key Village units having a total population of 2,000 adult cows and buffaloes. At each Centre two cow and two buffalo bulls were stationed to supply semen to the various units. Subsequently, the working of these centres was examined in detail by the F.A.O. Experts, who recommended that the facilities provided at the Artificial Insemination centres were adequate for insemination of much larger number of cows. They, therefore, suggested expansion of the existing centres. Accordingly, 109 Artificial Insemination centres started in the First Plan were expanded to cover a population of 5,000 cows. In addition to these, 145 new Artificial Insemination centres were established with 6 Key Village units attached to each with a total population of 5,000. 54 Urban Artificial Insemination centres have also been sanctioned under the Second Five-Year Plan and 21 Artificial Insemination centres have been sanctioned for being opened in conjunction with Key Village blocks to be set-up in areas of Milk Collection schemes.

162. It appears that no criteria were laid down for the expansion of the Key Village blocks. Some of the Artificial Insemination centres which were not quite popular in the First Plan were expanded in the Second Plan. The success already achieved was not taken as a guide in the expansion of the Key Village blocks. The result has been a rather unplanned expansion of the blocks. Success in those in which the results were already indifferent has not been very marked. Nevertheless, in several areas where people are more cattle minded, and cooperative, they have offered their whole-hearted support in the work of artificial insemination and have voluntarily surrendered the bulls located for natural service. On the whole, we find that considering the special conditions of this country, the progress has not been unsatisfactory. This would be evident

from the following figures of inseminations performed during the first four years of the Second Five-Year Plan in the Key Villages:—

K.V. No.	Year	No. of K.V. Blocks at the end of the year	No. of bulls kept for A.I.	No. of inseminations done	No. of insemination per bull	No. of bulls kept for natural service	No. of natural services	Natural services per bull	conception rate	No. of calvings recorded in K.Vlgs.
1	1956-57	167	544	166,262	305	967	41,232	44		*N.A.
2	1957-58	207	862	248,500	299	973	77,802	77	35 to 70 percent (Range)	N.A.
3	1958-59	245	1,195	338,294	282	1,394	86,927	61		N.A.
4	1959-60	291	1,472	438,450	297	1,593	92,105	57		143,705
5	Average for 4 years.	—	—	—	296	—	—	59		

*N.A.—Not available.

The above table would indicate that the progress in regard to artificial insemination *vis-a-vis* natural service in the Key Village blocks in the Second Plan period has been quite satisfactory. On an average, the bulls have been utilised fairly well as the number of inseminations per bull in the various areas averaged nearly 300 against nearly 60 per bull by natural service. There has, however, been a considerable difference in the conception rate in the various States, the reasons for which are discussed subsequently.

163. The year-wise figures of inseminations are not strictly comparable but they do show a progressive increase in the number of inseminations performed throughout the country in the Key Village blocks. However, the progress has not been uniform in all the States.

164. There are States like Assam, Orissa and Kerala where breeding in key villages is being done almost entirely through artificial insemination and no bulls for natural service are provided. Similarly in other States there are certain key village areas where breeding is done largely through artificial insemination. The above statement, however, should not be taken to mean that the progress of artificial insemination work in these States is satisfactory. Actually the position is somewhat different. There are still a fairly large number of scrub bulls operating in the key village areas, for instance, in Assam State. Artificial Insemination only has been resorted to in the Key Villages because of dearth of good bulls. Then, there are key villages like those located in the Khillar tract in Maharashtra and in Kutch and Saurashtra areas of Gujarat, in which the number of inseminations performed is negligible despite the fact that the Centres have been in existence for a number of years and the people demand bulls only for natural service. In the Kangayam tract, on the other hand, artificial insemination has been extremely popular and in some of the blocks in this tract the number of inseminations performed

Artificial Insemination as an essential part of the Key Village Scheme

165. As mentioned earlier, whenever any key villages were started the entire scheme was introduced in toto with the result that an artificial insemination unit was set-up irrespective of whether the area selected for the block was suitable for introducing this technique or not. We feel that this should have been avoided. While it was desirable to introduce artificial insemination on as wide a scale as possible for making intensive use of the limited number of good bulls available, it should have been planned cautiously and after taking into consideration all the factors that are considered essential for the successful adoption of this technique.

166. In areas like the hilly areas or other inaccessible places where the terrain is difficult, transport facilities inadequate, availability of ice not assured and the population sparse and spread out, a more cautious approach should have been adopted. At the same time there are areas where animals of well-defined breeds exist such as Kutch (Gujarat), and Punjab and where cattle breeding is an important avocation of people. Still in these areas artificial insemination has not made much progress for sentimental objections and other reasons. In such areas it is not desirable to force artificial insemination on the people as it only results in the failure of the method. Looking at the progress we would recommend that atleast in the Kutch area of Gujarat the insemination programme should be withdrawn from the Key Village scheme.

Need for use of Superior Bulls for Artificial Insemination

167. The importance of exercising proper care in selecting bulls for artificial insemination cannot be over emphasised. One of the most serious drawbacks observed in the functioning of artificial insemination centres is that the bulls stationed there have mostly been purchased from the open market or obtained from the poorly equipped cattle breeding farms. They are, therefore of unknown parentage and performance. Artificial insemination is for the rapid multiplication of superior germ plasm. The use of inferior bulls, therefore does just the reverse. Therefore, to achieve the objective it is essential that only the very best bulls in conformity with requirements are used for artificial insemination. Provision of good bulls would go a long way towards making artificial insemination popular among the cattle breeders. In quite a number of cases, bulls for Artificial Insemination centres are found to have been obtained from herds with low production levels. Bulls from such herds would contribute nothing outstanding in terms of milk production. Such bulls have, however, been used for artificial insemination work mostly because more importance has been given to the opening of Artificial Insemination centres and key villages than to using the right type of bulls.

168. In order to ensure systematic and regular supply of superior bulls it is necessary that at the Government Farms the breeding programmes should be placed on a more scientific basis. For this purpose in the previous Chapter a suggestion has already been made for the setting-up of Farms Reorganisation Committees and the reorganisation of farms. It is only through systematic breeding at the Government Farms that high class bulls can be expected to be produced. The Farms at present have certain limitations due to which they are not able to produce progeny tested bulls. This requires a certain minimum number of adult cows in the herd without which the programme cannot be taken up.

Intensive use of Superior Bulls

169. Of the bulls stationed at different artificial insemination centres it was observed that some were throwing superior progeny. For obvious reasons intensive use of such bulls is highly desirable. For this purpose it should be ensured that wherever such bulls exist they are maintained at Centres where there is the possibility of making maximum use of them.

170. Sons from these bulls born out of superior dams should also, as far as possible, be reared and kept for further artificial insemination work in other artificial insemination centres. At the same time in centres which have been functioning for 4 to 6 years there would be progeny which has matured and which might be required to be bred by artificial insemination. In such cases it is desirable to ensure that as far as possible, in-breeding is avoided.

Bulls for Artificial Insemination Centres in non-descript Cattle areas

171. As is well-known nearly 2/3rd of the cattle in the country are of the non-descript type. The States of Assam, Orissa, West Bengal, Kerala, parts of Bihar, Madhya Pradesh, Madras, Eastern Uttar Pradesh, the hilly areas, etc. have largely cattle which can be described as non-descript.

172. As mentioned earlier, it is desirable, rather essential, that only high class bulls (if possible progeny tested) are used at artificial insemination centres because inferior bulls are likely to cause damage over a very wide area. In this context, however, it may be mentioned that as there is a great variation in the type of animals met with in the various parts of the country, use of only very superior bulls at all artificial insemination centres is not necessary. In areas where the population is of inferior type it would suffice to use even bulls of medium quality to begin with. In the breeding tracts, however, it is desirable that only very superior bulls are used, preferably progeny tested. Similarly, in the key villages in which several generations have been bred, the use of progressively better bulls is essential. A careful assessment should be made of the types of bulls required for the different areas and the different schemes and allocations made accordingly.

Popularisation of Artificial Insemination

173. In order to further popularise the technique of artificial insemination it is desirable that the farmers and cattle owners are encouraged to pay visits to the centres where they should be shown the bulls kept for artificial insemination as well as the broad operations involved in the technique of artificial insemination. This should be done through charts and diagrams as well as by actual demonstration so as to convince them of the advantage and utility of artificial insemination.

174. At times lack of enthusiasm among the cattle-breeders for artificial insemination stems from the fact that they are required to wait for long hours at the Centres to get their animals inseminated. This happens because the semen is not readily available at the Centres and the work of collection of semen is started only after the cows have started coming in. Such delays naturally

cause dissatisfaction among the cattle-owners and work against artificial insemination. It is, therefore, imperative that due consideration should be given to the convenience of people so that they receive attention as soon as they bring their animals to the Centre. The staff should arrange for collection of semen and its despatch to the sub-centres early in the morning so that cows are inseminated as soon as they come in.

175. The long distance of some of the villages from the main Centre and the sub-centres is another factor that works against the artificial insemination programme. In such cases the cattle-owners are required to walk long distances to take their animals to the artificial insemination centres. This happens because the centre or sub-centre does not comprise a compact area. The villages proper are wide apart and not connected by roads with the centre. To avoid this, it is desirable that the cattle-owners are not made to walk long distances, in any case not more than about 2 miles for getting their animals inseminated. In distant villages service centres should be provided which should be visited daily at fixed times by the Stockmen so that people know when to bring the animals for insemination.

176. Ultimately the conception rate amongst the inseminated animals is the real test of the efficiency of the technique. To ensure a high conception rate strict care is necessary at all stages, from the collection and preservation of the semen to its ultimate use on the animals.

177. The interest taken by the Stockmen in the work has also a considerable bearing on the success or failure of artificial insemination in any particular centre or area. In several cases we found that there was a definite need for a change in the method of approach and in the attitude of the staff, particularly the Stockman. It is desirable that there should be a feeling of sympathy and spirit of service among the workers. For this purpose they should learn the technique of winning over the confidence of the villagers. It is, therefore, recommended that a short course of training in extension methods extending over a period of two weeks should be given to all Stockmen working in the Key Village scheme.

Centralised Collection of Semen

178. Artificial insemination, which is an integral part of the key village work has to be made more economical and efficient. This can be achieved by making the maximum use of the available bulls so as to reduce the cost of production of semen. Each Key Village block has at present an independent Artificial Insemination centre with a number of bulls, sheds and staff. Due to the limited demand for semen in some Centres, these bulls are not being fully utilized. To effect economy in bulls and thus to reduce the cost of insemination, it is recommended that wherever the cattle population is concentrated and in other compact and contiguous areas containing 15—20 thousand cows and she-buffaloes, the key village work should be so organised that instead of having 3 or 4 separate Artificial Insemination centres one central semen collection centre is established. Further, by centralizing collection it would be possible to maintain a high standard of collection and processing of semen.

179. In Orissa (Cuttack) and in West Bengal (Bengal Veterinary College, Calcutta), centralised collection of semen for use in the various Artificial Insemination centres has already been adopted successfully. In the case of Cuttack centre the number of inseminations performed with semen issued from the centre during 1957-58 and 1958-59 was 23,236 and 24,702 respectively. This works out at 550 inseminations per bull. In the case of Calcutta centre, the number of inseminations performed during 1958 and 1959 was 13,364 and 13,925, respectively. Since 14 bulls are maintained at this centre, this works out at about 1,000 inseminations per bull.

180. While centralised collection would reduce the cost, it has to be remembered that one Centre would be catering to the requirements of a much larger area and it is, therefore, of the utmost importance to ensure that the bulls maintained at such central collection centres are of high quality and of outstanding merit. In addition, scrupulous care in handling and maintenance of bulls, processing of semen and sterilisation of equipment would have to be taken.

181. It is suggested that the State Departments of Animal Husbandry should immediately review the location of the Artificial Insemination centres already established under the Key Village scheme and consider the feasibility of setting-up Central Artificial Insemination centres by coming two to more of the existing centres. In West Bengal, however, it was observed that the semen banks in the Key Villages have been placed under the charge of one of the Veterinary Assistants Surgeons, Incharge Key Village blocks, who in addition to the work of the semen bank has also to attend to the key village work in his own block. Such an arrangement is considered unsatisfactory as at the semen bank there should be enough work for one officer requiring his undivided attention in respect of collection and despatch of semen, feeding of bulls etc. It is, therefore, necessary that semen banks wherever started should be under the charge of an independent officer of at least a Class II status.

Technique of Insemination

182. Both the recto-vaginal as well as speculum methods of insemination are adopted at the various Artificial Insemination centres. There is, however, a gradual shift towards the recto-vaginal method. This method has advantages and is to be preferred but unless the operator is properly trained, faulty technique may seriously damage the genital tract and the method may do more harm than good. It is, therefore, recommended that unless the stockmen are fully trained in this method of insemination, it would be desirable to continue with the use of speculum method. In the latter case, however, it is essential that adequate number of specula are provided to each centre and it is ensured that in each case a sterilised and clean speculum is used for insemination so that there is no danger of transmission of disease from one animal to another.

183. In certain places it was observed that instead of using 1 cc. of diluted semen, 2 cc. or more were being used. This was being done in the hope of ensuring fertilisation by introducing a larger number of sperms. While there may be no objection to doing so, it appears unnecessary and betrays lack of confidence on the part of the officers in the soundness of artificial insemination. As at present the dilution rate is low, each cc. of diluted semen contains more than 3 to 4 times the

optimum number of sperms required for insemination. It is suggested that this fact should be brought to the notice of the officers in charge so that wastage of semen is avoided and a uniform method is adopted all over the country.

Testing of Semen

184. It is essential that the collection, processing and evaluation of semen is done at the main centre by the Officer-in-Charge and that the stockmen at the sub-centres are only responsible for testing the motility of the diluted semen. In this connection, we endorse the following recommendation of the Twelfth meeting of the Animal Husbandry Wing (1957):

“The testing of semen by Stockmen should be limited to examination for motility before insemination. A detailed testing should be carried out only by a specially trained Officer.”

Despatch of Semen

185. In order to ensure a high conception rate instructions have been issued to the various Artificial Insemination centres in the Key Village blocks that as far as possible semen which is older than 72 hours should not be used and that, preferably it should not be more than 48 hours old. By and large, these instructions are followed. The diluted semen from the main centre is sent on alternate days through special messengers either by jeep provided for the Key Village scheme or by public bus or sometimes by cycle. Whatever arrangement is made, it is necessary to ensure that only good quality semen is used and for that purpose the despatches should be made regularly.

186. As in certain cases the sub-centres have not been provided with microscopes, it is not possible to check the motility of semen kept at the sub-centres before use. In order to overcome this difficulty in certain Artificial Insemination centres, the practice is to send semen every day from the main to the sub-centre. In doing so, before actual despatch the motility of the diluted semen is checked and it is ensured that only viable semen is sent to the sub-centre. This practice is commendable so long as it is possible without unnecessary expenditure to send the diluted semen every day. In other cases where the distance of sub-centres is long, it would, of course be uneconomical to send the diluted material every day. In such cases it is particularly necessary for the Stockman to see that he does not use the material after the prescribed period.

Routine Procedure for Dilution and Evaluation of Semen

187. In almost all the artificial insemination centres Sodium Citrate buffer is used for dilution of semen. It was, however, observed that in quite a number of cases due care is not taken to see that only chemically pure salt is used. We therefore, emphasise the need for using only chemically pure Sodium-Citrate for preparing diluter for semen.

188. It has been laid down by the Indian Veterinary Research Institute and brought to the notice of all the artificial insemination centres that in order to properly preserve the semen anti-biotics should be added to the diluter as a routine. In several places this instruction, it was observed was not being followed. It is desirable that the need for using anti-biotics in diluters is brought to the notice of Officers-in-Charge, artificial insemination centres, once again.

189. The evaluation of the quality of semen is in practically all cases based on its density and motility. It is recommended that other tests like the total sperm count per millilitre, and evaluation of the percentage of live and dead sperms should also be performed periodically.

Follow-up and Conception Rate

190. As mentioned in the previous Chapter, the follow-up of insemination or natural services is generally not done in a systematic and planned manner. Some cows are tested for pregnancy after natural service or artificial insemination at periods ranging from three to six months, on the basis of which the success of natural service or artificial insemination is worked out. It has been prescribed that normally cows should be tested for pregnancy about 90 days after service. This is obviously not being followed. Besides, whatever cows are tested are generally from a selected lot, and as such the results obtained regarding conception rate cannot always be considered authentic.

191. So far as the conception rate following artificial insemination is concerned, the information received from the various states indicates that it varies from 35 to 70 per cent. There is, of course, variation from State to State and centre to centre. In centres where both artificial insemination and natural service are practised, the results indicate that the conception rates following artificial insemination and natural service do not differ much.

192. The conception rates reported by the States can be considered satisfactory keeping in view the difficult conditions of cattle husbandry in this country. However, since the conception rates are not worked out on a standard basis, they are not comparable. It is necessary that a uniform procedure is adopted for working out conception rate in all the key village centres. A standard method for working out the conception rate has been worked out by the Indian Council of Agricultural Research which should be adopted in the key village areas. The details of the suggested method are indicated in Appendix XI.

Equipment for Artificial Insemination Laboratories

193. The Department of Agriculture has standardised the minimum requirements of equipment for the artificial insemination centres and the sub-centre attached to these. It was observed that though generally the artificial insemination laboratories in the key village scheme have been provided with essential equipment, in quite a large number of cases, there are a few common items which have either not been provided or are not of the right type and size. This obviously resulted in failure of the centres and adversely affected the progress of artificial insemination. In view of this, it is recommended that no artificial insemination centre should be permitted to start work without having been adequately equipped. The major items of equipment which have not been provided are as follows—

- (a) Tattooing forceps.
- (b) Auto-clave for sterilizing dilutors.
- (c) Hot Air Oven for sterilizing glass-ware.
- (d) Steam sterilizer for sterilizing instruments, speculum, etc.
- (e) Refrigerators.

(a) Tattooing forceps

194. Though this item of equipment does not cost much and is available within the country, a large number of centres and sub-centres have not been provided with these. In certain key village blocks, the forceps have only been supplied to the main centres and not to the sub-centres. The reasons for not doing so are not quite understood. But the serious effect of non-supply of this item of equipment on the key village work has been that insemination work, testing of animals for pregnancy, recording of calvings, milk-recording etc., have been going on without the animals having been properly marked for identification. The calves born under the scheme and taken under the subsidy scheme unless marked cannot be properly identified and so there may be difficulty in their inspection and paying of subsidy to them. This simple lapse of non-marking is considered to be a serious matter because the entire records obtained without proper identification of animals are liable to be considered as un-authentic and open to criticism. It is, therefore, recommended that immediate steps be taken to supply this item of equipment to the centres and sub-centres in all the key village blocks.

195. At a number of centres although the tattooing forceps had been supplied there was no tattooing ink available for use with the forceps. This appears to be the result of purely administrative delay. Such a situation should be avoided in future by placing timely indents for sufficient quantities of ink.

(b) Autoclave

196. At present the dilutors used are made in distilled water prepared either in the laboratory or purchased directly from the market. It is essential that the dilutor is autoclaved before it is used. For this purpose it is desirable that the artificial insemination centres are provided with an autoclave of suitable size. This item is particularly essential for the centralised collection centres as these would be handling large quantities of semen and distributing it over a very wide area.

(c) Hot Air Oven

197. This is essential for sterilising the glass-ware which is used in artificial insemination work. In many centres a hot air oven has not been provided with the result that the pipettes and other glass-ware are sterilised by boiling in hot water in sterilisers and thereafter there is no arrangement for their proper drying. This procedure is obviously unsatisfactory. It is, therefore, recommended that it should be ensured that all artificial insemination centres are immediately equipped with hot air ovens to enable proper sterilisation of the glass-ware.

198. It was also observed that in many centres the hot air oven supplied was not of proper size with the result that it could not hold the insemination pipettes and other large sized glass-ware. The hot air oven in such cases, therefore, remains only a show piece of the laboratory. In all such cases immediate action should be taken to replace these with ovens of proper size. Similarly, it was observed that at several centres the steriliser provided is of small size and cannot hold the instruments that have to be sterilised. It is necessary that in all such cases the steriliser should be of proper size to ensure proper sterilisation of the various items of equipment.

(d) Steam Sterilizer

199. It is also necessary that the Controlling Officers closely scrutinise the indents from the artificial insemination laboratories to see that not only is equipment obtained but that it is of the right type.

(e) Refrigerator

200. Due to import restrictions considerable difficulty has been experienced in obtaining adequate numbers of kerosene operated refrigerators for the artificial insemination laboratories. This affects the proper preservation of diluted semen as well as supply of ice to the sub-centres particularly in the interior, where it is not possible to obtain ice throughout the year from the market. It is understood that now it is possible to obtain kerosene operated refrigerators manufactured within the country. In order to facilitate supply of these to the artificial insemination centres, it is recommended that the Central Ministry of Food and Agriculture (Department of Agriculture) should obtain the requirements of the various States in respect of this item of equipment and place a bulk order with the concerned Government agency for their procurement. Such an arrangement, it is felt, would not only help in the procurement of the refrigerator without much delay but would also enable the supplying department to meet the requirements with ease and within a reasonable time.

201. As regards procurement of some of the other items of artificial insemination equipment, such as microscopes, biotherms, B.D.H. Capillators, etc. the main difficulty appears to be that they are not available within the country and have to be obtained from abroad for which foreign exchange is required, the position about which is difficult. In order to overcome this difficulty, it is recommended that the Government should, as far as possible, encourage the manufacture of instruments and equipment of artificial insemination within the country, either through Government factories or by assisting the private manufacturers. In the meantime, import of essential items should be liberalised so that the working of this important cattle development scheme does not suffer.

Sterilisation of Equipment

202. As mentioned earlier, some of the centres have not been properly equipped for sterilisation of equipment. In other places where sterilisation equipment has been provided, the common practice is that the sterilisation of insemination pipettes etc., is done separately at the main and sub-centres. A change in this practice is considered necessary, as the sub-centres are invariably ill-equipped and the stock men who are in charge of these sub-centres do not generally carry out the sterilisation properly. It appears that so far as sterilisation of pipettes is concerned, it should be done at the main centre only. There would be no difficulty in such an arrangement as the sterilised pipettes can be sent regularly to the sub-centres along with the supplies of semen. The used ones can be returned with empty thermos flasks. The sterilisation of other equipment, however, particularly specula and syringes, may be done at the sub-centres for which purpose provision of a large sized steriliser has already been recommended.

Training

203. Artificial insemination is a technique which requires skill and professional competence. It is, therefore, necessary that only qualified personnel should be entrusted with this work. It was observed that in several places artificial insemination has been started with inadequately trained staff.

204. In order to ensure success of artificial insemination, it is essential that the staff working in the scheme is given proper training in the method of collection, processing, storage and transport of semen as well as sufficient practical training in the technique of actual insemination.

205. Training in artificial insemination in the country was initiated in 1946 at the Indian Veterinary Research Institute when a two weeks' course was started for persons holding qualifications in Veterinary Science, Agriculture and Dairying. Later the duration of training was extended to 3 months with a view to turn out more experienced and efficient technicians. In 1949 a six months' combined course of training in Artificial Insemination and Physiopathology of reproduction was introduced as it was considered desirable to combine this training with artificial insemination. In 1954 this course was condensed to 3 months at the suggestion of F.A.O. Experts. However, as the demand for training facilities for officers from all over the country increased and the Indian Veterinary Research Institute was unable to cope with it and since the States had in the meantime set up their own artificial insemination centres, it was decided that the training should be decentralised. Accordingly, some of the States have now started their own training courses in the subject. Broadly, two types of training courses are required in the country:

- (a) A training course for V.A.Ss. incharge of artificial insemination centres.
- (b) A course for stockmen and other lay technicians.

206. It is observed that although some of the States have started training courses for their officers, these are being held only on an ad-hoc basis. It is essential that a regular training course of at least 3 months' duration is organised in each major State, preferably at the Veterinary College or some important artificial insemination centre. As almost all the major States have now got separate Professors of Animal Gynæcology and Obstetrics, it is desirable that the training in artificial insemination and Physiopathology of reproduction is organised under them so that a high level of training is maintained.

207. It is also essential that the training in artificial insemination includes training in the diagnosis and treatment of sterility and other reproductive diseases. The field workers in artificial insemination in this country have to handle a good number of cows which are sterile and which are actually brought for artificial insemination only because of this reason. The ability of technicians to diagnose and treat cases of sterility which they may come across in the course of their artificial insemination work would go a long way towards making this system of breeding popular.

208. In addition, it is necessary that a separate course for training of stockmen who are required in large number is arranged in each State. The training for stockmen should be at least of 1-1½ months' duration and they should be trained in the method of testing and handling of semen and in the technique of carrying out inseminations. The training should be so organised that the stockmen are able to do insemination work independently of the veterinary officer. For this purpose, it should be ensured that each person during his training gets sufficient practical training in the subject.

209. In certain States it was observed that the present practice is to place a stockmen incharge of artificial insemination work and arrange for his training in the subject under the Officer-in-Charge of the Centre. In such cases the stockmen actually performs his duties and does not undergo a systematic and regular training. This is considered unsatisfactory.

210. It was further observed that there is no uniformity in the syllabus prescribed for training in artificial insemination for the Veterinary Officers and Stockmen in the different States. The period of training also varies from 1 to 3 months for Veterinary Officers and from 2 to 6 weeks for Stockmen. In the interest of adequate and uniform training, it is essential that a standard uniform syllabus for training of officers and stockmen in artificial insemination is adopted in each State. Model syllabii as suggested by the F.A.O. Experts for the training of Veterinary Officers and Stockmen are appended to this report (Appendices XII and XIII).

Use of Semen Shippers

211. There are several types of shippers which are at present used by the different centres for despatch of semen to the sub-centres. Most of them consist of ordinary thermos flasks in which semen is packed in ice. The thermos flask is put in an outer container which is padded with foam rubber or felt. Most of these shippers are found to serve the purpose for which they are used, i.e., for transporting semen without the ice melting for 24 to 36 hours.

212. In some of the centres, there is a tendency to use very costly shippers which have been developed in some of the Western countries. The general experience of the field workers in this country, however, appears to be that these shippers are in no way superior to the ordinary one consisting of thermos flasks.

Buildings for Artificial Insemination Laboratories

213. There is considerable difference in the accommodation and other facilities provided for the artificial insemination laboratories established under the key village scheme. In those States where artificial insemination has been accepted by the people and where the progress achieved has been marked, there is appreciation by the people of the benefits accruing from the scheme. The local farmers have donated buildings for locating the key village artificial insemination centres. A number of such buildings have been donated in Madras State and Andhra Pradesh. In such places the laboratory arrangements for artificial insemination work are satisfactory. In other places the laboratories are located mostly at the veterinary hospitals. Where such hospitals do not exist, the laboratories are located in hired buildings. In majority of cases where artificial insemination laboratories have been established in veterinary hospitals, it was noticed that the space allotted for the laboratory is very inadequate. In many cases a small space in the corner of one of the rooms of the hospital has been allotted for the artificial insemination laboratory. The same room is also utilised as laboratory for the hospital and in some cases even as a store for medicines and equipment for the hospital. Such an arrangement is considered unsatisfactory. Even in cases where artificial insemination centres have been established in certain Veterinary Colleges and State Cattle Breeding Farms, it was observed that the artificial insemination laboratory was squeezed in a very small

room in which there was not enough space even for laboratory benches. In other places the office table of the Veterinary Assistant Surgeon was being utilised for evaluation and dilution of semen, preparation of dilutors and for carrying on other operations connected with the work of artificial insemination. Lack of Laboratory accommodation leads to unsatisfactory work. It is desirable that an independent room is invariably provided for the artificial insemination laboratory. It is, therefore, recommended that before an artificial insemination centre is established, it should be ensured that the following minimum accommodation is provided for the Centre:—

- (a) One independent laboratory room of proper dimensions with adequate bench space for handling and preparing semen. This should be adjacent to the space allotted for collection of semen so that immediately after collection the material is transferred to the laboratory where it can be evaluated and processed.
- (b) One independent sterilization room where soiled glassware and other equipment can be cleaned and sterilized. This should preferably be connected with the laboratory room so that the sterilized equipment can be easily passed on to the laboratory.
- (c) One store room for keeping cattle feeds, packing material and other spare pieces of equipment and medicines.
- (d) One small office and record room.

214. However, when a new artificial insemination centre is started and for which accommodation cannot be found in an existing Government building, we suggest that to begin with, it should be housed in a hired building and construction of a new building for the same should be taken up only after it has started functioning satisfactorily.

Buildings for Sub-Centres

215. The sub-centres in the majority of cases are located in hired buildings. In a few places it was observed that the sub-centres consisted of only one room which served not only as a laboratory and dispensary, but also as a living room for the stockmen and his family. Such an arrangement is obviously unsatisfactory and should not be permitted. It should be ensured that for the sub-centre at least one independent room is provided wherein the essential equipment, diluted semen and medicines can be kept.

Economics of Artificial Insemination

216. Lately, there has been a feeling among certain sections that artificial insemination is a very expensive method of cattle breeding whose use should be restricted. The progress of artificial insemination in this country is not unoften judged *vis-a-vis* progress made in certain foreign countries. However, we feel that such comparisons are not valid as they are made without reference to the system of animal husbandry adopted in this country and certain other practical difficulties. It may be pointed out that the figures relating to those countries are generally from dairy cows and the farmers in those countries are educated and have facilities which are not available to the poor cattle-owners in this country. Nevertheless from the information available we do not think that the position is as bad as it is generally considered to be.

217. Although the number of inseminations performed has a definite relationship with the cost of insemination, it should be kept in view that this process also helps in the improvement of the genetic make up of the population covered and there is a rapid introduction of better and superior genes in the population. The progeny born yields more milk, matures early and better type of work animals are produced. Moreover, referring to the work under the key village scheme, it may be pointed out that artificial insemination is only a part, though an important one, of the work entrusted to the staff. They are required to attend to a number of other items of work which are essential for achieving the desired results under the scheme. It is, therefore, not correct to think that the cost on staff is only related to the number of inseminations.

218. We have gone carefully into the various factors which appear in the cost of insemination in the key village blocks and have found that there is a wide variation in the cost per insemination at different centres. It is difficult to lay down any definite method for working out the cost per insemination. The various factors which have to be taken into account are the cost of maintenance of bulls, maintenance of transport, pay and allowances of the bull attendants and stockman and depreciation on value of Bulls. (As mentioned earlier, it would not be right to include the entire cost towards the pay and allowances of the staff in working out the per insemination cost.) On these considerations the cost per centre works out at Rs. 18,000 to Rs. 20,000 per year. In those blocks, therefore where the number of inseminations is about 4,000 per year the cost per insemination comes to about Rs. 5.00. The cost would, however, vary and become high when the number of inseminations is small. In some cases we found it to be as high as Rs. 60-70. In the majority of cases, however, it ranges from Rs. 4 to Rs. 8. In Orissa, where a semen bank has been established, in 1957-58 and 1958-59 the number of inseminations performed per bull were 555.0 and 540.0 respectively. This obviously makes artificial insemination a very economic proposition. It may be mentioned that there are a number of centres located in various States where the insemination figures per block are about 2000 to 3000 per year. Such centres are definitely worth the expenditure on them. Against this for natural services in each key village unit two bulls have been located. Taking into consideration the feeding cost of these bulls and depreciation on them the total annual expenditure excluding the cost of staff, on merely maintenance of these bulls is about Rs. 900. Assuming that annually each of these bulls perform 100 services, the cost per natural service would be about Rs. 9. This, it would be seen, is in no way less than the cost of artificially inseminating a cow. Besides, 100 services per year as mentioned above are actually not performed in quite a number of key village blocks, which means that the cost of natural service in these blocks is proportionately high.

219. The above analysis shows that the cost of natural service and artificial insemination varies from the block to block and depends on a number of factors. In order, however, to ensure that the cost does not become excessively high some sort of criterion should be laid down for assessing the economics of artificial insemination when introduced in a certain area.

220. We feel that if from the bulls located at one artificial insemination centre, which caters to 6 units in a block, about 2000 inseminations per block or about 350 inseminations per unit are performed annually, then such a centre should be taken as a reasonably good centre and artificial insemination in such centres might be considered as an economic proposition.

CHAPTER V

SUGGESTIONS FOR FUTURE PROGRAMME OF WORK UNDER
THE KEY VILLAGE SCHEME

221. The existing position about the work in the Key Villages has been reviewed in the previous chapters and suggestions made for effecting improvements wherever necessary.

222. Taking an overall view of the working of the scheme and results obtained to-date we feel that the future policy with regard to the Key Village scheme should be one of consolidation rather than indiscriminate expansion.

223. During the First and Second Five-Year Plans a number of Key Village blocks have been set up and while some have shown good results, the progress has not been uniformly satisfactory. The various shortcomings, the reasons therefor and the measures to overcome them have been discussed in the previous chapters and it is not considered necessary to repeat them.

224. In considering the future of the scheme, there is one fundamental aspect on which a decision has to be taken. It has been pointed out in Chapter I dealing with the objectives of the scheme that while initially when the scheme was formulated the intention was to multiply the superior germ plasm available from the Government Farms in the breeding tracts and to use the resultant male progeny in other areas for grading up, this condition from the very beginning has not been observed and Key Village blocks have been set up both in areas of well defined breeds as well as in those where the animals do not conform to any definite breed. In other words, the scheme from the very beginning has been used not only as a means for breeding superior bulls but also for grading up the non-descript stock in the less developed areas. We have very seriously considered whether in consonance with the original objective of the scheme, the opening of Key Village blocks in the areas of non-descript cattle and these constitute by far the greater part of the country—should be discontinued, but have come to the conclusion that while it will not be advisable to place a complete embargo on the establishment of Key Village blocks in areas of non-descript cattle, new key villages should as far as possible be established only in the breeding tracts so that the production of superior bulls is stepped up.

225. In the Second Five-Year Plan provision had been made for the establishment of extension centres, in which it was intended that breeding should be carried out by natural means. For various reasons, which we have discussed elsewhere in the report, progress with the establishment of such centres has been slow, but even in these extension centres we see no objection to artificial insemination being used as a means of breeding, provided the conditions for the adoption of this technique are favourable. This would, in fact, effect a considerable saving in the requirement of bulls for such extension centres. The only difference will be that in these extension centres there would not be the same rigid control or insistence on all-round development as envisaged under the Key Village scheme. We also feel that while the shortage of superior bulls *vis-a-vis* our requirements will continue to persist for a considerable time, quite a large number of bulls are available even now in the Key Village blocks set up in areas of well-defined breeds; what is not being done is to acquire them and make use of them. In fact, many States, we observe have not provided sufficient funds for their purchase nor have they any scheme for their planned utilisation.

226. Keeping in view the fact that of the existing Key Village blocks nearly 58% have already been established in areas of non-descript cattle, we suggest that in future the policy in regard the opening of new Key Village blocks should be as under :—

- (a) The existing Key Village blocks both in the pure breeding tracts as well as in areas of non-descript cattle should be continued.
- (b) While there should not be a complete embargo on the establishment of Key Village blocks in areas of non-descript cattle, in establishing new blocks preference should be given to the breeding tracts.
- (c) In areas of non-descript cattle larger numbers of extension centres should be provided for the development of local cattle. In order to economise on the number of bulls as well as to make maximum use of the superior bulls in such areas, artificial insemination may also be permitted in the extension blocks. In doing so, the cost of introducing this technique should be kept in mind and it should be ensured that this is done within the present provision for extension centres. It is felt that this would be possible because use of this technique would necessarily reduce the number of bulls as well as the cost on their maintenance.

227. Before new Key Villages are established a careful survey should be carried out to make sure that the area is suitable, i.e., the people have interest in cattle breeding and that the conditions for the implementation of the programme exist. Availability of the type of bulls required should be assured. In locating new Key Village blocks preference should be given to sites in proximity to those where other Key Villages have already been established so that a solid block of area is brought under the improvement programme.

228. As we have mentioned, the future policy should be to consolidate rather than to expand and for this purpose, we would suggest that a careful study should be carried out by the State Animal Husbandry Departments of the progress of work of the different Key Village blocks and such of those as reveal short-comings which can be rectified should be assisted with means of overcoming them, say, by the provision of more staff, adequate transport, etc., and those which have shown good results should be further expanded by adding some more villages to them all the time bearing in mind that the area remains compact so as to cover a population of say, 10,000 cows/buffaloes.

229. A careful assessment of the work done at the different artificial insemination centres under Key Village blocks should be carried out and those which offer no promise of being successful despite having been given an adequate trial should be closed down. In this matter a firm decision should be taken so that wasteful expenditure is avoided. Artificial insemination requires the provision of certain facilities and organisation of complicated arrangements and unless the service rendered is commensurate with the funds expended and the effort put in organising them the existence of such centres cannot be justified. In such blocks it would be preferable to resort to natural service only.

230. When new Key Village blocks are established, it should be examined whether the needs of the centre cannot be met by supply of semen from an existing centre in the vicinity. A new artificial insemination centre should be

set up only if absolutely necessary. The States should examine whether two or more artificial insemination centres in contiguous areas cannot be combined into centralised semen collection centres, each under the charge of a senior officer with the requisite training and experience. This would make for considerable saving in the requirements for bulls and ensure that these men supplied was of good quality. Release of the Officers-in-charge of the Key Villages from the work of semen collection and despatch would allow them more time to see to the proper execution of the Key Village programme and exercise proper supervision over the staff in the block.

231. Some States, we find, have not provided jeeps, though they have been sanctioned by the Government of India. Since the work is handicapped for this, each Key Village block should be provided with the necessary transport facilities in the form of a jeep. In hilly areas and other similar tracts where the use of jeeps may not be feasible or economical, provision should be made for horses, ponies or bicycles and even for hired conveyances.

232. It is observed that there is considerable wastage of superior breeding bulls produced in the Key Villages as well as of those produced at some of the Farms in the breeding tracts. Whatever bulls are produced, it is essential that these are properly utilised. The method of procurement and utilisation of these animals is generally haphazard and incoordinated. There is a tendency on the part of certain States to purchase bulls from the breeding tracts in other States, although the types of bulls required may be available within the State itself. Such a tendency should not be encouraged. In order to ensure proper utilization of the available bulls and safeguard against any wastage, we suggest that in the Central Department of Agriculture a cell should be created which should co-ordinate the bull distribution programme on a country-wide basis.

233. The programme for the rearing of subsidized male calves in the Key Village areas should be further expanded. In this connection the States should be urged to take up the modified calf subsidy scheme to ensure that the superior breeding material is not allowed to be wasted and converted into bullocks. Arrangements should, therefore, be made for the rearing of subsidised calves at Government Farms and for this purpose adequate funds should be provided.

234. We find that the allowance of Rs. 60/- P.M. for the maintenance of bulls at the artificial insemination centres is proving inadequate due to the increase in the prices of feed and fodder. We recommend that it should be increased to Rs. 90/- P.M.

235. To ensure proper utilisation of bulls produced in the Key Village areas, it is essential that provision is made for the establishment of extension centres in the Third Five-Year Plan.

236. A portion of the loan amount in the State Plan funds and in the N.E.S. and Community Development Block budgets should be earmarked for giving loans for purchase of pure bred female stock in the Key Village blocks. This loan amount should be recovered in easy instalments.

237. We find that adequate attention has not been paid to the implementation of the feed and fodder development programme, though a scheme on the subject has been sanctioned. No lasting results from the Key Village

scheme can be expected unless the feeding aspect is attended to. We, therefore, recommend that the feed and fodder development programme should be further expanded. This should include intensification of work on the items already included in the programme as well as other items for increasing fodder production as mentioned in the relevant chapter.

238. As the demand for milk in the urban areas is increasing rapidly, it is desirable to provide suitable facilities for breeding of the animals in these and adjoining areas. In the Second Five-Year Plan provision had been made for the establishment of urban artificial insemination centres. These centres have been very popular. More such centres should be established during the Third Five-Year Plan. Similarly, the areas of milk collection schemes to be taken up during the Third Five-Year Plan should be carefully mapped out from now and improvement of livestock undertaken in them by establishing Key Village blocks.

239. We found that some of the Officers-in-charge, Key Village blocks, and the Stockmen have not been adequately trained. Since the possession by the staff of a high standard of technical competence is essential for the proper execution of the Key Village scheme, provision should be made for the training, both basic and in-service, of the staff engaged under the scheme. For this purpose training centres should be established either at Veterinary Colleges or elsewhere in each State.

240. It is also necessary to strengthen the supervisory staff in each State. For each convenient group of Key Village blocks, a supervisory officer in Class II scale should be provided to assist the Deputy Director, Key Villages, in exercising closer supervision over the Key Village work. There is also need for more frequent visits to the Key Villages in the various States by the technical officers from the Central Government and for this purpose, it is necessary to strengthen the staff under the Livestock Development Adviser in the Ministry of Food and Agriculture (Department of Agriculture).

241. We find that the marketing aspect has not received adequate attention in the Key Villages. In order to provide proper incentive to the cattle owners to undertake cattle improvement work, preference should be given in obtaining milk for the milk supply schemes, a large number of which are proposed to be set up in the Third Year Plan, to the Key Village blocks. In these and other areas where milk supply schemes do not exist, efforts should also be made to organise co-operative marketing societies for marketing of milk, milk products and livestock.

242. To enable the State Animal Husbandry Departments to organise marketing of livestock and livestock products, a marketing cell should be created in each State Animal Husbandry Deptt.

243. The agricultural policy should be so designed as to bring about a close integration of the livestock and agricultural production programmes. For this purpose, the development of agriculture on the lines of mixed farming seems to be the most rational pattern for agricultural development in India. We therefore, recommend that in the Third Five-Year Plan mixed farming should be taken up on a large scale in the different States. In selecting areas for taking up mixed farming, preference should be given, as far as possible, to Key Village blocks where livestock development work is already in progress.

CHAPTER VI

THE IMPORTANCE OF COWS AND BUFFALOES IN THE FARMER'S ECONOMY IN THE DIFFERENT REGIONS OF THE COUNTRY

244. Cattle and buffaloes have been kept in this country from time immemorial. They occupy a unique position in the agricultural economy of the country. Provision of motive power for agricultural operations and supply of milk are the two main functions performed by these animals. Their main difference from the point of view of utility lies in the fact that while cattle are mostly kept for draught purposes, buffaloes are maintained primarily for milk production. There are various factors which are concerned with the economic utilization of these species of animals and they are discussed in the following paragraphs :—

Trend of population

245. According to the 1956 Livestock Census, the total bovine population in this country is 203·56 million comprising 158·65 million cattle and 44·91 million buffaloes. The bovine population in 1951 as revealed by the census carried out in that year was 198·63 million comprising 155·23 million cattle and 43·40 million buffaloes. The census figures for 1951 and 1956 indicate that during the interim period there was an increase in the population of both the species of animals, the increase in cattle being 2·2 per cent and in buffaloes 3·5 per cent.

Trend of cattle and buffalo population in India.

Year	Cattle	Buffalo	Ratio	Cows in milk	Buffaloes in milk	Percentage of total cattle/buffalo population.	
						Cattle	Buffalo
1951	155,238,633	43,401,170	3·5 : 1	18,959,647	10,216,726	12·2	23·5
1956	158,850,624	44,915,750	3·5 : 1	20,095,334	11,810,837	12·6	26·2

Year	Total milch cattle above 3 years (dry and in milk)	Total milch buffaloes above 3 years (dry and in milk)	Percentage of total cattle/buffalo population		Working buffaloes (cattle)	Working bullocks (buffalo)	Ratio of total milch to draught		Ratio of milch to draught	
			Cattle	Buffalo			Cattle	Buffalo		
1951	46,373,268	21,003,758	29·8	48·3	58,474,915	6,027,663	1:1.26	1:0.28	1:3·0	1:0·59
1956	47,248,269	21,669,440	29·7	48·2	62,475,286	5,953,457	1:1.30	1:0.27	1:3·1	1:0·50

The above table gives a broad comparison between the cattle and buffaloes populations in India. It indicates that in 1951 and 1956 cattle outnumbered buffaloes as 3·5 : 1. The ratio of cattle to buffaloes, however, remained the same during the quinquennium. Both in 1951 and 1956 the number of cows in milk was almost twice that of buffaloes. In other words, of the total population of the respective species, about 1/4th of the buffaloes and 1/8th of the cattle

were in milk both in 1951 and 1956. This indicates that there has not been any organised attempt at increasing by breeding the number of milch cows or buffalo cows. Moreover, in 1956 as compared to 1951 there was a small increase in the total number of both cattle and buffaloes, the percentage of milch animals to the total population in each case remaining practically the same. This is further corroborated by the ratio of milch to draught animals, which figure also remained constant. The latter figure also shows that while for each cow in milk there are three working bullocks, in the case of buffaloes there are approximately two buffalo cows for each working animal. This trend is shown both in 1951 and 1956 indicating that in the country buffaloes are kept essentially for milk, while cattle are kept mainly for draught purposes.

246. The following table will further illustrate the trend in the population of cows and buffaloes :—

Species	Population 1940		Population 1945		Population 1951		Population 1956	
	No.	% of total cows and buffaloes	No.	% of total cows and buffaloes	No.	% of total cows and buffaloes	No.	% of total cows and Buffaloes
Total cows (dry & in milk)	40·73	68·9	41·10	67·7	46·37	69·2	47·25	68·55
Total she-buffaloes (dry & in milk)	18·35	31·1	19·57	32·3	21·00	30·8	21·67	31·45

247. In 1940, 1945, 1951 and 1956 the percentage of milch cows out of total milch animals remained unchanged, being respectively 68·9, 67·7, 69·2, 68·55. Similarly, figures for milch buffaloes were 31·1, 32·3, 30·8 and 31·45 per cent, respectively, of the total population of milch animals. This shows that in the country as a whole the relative position of milch cows and milch buffaloes has remained almost constant during the last two decades.

Milk Production

248. The annual milk production in India is estimated at 219·15 and 294·0 million maunds in the case of cows and buffaloes, respectively; that is, the buffalo contributes more than half (57·3%) of the total milk production in the country, although milch cows are more than double the number of buffaloes. The buffaloes' higher contribution is mainly due to the fact that their yield is markedly higher than that of the ordinary village cows. The approximate average annual yield per cow is 382 lbs. while in the case of the buffalo it is 1,117 lbs. The range of production in cows is 117 lbs. in Manipur to 1405 lbs. in Delhi. The range in buffaloes is 319 lbs. in Assam to 2485 lbs. in Delhi.

249. It has been shown at well-organised dairy farms that crossbred cows are superior to buffaloes as economic producers of milk and that the Red Sindhi and Sahiwal breeds are also superior to buffaloes, both as producers of milk and butter fat. Unfortunately, however, the number of such pure-bred cows

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is very small as compared to the large number of non-descript village cows. It is also significant that wherever market for ghee exists, it is the buffalo which supplies it (detailed statistics in respect of population and milk production in the different States are given in appendix XVII).

250. A State-wise comparison of population figures indicates that though in all States except Delhi and the Punjab cows exceed she-buffaloes, the latter make up for their deficiency in numbers by higher milk yield. In the States of Andhra Pradesh, Bombay (Maharashtra and Gujarat), Madhya Pradesh, Mysore, Punjab, Uttar Pradesh, Delhi, Himachal Pradesh and the Andaman and Nicobar Islands, buffaloes are responsible for more than half the total milk production. The States of Rajasthan, Manipur, Bihar and Jammu and Kashmir are on the border line as only a little less than half of the milk comes from buffaloes. On the other hand, the contribution of cows to milk production is more than half in the States of Assam, Kerala, Orissa, West Bengal and Tripura. Due to the generally low level of milk production in cows, it is obvious that the sale of milk or milk products alone can hardly be sufficient to pay for the up-keep of most of the cows even when they are in milk. However, the cows produce male calves which are marketed as bullocks which are an additional source of income to the owner.

Utility as draught animals

251. The relative merits of the cows and buffaloes discussed in the preceding paragraphs should not be taken to mean that the cow has no place in the economy of this country. On the other hand she occupies a very important place in the country's economy. Actually, she has been held in high esteem for her male progeny, as bullocks are the main draught animals in this country. Though in the recent past there has been some trend towards mechanisation of agricultural operations, in the immediate future there does not appear to be much possibility of large scale replacement of bullocks by mechanical power in this country. The cow is, therefore, important for the country both as a begetter of bullocks as well as a producer of milk.

252. In certain parts of the country, for agricultural operations, male buffaloes are also used but their number is comparatively small. These animals are not considered fit for agriculture on dry land because of their sluggish temperament and inability to stand high temperatures. However, there is a good deal of demand for them in the paddy-growing tracts of the country.

253. Another important factor that has to be considered in examining the utility of the two species of animals in the rural economy of the country is in regard to their ability to consume different types of feeds. In this connection, it may be mentioned that although not based on the results of scientific data, the general opinion is that buffaloes eat a greater variety of roughages and fodder than cattle and that for that reason, they are more efficient milk producers in situations where concentrate feeds are not abundant or relatively cheap, a situation which exist throughout the country. In such a situation the buffalo can beat the ordinary cow both in the production of milk as well as of butter. In view of the poor nature of the fodder available under village conditions and the difficult conditions under which the animals have to live the hardiness of the buffalo is a valuable asset to the cultivator.

254. Within recent years considerable attention has been paid to meeting the requirements for milk of large towns and cities. For this purpose, milk supply schemes are being organised. Wherever a demand for liquid milk has been created, the buffalo has gained preponderance over the cow, indicating that the villagers attach greater importance to this animal as an economic producer of milk than to the cow. Consequently, there has been a gradual tendency to take buffaloes from the rural areas to the cities or to areas in the vicinity of cities.

255. Increase in buffalo population has been very marked in certain parts of the country. For instance, in certain parts of Andhra Pradesh, where originally the Ongole breed was maintained buffaloes have increased to such an extent that now they out-number Ongole cows. In fact, in some of districts in that State the ratio of buffaloes to cows is as high as 4 : 1 or 5 : 1. A number of factors have been responsible for this increase in the buffalo population; the main ones being the ready availability of market for milk in the nearby cities and the introduction of irrigation which has reduced the grazing areas and made the tract somewhat unsuitable for raising cattle.

Selection

256. There has been some difference in the degree of selection among cows and buffaloes. As no sentiment attaches to the buffalo, there has been a very rigid selection for this animal with the result that it has improved in milk production. On the other hand, on account of the religious bias against the slaughter of cow and also because cows are maintained mainly for raising bullocks, selection among cows for increased milk production has not been equally rigid.

257. A consideration of the various factors discussed above will show that in the present agricultural economy of the country both cows and buffaloes play an important rôle. Improvement of both cows and buffaloes has, therefore, to be accepted as a national policy. In the light of present day developments, there is no need to think in exclusive terms, of either developing the cow or the buffalo only for meeting the nutritional requirements of people. Both these species have a significant rôle to play in the national economy and the projects for their development have to be viewed in this context as well as the scope available for their intensive development as milch animals for high milk production. In view of the reasons given above, we generally endorse the following recommendations made by the Animal Husbandry Wing of the Board of Agriculture and Animal Husbandry in India in its 12th and 13th meetings, but the precise policy which we suggest is discussed later on in this report.

“While improvement of cow had been accepted as the national policy, little had been done to improve the buffalo, although it is the premier dairy animal of the country. It is, therefore, important that every effort should be made to improve the milking qualities of buffaloes by practising judicious breeding, by establishing breeding farms for raising quality bulls for supply to villages as well as to Artificial Insemination Centres, and by spreading improved practices of feeding and management.

2. "The Committee noted that some valuable buffaloes were being prematurely lost due to their export to urban areas, where they were slaughtered when dry. There were indications that such losses were on the increase as a result of imposition of ban on slaughter of all cattle in certain States. As this was leading to serious national waste, every effort must be made to stop that and to preserve high yielding animals by regulating their exports from breeding tracts.
3. "While the buffalo was our important dairy animal, the cow was no less important, as it constituted the backbone of agriculture. However, cows were being neglected even more than buffaloes. This was primarily because of their low milk production. It was essential to rehabilitate the cow by improving her milking qualities. The breeding programme for cows must, therefore, place maximum emphasis on milking qualities.
4. "To facilitate supply of milk to urban areas, breeding of milch breeds should be encouraged in rural areas adjoining them as far as possible.
5. "Since cow's milk was not popular in certain areas educative propaganda should be carried out to foster increased consumption of cow's milk in such areas."

Demarcation of

- (i) *areas and tracts where the cow has been quite popular with the villagers and has served as an economic and useful animal;*
- (ii) *areas where only cows are being maintained, for example, Eastern States like Orissa, West Bengal etc.*
- (iii) *areas where both cows and buffaloes are maintained by villagers e.g. Punjab, Western U.P.*

258. From the terms of reference it appears that items (i) and (ii) although mentioned separately in the Government of India notification, actually cover the same aspect, namely, demarcation of areas where the cow as compared to the buffalo has been found an economic and useful animal by the farmers. As such our observations on both these items have been combined. Since item (iii) above also deals with the same problem we felt that it was not necessary to separate it from the other two items, and as such it has also been dealt with in this Chapter.

259. So far as the total number of cows and buffaloes is concerned cows far out-number buffaloes in the States of Assam, Orissa, West Bengal, Tripura, Manipur, Himachal Pradesh, Jammu & Kashmir and Kerala. Broadly, these States comprise Eastern India and the hilly States of Jammu and Kashmir and Himachal Pradesh. Only one southern State falls in this category. Taking into consideration the number of animals, their milk production, preference of the people and other related factors, we feel that the cow alone occupies a dominant position in the rural economy in the States of Assam, Orissa, West Bengal, Tripura and Manipur and that the buffalo plays a very insignificant role in these States. Taken together the cows in these areas

constitute over 93 per cent of the total milch animals, the remaining 6.5 per cent being buffaloes. The cows contribute 86.5 per cent to the total milk produced in the area, the remaining 13.5 per cent being provided by the buffaloes. By and large people also prefer to consume cow's milk in these States and there is comparatively little demand for buffalo milk. In view of these factors we feel that it is desirable to provide full encouragement for the development of the cow in these States and that it is not necessary to make any organised attempt at introducing the buffalo. It is essential that urgent measures are adopted for developing and rehabilitating the cow in these States, as the present-day animal is completely degenerated and uneconomical to keep. Unless its milk production is increased and it is made to produce more efficient bullocks, there would always be the risk of the cow being substituted by the buffalo which is a better producer of milk. At present the annual average milk yield of cows in these States is extremely poor varying from 117 lbs. in Manipur to 328 lbs. in Tripura. In the same area the small number of buffaloes have milk yields ranging from 319 lbs. in Assam to 1,011 lbs. in Tripura. Similarly, the bullocks are comparatively less efficient. Per pair the cultivated area is 3.7 to 6.0 acres only.

260. The same remarks apply to the States of Himachal Pradesh and Jammu and Kashmir, where also the cow occupies an important position in the rural economy. In Himachal Pradesh, the adult cows constitute nearly 75.6 per cent of the total adult cow and buffalo population but they are poor producers and are able to contribute only about half the quantity of the total milk produced in the State. The other half comes from buffaloes. The average milk yield of a cow is not even $\frac{1}{3}$ rd of that of the buffalo. In Jammu and Kashmir also, the position is about the same the cow contributing about 60 per cent of all milk produced.

261. In spite of the small buffalo population in the eastern States as well as in the hilly States of Himachal Pradesh and Jammu and Kashmir there is considerable demand for buffalo bullocks. This demand is at present met largely by purchases from other States and it does not appear necessary for these States to take up buffalo breeding for producing buffalo bullocks.

262. In Kerala also, the cow occupies an important place. In this State cows constitute nearly 88.6 per cent of all milch stock and produce 82 per cent of all milk produced in the State. Though the demand for buffalo milk for use in tea and coffee is increasing, the general preference of the people is for cow's milk. Although buffaloes are not in demand at present for production of milk in this State, buffalo bullocks are used in large numbers. They constitute about 53 per cent of the total buffalo population and 22 per cent of the total bullocks in the State. These animals are obtained from outside the State and as such at present there is hardly any demand for taking up buffalo breeding. In this State also, therefore, it is not necessary to take up any organised buffalo development work. The cow should, of course, be developed as its milk yield here also is very low.

263. Our recommendations for taking up work concerning the development of the cow in the above-mentioned States should not be taken to mean that the buffalo has to be completely ignored. What is suggested is that the cow

should receive more favourable and better treatment in so far as the development of livestock is concerned. Here and there in important pockets it would, of course, be necessary to take care of buffaloes also and provide necessary facilities for their development.

264. In the remaining States, viz., Andhra Pradesh, Bihar, Bombay (including Gujerat), Madhya Pradesh, Madras, Mysore, Punjab, Rajasthan, Uttar Pradesh and Delhi, a detailed examination of the various factors concerning cows and buffaloes indicates that it is necessary to develop both these animals. Here there are large areas where buffaloes are maintained and they are found to be economic producers of milk. The development of these animals, therefore, is important and has to be taken up side by side with the development of cows. In these States, however, there are several areas or tracts where the cows predominate and obviously, therefore, it is essential that their development should receive adequate attention. In certain areas in these States the demand for buffalo milk is increasing for mixing in tea and coffee and for making ghee because of its higher fat content. This coupled with the demand for milk from the Milk Supply Schemes has to some extent been responsible for increase in the number of buffaloes in certain areas. For instance, in Andhra Pradesh, in the various districts along the coast and some of the adjoining districts the buffalo population is larger than the cow population. Of the milch animals nearly 44 per cent are buffaloes, which produce 62.6 per cent of the total milk in the State. The cow is, nevertheless, important in the areas other than the coastal districts and makes an important contribution to the agricultural economy and milk production. Consequently, it is necessary that both these species should be developed in the State side by side. The position in the Bombay State (including Gujerat) is somewhat similar. Here also of the total milk produced nearly 68 per cent comes from buffaloes. In the State as a whole for every two milch cows there is one milch buffalo.

In this State, however, there are certain areas which now comprise parts of Gujerat such as Saurashtra and Kutch where the cow occupies a more important position than the buffalo and it is desirable that in future in these areas the emphasis should be more on the development of the cow. In the other areas of the State where both cows and buffaloes occupy an important position, equal attention should be given to both.

265. A somewhat similar position exists in the State of Mysore where the proportion of milch cows to milch buffaloes is the same, i.e. 2:1. Nearly 61.8 per cent of the total milk comes from buffaloes. In this State the buffalo-cow population is larger in the north-Western districts, though in other areas also they are present in appreciable numbers. This State is, however, very important in so far as the production of draught animals is concerned. It is the home of Amrit-mahal and Hallikar breeds which produce first-class bullocks. It is, therefore, essential that in order to maintain and further improve these animals proper attention should be paid to their development. Accordingly, broadly in this State both cattle and buffaloes should be developed, the former for supply of bullocks and the latter for meeting the requirements of milk.

266. In Madhya Pradesh in relation to cows, the milch buffaloes are less than in Bombay and Mysore, as for every 10 milch cows there are 3.6 milch buffaloes. But due to their higher milk yield, the buffaloes contribute nearly

57 per cent to the total milk produced in the State. The buffaloes are mostly confined to the western districts bordering Rajasthan and parts of Uttar Pradesh and Bombay States. In other areas and in the eastern parts of the State, cows are more important although buffaloes are also met with throughout. In this State, therefore, both the species, need to be developed.

267. In Madras State cows and buffaloes are in the proportion of about 3:1 and of the total milk produced in the State, the contribution of buffaloes is about 33.6 per cent. There are, however, certain areas like the Madras town and the districts of Coimbatore, Nilgiris, Tanjore, Tiruchirapalli and Tirunavelli where the ratio of buffaloes to cows is high. Buffaloes are important milch animals in these areas. In some of these areas the famous Kangayam breed is also found, but it is essentially a draught breed. In the towns generally as in the other States the demand for buffalo milk is gradually increasing due to the opening of the and Coffee shops and for the preparation of milk products. Accordingly, in this State also, depending upon the area, it is necessary that both cows and buffaloes should be developed for production of milk.

268. The position about buffaloes in Bihar State is also somewhat similar as buffalo cows comprise nearly 28 per cent of the total population of milch cow and buffaloes in the State. However, as in other areas, due to their higher milk yield the contribution made by buffaloes to the total milk production in the State is about 45 per cent. Buffaloes are spread out more or less in all the districts of the State, though they are concentrated more in the districts of Champaran, Muzaffarpur, Darbhanga and Patna. Enquiries from the local people in the State, both officials and non-officials, showed that while there is general preference for cow's milk for fluid consumption, buffalo milk is in great demand for making ghee and for use in tea, coffee, etc.

269. The State of Rajasthan has several important breeds or types of draught animals like Nagore, Rath, Mewati, etc. In certain districts bordering Pakistan and Gujerat, animals of Rathi, Kankrej (Sanchores) and Gir breeds which give better milk yield also exist. Then again there are large areas bordering Uttar Pradesh and Punjab where the dual purpose Haryana breed is found to a very large extent. Cattle alone comprise more than 78 per cent of the total bovine population, and of the milch animals 29 per cent are buffaloes. These animals are, however, scattered throughout the State, but contribute about 45 per cent to the total milk production. This is so mainly due to the fact that of the various cattle breeds met with in the State, the majority are of the draught type and their milk yield is low. Nevertheless, the importance of these animals for draught is well recognised. However, there are certain areas in the western parts of Rajasthan such as the Districts of Jaisalmer, Jodhpur and Nagore where the cow occupies a very important position as a milch animal also. In these places the buffaloes are of less importance. Looking to the requirements of draught and milk therefore, it appears that it is necessary that in this State depending upon the area, attention should be paid both to the development of the cow and the buffalo. However, in the western districts where the cow has a definite place and where people prefer to use only cow's milk, it is necessary that the emphasis should continue to be on the development of the cow. It may, however, be necessary to provide breeding facilities for the buffaloes kept in the towns. In other parts of the State where both cows and buffaloes have been kept the development of both these species is desirable.

270. In the States of Uttar Pradesh, Punjab and Delhi, the position about cows and buffaloes is markedly different. While in U.P. the number of breeding cows and buffaloes is practically the same, in the States of Punjab and Delhi buffaloes are slightly more in number than cows. In U.P. and Punjab of the total milk produced nearly 68 per cent comes from buffaloes while in Delhi State the buffalo is the chief producer of milk as it produces more than 75 per cent of the total milk. However, in spite of the dominant position occupied by buffaloes as milk producers, the cattle are of no less importance both in U.P. and Punjab and the rural areas of Delhi. The eastern districts of the Punjab, Delhi and the western districts of U.P. are the home of the famous Haryana breed which is in great demand all over the country. Accordingly, it is essential that in these areas intensive development of both cows and buffaloes should be continued.

271. In view of the position indicated above in the States under consideration we recommend that in future suitable action should be taken for the development of both cows and the buffaloes keeping in view the relative importance of these animals for the particular areas. The decision to develop the cow or the buffalo in any particular area should, however, be taken in consultation with the State Director of Animal Husbandry concerned.

Future Policy regarding Development of Cows and Buffaloes

272. It will be seen from what has been stated above that in India cattle and buffaloes are maintained for the production of bullocks and milk. So far as the country's requirements of bullocks are concerned, it is very likely that while not immediately but in due course they will gradually diminish with increasing mechanisation of operations which are at present being done by bullock power. Already use of motor-traction for carrying agricultural produce and other commodities from the villages to the towns is on the increase and there are certain areas in which the use of bullocks for this purpose has considerably diminished, if not disappeared altogether. Also, it is expected that as the quality of bullocks improves as a result of the various cattle improvement schemes that are being initiated, the size of the unit area which a bullock can plough will increase. On the other hand, our requirements for milk are increasing. As a result of urbanization, increased prosperity resulting from the implementation of the Five Year Plans, industrialization and various other factors the demand for milk is increasing at a fast pace. Milk is one of the important sources of protein in the diet of the pre-dominantly vegetarian population of this country and people are becoming increasingly conscious of the value of taking milk in their diet. This is proved by the great extension of the buffalo practically throughout the country within recent years not necessarily to large towns and cities. The trend is being helped by the irrigation projects which are bringing increasing area under cultivation.

273. We, therefore, feel that while draught is important, milk is no less so and that every effort should be made to increase the country's milk production as quickly as possible. This should involve the improvement of the buffalo wherever this animal has been found suitable. In the case of non-descript cattle which constitute nearly 75 per cent of the country's cattle population, the policy should be to put in more milk in them as well as to increase their draught capacity. In these animals even cross-breeding with exotic breeds may be

resorted to where the climatic and other conditions are considered favourable for this work such as the temperate Himalayan Region in the North, and areas in the Deccan plateau where experience has shown that cross-bred animals can thrive without any difficulty. In the case of well-defined breeds or specific types it is essential that their milking quality is improved by selective breeding.

274. In the light of the foregoing observations, we would reaffirm the National Breeding Policy, indicated below, as laid down by the Indian Council of Agricultural Research with minor modifications

Cattle Breeding Policy recommended by the I.C.A.R.

- (i) In view of the fact that a large percentage of our cattle population consists of non-descript animals, it is essential in the interest of producing a general utility animal, that it should combine in itself, draught and milk qualities to the optimum extent—in other words if in non-descript cattle, these two qualities are combined to an average degree to start with, the purpose will be served.
- (ii) In areas where specific types (as distinct from well defined breeds) exist, the policy should be to effect improvement by selective breeding with a view to improve both milk and work qualities.
- (iii) In the case of well-defined breeds, the objective should be to put in as much milk in them as possible without materially impairing the work quality.
- (iv) In the case of well-defined milch breeds, the number of animals of which has considerably decreased after partition, their milking capacity should be developed to the maximum, by selective breeding and they should be utilised principally for the development of cattle in under-developed areas.

275. In reiterating the above policy the following modifications are suggested.—

- (a) In the milk zones, i.e., in areas where specialised breeds already exist no cross-breeding with any other indigenous or foreign milch breeds should be permitted. However, in the non-descript areas where milk zones are created, the general embargo at present against cross-breeding except in areas of high altitude and heavy rain-fall may not be rigidly applied and in future cross-breeding with foreign breeds may be carried out in selected areas.
 - (b) Every effort should be made to develop the buffalo where it has already established itself and proved to be an economical animal and where it is also used for draught.
 - (c) In areas where the cow is an economical animal or where the buffalo has not yet established itself, the buffalo need not be encouraged and energetic steps should be taken to improve the cow as quickly as possible, by grading up with dual purpose or milch breeds depending upon the area.
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CHAPTER VII

SUMMARY OF MAIN RECOMMENDATIONS

1. In selecting the location of future Key Village blocks a careful study should be made of the prevailing animal husbandry practices, the needs of the people, the resources, actual and potential, of the area in the matter of feeds and fodders, the available marketing facilities or the possibility of organising the same, etc. The area selected should be compact and preferably close to existing Key Village blocks. In carrying out a survey, the instructions contained in the 'Hand-Book on Key Village Scheme' issued by the Department of Agriculture, Government of India, should be carefully observed. (51, 60, 63-65, 70).

2. If, in future, any of the existing Key Village blocks have to be transferred, then these should be located, as far as possible, in close proximity to the existing blocks. (65).

3. In many States the staff concerned does not seem to have a clear understanding of the objectives, the technical programme and the ultimate purpose of the Key Village scheme. In the interest of proper implementation of the Key Village programme, it is essential that the controlling officers explain these to them. (58,59).

4. Periodic meetings of the officers-in-charge of the Key Village blocks should be arranged by the controlling officers for assessing the progress and promptly correcting any deficiencies that may be detected. (59).

5. There should be flexibility in the approach to the scheme allowing for adjustments to suit local conditions in a State and in the different areas in the same State. The simultaneous implementation of all the items of the programme from the very beginning, if not found feasible, should not be insisted upon. (51).

6. States should carry out a careful review of the working of their Key Village blocks and such of them as have not shown the desired results, despite having been in existence for a number of years, should be closed down. (69).

7. An important objective of the Key Village scheme is to promote active participation by cattle-owners in the implementation of the programme of work. This has been found to be lacking to a considerable extent. To achieve this, village contact programme should be intensified. The cattle-owners should be made to realise that ultimately it is their responsibility to improve their livestock and that they should not look upon Government to do things for them indefinitely. (71).

8. By and large, State Farms have not played their part in producing bulls of the desired quality in sufficient numbers. It is urgently necessary to reorganise these farms in order to place them on a proper footing. For this purpose a Farms Reorganisation Committee should be set up by the State Governments to suggest ways and means for improving their working. The State Governments should also make liberal financial provision for these farms so that they are able to maintain adequate stock and undertake breeding on scientific lines to evolve superior strains. (72-74, 168).

9. To meet the increasing demand for high class bulls, both for natural breeding and artificial insemination, progeny testing programme should be taken up at as many Government Farms as possible and for this purpose suitable facilities and adequate funds should be provided. Progeny testing should also be encouraged at private Farms and Institution where the requisite facilities exist or can be provided. (76, 93).

10. State Governments should formulate well-thought-out purchase programmes in advance to overcome shortage of bulls. In States having extensive breeding tracts, from where every year large numbers of breeding bulls are purchased by other States, an agency should be set up by the Government to ensure purchase and supply of bulls at equitable prices. (77, 79).

11. In the Key Village blocks located in the breeding tracts only high class and very superior bulls should be used. The existing provision of Rs. 600 for bulls is in some cases inadequate. To enable purchase of proper types of bulls this provision should be made more flexible and the price limit should be raised to Rs. 1,200 to Rs. 1,500 for areas like the Ongole, the Deoni and the Khillar tracts. The actual price ceiling for each area should be fixed in consultation with the State Director of Animal Husbandry concerned. (92).

12. Every effort should be made to achieve satisfactory breeding control in the Key Village areas by intensifying castration and undertaking propaganda in favour of early castration of males. Those States which have not enacted a Livestock Improvement Act or framed rules there-under should take early steps to do so. (82, 83).

13. At present precise information about the effect of castration at different ages on the draughtability of animals is not available. Controlled experiments to investigate this problem should be undertaken in selected areas or institutions in the country. (84).

14. In order to ensure controlled breeding and maintenance of proper records only hand-mating by bulls for natural service should be permitted. These bulls should not be allowed to go out with the herds for grazing. (90).

15. Various systems are adopted for the maintenance of bulls for natural service in the Key Village blocks. Of these the most satisfactory appears to be the one, in which a bull attendant looks after the bull and its feeding is made the responsibility of the Village Panchayat, which is paid the prescribed feeding charges. (85-89).

16. The breeding policy in Key Village blocks in the border districts should be decided in consultation with the adjoining State or States, so that there is no conflict in policy in a contiguous areas in adjoining States. Frequent changes in the breeding policy should be avoided. (95-97A).

17. It is necessary to provide adequate and suitable equipment for carrying out the Key Village work. In many centres, particularly those which have been recently set up, kerosene operated refrigerators are not available. Suitable steps should be taken for arranging bulk supply of such refrigerators. Till such as the required number of refrigerators cannot be had within the country, adequate foreign exchange should be made available to the States to import this essential item of equipment. (98, 200).

18. The Government should, as far as possible, encourage the manufacture of instruments and equipment required for Key Village work within the country, either in Government factories or by assisting private manufacturer. In the meantime import of essential items should be liberalised. (201).

19. To avoid delay in the purchase of equipment for the Key Village scheme, authority for purchase of equipment and other minor items should be vested in the Deputy Director in-charge of the Key Village scheme and not in the Circle or Division Deputy Director. (100).

20. It is essential that adequate and experienced staff is provided for the Key Village blocks. In the event of shortage of staff priority should be given in the matter of posting of experienced staff to Key village blocks. (101, 104).

21. Frequent transfers of the Officers-in-charge of the Key Village blocks should be avoided. As far as possible, an Officer-in-charge of a Key Village block should be transferred to another Key village block only so that his knowledge and experience of Key Village work are not lost. (102-103).

22. The Officer appointed as in-charge of a Key Village block should, as far as possible, have adequate field experience of livestock development work. Posting of raw graduates directly as in-charge of a Key Village block should be avoided. (103).

23. To ensure better and closer supervision of Key Village work and to provide day-to-day guidance to the staff, a suitable number of Key Village Supervisors of Class II status, (each in-charge of a group of Key Villages) should be provided under the Deputy Director, Key Village scheme. As far as possible, these officers should be selected from amongst the senior Key Village officers, who already possess working knowledge of the scheme. (105, 240).

24. Technical officers of the Central Government should pay more frequent visits to the Key Village blocks to ensure proper supervision and for providing on-the-spot advice. For this purpose, it is essential that the staff under the Livestock Development Adviser in the Department of Agriculture is strengthened. (106, 107, 240).

25. In view of the arduous nature of Key Village work, compensatory allowance as provided in the scheme should be sanctioned to the staff in all the States. (108).

26. The present annual provision of Rs. 500 for the purchase of medicine etc. for providing veterinary aid is inadequate. It should be raised to Rs. 1,000. (110).

27. It is essential that proper and complete records of the work done are maintained in all the Key Village blocks. Records should include cards for individual cows or buffaloes. The supervising officer should make frequent checks of such records to ensure their completeness and accuracy. (111, 113).

28. At each Centre or Sub-Centre charts, graphs and maps should be maintained to show at a glance the broad achievements relating to the progress of the scheme. (112, 113).

29. Work done in areas outside the Key Village blocks (non-scheme work) should be recorded separately and shown separately in the returns and annual reports of the scheme. (116).

30. Recording of milk is extremely desirable as a measure of the progress achieved and should be carried out in all blocks located in areas of pure milch or dual purpose breeds. It need, however, be done only in 15—20% of the blocks located in areas of non-descript cattle and in blocks in which only pure draught breeds are being used, such as the Amritmahal, Hallikar, there would appear to be no purpose in recording milk yield at present. However, wherever milk recording is done, it should be done systematically in accordance with the instructions given by the Department of Agriculture. To ensure that milk recording is done properly it is essential that milk recorders are properly trained. Milk yield should be measured by weightment and not by volume. For this purpose, the required number of heard recorders should be provided. (122, 123, 125)

31. Provision for holding calf rallies should be raised from Rs. 500 to Rs. 1,000 so that their usefulness can be enhanced. Calf Rallies should be made more popular by inclusion of other activities of the Animal Husbandry Department. (126-127).

32. To win the cooperation of cattle-owners in Key Village work, formation of 'Cattle-owners Associations' on the lines of those in Madras State should be encouraged. (129).

33. A separate section for propaganda and publicity should be created in each Animal Husbandry Department. (130).

34. The programme for the rearing of subsidized male calves in the Key Village areas should be further expanded. Since this is one of the most important aspects of the Key Village scheme, the State Governments should provide adequate funds for the timely purchase of calves which are subsidized. Where the regular calf subsidy scheme is not found feasible, the States should be urged to take up the modified calf subsidy scheme. (131-133, 233).

35. The feed and fodder development programme has not made satisfactory progress and needs to be given more attention. For this purpose—

- (a) The Fodder Development Officer and other staff sanctioned under the feed and fodder development scheme should be immediately appointed in each State.
- (b) The State Governments should make adequate provision for carrying on the feed and fodder development work.
- (c) Intensive propaganda and publicity are necessary to convince the farmers of the advantages of fodder cultivation and adoption of improved feeding practices.
- (d) In certain States extensive areas are available for fodder development but lack of irrigation facilities is a serious impediment. This should be examined seriously in consultation with the Irrigation Department and some means found of providing cheap

irrigation in the Key Village blocks. Wherever possible adequate funds should be provided for installation of pumps for fodder development.

- (e) The States should draw up an integrated plan of work for feed and fodder development.
- (f) Fodder and Grazing Committees should be set up in the States where they have not been set up so far;
- (g) At present colossal waste of fodder like *Kadbi* straw occurs while feeding the animals because it is not chaffed. This wasteful practice should be countered by demonstrating the advantages of proper chaffing before feeding it to the animals. In order to popularise the idea in each of the sub-centres in the different Key Village blocks, a chaff cutter should be provided out of the scheme funds. This should be made available to the cattle-owners in the area for chaffing their fodder.
- (h) Wherever pastures, have been developed in the Key Village blocks their grazing should be properly controlled.
- (i) Growing of fodder on marginal and sub-marginal lands which at present lie fallow should be encouraged.
- (j) Suitable leguminous crops such as Berseem, Lucerne, etc., should be introduced in rotation to cereal and other crops.
- (k) Silage making should be encouraged in Key Villages wherever possible and for this purpose provision made for construction of silo pits should be utilized.
- (l) Wherever possible the growing of fodder trees should be encouraged.
- (m) Feeding of economic balanced rations should be popularized. For this purpose the Key Village Officers should formulate balanced rations based on the available feeds and make them known to the cattle-owners in the locality.
- (n) To popularize the growing of pasture grasses subsidy should be given even for plots smaller in size than 10 acres though the amount of subsidy may be proportionately reduced. (136-147, 237).

36. Cooperative Marketing Societies of cattle-owners should be organised in the Key Village blocks to provide facilities for marketing of livestock and livestock products. Wherever necessary, Government should extend financial assistance to these societies. (148, 149, 241).

37. To improve the marketing facilities preference should be given in collection of milk by Milk Supply Schemes, to the Key Village areas. In areas where such schemes do not exist, to ensure proper utilisation and disposal of milk, creameries should be set up. (241).

38. In the State Animal Husbandry Departments a separate marketing cell should be created for organising proper marketing facilities and undertaking propaganda to educate the farmers in the advantages of cooperative marketing. (151, 242).

45. More intensive propaganda and publicity to popularise artificial insemination should be carried out. The work of collection and processing of semen should be so arranged that the owners do not have to wait unnecessarily at the centres to get their animals inseminated. Service crates should be put up at convenient points and Stockmen should visit them at fixed hours so that cattle-owners do not have to walk long distances. (173—175).

46. To ensure a high conception rate strict care should be exercised in the collection, preservation, handling and despatch of semen. (176, 185—189).

47. At the artificial insemination centres, collection, processing and evaluation of semen should only be done by the Officer-in-charge, and stockmen should only test the motility of the diluted semen. (184).

48. To effect economy in the use of bulls as well as to make artificial insemination more economical and efficient, Centralized Semen Collection Centres should be established. For this purpose 2 or more existing artificial insemination centres should be amalgamated. At the Centralised Collection Centres, the bulls maintained should be of outstanding merit. (178, 180-181, 230).

49. Centralized Semen Collection Centre should be placed in charge of an independent officer of Class II status. (181).

50. At present insemination is done both by rectovaginal and speculum methods. Though the rectovaginal method is in many ways superior to the speculum method, it is necessary that the operator should be properly trained as faulty technique may cause damage. Unless, therefore the stockmen are fully trained in this method of insemination the speculum method should be continued, for which purpose adequate number of specula should be provided to each Centre. (182).

51. A uniform procedure should be adopted for following up the inseminations and working out the conception rate. To achieve this a standard method as suggested by the Indian Council of Agricultural Research should be adopted. (192).

52. It is essential to employ only trained personnel as Officers-in-Charge of artificial insemination centres. For this purpose a course of training of three months' duration in artificial insemination and physio-pathology of reproduction should be organised in each major State. The training should preferably be given either at the Veterinary College or at the principal artificial insemination centre. As almost all the major States have now got separate Professors of Animal Gynaecology and Obstetrics, the training course should preferably be organised under them so that a high standard of teaching is ensured.

Similarly, a separate course of training of 1—1½ months' duration should be started in every State for stockmen. The training should be such that it would engender confidence in the stockmen to do insemination work independently of Veterinary Officer. For this purpose it is necessary that each trainee is given sufficient practical training in the subject. Employing untrained stockmen and the Officer-in-Charge training them up while they are

39. Key Village blocks have been established under the Central Institutes viz., the Indian Veterinary Research Institute, the Indian Agricultural Research Institute and the National Dairy Research Institute (Karnal and Bangalore). It is observed that there are various practical difficulties in the day-to-day working of these blocks and there is no distinct advantage in continuing these blocks under the Central Institutes. It is, therefore, recommended that the Blocks under the Indian Veterinary Research Institute and National Dairy Research Institute should be transferred to the respective State Departments of Animal Husbandry.

The progress of work in the block attached to the Indian Agricultural Research Institute has been found to be poor and there are several practical difficulties due to which there seems to be little hope of effecting improvement. On a very careful examination of the working of this Centre it is suggested that it should be closed down immediately. (152—155).

40. Although artificial insemination is an important tool which should be utilised to the maximum possible extent, before starting artificial insemination centres various factors which are essential for the successful adoption of this technique should be carefully considered. Establishment of artificial insemination centres in each and every block should not be made compulsory.

In the hilly areas, due to the peculiar conditions, a more cautious approach should be adopted in starting artificial insemination centres. (165-166).

41. Artificial Insemination centres should not be opened indiscriminately. A careful assessment of the work done at the existing artificial insemination centres should be carried out and those which offer no promise of being successful despite having been given an adequate trial should be closed down. In such blocks it would be preferable to resort to natural service only. While establishing new Key Village blocks the possibility of obtaining semen from an existing centre in the vicinity should be examined and only in inescapable cases should a new artificial insemination centre be established. (229, 230).

42. In certain areas like Kutch (Gujarat), even though cattle breeding is an important avocation of people, due to various reasons artificial insemination has not made much progress. In such areas artificial insemination should be stopped in the Key Village blocks, and breeding should be done only by natural service. (166).

43. In order to achieve the desired objective, it is essential that only the best bulls in conformity with requirements are used for artificial insemination. In future the expansion of artificial insemination, especially in the more developed areas, should be so planned that it is possible to start the centres with pedigreed bulls, as far as possible. (167).

44. Although it is desirable, rather essential, that only high class bulls are used at artificial insemination centres, in the areas where the population is of inferior type, to begin with, it will suffice to use even medium quality bulls. In the breeding tracts, however, only superior bulls should be used. In order to make the best use of the available bulls a careful assessment should be made of the types of bulls required for the different areas and the different schemes, and allocations made accordingly. (172).

in their jobs is considered an unsatisfactory arrangement and should be discouraged. There should be uniformity in syllabii prescribed for the courses of training for Veterinary Officers and Stockmen in the different States. (203—210, 239).

53. Suitable laboratory accommodation should be provided for artificial insemination work. The laboratory building should consist of atleast one independent laboratory room, one sterilization room, one store room and one small office and record room. Where artificial insemination centres are located at Veterinary Hospitals, Government farms or Veterinary Colleges, sufficient laboratory space for the work required to be done should be provided.

At the sub-centres also there should be atleast one separate room for use as a laboratory and for storage of equipment. (213—215).

54. The future policy with regard to Key Village work should be to consolidate rather than to expand and for this purpose a careful study should be carried out of the progress of work in the Key Village blocks in each State and such of those as reveal short-comings which can be rectified should be assisted with means of over-coming them, say, by provision of more staff, equipment, etc. Those which have shown good results should be further expanded by adding some more villages to them. Before new Key Villages are established a careful survey should be carried out to make sure that the area is suitable, the breed to be used should be carefully determined and availability of bulls should be assured. In order to bring a solid block of area under the improvement programme, the sites for the new Key Village blocks should, as far as possible, be in proximity to the existing blocks. (51, 60—63, 65, 70, 222, 227, 228).

55. In establishing new Key Village blocks, preference should be given to the breeding tracts so that the production of superior bulls is stepped up [224, 226(b)].

56. The Key Village plan provides for the establishment of Extension Centres for utilization of bulls produced in the Key Villages. The progress under this item has been slow. This is a very important item in the programme of general cattle development in the country and it is essential that in future, more emphasis should be laid on the establishment of such Extension Centres and this programme should be fully expanded. Bulls for Extension Centres should as far as possible, be obtained from the Key Villages within the State. At present breeding in these Centres is done by natural service only. There should be no objection to artificial insemination also being used in the Extension Centres provided conditions for the adoption of this technique exist. This would result in considerable saving in the requirements of bulls for Extension Centres. (225, 235).

57. Although bulls produced in blocks which have been set up in areas of non-descript cattle cannot be utilised for breeding work until four or five generations have been completed there are quite a large number of bulls available even now in the Key Village blocks in areas of well-defined breeds. What

is required is to acquire them and use them. Adequate funds should be provided for their purchase and their utilization should be properly planned. (225).

58. In order to ensure proper utilization of available bulls and avoid wastage, a Committee should be set up at the Centre and this Committee should coordinate the bull distribution programme on a country-wide basis. (232).

59. Feeding charges of Rs. 60/- p.m. for maintenance of bulls at the Artificial Insemination centres are considered inadequate due to increase in the prices of feeds and fodder. These should be raised to Rs. 90/- p.m. A portion of the loan amount in the State Plan funds and in the National Extension Service and Community Development Block budgets should be earmarked for giving loans for purchase of pure-bred female stock in the Key Village blocks. This loan amount should be recovered in easy instalments. (234, 236).

60. Livestock and agricultural production programmes should be closely integrated and made fully inter-dependent. For this purpose in the Third Five-Year Plan mixed farming should be introduced on a large scale in the different States. In selecting areas for mixed farming, preference should be given, wherever possible, to the Key Village blocks. (243).

61. Consideration of various factors indicates that in the present agricultural economy of the country both cows and buffaloes play an important role and that, therefore, there is no need to think exclusively in terms of either developing the cow or the buffalo. Improvement of both these species had, therefore, to be accepted as the National Policy. (257).

62. Considering the relative importance of cows and buffaloes in the different States, it is suggested that in the States of Assam, Orissa, West Bengal, Tripura, Manipur, Kerala, Himachal Pradesh and Jammu and Kashmir, cow should receive more favourable and better treatment in so far as the development of livestock is concerned. In these States no organised attempts are necessary to develop the buffalo, though here and there in important pockets, provision of facilities for the development of this animal is also necessary. In the remaining States development of both cows and buffaloes should receive attention. (258—271).

63. A broad policy for future development of cows and buffaloes in the country is suggested in paras 274 and 275.

APPENDICES

APPENDIX I

Most Immediate

No. 13-155/59-LD

GOVERNMENT OF INDIA

MINISTRY OF FOOD & AGRICULTURE

(DEPARTMENT OF AGRICULTURE)

New Delhi, the 5th December, 1959

FROM

Shri Krishan Chand, I.C.S.,
Joint Secretary to the Government of India.

TO

All the State Governments/Union Territories.

SUBJECT—*Formation of a Committee to assess the utility and economics of the A.I. K.V.S. and recommend policies regarding cattle development and dairying in the Third Five Year Plan.*

SIR,

I am directed to say that it has been suggested to the Government of India that an Expert Committee should be set up to review and evaluate the work done under the All-India Key Village Scheme and that its findings and recommendations should be used both for the purpose of framing proposals for the Third Five-Year Plan and also for the successful implementation of the Cattle development Programme during that Plan. The Government of India has accepted the suggestion and has decided to constitute a Committee for this purpose.

2. The composition of the Committee will be as under—

1. Shri L. Sahai, Animal Husbandry Commissioner—*Chairman.*
2. Shri Rama Reddy, B.Sc. Agri., Model Dairy Farm, Bangalore—*Member.*
3. Shri Y.M. Parnerkar, Secretary, Akhil Bharatiya Serva Seva Sangh, Wardha—*Member.*
4. Shri A.C. Mathur, Quarantine Officer, I.C.A.R.—*Secretary.*
5. Shri S. Krishnamurthy, Assistant Livestock Officer, Department of Agriculture—*Joint Secretary.*

3. The Committee will co-opt, as additional members, the Director of Animal Husbandry of the States which it visits or his nominee in connection with the Committee's work.

4. Terms of reference of the Committee will be—

- I. (a) To review the working of the Key Village Scheme and to evaluate the progress made thereunder;
- (b) to examine the progress made in regard to the adoption of artificial insemination technique for breeding cattle and its economics and usefulness in relation to natural breeding;
- (c) to examine the programme and progress under the calf subsidy scheme and its achievements;

- (d) to examine the programme for development of feed and fodder resources in Key Village Blocks and suggest suitable measures and modifications for implementation of the scheme;
 - (e) to suggest a suitable programme for the organisation of marketing facilities for livestock and livestock products in the Key Village areas; and
 - (f) to make suitable recommendations for formulating future programme of work under the Key Village Scheme.
- II. (a) To study the importance of cows and buffaloes in the farmer's economy in the different regions of the country;
- (b) to demarcate;
 - (i) areas and tracts where the cow has been quite popular with the villagers and has served as an economic and useful animal;
 - (ii) areas where only cows are being maintained, for example, Eastern States like Orissa, West Bengal etc.;
 - (iii) areas where both cows and buffaloes are maintained by villagers e.g. Punjab, Western U.P.;
 - (c) to evolve a policy for development of cows and buffaloes in the different areas detailed above and examine the advisability or otherwise of introducing buffalo breeding indiscriminately in areas where cow has been kept mainly so far by the farmer.

5. The Committee will decide its own working procedure but may visit the States, if necessary, to examine the problem in detail. It should submit its report by end of March, 1960.

6. It is requested that the Committee may kindly be given all the facilities necessary for discharging the duties entrusted to it. The Committee will correspond directly with the State Governments and Central Ministries/Departments for obtaining information/documents and for arranging its tour programmes. All the correspondence meant for the Committee should be sent to the Member Secretary of the Committee (Shri A.C. Mathur), Room No. 304, 3rd Floor, Krishi Bhavan, Queen Victoria Road, New Delhi I.

Yours faithfully,

KRISHAN CHAND

Joint Secretary to the Government of India

Copy to—

1. All Central Ministries and Departments (including Cabinet Secretariat and Prime Minister Secretariat);
2. Planning Commission;
3. Chairman & Members of the Committee;
4. Directorate of E. & S.;
5. Directorate of Publicity;
6. All Officers and Advisers in this Ministry;
7. All Sections in the Ministry (with 50 copies for L.D. Section).
8. All Attached and Subordinate Offices.
9. Guard file.

By order,

D. RAMIAH

Deputy Secretary to the Government of India

APPENDIX II

COMMITTEE ON KEY-VILLAGES, MINISTRY OF FOOD AND
 AGRICULTURE (DEPARTMENT OF AGRICULTURE)
 GOVERNMENT OF INDIA, NEW DELHI-1

QUESTIONNAIRE

16th January, 1960

This questionnaire is issued for the collection of data in regard to various subjects which form the term of reference of the Committee on the Key-Village Scheme

SECTION I(a)

1. Please give the year in which the key village scheme was initiated in the State

2. Was an overall survey of the livestock position in the area carried out in accordance with the Key Village-Plan prior to the establishment of Key Villages at their present locations? If so, please attach a copy of the survey report

3. How many key villages have been transferred from one location to another during the past five years and what were the reasons for changing their location?

4. Is the present location of key villages considered to be satisfactory? If not, the particular respects in which the location is unsatisfactory may be stated

5. The number of centres, population of adult cows and buffaloes and bulls (Zebu and buffaloes) stationed in key village blocks on 31st December 1959 or on earlier date, and their breeds may be given for the key villages started during the first and second plan periods

N.B.—Please give particulars in the enclosed proforma.

6. (a) Whether the Livestock Improvement Act has been enacted in the State

(b) whether rules have been framed thereunder

(c) whether the Act has been enforced in all the key village blocks

(d) in what manner, if any, is the administration of the Act and Rules defective

(e) number of castrations performed in the key village areas till 31st March 1959 since its inception :—

Year	Cattle	Buffaloes
1	2	3

(f) number of uncastrated mature males in the key village areas on 31st March 1959 :—

1. Cattle
2. Buffaloes

7. Whether the Contagious Diseases Act has been—

- (a) enacted in the State
- (b) whether rules have been framed thereunder
- (c) whether the Act has been enforced in key village blocks
- (d) in what manner, if any, is the administration of the Act and the Rules defective
- (e) No. of preventive inoculations done
 - (i) year; (ii) name of the disease; (iii) No. inoculated.

8. Do the State Government Farms produce (issue for breeding) adequate number of bulls to meet the entire requirements of the main key village scheme in your State?

9. If not, what proportion of requirements of bulls for the key village and A.I. centres are met from—

- (a) State Government Farms—
 - (i) in your State
 - (ii) outside your State
- (b) Breeding Tracts—
 - (i) in your State
 - (ii) outside your State

10. What was the number of bulls (Zebu and buffalo) issued for breeding in key village and other centres from your State Government Farms during the last 5 years (breedwise and yearwise)

11. (a) In what proportion of the existing key villages are over 2/3 of the services (Natural and artificial) recorded

(b) In what proportion of the existing key villages are between 1/3 and 2/3 of the services (natural and artificial) recorded

(c) in what proportion of the existing key villages are under 1/3 of the services (natural and artificial) being recorded

12. What are the reasons for incomplete recording of natural services and what steps do you suggest for making the breeding control complete so that the sire and dam of each calf born are known

13. In what proportion of the key villages was—

- (a) over 2/3 of the progeny born from approved sires
- (b) between 1/3 and 2/3 of the progeny born from approved sires
- (c) less than 1/3 of the progeny born from approved sires

14. Give in detail the reasons leading to the lack of breeding control in the group of key villages under Q. 13(b) and (c) above and suggestions for improvement

15. What is the system of locating bulls for natural service in the key villages with regard to the payment for their feeding and arrangements for their maintenance. If there are more systems than one, it may be indicated if any one system is better than another, giving reasons for the difference

16. Please give—

(a) the number of key village blocks in which milk recorders have been posted

(b) the number of key village blocks where systematic milk recording according to the plan laid down in the scheme, has been taken up

17. What has been the trend of milk production in cattle and buffaloes in the different types of key village blocks, rural, urban and those established in conjunction with dairy schemes. This trend may be indicated separately for cows and buffaloes which are the progeny of improved bulls and those from other breeding ..

Are the above observations based on any recorded data? If so, reference to them may please be given

18. In case of those key villages where proper breeding and milk records have been kept, have any bulls been progeny tested. If so, give their breeds and numbers

19. As far as breeding is concerned, do you think that the key village scheme has achieved its objective of—

(a) improving the genetic make up of the cattle population

(b) improving production of cattle by providing better management and environment

(c) producing improved bulls for furthering livestock development in other areas

If not, please give the reasons and make suggestions for improvement

SECTION (b)—

20. In what year was the A.I. work started in the State? ..

21. Number of A.I. centres which have been established in your State in—

(a) Government farms

(b) Key Village Scheme

(c) State Schemes

(d) C.D. Blocks and N.E.S. Blocks

(e) Other Schemes

22. No. of breeding bulls (Zebu and buffalo) in the State kept at the A.I. centres

23. Adult cow and buffalo population covered by the A.I. centres in—

- (a) Government farms
- (b) Key Village Schemes
- (c) State Schemes
- (d) C.D. Blocks and N.E.S. Blocks
- (e) Other schemes

24. No. of inseminations done in cows and buffaloes in the A.I. centres in—

- (a) Government farms
- (b) Key Village Schemes
- (c) State Schemes
- (d) C.D. Blocks and N.E.S. blocks
- (e) Other Schemes

25. No. of farms, key village, community development/N.E.S. Blocks etc. where breeding is done by—

- (a) A.I. alone
- (b) A.I. and natural service
- (c) Natural service alone

26. Average percentage of conception obtained by—

(i) A.I.

(ii) natural service in—

- (a) Government farms
- (b) Key Village Scheme
- (c) State Schemes
- (d) C.D. Blocks and N.E.S. Blocks
- (e) Other Schemes

27. No. of calves (Zebu and buffalo) born by A.I. and Natural Service

N.B.—Answers to question Nos. 21 to 27 may be given in the attached proformas.

28. What is the average annual cost of maintenance of bulls at the A.I. Centres and for natural service?

29. Have any comparative studies been undertaken to determine the comparative cost of breeding, say, 100 cows/buffaloes by A.I. as compared to natural service?

30. What are the factors which limit the extension of A.I. in centres where natural service or both A.I. and natural service are being practised? Is it due to want of—

- (a) high quality bulls
- (b) adequate No. of trained personnel
- (c) transport facilities
- (d) proper equipment
- (e) proper storage facilities for semen
- (f) acceptability of technique by local cattle owners ..

31. At the farms, key village blocks, State A.I. centres and C.D. and N.E.S. Blocks, where A.I. is practised, what factors in your opinion, limit the use of this technique. Is it due to—

- (a) Limited No. of cows/buffaloes allotted to the centre ..
- (b) poor response of bulls for giving collections
- (c) paucity of trained personnel
- (d) non-availability of proper transport facilities ..
- (e) non-availability of proper equipment
- (f) want of semen storage facilities
- (g) want of acceptability of A.I. technique by local cattle owners and
- (h) inadequate viable supply line of semen to the insemination centres

32. Do you think that at the farms/key village/C.D./N.E.S. Blocks, State A.I. Centres etc. the conception rate in cows and buffaloes is lower by A.I. as compared to natural service? If so, what are the major factors involved out of the following—

- (a) Low fertility of bulls
- (b) improper technique of collection, storage, transport or A.I.
- (c) impaired fertility of cows due to malnutrition and disease condition etc.
- (d) not presenting cows and buffaloes for insemination at the proper stage of heat

33. What is the present system of reporting of cows/buffaloes in heat for insemination in the Key Village/CD/NES blocks and State A.I. Centres? Do the inseminators visit the villages or the owners are required to bring their animals to the centres? ..

34. Is there a marked difference in the response of the cattle owners to the use of A.I. technique in the urban and rural areas. If so, in which areas is it more popular?

35. What special steps like calf rallies, payment of cash prizes are taken to popularize A.I. in the State?

36. What facilities, if any, are available in your State for training—(i) Officer Incharge A.I. work and (ii) Stockmen Incharge A.I.?

37. Do you think the present facilities available in the country and the type of training imparted are adequate to meet the requirements of A.I. work in the country? If not, give suggestions for their improvement

SECTION I(c)

38. Year of starting calf subsidy scheme in the State under key Village Scheme

39. No. of male and female calves born and recorded in the Key Village Blocks (yearwise since inception) from total No. of inseminations and natural services

40. No. of male and female calves taken up for subsidy (yearwise since inception)

41. Programme under the calf subsidy scheme for the year 1959-60, 1960-61 and the Third Five Year Plan. Is it based on an overall survey of the requirements of the State for pedigree bulls for cattle development schemes?

42. No. of subsidised calves purchased for breeding by your Government and other State Governments (yearwise)

43. No. of subsidised calves purchased within your State and in other States for breeding by other agencies like the District Boards, local bodies etc.

44. What are the arrangements for inspection of subsidised calves during the period of subsidy to ensure their proper keeping and maintenance?

45. Whether any check is kept on such subsidised male and female calves as are released for breeding to other States or non-Government agencies with regard to their proper use. If so, please state briefly your observations

46. Whether the modified calf subsidy scheme, suggested by this Ministry, has been taken up for overcoming the difficulties of rearing (i.e., producing the calves at 1/3 market value and rearing them in a Government or private farm).. .. .

47. What are the difficulties experienced in your State in implementation of the calf subsidy scheme

48. Whether, in your opinion, only the male calves should be subsidised under the key village scheme or subsidy should also be given to female calves. Please state briefly the reasons for recommending subsidy for the females

49. Please give your suggestions, if any, for improving the working of the calf subsidy scheme for fuller utilisation of subsidised calves

SECTION I(d)—

50. Please state whether an overall survey of the key village blocks has been undertaken with regard to the requirements, availability and supply of feedstuffs. Has the deficit or surplus been determined?

51. In which year was the feeds and fodder development programme started under the key village scheme in your State? ..

52. The No. of key village blocks in which the programme has already been taken up

53. What items of feeds and fodder development programme have been taken up for implementation out of those which were approved by the Ministry in the model scheme?

54. Whether full complement of the headquarters staff proposed under the scheme for feeds and fodder development at State level has been appointed

55. Do the cattle owners cooperate in implementation of the various items of programme of work under the feeds and fodder development programme?

56. Has the State Grazing and Fodder Committee been formed, as recommended by this Ministry?

57. What changes or modifications do you suggest in the programme of feeds and fodder development scheme for improving its working?

SECTION I(e)—

58. Has an overall survey of the key village blocks been undertaken to determine the marketable surplus of livestock and livestock products? If so, the results of survey may be indicated..

59. What steps have been taken for the development of facilities for marketing of livestock and livestock products in the key village areas? The detailed programme for 1959-60 and 1960-61 and the 3rd Five Year Plan may be indicated

60. What steps have been taken to organize owners into cooperative societies for improvement of marketing and how many such societies have been formed?

61. Please give your suggestions for improving the marketing programme under the Key Village Scheme

SECTION I(f)—

62. Give broadly the future programme of work under the key village scheme as formulated and accepted by the State Government

63. In what manner do you think the programme under the key village scheme should be modified to make it more effective?

64. In what manner do you think can the programme under key village scheme be integrated with other cattle development programmes in the State?

SECTION II (a) (b) & (c)—

65. Give the names of the districts in which in 1956 as compared to 1951 the population of (a) cows over 3 years for breeding and milk production, and (b) buffaloes over 3 years used for breeding and milk production has gone up (i) by 5 per cent or more; (ii) has gone down by 5 per cent or more

66. What, in your opinion are the factors which are responsible for the above variations particularly in districts where the trend in the two species has not been the same

67. Give the names of the districts in which in 1956 as compared to 1951 the population of (a) bullocks over 3 years used for work, and (b) male buffaloes over 3 years used for work (i) has gone up by 5 per cent or more; (ii) has gone down by 5 per cent or more

68. What, in your opinion, are the factors that are responsible for the above variations, particularly in districts where such a trend in the above two species has not been the same

N.B.—Please use the attached proforma for compiling answers to question Nos. 62 and 64.

69. What is the preference of people in the different areas in your State in regard to their consumption of milk and milk products obtained from cows and buffaloes?

(Please give the answer in the attached proforma).

70. What is the breeding policy which is being adopted in the various zones of the State? Give names of the districts included in the different zones and names of the breeds of cattle and buffaloes used

71. Have any schemes or projects been undertaken on systematic lines by the State Government/private agencies for introduction and popularisation of buffaloes in your State in recent past? Have such attempts been appreciably successful as judged by the response of people by way of increased demand for keeping buffaloes?

Question No. 5—Statistics of Key Village Population etc.

	Breed	No. of K. V. Blocks	Adult cow population		No. of bulls in service on	
			Zebu	Buffalo	Zebu	Buffalo
A. No. of Key Village Blocks established in First Plan						
(a) In homes of well defined breeds
(b) In other areas
B. Number of Key Village Blocks established in Second Plan—						
(a) In the homes of well defined breeds—						
(i) Rural
(ii) In conjunction with dairy scheme
(iii) Urban
(iv) Extension Centres
(b) In other areas (areas where local cattle are not of well defined breeds)—						
(i) Rural
(ii) In conjunction with dairy scheme
(iii) Urban
(iv) Extension-Centres

Question Nos. 21 to 24—Statistics regarding Artificial Insemination Centres

	Farms	K. V. Blocks	State A.I. Centres	C.D. Blocks	N.E.S. Blocks	Others
	1	2	3	4	5	6
(a) No. of Centres working—						
1951-55 (average)
1955-56
1956-57
1957-58
1958-59
(b) Bulls kept (Zebu)—						
1951-55 (Average)
1955-56
1956-57
1957-58
1958-59
Buffaloes—						
1951-55 (Average)
1955-56
1956-57
1957-58
1958-59
(c) Adult cow population covered by the centres—						
Zebu—						
1951-55 (average)
1955-56
1956-57
1957-58
1958-59
Buffaloes—						
1951-55 (average)
1955-56
1956-57
1957-58
1958-59
(d) Artificial inseminations done—						
Zebu—						
1951-55 (average)
1955-56
1956-57
1957-58
1958-59
Buffaloes—						
1951-55 (average)
1955-56
1956-57
1957-58
1958-59

Question Nos. 25 to 27—Details about use of A. I. Technique calves born etc.

(Figures should relate to 1958—59 or the latest year for which they are available).

	Farms	K.V. Blocks	State A.I. Centre	C.D. Blocks	N.E.S. Blocks	Others
	1	2	3	4	5	6
(a) No. of centres where A.I. alone is done—						
(i) Adult cow population covered.	..	Z B	..	..	..	..
(ii) No. of bulls used	..	Z B	..	..	..	..
(iii) No. of cows bred	..	Z B	..	..	..	..
(iv) Conception rate	..	Z B	..	..	..	..
(v) Calves born	..	Z B	..	..	..	..
(b) No. of centres where A.I. and natural services are permitted—						
(i) Adult cow population covered.	..	Z B	..	..	..	..
(ii) No. of bulls used	..	Z B	..	..	..	..
(iii) No. of A.I. performed	..	Z B	..	..	..	..
(iv) Conception rate	..	Z B	..	..	..	..
(v) Calves born	..	Z B	..	..	..	..
(vi) No. of natural services performed.	..	Z B	..	..	..	..
(vii) Conception rate	..	Z B	..	..	..	..
(viii) Calves born	..	Z B	..	..	..	..
(c) No. of centres where natural service alone is done—						
(i) Adult cow population covered.	..	Z B	..	..	..	..
(ii) No. of bulls used	..	Z B	..	..	..	..
(iii) No. of cows served	..	Z B	..	..	..	..
(iv) Conception rate	..	Z B	..	..	..	..
(v) Calves born	..	Z B	..	..	..	..

Z=Zebu.

B=Buffaloes Cattle.

Question Nos. 62 and 64—Trend of cattle/buffalo population

District	Zebu				Buffalo			
	Working bullocks over 3 years		Breeding cows over 3 years used for breeding or milk production		Working buffaloes over 3 years	Breeding cows over 3 years used for breeding or milk production	Increase or decrease in proportion of Zebu	
	A	B	A	B	A	B	A	B
	1951	1956% + or -	1951	1956% + or -				
A.	R.							
	U.							
	R.							
	U.							

R=Rural

U=Urban

Question No. 66—Consumption of milk and milk products

RURAL			URBAN		
For Milk products	For fluid use		For Milk products	For adults	For children and babies
	For adults	For children and babies			
District					

Predominantly prefer cows milk Z
 Predominantly prefer buffaloes milk B
 Use both milks almost equally ZB
 Predominantly prefer cows milk but are changing over to buffalo milk Z/B
 Predominantly prefer buffalo milk but are changing over to cows milk B/Z

APPENDIX III

Key Village Plan for Cattle Improvement in India

According to 1945 livestock census, there are in the Indian Union about 44 millions cows over 3 years of age which are fit for breeding purposes. In order to breed these cows properly and to improve them progressively, about 7,50,000 bulls of known parentage and performance are required. Actually the present effective production of bulls is only about 750 per year on farms where proper records are maintained and where breeding control is exercised. Assuming that bulls require replacement every 4 years, this number works out to only 1 bull available where 250 are required. There is thus a wide gap to be filled.

It is not possible to fill this gap by starting more farms which will mean considerable expenditure of money. It was recently estimated that the production of bulls in Government farms costs a large amount of money both in recurring as well as in non-recurring expenditure, whereas bull rearing farms started in conjunction with key villages, where pedigree bulls are multiplied, can turn out pedigree bulls at a fraction of the cost. The only possible way by which the large gap between the present production and requirements of breeding bulls can be filled is by the multiplication in key villages of the bulls now available. The establishment of key villages has got an added advantage. They demonstrate to the villagers under his own conditions, modern scientific methods of breeding and rearing cattle. However, much, Government may try it is not possible for them to run a Government farm under the conditions of the villagers. These conditions vary widely and it is difficult to strike an average or to reproduce those conditions in Government farms. Under the key village plan, the villager is encouraged to do the work himself on his own field and under his own conditions.

The term Key Village is expressively worded. It shows that the key village holds the key to the success of cattle improvement. It also denotes that successful cattle improvement can be achieved only by large scale work in villages where most of the cattle breeding in India is carried on. On a study of this problem the Indian Council of Agricultural Research has realised that it is impossible to start the number of farms required for producing the large number of bulls required for improving a quarter of the world's bovine population. Some Government farms are however essential but they can be really effective only when worked in conjunction with the key villages. Not that the villages have been neglected hitherto. They have received attention. Bulls have been produced and distributed in villages. Scrubs have been castrated. Disease control has been attended to. Propaganda and demonstrations of various kinds among villagers have been undertaken. But all these measures have not produced the desired results because the effort was too small for the task and, in the majority of cases, there was no plan or system behind it. The bulls bred on the farms were indiscriminately distributed and there was no concentration or continuity of effort. Experience has shown that effort should be concentrated continually in small, compact and suitable areas till they are improved and then the improvement should be made to spread to other parts in a gradual and everwidening circle.

It is now generally agreed that the key village has a very important role to play in all our livestock improvement plans and if judiciously exploited, it is likely to yield results of far reaching importance. As, however, the key village is still in its infancy, a clear perception of its scope and functions and how it may be organised and developed is necessary for ensuring uniformity in design and execution.

The key village has been described and defined as a compact area consisting of one village or group of contiguous villages having a total population of about 500 cows. It is selected in a breeding tract and seven to eight bulls of known breeding value are located there. All the other bulls in the area are castrated or removed and no bull other than the selected seven or eight is allowed in the area at any time. A Livestock Improvement Act similar to that passed in Bombay, Madras, U.P., Punjab and other States, is enacted and enforced in the area. When these bulls become too old to be of service, they are replaced by an equal number of equally good or better bulls, so that in the course of four or five generations the entire stock of the key village is of a superior strain. The bulls from the key village are then available for distribution in other areas. Each key village with a population of 500 cows should produce about 100 bulls annually in addition to a similar number of improved heifers which can be used for replacement for further improvement in other areas.

The farm-bred bull is thus multiplied 10 to 15 times. By planned distribution, the area of location of bulls sent out from key villages, can also be defined so that the improvement proceeds in accordance with a pre-planned programme. Bulls are thus produced on the farms, multiplied in key villages and distributed in other well-defined areas.

The above picture of planned improvement may be contrasted with what is being done today. The number of bulls produced at present on the farms is only 1/250 of the actual requirements. These are often indiscriminately distributed, with the result that one improved bull is placed among a host of 250 scrubs, which in many cases, nullify in the second generation the improvement produced by the approved bull in the first. Under this systems little improvement is possible. The key village is designed to put a stop to this haphazard practice which has been going on for years.

Only a bare outline of the key village has been given in the foregoing paragraphs. If properly organised and developed, the key village is pregnant with potentialities for the improvement not only of cattle, but of all species of livestock. Experience, has however, shown that in planning the development of key villages one should hasten slowly. During the past few years, the Indian Council of Agricultural Research has established a number of key villages designed to operate with a full programme of breeding control, such as maintenance of complete records of breeding and milk production and tattooing or branding for identification. The attempt failed to produce results. It is clear now that this detailed programme should be introduced by stages. The first stage of development should be merely the establishment of key villages, with the approved bulls suitably located existing bulls removed or castrated and the whole cattle population protected against contagious diseases. In the second

stage, which will be five years after the establishment of key villages, full breeding control should be introduced. Other measures of cattle improvement like preservation of surplus monsoon fodder as silage, hay-making, cooperative purchase of feeding stuffs, cooperative sale of milk and milk products, may also be taken up in the second stage. In the third stage, the maintenance of complete records of breeding and milk production, tattooing or branding of the animals for identification should be undertaken. Other investigations on the economics of milk production, suitability of feeding scale, transmitting ability of breeding males and cognate matters can also then be conducted and accurate data obtained for planning further improvement. When the third stage is completed, it should be possible to select breeding stock on the sure basis of pedigree and production. The improvement thereafter will be rapid. If organised and developed with vision and understanding, the key village will be the corner stone of mighty edifice of cattle improvement in India.

The scope of this scheme is limited to the annual production of 54,000 bulls, which is nearly a third of the country's requirements. It is not practicable to embark on a more ambitious plan. Nor is it necessary. In the first place the increasing popularity of artificial insemination will make this number satisfy the entire demand. Secondly, when such a large number of bulls, which are progressively improved in quality, are at stud, there will be sufficient progeny in the country at large, for choosing breeding bulls from.

As has already been stated present effective production on farms is 750 bulls annually. Assuming half the cows can be inseminated artificially each key village requires 5 bulls, and providing for four year replacements 600 key villages can be established in the course of four years. This will require 150 Artificial Insemination Centres and 540 Bull Rearing Farms, where progeny of the original bulls from key village cows will be reared.

Detailed estimates for the establishment and running of 600 key villages and 540 bull rearing farms and also for the expenses connected with the staff for supervision, administration etc., both central and provincial are attached.

These 600 key villages will produce roughly 54,000 bulls in a year which is about 1/3rd of the country's total requirements.

As the development of cattle is primarily the function of the State Governments, it is expected that they would bear their full share of responsibility and cost in the execution of the scheme. What the respective contributions from the Central and State Governments should be, is a matter to be decided in consultation with the States. In regard to the actual running of the scheme, the States should be primarily responsible for the successful working of the scheme and for its administration the Centre being concerned only with coordination and guidance. The Centre should however, have a controlling voice in the shaping of the key village and in the determination of the pace of progress.

All the 600 key villages cannot be started together. With the available supply of superior bulls, only 150 can be started in year, all the 600 being established by the 4th year of the scheme. In the 5th year, bulls from the first year's 150 villages will be ready for issue, in the 6th year the second year's also will be ready and so on, the full quota of bulls from all the 600 villages being ready in the 8th year of the scheme.

APPENDIX IV

Technical Programme of the All-India Key village Scheme

- (a) A well defined breeding policy should be laid down for each State.
- (b) The Livestock Improvement Act and Control of Animal Contagious Diseases Act should be enacted and rules framed thereunder. The act should be enforced in the areas selected for the operation of the scheme.
- (c) After a survey of the climatic agricultural and animal husbandry conditions of the State and of its resources in breeding bulls, a plan should be prepared for the initiation of the Key Village Scheme and establishment of Artificial Insemination Centres in selected places.
- (d) A complete preliminary survey of the key village areas should be undertaken.
- (e) Advice and help on all cattle husbandry problems should be tendered to the breeders by way of :—
- (i) castration of unapproved bulls and breeding naturally or artificially of all cows from better bulls provided under the scheme;
 - (ii) protection against prevalent contagious diseases and provision of first-aid facilities for the sick cattle;
 - (iii) assistance and advice for better feeding, and
 - (iv) provision of better marketing facilities through organisation of villagers as a multi-purpose cooperative breeder's society.
- (f) Holding of cattle shows and calf rallies.

Other aspects of the work such as milk recording should be taken up at a later date during the progress of the scheme.

DETAILED PROGRAMME OF WORK

What a Key Village is?

The Key village is an intensive cattle improvement unit worked in a compact area of one village or a group of contiguous villages containing a total population of about 500 cows and/or she-buffaloes over three years of age fit for breeding or milk production. All aspects of cattle improvement, viz., breeding, feeding, disease control, management and marketing will be attended to by the staff and the village eventually developed into a cooperative Cattle Breeding Farm.

What a Key Village is not?

The Key Village is not an area where a certain number of 'approved' bulls are located, castration is done 'as far as possible' a few 'selected' cows are served by the approved bulls, the progeny are periodically inspected and certified as good by an Inspector etc.

The scope of Key-village is not limited to breeding. But is extended to all aspects of cattle development. No cows are selected for improvement, but all cows—good, bad and indifferent receive equal attention. Improvement is not measured by the appearance or conformation of a few selected progeny, or by the impressions of visiting officer.

It is measured by the conformation and productive capacity of all progeny, from generation to generation, not from year to year, the actual measure of progress being the average and variability in the performance of the progeny as a whole. This will be compared and contrasted with the result in the farms from which bulls are supplied to the Key villege.

The villager will not be continually spoon fed and made into a spectator witnessing what the Government staff is doing. The staff will make him do things under their guidance and help him to utilise in practice all the general recommendations adopted for cattle improvement. Co-operation will be made to play its full part in this endeavour.

All the 6,00,000 villages in India are not proposed by Key villages, but only a thousandth of them. Another thousandth may be taken up after 15 years and if necessary, a third thousandth after 30 years. By the actual issue of breeding material from the Key Villages and by their demonstrative and educative value the whole country will be eventually benefited.

Programme of work and systematic development of Key Villages. A statement is attached showing in outline the programme of work for the Key Villages in the different stages of development. It is for the controlling officer to study the plan and programme of work thoroughly and to see that the field staff do carry out systematically and in time the various details of work necessary to achieve the objective of developing the Key Village into a Co-operative Cattle Breeding farm which will function not only as a radiating centre of superior germplasm but also as a centre of demonstration and education and a field laboratory for testing, on a large scale under village conditions, the practicability of general recommendations the transmitting ability of bulls, suitability of particular breeds to particular areas, causes of degeneration of cattle in backward areas, efficacy of new drugs or biological products, feeding value of different feeds, existing or newly discovered balanced rations, mineral mixtures, grading up methods, cost of production figures and so on.

What the Inspector should do to realise this objective may be elaborated as under :—

The first item of work is a detailed house-to-house survey for obtaining essential information regarding the back-ground of animal husbandry conditions in the area and to collect the material data relating to them. In particular the following will be collected and recorded :—

- (a) The number and distribution of all cattle, classified according to quality and breed.
- (b) Methods of production and disposal of cattle and cattle products.
- (c) General agricultural condition of the area, with particular reference to fodder and its increased production.
- (d) The total requirements of fodder for the area, the actual production and approximate potential capacity.
- (e) Source of supply of concentrates, how much is required in the area.

- (f) Contagious diseases prevalent in the area, whether animals are already protected.
 - (g) The names of more important or progressive breeders in the area who can be used as propaganda medium and with whom bulls can be located.
 - (h) Central information regarding.
 - (i) Other species of livestock in the area and their importance, and
 - (ii) Other occupation of the cattle-owners.
- Routine work of Inspector and staff.

They should move freely with the villagers, befriend them and be always ready to render any help required by them. Absolutely no official air should be put on. As far as possible, acquaintance of individuals should be cultivated so that they may be fully alive to the problems and difficulties of the villagers.

The following should be done in particular in regard to the various aspect of cattle development:—

1. *Breeding*—Every care should be taken to see that the bulls located in the villages are properly looked after, housed and utilised. It may not be possible to have full breeding control to start with, but the services of bulls should be so planned so as to enable ultimately to arrange for absolute breeding control with the object of knowing which bull served which cow and when. This should be done by stages. First it may be enough if it is known that one of a group of bulls served a particular cow. Then the number in the group can be gradually reduced to one. With increasing popularity of Artificial Insemination breeding control will become progressively easier. The practice obtaining in the villages for allowing the bulls to run with the herd should be so changed as to enable this objective of absolute breeding control to be realised in due course. No general rule can be laid down for all Key villages but this is a matter for the Inspector to decide in accordance with the local conditions and circumstances. Nor is it possible to have flat rule as to whether the bulls should be entrusted to local villagers or should be looked after by Government. Here again, the local conditions shall determine what method should be employed consistent with economy and with the limitations of the budgetary provision. Accurate records of breeding should be maintained for which farms will be supplied by the India Council of Agricultural Research in due course.

Intensive propaganda should be carried on in favour of artificial insemination and as far as possible, from the very beginning Artificial Insemination should be preferred to natural breeding. Every occurrence of heat should be watched and promptly reported to the Artificial Insemination Centre where messenger stockmen are employed for carrying semen to the villages and for insemination. Castration or removal of existing bulls should be complete. There should not be any entire male in the area other than the farm breed bulls or other bulls specially selected for the scheme. All the others not only the existing ones but the calves as they grow up, which are not approved for breeding, should be castrated. If the Cattle Improvement Act is not in forces in that area, the matter should be reported to the higher authorities.

2. *Feeding*—Generally it will be found that every village is short of fodder and other feeding stuffs. The requirements of the area should be properly assessed and every effort should be made to help the villagers to obtain adequate feeding stuffs. In that case he may be helped in adopting rotational grazing preservation of surplus monsoon fodder, growing of fodder crops in rotation with other crops and so on. If all these sources fail to supply the minimum requirement, effort should be made to tap forest or other areas from where fodder can be transported into the village. Similarly, in the case of concentrates, if the local supplies are insufficient, arrangements should be made for obtaining them from elsewhere.

In all these endeavours the Inspector should impress the necessity of co-operative effort and try to combine the breeders into a cooperative society for cattle improvement. If there is a society already existing, a branch of it should be devoted entirely to animal husbandry work. This branch or this special co-operative society can handle not only the feeding part but also the marketing which will be referred to later. It will also be helpful in the case of exchange of bulls, trying of experiments etc.

3. *Disease Control*—To begin with, animals should be protected against all the prevalent contagious diseases. The Inspector should keep with him a stock of the essential medicines necessary for minor ailments or for giving first aid.

The Co-operation of the local veterinary staff should be sought in the work of the control of diseases. Timely warning should be given to the villagers in regard to outbreak of diseases in the neighbourhood and every help should be rendered in controlling the disease when there is an out-break. Timely intimation also be given to the nearest veterinary hospital if they are not otherwise aware of the out break. If the control of contagious diseases Act has not been passed, the matter should be brought to the notice of the higher authorities so that action may be taken for the enactment of the Act.

4. *Marketing*—Marketing is perhaps the item which is of utmost interest to the villagers. A complete study should be made of the method of marketing, the financial condition of the producer his indebtedness to the money lender etc. and suitable suggestions should be given to him in order to enable him to obtain a better price to make his cattle breeding venture a paying proposition. It is in this respect that cooperation can play the most important part. Cooperatively the villagers can sell their products at a higher price and cooperatively this can cheapen production by producing more fodder and obtaining concentrates at whole-sale rates.

5. *Propaganda*—Every opportunity should be taken, at least once a week, to collect together villagers in the scheme and to conduct educative propaganda on all current topics. The Inspector can deliver lectures to them as frequently as possible. It is difficult to give an exhaustive list of topics on which he should lecture but generally each season will have its own problems. Thus in summer before the rains start, there will be the scarcity of fodder, the scarcity of milk and so on. After the rains, there will be plenty of fodder and the

problem is how to use it economically and carry over the surplus. Then there are questions like the disposal of dead animals and economic utilisation of hides, horns and hoofs, etc. Disposal of manure for raising soil fertility rather than utilising it as fuel may form another topic. Talks may also be arranged in village schools, so that children may become cattle minded. In all these talks the advantages of using first class bulls, artificial insemination, controlled breeding, etc., should be referred to and repeated again and again, wherever or whenever possible magic lantern lectures may also be arranged.

PROGRAMME OF WORK FOR KEY VILLAGES

I Stage

(1) A coordinated breeding policy for the whole country will be basis of the entire plan. Having decided upon this policy, the availability of breeding bulls, in the country will be assessed, the available resources in breeding bulls will be pooled and allocated in terms of that policy, suitable centres for location of Key Villages will be selected and the provisions of Livestock Improvement Act and of the Control of Contagious Diseases Act passed by the States, will be applied to the selected areas.

(2) The training and recruitment of staff required.

(3) A house-to-house survey will be conducted in each Key-Village to ascertain the number and distribution of cattle, the location of scrubs, the present production of milk, the present methods of marketing, the existing sources of fodder, prevalent contagious diseases and so on. The staff in the Key village will advise and assist the villager in all these aspects.

(4) Arrangements for the transfer of selected farm bred bulls to the Key Villages along with arrangements for the castration of all the scrubs that have been located in the survey explained under item (2). At this stage, all the animals in the area will be inoculated against all the prevalent contagious diseases; to effect economics in bulls and to spread, to the widest extent possible, the superior germ plasm available in the country. Artificial Insemination Centres will be established in suitable places and arrangements made to carry semen to the Key Villages for insemination wherever possible and practicable.

(5) Observations will be maintained for purposes of assessing the annual or periodical improvement in the cattle of the area as a result of this work. Initially this will be done by random sample surveys.

(6) Trying to help the breeder in his day to day problems of animal husbandry and carrying on educative propaganda regarding better methods of breeding, feeding, disease control and management, gradually combining the breeders into a cooperative society. If a multi-purpose society exists already, a section will be opened for purposes of Livestock development.

II Stage

(7) The above items of work will be completed in I stage which may take 1 to 2 years. The II stage will begin with full breeding control with the object of

knowing which bull served which cow and when, systematic marking of animals for identification and maintenance of complete records of milk production along with data relating to feeding and disease control.

At this stage, the animals will be brought into the Central Herd Book Scheme, when they will be registered, births and deaths notified and changes of ownership recorded.

(8) Through the cooperative society the members will be helped to eliminate middlemen in the marketing of cattle and cattle products and to obtain a better price.

(9) Development of the available common grazing land, propaganda in regard to controlled and rotational grazing, growing of fodder crops, preservation of fodder as silage or hay, cooperative purchase of fodder, if necessary and of concentrates.

(10) Marketing out of male progeny for extension work etc.

III Stage

(11) Preparation of a plan for the systematic distribution in the country at large of selected male calves purchased from Key Villages.

(12) Completion of all items of work started in the first two stages for developing the Key Village into a cattle breeding farm.

(13) Study and utilisation of records of breeding and production, comparison of results obtained in villages with those in farms, utilisation of these results for selecting bulls etc.

(14) Utilisation of Key Villages for

(a) Progeny testing of bulls,

(b) the testing of biological products in the field,

(c) testing of balanced rations, mineral mixtures, new discoveries and other improvements on feeding evolved in nutrition laboratories,

(d) Investigation under village conditions on numerous aspects of animal husbandry like the suitability of particular breeds to particular localities, causes of degeneration in different areas, various problems of grading up of inferior cattle, cost of production under different conditions, management practices etc.

(15) Linking up of Key Villages with the Institutes and the farms in every way for comparison and contrast of results.

IV Stage

(16) Extension of this work to other species of livestock like goats, sheep and poultry.

APPENDIX V

Statement showing the No. of A.I. Centres in different States (as on 1-4-1960)

Serial No.	Name of State	K. V. Scheme		N.E.S./C.D. Blocks		State		C.B.		Other Scheme	
		A.I.	Sub.	A.I.	Sub.	A.I.	Sub.	A.I.	Sub.	A.I.	Sub.
1	Andhra Pradesh ..	41	126	16	..	1	..	2	9	..	..
2	Assam	5	22	6	8	7	5	1	4	..	..
3	Bihar	39	136	..	..	86	227	1	4	..	..
4	Bombay	26	156	1	5	7	23	..	..	..	..
5	Kerala	14	77	31	49	6	4	2	8	..	..
6	Madhya Pradesh ..	31	185	1	7	7	7	..	..	..	..
7	Madras	32	192	14	16	6	16	1	4	13	..
8	Mysore	14	54	18	9	18	2	1	4	1	..
9	Orissa	4	50	3	10	3	55	..	..	1	33
10	Punjab	25	120	8	..	5	..	1	4	3	..
11	Rajasthan	15	60	18	..	1	2	..	..	..	..
12	Uttar Pradesh ..	40	69	22	13	20	33	1	4	1	..
13	West Bengal	20	102	3	24	1	3	1	4	1	..
14	Jammu and Kashmir ..	3	3	..	..	2	..	..	..	..	..

APPENDIX V--contd.

1	2	3	4	5	6	7	8	9	10	11	12		
				UNION TERRITORIES									
15	Delhi .. ..	..	..	..	..	..	..	..	..	..	..
16	Himachal Pradesh ..	4	24	..	..	1	..	..	..	..	..
17	Manipur	2	12	1	6	..	..	1	4	..	..
18	Tripura	3	18	1	..	..	..	..	..	..	..
19	Pondicherry	2	..	..	..	..	..	..	..	..	..
20	Andaman .. ..	..	..	..	..	..	..	..	..	..	..
				CENTRAL INSTITUTIONS									
21	I.V.R.I., Izatnagar ..	..	4	..	..	1	2	..	..	..	..
22	I.A.R.I., New Delhi ..	1	..	..	..	..	..	..	..	..	..
23	N.D.R.I., Karnal ..	1	9	..	..	..	..	..	..	..	..
24	S.R.S., N.D.R.I., Bangalore	1	8	..	..	..	..	..	..	..	..
	Total ..	323	1,427	143	147	172	379	12	49	20	33		

K.V. Scheme—Key Village Scheme.

C.B. Scheme—Cross Breeding Scheme,

APPENDIX VI

Statement showing the total number of Artificial Insemination Centres and Key Village Units established up to the end of First Five Year Plan in different States.

Serial No.	Name of State	No. of A.I. Centres	No. of Key Village-Units
1	Andhra Pradesh	5	20
2	Assam	6	12
3	Bihar	12	48
4	Bombay	20	76
5	Kerala	5	20
6	Madhya Pradesh	17	50
7	Madras	16	61
8	Mysore	6	24
9	Orissa	5	20
10	Punjab	8	32
11	Rajasthan	6	24
12	Uttar Pradesh	23	92
13	West Bengal	4	16
14	Himachal Pradesh	4	16
15	Manipur	2	8
16	Tripura	3	12
17	Central Institutes—		
	(i) I.A.R.I., Now Delhi	1	4
	(ii) I.V.R.I., Izatnagar	1	4
	(iii) N.D.R.I., Karnal	1	8
	(iv) N.D.R.I., S.R.S., Bangalore	1	8
		146	555

APPENDIX VII

Statement showing all-India targets and achievements under various items during 2nd Plan period in the Key Village Scheme.

Year	Expansion on 1st Plan Centres	Establishment of the New Key Village Blocks Rural	Establishment of New Key—Village Blocks along with Dairy Schemes	Establishment of Urban A.I. Centres	Establishment of Extension Centres	No. of calves to be subsidised
PHYSICAL TARGETS						
1956-61	108 (117)	124 (157)	51 (21)	70 (54)	254 (51)	34,545 (22,512)
1956-57	71 (65)	37 (30)	5 (3)	15 (11)	10 (7)	4,030 (4,626)
1957-58	22 (33)	29 (46)	20 (6)	19 (14)	18 (16)	5,191 (4,478)
1958-59	15 (9)	27 (36)	18 (6)	17 (9)	59 (11)	6,428 (6,328)
1959-60	.. (10)	18 (45)	6 (6)	10 (20)	167 80 (17)	9,176 (7,080)
1960-61	108 (117)	114 13 (157)	492 21	61 9 62	87 51	9,720 2512 24825
ACHIEVEMENTS						
1956-57	59	21	2	9	7	2,550
1957-58	28	40	6	14	16	3,333
1958-59	12	38	3	11	8	5,805
1959-60	10	46	5	19	17	8,366
Total	109	145	16	53	48	20,054

The figures given in the brackets are the revised targets based on the allocations made by the Working Group.

APPENDIX VIII

Statement showing Targets and Achievements under various items during the period 1956—60 (1st four years) of the second Five Year Plan under the Key Village Scheme.

Serial No.	Name of the State	Expansion of 1st plan centres		Rural K.V. Blocks		K.V. Block with Dairy Schemes		Urban A.I. Centres		K.V. Extension Centres		Calf subsidy	
		T	A	T	A	T	A	T	A	T	A	T	A
1	Andhra Pradesh	5	5	28	21	5	7	10	10	3	3	983	471
2	Assam	3	5	3	3	1	..	3	3	..	..	300	300
3	Bihar	14	14	15	17	3	1	8	8	..	3	5,850	3,648
4	Bombay	9	6	18	13	1	..	..	1	3	..	1,881	836
5	Kerala	3	3	9	8	..	..	1	1	..	..	350	128
6	Madhya Pradesh	15	9	9	8	2	1	4	2	1	1	1,565	526
7	Madras	15	15	15	15	1	1	13	13	29	29	4,000	6,358
8	Mysore	6	6	12	12	..	..	..	..	..	..	770	269
9	Orissa	5	5	2	2	2	2	1	1	1	1	1,350	431
10	Punjab	8	9	12	12	1	..	5	5	..	..	875	598
11	Rajasthan	3	4	5	5	1	..	1	1	..	..	95	..
12	Uttar Pradesh	15	15	9	8	4	4	6	6	14	11	2,700	1,946
13	West Bengal	7	4	14	14	..	..	2	2	..	..	420	510
14	Jammu and Kashmir .. ..	..	..	3	3	..	..	..	..	..	..	..	..

APPENDIX VIII—*contd.*

Serial No.	Name of the State	T	A	T	A	T	A	T	A	T	A	T	A
UNION TERRITORIES													
15	Delhi .. .. .	..	..	..	..	..	..	..	..	..	..	130	234
16	Himachal Pradesh	3	3	..	..	..	..	..	..	..	..	52	52
17	Manipur	2	2	..	..	..	..	..	..	..	..	92	28
18	Tripura	3	3	3	2	..	..	..	..	..	..	90	111
19	Pondicherry .. .. .	..	..	..	1	..	..	..	..	..	..	..	..
20	Andaman .. .. .	..	..	..	1	..	..	..	..	..	..	..	..
CENTRAL INSTITUTES													
21	I.V.R.I. Izatnagar	1	1	..	..	..	..	..	..	..	..	..	..
22	I.A.R.I. New Delhi .. ..	..	..	..	..	..	..	..	..	..	..	..	..
23	N.D.R.I. Karnal .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
24	S.R.S. N.D.R.I. Bangalore, d ..	..	..	..	..	..	..	..	..	..	..	11	5
25	Calf subsidy Aarey Bombay	..	..	..	..	..	..	..	..	..	..	1,000	1,699
26	Calf Salvage, Aarey Bombay	..	..	..	..	..	..	..	..	..	..	..	1,057
27	Calf Salvage, Haringhata Calcutta.	..	..	..	..	..	..	..	..	..	..	..	109
	Total	117	109	157	145	21	16	54	53	51	48	22,512	20,054

T. Targets.—A. Achievements.

X.—The targets are based on allocations, made by the working groups on Annual Plans.

APPENDIX IX

Statement showing Statewise expenditure of the Key Village Scheme in the 2nd Five Year Plan.

(In lakhs)

Sl. No.	Name of the State	Total al- location second plan period	Expenditure			Revised estimate 1959-60	Proposed amount 1960-61
			1956-57	1957-58	1958-59		
1	Andhra Pradesh	56.80	1.44	1.44	7.22	10.92	16.26
2	Assam	23.75	..	0.52	1.27	2.27	4.88
3	Bihar	112.20	4.06	7.23	8.15	12.24	16.00
4	Bombay	33.98	5.14	5.0	2.48	9.10	8.53
5	Kerala	13.03	0.02	N.A.	2.48	2.50	3.67
6	Madhya Pradesh	95.69	1.72	1.28	2.81	4.42	6.03
7	Madras	105.23	7.72	13.00	14.51	26.07	36.75
8	Mysore	22.13	1.24	1.53	2.65	5.35	6.00
9	Orissa	16.74	2.40	2.52	2.24	3.29	5.30
10	Punjab	46.59	1.12	3.13	2.69	8.42	9.50
11	Rajasthan	29.64	2.00	N.A.	4.06	6.44	8.99
12	Uttar Pradesh	54.92	2.24	N.A.	11.89	9.29	10.27
13	West Bengal	36.67	1.36	1.91	3.04	4.61	7.59
14	Jammu & Kashmir	7.98	0.12	0.11	0.49	0.79	2.81
UNION TERRITORIES							
15	Delhi	4.18	..	..	..	0.08	0.12
16	Himachal Pradesh	2.39	..	0.16	0.97	0.77	0.58
17	Manipur	0.96	..	..	0.06	0.20	0.31
18	Tripura	4.71	0.78	0.53	0.35	1.56	1.09
19	Pondicherry .. ..	..	..	..	0.35	0.61	1.29
20	Andaman	1.54	..	..	0.13	0.65	0.69
Total		668.13	31.36	38.33	67.84	109.58	146.66

Source—Annual Plan proposals received from States.

APPENDIX X

Statement showing the location of Key Village Blocks together with breeds used etc.

Name of States	S. No.	Location of Key Village Block	District	Date of Estt.	Zebu	Buffalo	Remark
1	2	3	4	5	6	7	8
<i>Andhra Pradesh—</i>	1	Karimnagar ..	Karimnagar ..	1-2-1952	Malvi	Murrah.	
	2	Nidubrolu	Guntur	9-12-52	Ongole	Do.	
	3	Ammanabrolu ..	Do.	19-12-52	Do.	Do.	
	4	Chilakalurpet ..	Do.	26-1-56	Do.	Do.	
	5	Dodduvarapadu ..	Do.	29-3-56	Do.	Do.	
	6	Velangi	W. Godavari ..	10-2-58	Do.	Do.	
	7	Kolluru	Guntur	7-3-58	Do.	Do.	
	8	Guldavaleru ..	Krishna	14-3-58	Do.	Do.	
	9	Tanuku	W. Godavari ..	15-3-58	Do.	Do.	
	10	Chandragiri ..	Chittor	28-3-58	Sindhi	Do.	
	11	Srirampur	Karimnagar ..	16-3-58	Mavli	Do.	
	12	Narsampet	Warangal	22-3-58	Do.	Do.	
	13	Gopalsingavaram ..	Kurnool	27-3-58	Do.	Do.	
	14	Tungutur	Guntur	8-11-58	Ongole	Do.	
	15	Hindupur	Karnool	14-11-58	Hallikar	Do.	
	16	Gundalkunta ..	Guntur	30-3-58	Ongole	Do.	

17	Zaheerabad ..	..	..	1-9-59	..	Do.
18	Aragonda ..	..	Guddapah ..	1-9-59	Ongole ..	Do.
19	Suryapet ..	..	Nalgonda ..	8-12-59	Do.	Do.
20	Chinnachowkur ..	..	Guntur ..	29-3-60	Do.	Do.
21	Tamballepalle ..	..	..	6-3-60	Hallikar ..	Do.
22	Buchannapet ..	..	Warangal ..	29-3-60	Malvi ..	Do.
23	Budu ..	..	Adilabad ..	31-3-50	Do.	Do.
24	Shamirpet ..	..	Hyderabad ..	28-10-58	..	Do.
25	Chinthaparthly ..	..	..	17-3-60	Hallikar ..	Do.
26	Kondapatur ..	..	Guntur ..	24-11-60	Ongole ..	Do.
27	Narasannapeta ..	..	Visakapatnam ..	10-10-59	Do.	Do.
28	Vizianagaram ..	..	Visakapatnam ..	4-3-60	Do.	Do.
29	Mandapeta ..	..	East Godavari ..	30-8-59	Do.	Do.
30	Kankipadu ..	..	Krishna ..	26-9-59	Do.	Do.
31	Bhimavaram ..	..	West Godawari ..	27-3-60	Do.	Do.
<i>Assam—</i>						
1	Shillong ..	..	Shillong ..	1-6-52	..	..
2	Joysagar ..	..	Sibsagar ..	21-12-52	Haryana ..	..
3	Dibrugarh ..	..	Lakimpur ..	1953	Haryana ..	..
4	Gauhati ..	..	Kamrup ..	1-6-53	Sindhi ..	..
5	Barpeta Road ..	..	Kamrup ..	6-6-53	Tharparkar ..	..

APPENDIX X—contd.

1	2	3	4	5	6	7	8
<i>Assam—contd.</i>	6	Tezpur	Darrang	28-2-56	Haryana ..	..
	7	Charaibahi ..	..	1-2-60	..	..
	8	Kokrajah ..	..	1-4-60	..	..
	9	Kachudaram ..	..	..	..	..
	10	Jorhat (Urban) ..	..	1-4-60	..	..
	11	Silchar (Urban) ..	..	1-4-60	..	..
	12	Nowgong (Urban) ..	..	20-5-60	..	..
<i>Bihar—</i>	1	Dharbhanga ..	Dharbhanga ..	8-6-52	Tharparkar Haryana	Murrah.	
	2	Shree Goshala Bhagalpur.	Bhagalpur ..	24-6-52	Haryana ..	..
	3	Pusa	Dharbhanga ..	1-9-52	Haryana ..	..
	4	Dumraon	Dumraon	2-9-52	Haryana ..	Murrah.	
	5	Bhita	Patna	1-10-52	Tharparkar ..	Do.	
	6	Maner Telpa ..	Bikram	2-10-52	Do.	Do.	
	7	Sasaram	Shahbad	20-2-54	Haryana ..	Do.	
	8	Barbigha .. ..	..	13-3-54	Do.	Do.	
	9	Monghyr (U.A.I.) ..	Monghyr	1-6-58	Do.	Do.	
	10	Ekangasari ..	Patna	2-10-54	Tharparkar ..	Do.	
	11	Sakra	Muzaffarpur ..	1-1-55	Haryana ..	Do.	

12	Maner	Patna	16-12-55	Tharparkar	Do.
13	Bikramganj	Shahbad	1-9-56	Haryana	Do.
14	Manjhaul	Monghyr	1-10-56	Haryana (Bachuar)	Do.
15	Barhiya	Do.	1-11-56	Haryana	Do.
16	Lesliganj	Palamau	1-11-56	Do.	Do.
17	Mokamah	Patna	14-4-57	Do.	Do.
18	Khagaria	Monghyr	1-5-57	Do.	Do.
19	Arwal	Gaya	9-5-57	Do.	Do.
20	Brahmapur	Shahbad	9-5-57	Do.	Do.
21	Hathwa	Saran	30-8-57	Do.	Do.
22	Barh	Patna	21-5-58	Do.	Do.
23	Begusarai	Begusarai	1-6-58	Do.	Do.
24	Buxer	Shahabad	15-6-58	Do.	Do.
25	Bettiah	Champanan	19-7-58	Do.	Do.
26	L.T. Arrah (U.A. I.)	Arrah	1-9-57	Do.	Do.
27	Muzaffarpur (UAI)	Muzaffarpur	1-7-57	Do.	Do.
28	Chapra Vety. Hospital (U.A.I.)	Chapra	1-9-57	Do.	Do.
29	Piroo	Muzaffarnagar	15-6-58	Do.	Do.
30	L.T. Gaya (U.A.I.)	Gaya	1-12-56	Do.	Do.
31	(U.A.I.) Mothihar	Champanan	5-9-58	Do.	Do.

APPENDIX X—contd.

1	2	3	4	5	6	7	8
<i>Bihar—contd.</i>	32	Sita Marhi	Dharbhanga	1-7-58	Haryana	Murrah.	
	33	Dhanbad (UAI)	Do.	1-9-60	Do.	Do.	
	34	Behcha	Do.	1-5-59	Do.	Do.	
	35	Jagdishpur	Do.	1-5-59	Do.	Do.	
	36	Shahpur	Do.	1-5-59	Do.	Do.	
	37	Behpur	Bhagalpur	1-6-59	Do.	Do.	
	38	Patna (UAI)	Patna	May '59	Tharparkar	Do.	
	39	Gogri	Monghyr	1-6-59	Haryana	Do.	
	40	Fatwah	Patna	1-8-59	.. ..	Do.	
	41	Hajipur (Muzaffarpur)	Muzaffarpur	23-11-59	Haryana	Do.	
<i>Gujarat—</i>	1	Anand	Kaira	27-7-50	.. ..	Surti.	
	2	Kadod	Surat	22-2-52	Khillar	Do.	
	3	Bhuj	Kutch	12-5-52	Tharparkar	Do.	
	4	Nakhtrana	Do.	31-5-52	Do. .. ..	..
	5	Anjar	Do.	1-8-52	Do. .. ..	..
	6	Morvi	Rajkot	1-1-53	Gir	Jaffrabadi.	
	7	Sarvkandla	Bhavnagar	7-1-53	Do. .. ..	..

Jammu and Kash-
mir

8	Junagarh	Junagarh	1-4-53	Do.	
9	Mahuba	Bhavnagar	15-7-54	Do.	
10	Mandvi	Kutch	Jan. '59	Report not received	
11	Jamnagar	Jamnagar	22-11-59	Do.	Do.
12	Bhavnagar	Bhavnagar	1-1-60	Do.	Do.
13	Alwa	Darya		Do.	Do.

Kerala—

1	Kathua	Jammu	27-2-58	Hariana	Murrah.
2	Bishna	Do.	1-3-58	Do.	
3	Jaurian	Do.	17-3-58	Do.	
1	Ollukara	Trichur	2-2-52	Sindhi	
2	Ernakulam	Ernakulam	1-2-52	Do.	
3	Trivandrum	Trivandrum	1-2-52	Do.	
4	Kottayam	Kottayam	1-2-52	Do.	
5	Panamcherry	Trichur	1-4-54	Do.	Murrah.
6	Kunnamkulam (Urban)	Do.	March '57	Do.	Do.
7	Quilon	Trivandrum	2-8-58	Do.	Do.
8	Cannanore	Malabar	13-12-58	Do.	Do.
9	Palai	Do.	5-12-58	Do.	Do.
10	Kozhikode (Urban)	Kozhokode	15-9-58	Do.	Do.

APPENDIX X—contd.

1	2	3	4	5	6	7	8
<i>Kerala—contd.</i>	11	Palghat	Malabar	1-8-58	Sindhi	Murrah:	
	12	Sasthamcotah .. ..	.. ..	10-12-58	Do.	Do.	
	13	Kottarakara .. ..	.. ..	13-10-59	Do.	Do.	
	14	Alleppey .. ..	.. ..	24-12-59	Do.	Do.	
<i>Madhya Pradesh—</i>	1	Bhopal	Sehore	4-9-51	Tharpanker	Do.	
	2	Ashta	Do.	13-6-55	Malvi	Do.	
	3	Sehore	Do.	10-9-55	Do.	Do.	
	4	Berasia	Do.	28-3-58	Do.	Do.	
	5	Obaidullaganj	Raisen	21-10-56	Do.	Da.	
	6	Vidisha	Vidisha	1-3-55	Do.	..	
	7	Agar	Shajapur	23-1-52	Do.	Murrah.	
	8	Sarkanda	Bilaspur	1-4-55	Haryana	Murrah Nagpuri.	
	9	Raigarh	Raigarh	March '58	Haryana	Murrah.	
	10	Sitapur	Sarguja	1-4-58	Malvi	Do.	
	11	Gwalior	Gwalior	26-2-58	Haryana	Do.	
	12	Guna (UAI)	Guna	2-2-58	Do.	Do.	
	13	Mehgaon	Bhind	25-1-52	Do.	Do.	

14	Pichhore	Gwalior	14-4-56	Do.	Do.
15	Morena (UAI)	Morena	23-5-57	Do.	Do.
16	Indore	Indore	1-8-53	Do.	Do.
17	Naraingarh	Mandsore	1-3-55	Do.	Do.
18	Segaon	Khargone (Nimar)	1-4-56	Do.	Do.
19	Thikri	Do.	20-7-57	Malvi	Do.
20	Ujjain	Ujjain	1-9-53	Haryana	Murrah.
21	Adhartal	Jabalpur	Feb. '58	Malvi	Do.
22	Imlikonda	Chindwara	March '58	Do.	Do.
23	Mandla	Mandla	4-3-58	Do.	Do.
24	Ratona	Saugor	22-4-58	Do.	Do.
25	Waraseoni	Balaghat	29-9-54	Do.	Murrah.
26	Jagdapur	Bastar	20-1-56	Haryana Sindhi	Do.
27	Rajnandgaon	Durg	Sept. '56	Sahiwal	Do.
28	Ajajgarh	Panna	1-9-51	Do.	Do.
29	Annuppur	Sahdol	1-3-55	Harjana	Murrah.
30	Nowgong	Chhatarpur	1-9-56	Do.	Do.
31	Rewa (UAI)	Rewa	Feb. '56	Do.	Do.
32	Satna	Satna	9-3-58	Do.	Do.
33	Khandwa (U.C.)	Do.	31-3-58	Malvi	Do.

APPENDIX X—*contd.*

1	2	3	4	5	6	7	8
<i>Madras—</i>							
	1	Hosur	Salem	17-10-51	Hallikar	Murrah.	
	2	Nagercoil	Kanyakumari	1-11-52	Sindhi	Do.	
	3	Vellakoil	Coimbatore.. ..	19-12-52	Kangayam	Do.	
	4	Idaiyaskottai	Madurai	23-1-53	Do.	Do.	
	5	Arvakurchi	Coimbatore	10-10-58	Do.	Do.	
	6	Valarpuram Poonamallee.	Shifted to Chinglepet	7-2-53	Sindhi	Do.	
	7	Chidambaran	South Arcot	18-2-53	Do.	Do.	
	8	Kangayam	Coimbatore	10-1-53	Kangayam	Do.	
	9	Kilacheri	Chinglepet	7-2-53	Sindhi	Do.	
	10	Neikarapatty	Madurai	3-2-53	Kangayam	Do.	
	11	Mulanur	Coimbatore	4-3-54	Kangayam	Do.	
	12	Sangarandampalayam	Do.	4-3-54	Do.	Do.	
	13	Malayandipatnan	Do.	31-3-54	Do.	Do.	
	14	Thoppampatti	Madurai	3-2-55	Do.	Do.	
	15	Chikkanapuram	Coimbatore	3-2-55	Do.	Do.	
	16	Sivagiri	Do.	24-11-56	Do.	Do.	
	17	Pattaikalipalayam	Do.	23-11-56	Do.	Do.	
	18	Chinnadharapuram	Do.	20-11-56	Do.	Do.	

19	Sultanpet	Do.	24-11-56	Do.	Do.
20	Thonnilai	Trichanapalli ..	10-11-57	Do.	Do.
21	Ayakudi	Madurai	12-8-58	Do.	Do.
22	Kallimandyam ..	Madurai	27-3-57	Do.	Do.
23	Pongalur	Coimbatore	13-11-57	Do.	Do.
24	Conjéepuram ..	Changleput	20-10-57	Sahiwal	Do.
25	Vadugapatty ..	Coimbatore	1-8-58	Kangayam	Do.
26	Muthur	Do.	1-9-58	Do.	Do.
27	Vedasandur	Madurai	12-8-58	Do.	Do.
28	Guziliamparai ..	Do.	2-10-58	Do.	Do.
29	Valavadi .. ..	.. ..	18-5-59	Do.	Do.
30	Denkunikottah ..	.. ..	5-5-59	Hallikar	Do.
31	Vthukali .. ..	.. ..	20-5-59	Kangayam	Do.
32	Vedasarar .. ..	.. ..	12-8-59	Do.	Do.
33	Chinnamalai .. ..	.. ..	15-5-59	Do.	Do.
1	Vellore	Vellore	8-11-56	Sindhi	Do.
2	Tirunelveli	Tirunelveli	6-12-56	Do.	Do.
3	Virudhunagar ..	Do.	1-1-57	Do.	Do.
4	Cuddalore	North Arcot	24-11-57	Do.	Do.
5	Chingloput	Chingloput	8-2-58	Do.	Do.

Urban A.I.
Centres)—

APPENDIX X—contd.

1	2	3	4	5	6	7	8
<i>Urban A.I. Centres—contd.</i>							
	6	Tanjore	Tanjore	12-3-58	Sindhi & Gir	Murrah.	
	7	Pollachi .. ..	.. ..	9-8-58	Sahiwal	Do.	
	8	Tiruppūr	Coimbatore	11-2-59	Kangayam	Do.	
	9	Kodaikanal	Madurai	12-8-59	Sahiwal	Do.	
	10	Kallakurichi	North Arcot	5-11-59	Sindhi	Do.	
	11	Udumalpet .. ..	.. ..	1-4-59	Sahiwal	Do.	
	12	Poriakulam	Madurai	1-1-60	Sindhi	Do.	
	13	Karur	Thirachirappally	6-12-59	Do.	Do.	
<i>Maharashtra—</i>							
	1	Aarey .. ..	.. ..	1-5-51	.. ..	Do.	
	2	Kopergram	Ahmednagar	22-2-52	Gir	Surti.	
	3	Udgir	Osmanabad	19-2-52	Deori	Nagpur.	
	4	Mahud	Sholapur	22-2-52	Khillar	Murrah.	
	5	Wadiwarhe	Nalik	22-2-52	Deoni	Surti.	
	6	Aurangabad	Aurangabad	11-3-52	Red Khandari	Maratwada	
	7	Pimple (Jalgaon)	East-Khandesh	19-3-52	Khillar	Surti.	

8.	Arvi	Wardha	25-1-55	(Tharparkar Gaola)	Nagpuri.
9	Hingoli	Parbhani	9-2-55	Red Khandvi ..	..
10.	Telenkhendi ..	Nagpur	1-3-55	..	..
11.	Kharangana ..	Wardha	1-4-55	Gaola .. ..	..
12.	Buldana	Buldana	1-7-55	Gir.	Bidari.
13	Mominabad ..	Mominabad ..	1-2-58	Deoni	Maratwada,
14.	Latur	Osmanabad ..	18-2-58	Do.	Do.
15	Borgoan	Akola	11-12-58	Hariana	Bidari,
16	Akola	Akola	11-12-58	Report not received	..
17	Paraswad	Bhandra	21-1-59	Do. .. ..	..
18.	Wardha	Wardha	28-2-59	Do.	Do.
19	Chanda	Chanda	5-3-59	Gaola	Nagpur.
20	Amravati	Amravati	1-4-59	Hariana	Bidari.
21.	Digras	Yeotmal	20-4-59	Do.	Do.
22	Tulhapur	Osmanabad ..	1-10-59	Deoni	Murrah.
23	Sitara	Do.	20-10-59	.. .. ..	..
24	Ratnagiri	Ratnagiri	20-11-59	Dangi	Pandharpari.
25	Washin	Akola	Nov. '59	Dangi	Surti.
26	Diglur	Nanded	Jan. '66	Do.	Do.
27	Bhandara	Bhandara	26-3-60	Gaola	Murrah.
28	Bhir	Mominabad ..	..	.. .. ..	..

APPENDIX X—contd.

1	2	3	4	5	6	7	8
<i>Mysore—</i>	1	Kudige	Coorg	20-12-51	Hallikar Sindhi ..	Murrah.	
	2	Ajjampur	Chickmangalore ..	1-2-52	Amrit-Mahal ..	Do.	
	3	Hessarghata	Bangalore	1-2-52	Hallikar	Do.	
	4	Devihosur	Dharvar	22-2-52	Hallikar Amrit- Mahal.	Do.	
	5	Ponnampet	Coorg	1-7-53	Sindhi	Do.	
	6	Somwarpet	Do.	1-2-55	Do.	Do.	
	7	Amnawathi	Do.	1-7-53	Do.	Do.	
	8	Kunigal	Tumkur	30-3-57	Hallikar .. ..	..
	9	Kumugoli .. ..	.. ..	30-10-57	Do.	..	
	10	Bidar	Bidar	21-1-58	Do.		
	11	Sirsi .. ..	.. ..	March '58	Amrit Mahal ..	Pandharpur.	
	12	N.D.R.I. Bangalore	Bangalore	1-2-52	Hallikar Sindhi ..	Murrah.	
	13	Hospet .. ..	.. ..	15-10-58	Hallikar	Do.	
	14	Jamkhandi .. ..	.. ..	20-11-58	Khillar .. ..	..
	15	Kollagal .. ..	.. ..	2-1-59	Hallikar	Murrah	
	16	Chammarayapatnam	.. ..	..	..	..
	17	Kanakapura .. ..	.. ..	10-3-60	Hallikar .. ..	..
	18	Hubli .. ..	.. ..	..	Khillar	Murrah.	

Orissa—

1	Salipur	Cuttack	1-3-52	Haryana .. ..	.. ..
2	Kisenagar	Do.	1-2-52	Do. .. ..	.. ..
3	Barasahi	Mayurbhanj	1-11-53	R. Sindhi .. ..	.. ..
4	Tihidi	Belasore	1-8-56	Do. .. ..	.. ..
5	Kujang	Cuttack	1-8-56	Do. .. ..	.. ..
6	Kendrapara	Do	1-4-57	Haryana .. ..	.. ..
7	Pipli	Puri	1-4-57	R. Sindhi .. ..	.. ..
8	Barapalli	Sambalpur	1-8-57	Do .. ..	.. ..
9	Jagatsinghpur	Do.	1-8-59	Haryana .. ..	.. ..
10	Cuttack (Urban)	Do.	1-8-56	Red Sindhi .. ..	.. ..
Punjab—					
1	Hissar	Hissar	1-12-51	Haryana	Murrah.
2	Nabha	Patiala	Jan. '54	Haryana	Do.
				(Hissar)	Do.
3	Chandigarh	Ambala	2-2-54	Haryana	Do.
4	Ludhiana	Ludhiana	15-2-54	Hissar	Nili.
				(Sahiwal)	
5	Rewari	Gurgaon	16-2-54	Haryana	Murrah.
6	Phillaur	Jullundur	1-3-54	Hissar	Nili.
7	Amritsar	Amritsar	26-3-54	Do.	Do.

APPENDIX X—contd.

1	2	3	4	5	6	7	8
<i>Punjab—contd.</i>							
	8	Rajpura	Patiala	16-1-56	Sahiwal	Murrah.	
	9	Hoshiarpur (UAI) ..	Hoshiarpur ..	1-4-57	Haryana	Nili	
	10	Patti	Amritsar	1-8-57	Haryana	Nili.	
	11	Jullundur (UAI) ..	Jullundur	23-12-57	Do.	Do.	
	12	Rohtak	Rohtak	4-12-57	Do.	Murrah.	
	13	Patiala (UAI)	Patiala	1-1-58	Haryana	Do.	
	14	Dhannaula	Sangrur	17-1-58	Haryana	Do.	
	15	Bajakhana	Bhatinda	22-1-58	Do.	Do.	
	16	Narnaul .. ..	.. ..	24-2-58	Do.	Do.	
	17	Kapurthala (UAI) ..	Jullundur	1-3-58	Do.	Nili.	
	18	Muktsar	Ferozepur	24-4-58	Do.	Do.	
	19	Mehta	Amritsar	8-3-59	Nil report.		
	20	Karnal (NDRI)	Karnal	1-11-51	Haryana	Murrah.	
	21	Phagwara	Jullundur	5-6-57	.. ..	..
	22	Sampla	Rohtak	March '59	Haryana	Murrah.	
	23	Ambala Cantt. (UAI) ..	Ambala	8-7-59	Do.	Do.	
	24	Tanda Urmur	Hoshiarpur	5-8-59	Do.	Nili.	

Rajasthan

25	Samana	..	..	Karnal	..	..	..	..
26	Badal	..	..	Ferozepore	..	21-7-59	Sahiwal .. (Haryana)	.. Nili.
27	Pahwa	..	..	Karnal	..	13-7-59	Haryana ..	.. Murrah
1	Beawar	..	..	Ajmer	..	21-1-51	Haryana ..	.. Do.
2	Alwar	..	..	Alwar	..	1-4-55	Mewati ..	.. Do.
3	Nagaur	..	..	Nagaur	..	1-4-55	Naugori ..	.. Do.
4	Bassi	..	..	Jaipur	..	4-5-55	Haryana ..	.. Do.
5	Kotah (Jhalwadpatan)	..	..	Kotah	..	May 55	Malvi ..	.. Do.
6	Kekri	..	..	Ajmer	..	13-10-55	Haryana ..	.. Do.
7	Masuda	..	..	Do.	..	1-11-56	Gir ..	.. Do.
8	Jodhpur	..	..	Jodhpur	..	12-11-57	Tharparkar	.. Do.
9	Sanchore	..	..	Jalore	..	13-11-57	Kankrej ..	.. ..
10	Mahajan	..	..	Bikaner	..	22-1-58	Sahiwal ..	.. Murrah.
11	Bikaner	..	..	Do.	..	1-7-58	Do.	.. ..
12	Pilani	..	..	Jhunjhunu	..	15-5-59	Haryana ..	.. Murrah.
13	Nazirabad	..	..	Ajmer	..	1-7-59	Gir ..	.. Do.
14	Ajmer (Urban)	..	..	Do.	..	6-7-59	Do.	.. Do.
15	Andhi	..	..	Jaipur	..	21-7-59	Haryana ..	.. Do.

APPENDIX X—contd.

1	2	3	4	5	6	7	8
<i>Uttar Pradesh—</i>							
	1	Chhata	Mathura	1-12-50	Haryana	Murrah.	
	2	Bhadri	Pratapgarh	1-4-51	Sahiwal	Do.	
	3	Hastinapur	Meerut	1-11-51	Haryana	Do.	
	4	Aligarh	Aligarh	1-11-51	Do.	Do.	
	5	Kanpur	Kanpur	1-11-51	Haryana (Sahiwal)	Do.	
	6	Raebareli	Raebareli .. ..	..	Do.	Do.	
	7	Orai	Jalaun	1-11-51	Haryana	Do.	
	8	Bewa	B. Banki	1-11-51	Do.	Do.	
	9	Nilgaon	Sitapur	1-11-51	Do.	Do.	
	10	Haldwani	Haldwani	1-11-51	Do.	Do.	
	11	Nagla	Nainital	1-11-51	Do.	Do.	
	12	Sitapur	Sitapur	1-11-51	Do.	Do.	
	13	Arzilines	Varanasi	1-11-51	Gangetri	Do.	
	14	Bhardwaj	Allahabad	1-4-52	Sahiwal (Haryana)	Do.	
	15	Basti	Basti	1-4-52	Haryana	Do.	
	16	Sultanpur	Sultanpur	1-4-52	Sahiwal	Do.	
	17	Varanasi	Varanasi	1-4-52	Haryana	Do.	
	18	Ferozabad	Agra	1-4-52	Do.	Do.	

19	Jaunpur	Jaunpur	1-4-52	..	..
20	Lucknow (Bakshi-ka-Talab).	Lucknow	1-4-52	Haryana & Sahiwal	Murrah.
21	Kanthla	Muzaffarnagar	1-2-57	Haryana	Do.
22	Ballia	Ballia	5-2-57	..	..
23	Trivoniganj	B. Banki	1-4-57	Haryana	Murrah.
24	Sikandrabad	B. Banki	19-7-57	Do.	Do.
25	Kasganj	Etah	19-9-57	..	..
26	Shah Jahanpur Kithori	Meerut	4-11-57	Haryana	Murrah.
27	Farukhabad (Urban)	Farukhabad	1-10-57	..	..
28	Mohammadabad	Saharanpur	19-11-57	Haryana	Murrah.
29	Oharthawal	Muzaffarnagar	24-1-58	Do.	Do.
30	Fatehpur	Saharanpur	20-2-56	Do.	Do.
31	Nagla-Khawaja	Meerut	11-3-58	Do.	Do.
32	Bareilly (Urban)	Bareilly	17-3-58	Do.	Do.
33	Raya	Mathura	1-5-58	Do.	Do.
34	Unnao (Urban)	Unnao	1-7-58	Do.	Do.
35	Faizabad	Faizabad	15-10-58	Do.	Do.
36	Barabanki	Barabanki	1-3-58	Do.	Do.
37	Rampur (Urban)	Rampur .. ..	..	Do.	Do.
38	Khatoli .. ..	.. ..	14-3-59	Do.	Do.
39	Khadari	Agra	1-4-52	Do.	Do.

APPENDIX X—contd.

1	2	3	4	5	6	7	8
<i>West Bengal</i>							
	1	Chinsura	Hooghly	16-3-52	Haryana .. ..	..
	2	Berhampore	Murshidabad	21-3-52	Do.	..	
	3	Haringhata	Nadia	May '53	Do.	..	
	4	Belmuri	Hooghly	14-11-55	Sahiwal .. ..	..
	5	Burdwan	Burdwan	March '57	Tharparkar .. ..	..
	6	Simlagarh	Hooghly	March '57	Do.	..	
	7	Beldanga	Murshidabad	March '57	Haryana .. ..	..
	8	Sonadanga	24-Parganas	1-4-57	Do.	..	
	9	Malda	Malda	1957	Do.	..	
	10	Memari	Burdwan	March '58	Tharparkar .. ..	..
	11	Tarkashwar, Beliogori	Hooghly	March 58	Sahiwal .. ..	..
	12	Vishnupur	Do.	April '58	Haryana .. ..	..
	13	Phulia	Nadia	1958	Do.	..	
	14	Kalia	Malda	1-8-58	Do.	..	
	15	Purulia	Purulia	1958	Tharparkar .. ..	..
	16	Bethuadhari	Nadia	1958	Haryana .. ..	..	} At preliminary stages.
	17	Ohdagram	Bankura	1958	Do.	..	
	18	Birlapore (UAI)	24-Parganas	30-3-55	Do.	..	

	19	U. Contre Baraset (UAI).	Distt. 24-Parganas ..	March '57	Do.	..
	20	Chinsura (UAI) ..	Hooghly	1-9-58	Do.	..
<i>Andaman and Nicobar—</i>			UNION TERRITORIES			
	1	Port Blair .. ..	.. ..	..	Red Sindhi ..	Murrah.
<i>Delhi—</i>	1	I.A.R.I., New Delhi ..	Delhi	1953-54	Haryana	Murrah.
<i>Himachal Pradesh—</i>	1	Kotgarh	Mahasu	11-2-52	Red Sindhi ..	..
	2	Solan	Solan	Feb. '52	Red Sindhi ..	Murrah.
	3	Bilaspur	Bilaspur	26-3-53	Haryana	Do.
	4	Ghumarwin	Bilaspur	24-8-53	Do.	Do.
<i>Manipur—</i>	1	Imphal	Imphal	22-4-54	Red Sindhi ..	..
	2	Thoubal	Thoubal	Feb. '54	Haryana .. ..	..
<i>Pondicherry—</i>	1	Pondicherry	Pondicherry	10-12-56	Sindhi	Murrah.
	2	Karaikal	Do.	10-11-57	Do.	..
<i>Tripura—</i>	1	Agartala	Agartala	31-10-51	Tharparkar ..	..
	2	Udaipur	Udaipur	22-1-56	Do.	..
	3	Kailashahar	Kailashahar	15-1-57	Do.	..
	4	Belonia .. ..	.. ..	March '60	Do.	..
	5	Dharamnagar .. ..	.. ..	March '60	Do.	..

APPENDIX XI

Indian Council of Agricultural Research, New Delhi

METHOD OF CALCULATION OF CONCEPTION RATE IN SCHEMES OF CATTLE DEVELOPMENT WHERE ARTIFICIAL INSEMINATION IS BEING USED ON VILLAGE CATTLE.

Conception rate will be calculated by using the following formula—

$$\text{Conception rate} = \frac{\text{Number of cows conceived}}{\text{Number of cows bred and examined}} \times 100$$

For uniformity the terms 'number of cows conceived' and 'number of cows bred' should be interpreted in the same manner by all concerned. The following standardisation is proposed:

1. Amongst 'cows bred' only such animals should be taken as are located in the scheme area. Cows from outside the scheme area which were inseminated should be excluded for this calculation.

2. Only first inseminations should be counted. Animals which were inseminated for 2nd or 3rd time should not be included. The animals which were bred naturally before being inseminated, should, however, be included.

3. If the report is for the year ending 31st March, the cows inseminated during the previous period January to December should be included. This will exclude the cows for which the results of inseminations are not available.

4. All scheme cows inseminated should be examined for pregnancy during the 3rd month of insemination. If, however, any cows could not be examined for pregnancy during the 3rd month due to death or sale from the area within three months of first insemination or for any other reason, they should be excluded from the 'number of cows bred' for the purpose of this calculation.

5. "Number of cows conceived" will be the number of cows found pregnant by the Veterinary Assistant Surgeon or Assistant Research Officer by personal examination during the third month.

6. The "percentage of cows examined" should be worked out by using the following formula—

$$\text{Percentage of cows examined} = \frac{\text{Cows examined}}{\text{Cows inseminated}} \times 100$$

7. The figures should be calculated to the nearest whole number only by rounding off the figure in the first decimal place.

8. Figures will then be reported as "Conception rate per cent calculated on first insemination and on the examination per cent of the cases."

9. Similar figures should be calculated for second and third inseminations particularly where conception rate for the first insemination is below 50%.

Reference—Enclosure to I.C.A.R. letter No. F. 12(40)/59-H.III, dated the 2nd December, 1959.

APPENDIX XII

*Syllabus for the Training in A.I. and Key Village Work to be applied in Stockmen's and Livestock Inspectors' Courses**Theoretical lectures—50 hours.**Practical work—100 hours.*

I. THEORETICAL

- (1) Anatomy of the female genital organs.
- (2) Physiology of reproduction—
 - (a) Sexual maturity, the oestrous cycles and symptoms of heat; ovulation.
 - (b) Transport of spermatozoa in the female genital tract.
 - (c) Fertilization.
 - (d) Implantation; gestation.
 - (e) Pregnancy diagnosis.
- (3) Artificial Insemination—
 - (a) Introduction and history.
 - (b) Advantages and disadvantages of its use in livestock improvement work.
 - (c) Equipment for A.I.; its cleaning and sterilisation.
 - (d) Technical and personal hygiene in the work; protective clothing.
- (4) Pathology of reproduction—
 - (a) Different causes of infertility in cattle (in brief).
 - (b) The most common symptoms of reproductive disorders in the female.
 - (c) Spreading of infertility due to infectious diseases in the genital organs; general aspects of prevention.
- (5) General information on collection, evaluation, preservation, storage and transport of semen.
- (6) Technique of A.I.; the vaginal and the recto-vaginal methods.
- (7) Following up results.
- (8) Recording and reporting systems. Identification marketing; tattooing, ear metal marking; branding.

II. PRACTICAL

A. During the Course—

- (1) Examination of genital organs:—
 - (a) Slaughter-house and post-mortem material.
 - (b) Experimental animals.
 - (c) Field material.

(2) Pregnancy diagnosis by rectal examination, three months after conception.

(3) The technique of artificial insemination; vaginal and recto-vaginal methods.

(4) Cleaning and sterilization of equipment.

(5) Practice of hygienic measures in artificial insemination work.

(6) Identification marking of animals.

(7) Maintenance of records, and preparation of reports.

B. After Termination of Course—

Three weeks of practical training in an artificial insemination field centre should be arranged immediately after the practical courses for individuals or batches of two, before the stockmen appointed at key village or artificial insemination centres take up their duties.

APPENDIX XIII

Syllabus for Advanced Course in Obstetrics and Animal Gynæcology including Artificial Insemination

I. PHYSIOLOGY AND PATHOLOGY OF REPRODUCTION

*Introduction**Physiology*

General aspects of physiology of reproduction in males and females
 Anatomy of the male genital organs. Sexual physiology of the male. Act of copulation. Semen and its deposition. Physiology of spermatozoa. Anatomy of the female genital organs. Sexual physiology of the female. Oestrus and the oestrous behaviour. Various patterns of the oestrous cycle. Transport of spermatozoa in the female genital tract. Ovulation. Fertilization. Nidation. Pregnancy.

Pathology

General aspects concerning pathology of reproduction in male and female. Existing fertility conditions in different species. Hereditary and environmental factors.

Special aspects of infertility:

Male—Factors affecting serving ability and spermatogenesis. Malformation including under-development of sexual organs. Endocrine imbalance. Pathological changes in the sexual organs, e.g. testes, epididymis, ampullæ, seminal vesicles, penis. Pathology of spermatozoa.

Female—Factors affecting oestrus and ovulation. Malformation of the genitalia, including underdevelopment. Endocrine imbalance. Pathological changes in the sexual organs, e.g. ovary, ovarian bursa, oviduct, uterine cervix, vagina, vulva.

Enzootic Sterility—Brucellosis, Trichomoniasis. Spirillosis. General aspects of prevention and treatment for various types of reproductive disorders.

Physiology and Pathology of Pregnancy—Pregnancy diagnosis. Various types of abortions. Hydro-amnion. Hydro-allantois. Mummification of fœtus. Pregnancy toxæmia.

Physiology and Pathology of Parturition—Dystokia, Retention of placenta. Purpural infections. Post-parturition metabolic disorders.

Physiology and pathology of lactation—Mastitis.

Diseases of the new-born calf.

II. ARTIFICIAL INSEMINATION

Introduction

History of the development and field application of artificial insemination in foreign countries and in India. Use of artificial insemination in livestock. Advantages and disadvantages of artificial insemination, with special reference to India.

Technical and personal hygiene in artificial insemination work. Protective clothing.

Artificial insemination equipment. Sterilisation and cleaning of artificial insemination instruments.

Types of semen. Various techniques of collection of semen from different types of farm animals.

Handling of semen. Examination of semen for mass activity, initial motility, pH, density and methylene blue reduction time. Fructylolysis index.

Techniques of artificial insemination by various methods. Site of insemination.

Transport of semen. Semen containers.

Management and care of artificial insemination bulls. Bull paddocks. Bull exercises.

Pregnancy control and sterility treatment in A.I. work.

Recording system in artificial insemination work.

Organisation of artificial insemination work. Artificial insemination organisation in India.

III. GENETICS

Principles of Genetics—

Scope of genetics in animal husbandry. Mendel's laws of heredity. Fluctuations and variations. Factors and character conception. Expression and interaction of factors. Inheritance of quantitative characters. Lethal genes.

Chromosome theory of inheritance—

Chromosome basis of heredity. Linkage and crossing over.

Mutation of Theory

*Sex and its inheritance—*Determination of sex. Sex-linked inheritance. Inter-sexes and super-sexes. Gynanders Twinning.

General principles of animal breeding

Various systems of breeding e.g. crossing, grading up, inbreeding and line breeding, etc. Use and value of pedigree and progeny records. Sire indices.

Genital aspects on fertility and sterility.

IV. STATISTICS

Meaning of statistics and its uses.

Definitions of the following terms—

A variable or a variate. Frequency and a frequency distribution table. Average and scatter or dispersion. Sample and population. Parameter and statistics.

Summarization of Data—

Calculation of arithmetic mean, range, average deviation, standard deviation and coefficient of variation.

Construction of frequency distribution table.

Calculation of arithmetic mean and standard deviation from the frequency distribution table.

Graphic representation of the frequency distribution table—Histogram, frequency polygon, frequency curve, normal curve and its properties

Meaning of standard error of a statistic.

Probability and meaning of statistical significance.

Test of significance of a mean and difference between two means.

PRACTICALS

1. Examination of genital organs—

(a) On material obtained from slaughter-house

(b) On living animals

Male Testicles
Epididymis
Vas deferens
Ampullæ
ves. Deminalis
Prostate
Penis

Female ovaries
Ovarian bursa
Fallopian tubes
Uterine cornuæ
Corpus uterus
Cervix
Vagina and vulva.

2. Pregnancy diagnosis during various stages of gestation.
3. Diagnosis of various types of reproductive disorders.
4. Effect of cold and hot temperature on semen production.
5. Treatment for various types of reproductive disorders
Intra-uterine irrigation and treatment.
Removal of corpus luteum.
Rupture of ovarian cysts.
Ovariectomy.
6. Dystokia—
Epidural anæsthesia.
Correction of foetal mal presentation.
Embryotomy.
7. Vasectomy.
8. Caesarian section.
9. Artificial lactation.
10. Treatment of mastitis.
11. Collection of material for investigation of brucellosis.
12. Collection of semen from horse, bulls, buffalo bulls, rams, goats and poultry.
13. Sperm morphology.
14. Dilution of semen.
15. Various techniques of artificial insemination.
16. Recording systems.
17. Semen transport.
18. Consulting library for literature.

APPENDIX XIV

Leafy Fodders that form a Maintenance Ration

A list of some species of trees and shrubs, the leaves of which have been found to constitute a maintenance ration together with short notes on each of them and the areas where they flourish under natural conditions is given below:

1. *Sandan (Orgeinia Dabbergiodes)*—

It is a deciduous tree with a short crooked trunk and cracked bark. It grows in the sub-Himalayan tract and outer Himalayan valleys and slopes up to 5,000 feet above sea level.

2. *Tut (Morus Indica)*—

It is a small tree and is found wild in the Sub-Himalayan tract from Sutlej eastwards up to 5,000 feet and is also cultivated in silk-producing areas.

3. *Jharbari (Zizyphus Numularia)*—

It is a small shrub branched near the root. The branches are slender. The shrub grows extensively in the dry and arid regions of Western Rajputana, Kutch, Kathiawar and Gujerat, and is also found in Western U.P.

4. *Bans (Dendrocalamus Strictus)*—

It is a deciduous and densely tufted bamboo with strong stems which are solid in dry climates and hollow in moist. It is indigenous and gregarious in Siwaliks especially towards Hardwar. In North-West India it is found wild, where it grows extensively. It is also found in Assam, Central and South India.

5. *Gauj (Mileettia Auriculata)*—

It is a large woody climber with downy branchlets. It is found in the outer Himalayas from the Sutlej eastwards to Sikkim and Bengal. It is common in areas which are one to three thousand feet above sea level.

It forms an excellent fodder for cattle but being a pest inhibiting or restricting the growth of important forest flora of timber value it cannot be recommended for afforestation purposes. The leaves could, however, be lopped for fodder which may help in checking the growth.

6. *Marerfal (Helicteres Isora)*—

It is a shrub with thin-spreading branches. It is gregarious in habit and is a very common shrub in Dehra Dun, Saharanpur, Ramnagar and Haldwani Forest Divisions of Uttar Pradesh, especially in the coppice areas. It is also found in Bengal, Punjab and M. P. This shrub is considered to be in favour with the graziers for its milk-yielding qualities in the Himalayan Tarai.

7. *Katchnar (Bauhinia Variegata)*—

It is a medium-sized deciduous tree and is found in the sub-Himalayan tract and outer Himalaya of the Punjab ascending to 4,000 feet above sea level from Indus eastwards.

8. *Pipal (Ficus Religiosa)*—

It is well-known all over India and grows wild in the sub-Himalayan forests in Bengal, Madhya Pradesh, Punjab and Bombay.

9. *Gular (Ficus Glomerata)*—

It is an evergreen tree and is found throughout India.

10. *Banj (Quercus Incana)*—

It is an evergreen tree and is commonly found in temperate Himalaya between 4,500 to 7,000 feet above sea level.

11. *Phaliant (Quercus Clavica)*—

It is not so common as *Quercus Incana* and is usually found in moist ravines between 2,000 to 6,000 feet.

12. *Khair (Acacia Catechu)*—

It is a moderate-sized tree having dark-coloured bark. It grows quite extensively in North West Himalaya, Punjab, Central India, Bihar and Deccan.

13. *Pula (Kydia Calycina)*—

It grows in the tropical Himalayas from the Indus eastwards in deciduous forests and in the Western Penninsula along the Chata in deciduous forests, Deccan Hills and in Madras.

14. *Beri (Zizyphus Jujuba)*—

It is a small subdeciduous tree with dense-spreading crown 30—50 feet high with spiny branches and dark coloured bark.

It is indigenous and naturalised throughout India from the base of the Himalayas to Ceylon and grows up to 4,500 feet.

15. *Babul (Acacia Arabica)*—

It is a small tree with straight finely greydowny branchlets. It grows from Punjab eastwards to Bihar, Rajasthan and Western Penninsula.

16. *Bel (Aegle Marmelos)*—

It is a medium-sized deciduous tree armed with axillary thorns. The tree grows wild in the sub-Himalayan tract and in Central and South India.

17. *Sesbania Grandiflora (Agasthi, Agathi)*—

NOTE—The above list is illustrative but not all inclusive.

APPENDIX XV
No. F. 24-8/57-LD
GOVERNMENT OF INDIA
MINISTRY OF FOOD & AGRICULTURE
(DEPARTMENT OF AGRICULTURE)

New Delhi, dated the 4th January, 1958.

FROM

SHRI K. C. SARKAR, M.A.,
Under Secretary to the Govt. of India.

TO

ALL STATE GOVTS. & UNION TERRITORIES

SUBJECT—*Development of Feed and Fodder Resources in Key Village Areas—
Scheme for—Basis of Financial Assistance.*

SIR,

In continuation of this Ministry letters No. 17-20/56-LS, dated 17th December 1956 and 21st February 1957 on the above subject, I am directed to say that the Government of India have now decided, in consultation with the Planning Commission, that Central subsidy for the following items of the feed and fodder development scheme will be granted to the State Governments during the Second Five Year Plan as shown against each:—

- (1) Appointment of Fodder Development Officer and other staff (as detailed in the attached Statement—Annexure I).— 50%
- (2) Establishment of 10 acre pasture demonstration plots in Key Village blocks.— 50%
- (3) Feeding of selected cattle in } 50% in the first year.
balanced rations in Key Vil- } 33-1/3 in the second year.
lage blocks. } 25% in the third year.

Item (3) of the scheme will be first tried as a demonstration measure in 5 Key Village areas only. This subsidy will be shared by the State and Central Governments on the usual 50 : 50 basis.

- (4) Distribution to cultivators of fodder seeds, roots etc. produced by State Animal Husbandry/Agriculture Farms. 25%
- (5) Distribution to cultivators of quality seeds of pasture grasses produced by the Military Grass Farms, Forest Department, etc. 25%
- (6) Establishment and improvement of pasture on State Govt's farms. 25%
- (7) Construction of silo-pits for construction of fodder. 25%

In the case of items (4), (5) and (7) above the Centre's contribution is conditional on the State Government providing an equal share of the subsidy so that the cattle breeders may get 50% subsidy on the fodder seeds, roots etc. and pasture grass seeds supplied to them as well as for the construction of silo-pits.

2. Other items of the schemes are not eligible for any Central subsidy.

3. Planning Commission have expressed their inability to make available any additional funds for this scheme and the State Governments are expected to provide necessary funds for their share from within their Plan ceilings.

4. It is requested that the schemes on the basis of financial assistance, as shown above, may kindly be formulated and submitted to this Ministry, in the attached Proforma (Annexure II) for scrutiny, as early as possible.

Yours faithfully
K. C. SARKAR,
Under Secretary to the Govt. of India

Copy to—

1. The State Directors of Animal Husbandry for information ;
2. Planning Commission;
3. Ministry of Finance;
4. Ministry of Community Development;
5. Indian Council of Agricultural Research;
6. E. & S. Directorate;
7. Central Council of Gosamvardhana;
8. Directorate of Publicity;
9. LDA/ALDAs/ALOs/TAs (Z & K);
10. Guard file.

By order
(Sd.)
Under Secretary

ANNEXURE I

Estimates for Appointment of Fodder Development Officers in the States

Serial No.	Details of Staff	Number
1	Fodder Development Officer (Class II State Scale) Rs. 275—25—500—EB—30—800.	One
2	Technical Assistants (suitable State Scale) Rs. 160—10—330	Two
3	Upper Division Clerk (Rs. 80—5—120—8—200—10/2—220)	One
4	Typist—(Rs. 55—3—85—4—125—5—130)	One
5	Peons—(Rs. 30)	Two
	Dearness and other allowances (approximate).	
	Travelling allowances (approximate).	
	Miscellaneous contingencies (approximate).	

APPENDIX XVI

Statement Showing the Achievements made under Feds & Fodder Development Scheme during 1959-60 in various States

Serial No.	Items of the scheme	Andhra Pradesh	Assam	Bombay	Madhya Pradesh	Madras	Mysore	Orissa	Rajasthan	Uttar Pradesh	Tripura	Manipur
1	Appointment of staff .. ..	..	yes	yes	yes	yes	yes	..	yes	yes	..	..
2	No. of 10-acres pasture demonstration plots established in K.V. Blocks.	17	3	7	4	5	1	..	6	6	1	1
3	No. of Farms taken up for Pasture Development.	2	..	3	7	3	1	..	1	4	..	..
4	No. of farms taken up for the production of seeds, roots.	5	2	3	10	2	2	3	2	..	..	..
5	Quantity of seeds/roots distributed to cultivators.	60,000 roots.	3,71,180 roots. 3 mds. 18 srs. (seeds).	6,000 roots. 5,208 lbs. (seeds).	..	70,000	..	..	..	..	1,00,000	..
6	No. of cattle selected for feeding on balanced ration.	392	15	..	..	..	..	..	..	..	..	..
7	No. of silo-pits constructed ..	6	2	24	1.	..	2	5	2	..	6	2

APPENDIX XVII

Statement showing the Number of Working Bullocks, Cows and Buffaloes and their Milk Production in India

(In thousands)

Serial No.	Name of the State	Total Cattle	Total Buffaloes	Working Zebu	Bullocks Buffaloes	Cows over 3 years kept for breeding or milk production	Buffaloes over 3 years kept for breeding for milk production	Total annual milk production (in thousand mds.)		Total milk production (Cows and buffaloes)	Proportion of buffalo milk to total milk production	Average annual milk yield per cow in lbs.	
								Cows	Buffaloes			Cow	Buffaloes
1	Andhra Pradesh	11,277	5,968	4,554	992	3,502	2,771	19,691	32,997	52,688	62.6%	463	980
2	Assam	5,309	521	1,741	174	1,508	168	2,661	653	3,314	19.7%	145	319
3	Bihar	14,398	3,426	6,198	604	3,867	1,483	31,852	26,265	58,117	45.1%	678	1,457
4	Bombay	20,216	5,337	8,322	286	5,920	2,884	15,150	30,233	45,383	68.8%	211	863
5	Jammu & Kashmir	1,757	374	493	29	606	199	2,106	1,425	3,531	40.3%	286	589
6	Kerala	2,510	488	553	247	972	125	4,446	982	5,428	18.0%	377	646
7	Madhya Pradesh	22,640	5,009	7,873	907	7,052	2,219	14,397	19,422	33,819	57.7%	168	720
8	Madras	9,698	2,041	3,908	227	2,720	990	14,739	17,487	22,226	33.6%	446	622
9	Mysore	8,966	2,669	3,223	249	2,908	1,416	7,549	12,229	19,778	61.8%	214	711
10	Orissa	7,862	829	3,300	381	2,342	197	6,066	1,245	7,311	17.0%	213	519
11	Punjab	5,948	3,810	2,253	229	1,634	1,934	20,384	43,887	64,271	68.0%	1,026	1,867
12	Rajasthan	12,073	3,439	3,450	109	4,371	1,757	17,065	14,448	31,313	45.9%	321	1,677

13	U. P.	23,022	9,798	11,780	999	5,761	5,156	45,022	98,122	142,144	68.5%	643	1,566
14	West Bengal	11,108	789	4,235	493	3,516	151	16,044	1,848	17,892	10.4%	375	1,011
UNION TERRITORIES													
15	Delhi	120	115	35	1	29	53	493	1,587	2,080	76.2%	1,405	2,485
16	Himachal Pradesh	1,17	206	370	1	400	142	1,052	1,036	2,088	50.0%	216	601
17	Manipur	268	52	81	10	51	10	72	50	122	43.7%	117	478
18	Tripura	303	40	104	14	88	13	353	119	472	25.4%	328	751
19	Andaman and Nicobar Islands	4	5	1	2	1	2	6	22	28	79.0%	393	1,110
20	Laccadive Minicoy and Amin-divi Islands.	1	..	..	..	..	..	2	..	2	..	367	..
Total		158,651	44,910	62,475	5,953	47,248	21,670	219,150	294,003	513,213	57.3%	382	1,117
												(Average for the Country).	

APPENDIX XVIII

Statement Showing the Breeding Policy in various States

Name of State	Name of Zone	Districts in Zone	Breed	Breeding policy
Andhra Pradesh.	Zone No. I ..	Srikakulam, Visakhapatnam, East & West Godawari, Krishna, Guntur, Nellore, Khamman, Nalgonda, Mahabubnagar and parts of Cuddapah, Anantpur, Kurnool, and Chittoor distts.	Ongole	Selective Breeding.
	Zone II ..	Parts of Chittoor, Anantpur, Kurnool and Cuddapah distts.	Hallikar	"
	Zone III ..	Adilabad, Nizamabad, Karimnagar, Warangal, Hyderabad and part of Medak districts.	Malvi	"
	Zone IV ..	Zahirabad and Vicarabad taluks.	Deoni	"
Assam ..		Lakhimpur, Sibsagar Nowgong, Darrang, Kamrup, Garo hills, K & J hills, Goalpara, Cachar	Sindhi, Hariana, Tharparkar. Sindhi Hariana ..	Grading up.
Bihar ..	1. Bachaur Zone	Champaran Dist. Sitamarhi sub-Divn., Sardar & Madhubani Sub-Divn. Sirpaul, Madhipure, Purneau district. Saharsa district.	Bachaur	Selective Breeding.
	2. Hariana Zone	Shahbad Dist. Barh sub-Divn. South Bhagalpur, Begusarai, sub-Divn., Khogaria, Bihpur, thana, Diara, Saran dist. Sametipur sub-divn. and Hajipur sub-Divn.	Hariana	Grading.
	3. Patna Zone	Around Patna ..	Tharparkar	Grading.
	4(a) Shahbadi sub-Zone.	Hazaribagh, Palamau, Dhanbad district and parts of Gaya.	Shahbadi or small type Hariana.	Grading.
	4(b) Red Sindh sub-zone.	Part of Ranchi and Singhbhum district.	Red Sindhi ..	
4(c) Jersey cross breeding sub-zone.	Ranchi and Ramgarh towns and Silli P.S.	Jersey (experimental)	Up-grading.	

APPENDIX XVIII—contd.

Name of State	Name of Zone	Districts in Zone	Breed	Breeding policy
Gujarat ..	Kutch ..	Southern and Western parts of Kutch. Northern and North Eastern parts of Kutch	Tharparkar ..	Up-grad- ing. Selective Breeding.
			Kankrej Buffaloes Murrah and Mehsana.	
	Saurashtra ..		Gir Buffalo—Jaffar- badi.	Selective Breeding.
	North Gujarat		Cow—Kankrej Buff.—Mehsana.	"
	South Gujarat		Cow—Kankrej. Buff.—Surti.	"
Jammu & Kashmir.	Up to altitude of about 2,000 ft. Between 2 to 5,000 ft. Between 5 to 8,000 feet. Srinagar Town		Hariana ..	Grading up.
			Red Sindhi ..	
			Jersey ..	"
			Jersey ..	"
Kerala ..	Sindhi ..	All State except areas below.	Sindhi ..	Grading.
	Kangayam ..	Talukas of Palghat, Chittor, Kezhijampara and parts of Talala- pilly.	Murrah Kangayam ..	Grading.
Madhya Pradesh*	Zone I ..	Wardha, Nagpur, Bha- ndare, Balaghat, parts of Chindwara, Betul, Amraoti, Chanda, Yeotmal.	Gaolao (Sahiyal around cities).	
	Zone II ..	Saugor, Jubbulpur Hoshangabad, Malda & parts of Chindwara, Betul.	Malvi & Hariana (Thar- parkar around cities).	
	Zone III ..	Bilaspur, Raipur, Drug Chattisgarh.	Malvi (Thari and Sahi- wal round cities.)	
	Zone IV ..	H.mar, Buldana, parts of Amraoti.	Nimari	
	Zone V ..	Parts of Amraoti & Akol Distt.	Lakhbonda Sindhi	
	Zone VI ..	Parts of Akola, Chanda Yeotmal.	Hariana	
Madras ..	Kangayam ..	Coimbatore Distt. parts of Tiruchi, Madurai and Salem District.	Kangayam ..	Selective Breeding & Grading up border- ing areas of the districts.

*This relates to old Madhya Pradesh State, More recent. information is not available.

APPENDIX XVIII—*contd.*

Name of State	Name of Zone	Districts in Zone	Breed	Breeding policy
Madras <i>—contd.</i>	Umblacherry ..	Tanjore District ..	Umblacherry	Selective Breeding.
	Hallikar ..	Parts of Salem, N. Arcot districts.	Hallikar	Do.
	Alambadi ..	Part of Salem district	Alambadi	Do.
	Burghur ..	Part of Coimbatore ..	Burghur	Do.
	Buffaloes ..	Entire area of Madras State.	Murrah Buffaloes ..	Grading up.
Apart from above, breeds of Sindhi, Sahiwal, Gir are also used in urban area, sub-urban areas of State.				
Maharashtra	Heavy rainfall region.		Cow—Dangi. Buff—Surti.	
	Arid and semi arid zone of Bombay Decan.		Cattle—Khillari .. Buff—Pandharpuri or Surti.	
	North Eastern part of East Khandesh and Buldhana distt.		Cow—Nirmari Buff—Surti and Purnathali.	
	Marathwada region.		Cattle—Deoni and Red Khandheri Buff—Marathwada.	
	Vidharbha region.	Plains of Berar ..	Cow—Hariana except Gaolao for Wardha. Buff—Puranthali.	
		Areas around Cities like Nagpur.	Cow—Sindhi Sahiwal. Buff—Purnathali Nagpuri or Berari.	
Mysore ..	Amritmahal Zone.	Chitaldrug & parts of Shimoga, Chikmaglur and Tumkur, Bellary and Dharwar, Bidar and part of Bijapur district.	Amritmahal Khillar	Selective Breeding & Grading up.
	Deoni Zone ..	Bidar and Gulbarga districts and part of Bijapur district.	Deoni	Grading up.
	Hallikar zone	Kolar and parts of Hassan, Mandya, Tumkur, Bangalore and Mysore Districts.	Hallikar	Grading up.
	Krishan Valley Zone.	Raichur & part of Bellary district, Belgaum & parts of Bijapur & Dharwar districts.	Krishana Valley ..	Selective Breeding.

APPENDIX XVIII—*contd.*

Name of State	Name of Zone	Districts in Zone	Breed	Breeding policy
Mysore — <i>contd.</i>	Malnad Giddas Zone.	Parts of Shimoga Chickmagalur and Hussan, South Kanara district, Coorg and Karwar.	Cow—Sindhi Buff—Murrah.	Up grading with Amritmahal areas of heavy rainfall in Shimoga and Chickmagalur.
Orissa	First Zone	Ganjam, Cuttack (except Cuttack city).	Cow—Hariana Buff—Murrah.	Grading up.
	Second Zone	All the eleven other districts of State except the district of Cuttack and Ganjam, Cuttack city.	Cow—Red Sindhi Buff—Murrah.	Grading.
Punjab		Kapurthala, Amritsar, Jullundur, Hoshiarpur, parts of Bhatinda, Ambala.	Cow—Hariana. Buff—Nili.	
		Sangrur, Mahendragarh, Ludhiana, Hissar, Rohtak, Gurgaon, Karnal, parts of Patiala, Bhatinda, Ambala.	Cow—Hariana.	
	Kundaghat Nalagarh.	Kundaghat & Nalagarh	Cow—Sindhi. Buff—Murrah.	
		Ferozpur and Gurdaspur.	Cow—Hariana Sahiwal Buff—Murrah Nili.	
Rajasthan		Kangra	Sahiwal	
		Sikar, Jhunjhunu, Cheru and parts of Jaipur, Tonk, Bikaner and Sri Ganganagar districts.	Hariana	
		Jalore, Pali and parts of Barmer, Jodhpur and Jaipur districts.	Nagaur.	
		Jalore, Pali, Sirohi and part of Barmer distt.	Kankrej.	
		Bharatpur, Swai—Madhawpur part of Jaipur and Alwar distt.	Mewat.	
		Jaisalmer and part of Jodhpur and Barmer distt.	Tharparkar.	
	Parts of Alwar and Jaipur districts.	Rath.		

APPENDIX XVIII—*contd.*

Name of State	Name of Zone	Districts in Zone	Breed	Breeding policy
Rajasthan — <i>contd.</i>		Ajmer, Pali and part of Jaipur, Tonk, Bundi, Udhapur and Bhilwar districts.	Gir.	
		Parts of Bikaner and Sri Ganganagar districts.	Rathi.	
		Kotah, Jhalawar, Dungarpur, Banswara, Chittore and part of Bundi, Udaipur and Bhilwara districts.	Malvi.	
Uttar Pradesh.	1. Hill tract ..	Tehri Garhwal, Garhwal, Almora, and parts of Nainital and Dehra Dun.	Murrah upto 3,000 ft. Sindhi above 3,000 ft. (if Sindhi not available then Hariana) Yak may be given above 6,000 ft. if desired by public.	
	2. Western Terai tract.	Parts of Nainital, Pilibhit, and Shahjahanpur.	Buff—Murrah.	
	3. Eastern Terai tract.	Parts of Kheri, Bahraich, Gonda, Bast, Deoria and Gorakhpur.	Cow—Hariana Ponwer & Kherigarh be given to nomadic breeders and to others also if they desire. Buff—Murrah.	
	4. Western tract.	Saharanpur, Muzaffarnagar, Meerut, Balandshahr Nagpur, Aligarh, Mathura, Bijnor, Badaun, Etah, Bareilly, Mordadabad and parts of Dehradun and Pilibhit, Meerut, Blundshahar.	Same as for Zone 2.	
	5. Western middle tract.	Distts. of Sitapur, Hardoi, Farukhabad, Mainpuri, Etawah, Kanpur, Unnao, Fatepur and parts of Shahjahanpur and Kheri districts.	Cow—Hariana. Buff—Murrah except Chakernagar and Ayana Shadow block in Agra Distt. which will have the pocket of Bhadawari).	
				Cow—Hariana. Buff—Murrah except Chakernagar and Ayana Shadow block in Etawah distt. which will have the pocket of Bhadawari breed. Establishment of pockets of Tharparkar and Bhadawari breed in Kanpur is under consideration.

APPENDIX XVIII—*contd.*

Name of State	Name of Zone	Districts in Zone	Breed	Breeding policy
Uttar Pradesh— <i>contd.</i>	6. Eastern Middle tract.	Barabanki, Fyzabad, Lucknow, Rae Bareli, Partabgarh, Sultanpur and parts of Allahabad Bhabraich, Gonda and Basti.	Cow—Hariana Sahiwal certain pockets. Buff—Murrah.	
	7. Far Eastern tract.	Azamgarh, Ballia, Ghazipur, Jaunpur Benaras and Parts of Deoria & Gorakhpur.	Cow—Hariana Ganga-ter in certain pockets	
	8. Vindhya tracts.	Mirzapur and parts of Allahabad.	Cow—Hariana Sindhi in Allahabad town. Buff—Murrah.	
	9. Bundelkhand tract.	Jhansi, Hamirpur, Banda and Jalaun.	Hariana, Kankatha, Tharparkar. Buff—Murrah Bhada- weri.	
West Bengal.	1. Darjeeling.	..	Siri (with Harian Thari and Sahiwal, for parts of Hoogly).	
	2. Rest of West Bengal.	..	..
Andaman & Nicobar Islands.	All State ..	..	Sindhi & Sahiwal.	
Delhi ..	All State ..	..	Cow—Hariana. Buff—Murrah.	
Himachal Pradesh.	..	Lower altitude Higher altitude.	Hariana Red Sindhi	
Lacadive & Minicoy Islands.	..	..	..
Manipur ..	..	Imphal ..	Sindhi ..	Grading-
	..	Thoubal ..	Hariana	
Naga Land	..	..	..
Nefa ..	..	..	..
Tripura	All State ...	..	Tharparkar	

APPENDIX XIX

Statement showing position about the Livestock Improvement and Contagious Diseases Acts in the States

States where Act has been passed	States where Rules under the Act have been framed	States where the Act has been enforced
(LIVESTOCK IMPROVEMENT ACT)		
Andhra Pradesh Assam Bihar Jammu & Kashmir Kerala Madhya Pradesh Madras Maharashtra Mysore Orissa Punjab Rajasthan West Bengal Delhi Manipur	Andhra Pradesh Bihar Jammu & Kashmir Kerala Madras Maharashtra Mysore Orissa Punjab Rajasthan West Bengal	Andhra Pradesh (in 1st plan key-village blocks only). Jammu & Kashmir Kerala (Partially) Madras Maharashtra Mysore (partially)
(CONTAGIOUS DISEASES ACT)		
Andhra Pradesh Assam Bihar Jammu & Kashmir Kerala Madras Maharashtra Mysore Orissa Punjab Rajasthan West Bengal Delhi Himachal Pradesh	Andhra Pradesh Bihar Jammu & Kashmir Madras Maharashtra Mysore Orissa Punjab Rajasthan West Bengal Himachal Pradesh	Jammu & Kashmir Madras (enforced wherever necessary). Maharashtra (partially) Mysore Himachal Pradesh

APPENDIX XX

No. F. 23-3/58-LD

GOVERNMENT OF INDIA

MINISTRY OF FOOD AND AGRICULTURE
(DEPARTMENT OF AGRICULTURE)*New Delhi, dated the 14th August 1959*

From

Shri D. Ramiah,
Deputy Secretary to the Govt. of India

To

All State Governments and Union Territories

SUBJECT—*Key Village Scheme—Rearing of Selected Bull Calves for Extension Centres—Subsidy for—Extensin to all Breeds.*

Sir,

I am directed to refer to this Ministry letter No. 17-18/57-LD, dated the 19th March, 1958 on the above subject, addressed to the Governments of Andhra Pradesh, Madras, Punjab and Uttar Pradesh and Union Territory of Delhi (copy enclosed) and to say that in order to make the scheme more workable, the Government of India have now decided that the revised procedure for rearing of selected bull calves in Key Village Blocks, as contained in this Ministry circular letter cited above, may be extended to all breeds and to all Key village Blocks.

2. It is requested that necessary instructions in the matter may please be issued to the State Directors of Animal Husbandry etc., and all possible efforts be made to achieve the targets laid down for rearing of calves for the Second Five Year Plan. Additional cost, if any, will have to be adjusted against the current Plan ceilings for Key Village Scheme.

Yours faithfully

D. RAMIAH

Deputy Secretary to the Government of India.

Copy with enclosure forwarded for information to :—

1. All State Directors of Animal Husbandry.
2. The Director, National Dairy Research Institute, Karnal, /Indian Agricultural Research Institute, New Delhi /Indian Veterinary Research Institute, Izatnagar.
3. Ministry of Finance (F.A. & C.D.)
4. Planning Commission.
5. I.C.A.R.
6. E. & S. Directorate.
7. C.C.G.
8. LDA/ALDAs/ALOs/TAs.
9. Guard File.

By order,

D. RAMIAH,

Deputy Secretary

No. F. 17-18/57-LD

GOVERNMENT OF INDIA

MINISTRY OF FOOD AND AGRICULTURE
(DEPARTMENT OF AGRICULTURE)

New Delhi, dated the March, 1958

from

Shri K. C. Sarkar, M.A.
Under Secretary to the Govt. of India

To

The Governments of Andhra Pradesh, Madras, Punjab and Uttar Pradesh and Union Territory of Delhi.

SUBJECT—*Key Village Scheme—Rearing of Selected Bull Calves for Extension Centres—Subsidy for.*

Sir,

I am directed to say that the All India Key Village Scheme provides *inter alia* for subsidising the rearing of selected calves at the rate of Rs. 10 per month per calf from the time of its weaning to 3 years of age or the date of maturity whichever is earlier. The calves thus reared are generally purchased at maturity by the State Governments at prevailing market rates for use as stud bulls to upgrade the local stock in other development areas particularly the extension centres under the Key Village Scheme, Community Development areas, National Extension blocks etc. The progress under this scheme has not been satisfactory in certain cattle breeding areas mainly because in these tracts the cattle-owners find it difficult to rear bull calves up to 3 years of age due to their limited resources. As such, in some of the breeding tracts, bull calves are being disposed of by their owners soon after weaning to be reared as bullocks. They are, thus lost to the cattle development programme.

2. This subject has been engaging the attention of this Ministry for some time past. The question was also discussed at the Southern Regional Key Village Officers Seminar at Coimbatore in May, 1957. It has since been decided that in areas where the present calf rearing subsidy is not acceptable to the cattle-breeders, the State Departments of Animal-Husbandry may purchase the selected bull calves at weaning age 9 to 12 months at about one-third the price of grown-up bulls (i.e. for approximately Rs. 250-300) provided under the scheme for extension centres and rear them at the Government and private farms where necessary facilities are available. *The usual subsidy at the rate of Rs. 10 per month per calf will be given to the Owner of the calf till it is taken over by the State Government and thereafter to the State Government.* When these calves have attained maturity they should be issued to the Key Village extension centres and the balance of two-third of the price (approximately Rs. 500—600) be adjusted for each matured bull. The subsidy for calves, and the price of matured bulls will be shared on the usual 50 : 50 basis between the Central and State Governments.

3. The scheme will, in the first instance, be taken up in the home tracts of Ongole, Kangyam and Hariana breeds only.

4. It is requested that the State Governments concerned may submit proposals in this regard to this Ministry during 1958-59 wherever it is possible to implement the scheme in their areas.

5. It is considered that the procedure out lined above will not entail any additional expenditure. Additional cost, if any, will have to be adjusted against the plan ceiling for Key Village Scheme and no additional funds, will be provided for the purpose.

Yours faithfully

K. C. SARKAR

Under Secretary to the Govt. of India

Copy forwarded for information to—

1. The State Directors of Animal Husbandry.
2. The Directors, National Dairy Research, Institute, Karnal, Indian Agricultural Research Institute, New Delhi and Indian Veterinary Research Institute Izatnager, U.P.
3. Planning Commission.
4. Ministry of Finance, New Delhi.
5. Ministry of Community Development.
6. Indian Council of Agricultural Research, New Delhi.
7. Economics & Statistics Directorate.
8. Central Council of Gosamvardhana, New Delhi.
9. Directorate of Publicity.
10. Dy. LDA/ALD(s)/ALO(s)TA(s).
11. Guard File.

By order,

for Under Secretary

APPENDIX XXI

List of places visited by the Key Village Expert Committee

ASSAM

1. Government Cattle Breeding Farm, Khanapara, Gauhati.
2. Veterinary Field Assistants School, Gauhati.
3. Assam Veterinary College, Gauhati.
4. Artificial Insemination Centre, Key Village block, Gauhati.
5. Key Village Unit, Sonamari.
6. Artificial Insemination Centre, Key Village Block, Barapeta Road.
7. Key Village Unit, Barapeta Road.
8. Government Cattle Breeding Farm, Barapeta.

WEST BENGAL

1. Bengal Veterinary College, Calcutta.
2. Artificial Insemination Centre, Key Village Block, Tarakeswar.
3. Key Village Unit, Tarakeswar.
4. Key Village Unit, Dhankhali.
5. Key Village Unit, Kanajauli.
6. Key Village Unit, Behinoree.
7. Artificial Insemination Centre, Key Village Block, Beldanga.
8. Cattle Farm, Beldanga.
9. Key Village Unit, Memari.
10. Key Village Unit, Rasulpur.
11. Key Village Unit, Shaktighar.
12. Key Village Unit, Nari.
13. Artificial Insemination Centre, Key Village Block, Burdwan.
14. Key Village Unit, Rayon.

ORISSA

1. Artificial Insemination Station, Cuttack.
2. Milk Supply Scheme-cum-Livestock Farm, Khapuria, Cuttack.
3. Key Village Unit, Salipur.
4. Key Village Unit, Pipli.

BIHAR

1. Key Village Block, Munertalpa.
2. Key Village Block, Bhita.
3. Key Village Block, Maner.

ANDHRA PRADESH

1. Artificial Insemination Centre, Key Village Block, Kankipadu
2. Milk Collection Area, Veerankkac.
3. Milk Collection Area, Pammaru.

4. Artificial Insemination Centre, Key Village Block, Guduvalleru.
5. Key Village Unit, Guduvalleru.
6. Key Village Unit, Mundivapalu.
7. Key Village Unit, Cannavaram.
8. Cattle Breeding Farm, Guntur.
9. Artificial Insemination Centre, Key Village Block, Nidubrolu.
10. Key Village Unit, Pyaparru.
11. Artificial Insemination Centre, Key Village Block, Doddavarapadu.
12. Key Village Unit Doddavarapadu.
13. Key Village Unit, Ammanabrobu.
14. Artificial Insemination Centre, Key Village Block, Chilakalurpet.
15. Cattle Breeding Farm, Karimnagar.
16. Artificial Insemination Centre, Key Village Block, Karimnagar.
17. Key Village Unit, Manakondur.
18. Key Village Unit, Kotha path.
19. Cattle Breeding Farm, Himayatsagar.
20. Veterinary School, Himayatsagar.
21. Artificial Insemination Centre, Seethrampet.
22. Osmania College of Veterinary Science, Hyderabad.

MAHARASHTRA

1. Udgir Gaushala, Udgir.
2. Government Cattle Breeding Farm, Udgir.
3. Key Village Unit, Udgir.
4. Key Village Unit, Somnathpur.
5. Key Village Unit, Hundergatti.
6. Cattle Breeding Farm, Hingoli.
7. Key Village Unit, Hingoli.
8. Calf Subsidy Scheme, Aarey Milk Colony, Bombay.
9. Key Village Block, Mahud.

MADRAS

1. Urban Artificial Insemination Centre, Erode.
2. Artificial Insemination Centre, Key Village Block, Kangayam.
3. Key Village Unit, Kangayam.
4. Key Village Unit, Sangalandampalayam.
5. Key Village Unit, Thopampatti.
6. Artificial Insemination Centre, Key Village Block, Neikarapatti.
7. Key Village Unit, Neikarapatti.
8. Narendra Dairy Farm, Neikarapatti.
9. Artificial Insemination Centre, Key Village block, Ayakudi.
10. Key Village Unit, Ayakudi.

11. Key Village Unit, Kanakampatti.
12. Artificial Insemination Centre, Key Village Block, Idayakotti.
13. Artificial Insemination Centre, Key Village Block, Poonammalli.
14. Key Village Unit, Poonammalli.
15. Artificial Insemination Centre, Key Village Block, Canjeevaram.
16. Artificial Insemination Centre, Madras Veterinary College, Madras.
17. Hosur Cattle Farm, Hosur.

KERALA

1. Key Village Unit, Trivandrum.
2. Key Village Unit, Thrumala.
3. Key Village Unit, Maruthinkozhy.
4. Government Cattle Breeding Farm, Trivandrum.
5. Milk Cooperative Union, Trivandrum.
6. Key Village unit, Quilon.
7. Key Village unit, Chathannur.

MYSORE

1. Artificial Insemination Centre, Key Village Block, Hasserghatta Farm, Hasserghatta.
2. Key Village Unit, Chikbanavara.
3. Artificial Insemination Centre, National Dairy Research Institute Bangalore.
4. Key Village Unit, Kudlu, Bangalore.
5. Urban Artificial Insemination Centre, Ma'leshwar, Bangalore.
6. Key Village Block, Kunigal.

RAJASTHAN

1. Artificial Insemination Centre, Ajmer.
2. Artificial Insemination Centre, Key Village Block, Nasirabad.
3. Key Village Unit, Nasirabad
4. Key Village Unit, Dilwara.
5. Artificial Insemination Centre Key Village Block Dilwara.
6. Artificial Insemination Centre, Key Village Block Bewara-
7. Urban Artificial Insemination Centre, Jaipur.
8. Artificial Insemination Centre, Key Village Block, Cattle Breeding Farm, Bassi.
9. Seed Multiplication Farm, Bassi.

GUJRAT

1. Key Village Unit, Anjar.
2. Key Village Unit, Sinnogra.
3. Key Village Unit, Udipur.
4. Govt. Cattle Breeding Farm, Bhuj.
5. Key Village Unit, Sukhpur.
6. Key Village Unit, Madhopur.
7. Key Village Unit, Mandvi.
8. Key Village Unit, Bidra.
9. Mandvi Gaushala, Mandvi.
10. Mundra Gaushala, Mundra.

CENTRAL INSTITUTES.

1. Key Village Block, Indian Veterinary Research Institute, Izatnagar.
2. Key Village Block, National Dairy Research Institute, Karnal and Bangalore.
3. Key Village Block, Indian Agricultural Research Institute Nangloi, Delhi.

APPENDIX XXII

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

No. Dy 950/61-AHC

New Delhi, April 3, 1961.

From

Shri L. Sahai, MSC, M.R.C.V.S.

Animal Husbandry Commissioner with the Government of India

To

The Secretary to the Government of India,
 Ministry of Food & Agriculture, (Department of Agriculture)
 NEW DELHI

Dear Sir,

Kindly refer to my letter No. 520/61-AHC dated the 21st February, 1961, forwarding the report of the Key Village Expert Committee. Shri N. Sri Rama Reddy, a member of the Committee, who was unable to sign the report has submitted a note under cover of his letter No. nil dated the 20th March, 1961. I am forwarding the same herewith in original together with a note containing comments of other members of the Committee on the points raised in Shri Reddy's note.

2. Shri Reddy desires that his note may be included in the Report of the Committee. I and other members of the Committee have no objection to this, but suggest that, in that case, the comments of other members of the Committee may also be incorporated as a supplementary note.

3. The two notes may be included as appendices XXII and XXIII in the Report.

Encl. 2

Yours faithfully,
 L. SAHAI.

From

N. Sri Rama Reddy, B. Sc. (Agri)
 Member of Parliament (Rajya Sabha)

41-SOUTH AVENUE
 NEW DELHI
 20th March, 1961

To

The Chairman,
 Expert Committee on Key Villages,
 Government of India, NEW DELHI.

Sir,

While generally agreeing with the recommendations made in the main body of the report which I was not able to sign, though I have participated in drafting the report and discussions thereon, I am herewith enclosing a supplementary note which is deemed necessary to be included along with the main report. I request you to include it accordingly and send it up to the Ministry.

Thanking you,

20-3-61.

Yours faithfully
 N. SRI RAMA REDDY

APPENDIX XXII

*Supplementary Notes to the Report of the Committee on Key Villages
by Shri N. Sri Rama Reddy*

Key village scheme was intended to assist production of breeding bulls with a superior germ plasm and truer characteristics of the important breeds of cattle in the country. Therefore, about 350 key village schemes have been sanctioned all over India. These schemes are situated in areas of well defined breeds as well as in areas where cattle are non descript.

The Key village scheme has failed to produce desired results in areas of well defined breeds for the reasons mentioned under Chapter 3 except in the Kangayam tract in Madras.

The Key village schemes were not required in non-descript areas since the operation of this scheme in areas of non-descript cattle cannot be anything more than an extension work.

The scheme has not been able to—

- (a) Produce bulls of higher breeding quality.
- (b) Enthuse people for production of feeds and fodders.
- (c) Increase any milk production. There was practically no milk recording done any where in the Key village scheme and where it was done it was a concocted document.
- (d) Procure bulls of ideal characteristics for service in the areas concerned. Most of the bulls we saw in key village scheme were not up to the mark. The private bulls maintained in the same areas where key villages are situated were more often superior to the government bulls specially in areas of well defined breed. Consequently the key village scheme has not enthused the breeders in their own areas.
- (e) Undertake progeny testing programmes in any scheme.
- (f) Control breeding in any chosen direction. ..
- (g) Castrate all the bulls within the key village areas with the result mixing of breeding is taking place. ..
- (h) Save expenses through artificial insemination work as compared to natural service. A jeep which is wholly unnecessary for the work on hand, a big staff attendance and in short a sum of Rs. 35,000 for every key village scheme is a prodigal expenditure.
- (j) Tattoo the calves born in the area.
- (k) Purchase bulls produce in scheme areas for service elsewhere.
- (l) Undertake prophylactic measures for diseases control.
- (m) Treat diseases on large scale apart from the first aid offer.
- (n) Undertake follow up work in any measure.
- (o) Carry on propaganda and publicity on a scale required.
- (p) Effectively use calf subsidy scheme.

APPENDIX XXII—*contd.*

- (q) Popularise silo pits scheme for preservation of fodder in spite of subsidies.
- (r) Utilise the subsidies for popularising the feeding of balanced nutrition to animals.
- (s) Organise markets for the sale of cattle or their production.

If there has been a failure in the above activities with regard to cattle development work what then is the achievement of the scheme can be better imagined than described.

Development of Feed and Fodder—

The Indo-German Team on Agriculture Education observed "All these (203.5 million cattle and buffaloes, 85.4 million sheep and goats, 8.3 million other livestock and 94.7 million poultry) and 400 million human beings derive their substance from 320 million acres of net area sown. The former have therefore naturally to subsist mostly on the by-products of agricultural produce and scanty and precarious grazing available in fallow lands culturable wastes or other unproductive lands. It has been roughly estimated as compared to the total requirements of balanced nutrition for livestock there is a shortage of 26 million tons with regard to straws and karbi, 250 to 300 million tons in regard to green fodder and 25 million tons in concentrates i.e., grams, bran, oil cakes etc. This approximately constitutes a deficiency of well over 2/3rd of the optimum concentrated requirements. There is thus a very heavy shortage of roughages as well, though it may be assumed that increased production of food grains, under 5 year plans would tend to make up for deficiency in regard to straws and karbi. The deficiency in green fodder and concentrates would be further accentuated by the constant increase in the number of livestock".

The above observations hold good today. The livestock in our country subsist mainly on by-products of agricultural produce. It is crops like rice, millet and pulses that yield roughages. The sown area of millets and pulses are given below for 1959-60—

Rice	..	..	..	..	..	81,343,000
Jowar	..	..	..	..	..	41,602,000
Bajra	..	..	..	..	..	26,699,000
Maize	..	..	..	..	..	10,457,000
Ragi	..	..	..	..	..	6,211,000
Small millet	..	..	..	..	..	12,340,000
Wheat	..	..	..	..	..	31,508,000
Barley	..	..	..	..	..	8,220,000
Gram	..	..	..	..	..	25,046,000
Tur	..	..	..	..	..	5,843,000
OK pulses	..	..	..	..	..	16,075,000
OR pulses	..	..	..	..	..	12,788,000
						278,132,000
					Total	

APPENDIX XXII—*contd.*

On an estimate of about 1,000 lbs. of straws and karbi from rice, millet and pulse crops, per acre we have annual total yield of 278,132 million tons of cattle feed.

1956 livestock census reveals we have a cattle and buffaloes population of 203.5 million. It is quite possible the figure has now increased to about 210 million. If we allow a daily feed of 20 lbs. per head of livestock on an average, the annual requirement will be 1,512,000 million tons. As against this requirement the production of roughages is only 278,132 million tons. The shortfall therefore is 1,233,868 million tons. I estimate that only 1/10th of the total feed required is secured by our livestock through grazing resources of all kinds put together. This leaves us with a deficit of 1,082,668 million tons calculated as follows—

1. Total requirement of 210m livestock at 20 lbs. per head per day	1,512,000 m tons.
2. (a) Total annual production estimated at 1,000 lbs. per acre of cereal and pulse crops	278,132 m tons.
(b) Grazing available estimated as 1/10th of total requirement	151,200 m tons.
	429,332 m tons.
Total annual deficit of roughages	1,082,668 m tons.

Allowing for errors in the estimation and rounding off, of shortfall it can be safely assumed that there is a deficit of 1,000,000 m tons of roughages. The production of cattle feed to this extent is almost impossible, for at the assumed rate of 1,000 lbs. per acre we require an extra land of 1,000 m acres and our total geographical area is only 811 m acres out of which the total cultivable area does not exceed 467 m acres in all times to come. Thus we see the utter impossibility of maintaining all the livestock our land has been called upon to bear unless we keep the livestock in less than half starved condition. This drives us to the inevitable necessity of reducing the livestock burden of our country. Any scheme of livestock improvement which does not take this salient fact into consideration is doomed to fail.

The work done under this scheme in any state looks to be almost nothing. No enthusiasm has been shown by any state in the actual development of feeds and fodders. The essential work in this behalf has to be done in the farmers fields. The real test of the success of this work lies in the farmers including the fodder growing schemes in their own cropping pattern. Such a thing was not seen anywhere. The by-product obtained from the grain crops grown for food in the form of straw is all the fodder that is available to all the 200 million cattle in our country. The fact that in several places grasses grown in pots were shown to the members reveal in a very glaring way the awful indifference shown by the key village staff. Thus the scheme having failed to generate any enthusiasm for the work, it is felt that it would be advisable to leave the matter entirely to the state governments instead of wasting central grants on half hearted and ill-understood projects.

APPENDIX XXII—*contd.*

There is a provision made in the central scheme for subsidy for the distribution of concentrates to milch cows. It is strange that such provision has been made without reference to practicability of its adoption usefully in the field. I think instead of generating enthusiasm amongst the farmers for production of feeds and fodders the government is trying to corrupt the farmer with their subsidies the utilisation of which cannot be effectively enforced. Similarly is the case with regard to subsidies for silo-pits. My recommendation is that these subsidies schemes should be scrapped immediately.

Calf Subsidy Scheme—

This scheme though designed to encourage production of superior breeding bulls and though subsidising at Rs. 10 per calf per month was allotted, has failed to produce the desired results. In the Second Five Year Plan a target of 35,000 subsidy bull calves was laid down. Against this only 20,504 calves were subsidised out of which 4,000 were female calves. It has been estimated now that allowing for mortality and rejection, etc. about 10,000 bull calves would be made available for breeding purposes. Another, 3,000 bulls are estimated to be subsidised in the year 1960-61. This is only an estimate and so far no appreciable number of bulls were secured from out of this scheme for breeding purposes let alone the quality of such bulls on which no information is available. Thus, I have no hesitation in saying that the whole calf subsidy scheme has failed in achieving its purpose.

Organisation of Marketing Facilities—

The main marketable commodities are (i) cattle (ii) milk and milk products (iii) hides and skins (iv) bones. With regard to marketing of cattle each state has developed its own markets which are seen in the form of weekly markets in suitable places or in the form of festivities connected with shrines and temples. It is also observed that the work bullocks and bull calves intended for work are purchased by the local traders in the breeding tracts and transported to the non breeding tracts mostly by driving them on foot or by train depending upon the distances to be covered.

Milch cattle both cows and buffaloes are purchased in the rural parts and transported to cities and towns. In most of the cities cattle markets have developed all on their own way. I suggest the marketing department of the Government of India study the existing practices in each of the cattle markets in major cities and offer suggestions for improving the milch cattle marketing. The cattle market we saw in Madras had developed a two way system intended to bring in cows and buffaloes in milk for sale to city dairymen or house holders on the one hand and move the cows and buffaloes from the city to rural parts. This is an excellent system which should be further studied and improved upon for adoption in other major cities and town. I commend the scheme for study and adoption elsewhere. This is a method where high yielding animals could be saved as against the fear of loosing them by slaughter which is often said to be the case in Calcutta, Bombay, Delhi and other cities.

Milk and milk products are most important marketable animal products. The development of milk co-operative societies atleast in and around the cities and town for production and collection of milk is of utmost importance. Along with organisation of such societies it is necessary, processing societies in town and cities should be organised for collection, processing and distribution of

APPENDIX XXII—*contd.*

milk products. This may be entrusted to unions of milk production primary societies with a view to build up a strong co-operative structure. The establishment of dairies on a government sponsored basis as is being done at present is a very unwise and hasty method. After all we have sworn by co-operative commonwealth and socialistic pattern of society. To build up government owned or sponsored dairies as is done in Bombay and Delhi and proposed to be done in few other places is to depart from our ideals in opposite direction. After all any venture or enterprise sponsored should give opportunities for the population involved in production, to participate in the building up of institutions and they must be made to be adventurous. The co-operative organisation for production, collection, processing and distribution is a desideratum and steps should be taken in this behalf. The other method of building dairies in cities and towns on government sponsored basis should be given up immediately. Similarly for hides and skins and bones which should be collected on a co-operative basis. In my sojourn in Gujarat I saw any number of carcasses lying on road sides and forests and grazing grounds. I think our natural wealth should not be allowed to go to waste like this. The skins of dead animals should be collected and also bones for commercial uses.

The working of the key village scheme as at present can be said to be on the whole no better than an extension work in livestock breeding. As such I would not see why it should be called key village scheme at all without providing any key. The community development blocks which are in any case going to cover up the entire rural population by 1962 and to which invariably veterinarians are attached may well take care of this work as part of extension work.

The Jeep in the Key Village Scheme—

This is an instance of imitation of American ideas. The transportation of semen from the main artificial insemination centres to the sub centres can be done more economically by cycles. As such the jeep should be removed from the Key Village Scheme. In place of every jeep removed we can find employment for six cyclemen I totally reject the idea that semen cannot be transported by cycles. If I have found in my experience as a dairyman employing 50 cyclemen for transportation of milk from and to my dairy, where there were few or no cases of accidents or undue delays, I should think the key village scheme can avoid all corrupting and costly influences of jeep and take to cycles instead.

In conclusion I have to say a word more. This is in respect of development of cows and buffaloes in different areas as per II(c) of terms of reference. The importance of cattle as motive power for traction in the agricultural field is dwindling day by day. It has gone off the road. The motor lorry has replaced it on the road. Lift irrigation is rapidly being switched on to electric power. Agricultural operations is the only work now left for bullock and these agricultural operations like ploughing and cultivation are seasonal.

Any bullock in the farmer's family hardly works for 3 months in a year. It is idle for 9 months. The bullock therefore imposes heavy cost on farmers' economy having had to be maintained for about 9 months in a year without work. I do not know if the work of the bullock on the farm will eventually be taken over by the tractor and the combine. The European history in this behalf

APPENDIX XXII—*contd.*

reveals oxen were replaced by horses which in turn were replaced totally by tractor. While I cannot presume what is in store for the Indian farmer in future, I believe the importance of cattle will be there for milk and manure only.

Therefore the development of cows and buffaloes would mean putting more milk in them. Having lost red sindhi and sahiwal tracts to Pakistan, we are left with no milk breed cows though we are having buffaloes with high yielding capacity. The future of the cow at any rate depends upon its capacity for milk yield. The greatest factor influencing the milk yield is the genetic make up of the cow. My experience of 25 years in the field of milk production has shown me that this can best be done by cross breeding of our cows with bulls of high pedigree from European origin. In Bangalore area within this 25 years by a process of this kind we the dairymen have been able to quadruple the per capita milk yield of cows, with dry period reduced and calving capacity enormously increased. Such a cow has replaced the buffaloes which has been a specialised dairy animal in this area as in others. I, therefore, venture to suggest that importation of suitable types of foreign bulls may be arranged and cross breeding of our cows undertaken at least in all the urban areas and their surroundings to start with.

Hill Areas—

In my sojourn in hilly areas of Himachal and Punjab, I found the hill cattle are small in size. This type is not required for heavy work, the patches of cultivable lands being small in hills. But the grasses naturally growing on the hills looked to be succulent and grown well. Thus the hill area seem to be particularly suited for milk bredevelopment work. Cross breeding these animals with jersey breed of bulls will produce excellent results. We can convert by this process the entire northern hilly areas into dairy tracts. The grasses growing in the hills now mostly going to waste may be harvested in time and served as a good cattle feed either by making proper hay or storing them as silage which is now totally absent in all the 2,000 miles of hilly areas on the northern border.

20-3-61

N. SRI RAM REDDY

APPENDIX XXIII

Supplementary note by other members

Shri Reddy, one of the members of the Committee, could not be present at the time of the signing of the report but he has now submitted a 'supplementary note' which is, in fact, a minute of dissent as some of the points referred to by him are not fully in keeping with the recommendations of the Committee.

In his note a number of defects in the working of the Key Village Scheme have been mentioned. These appear to have been picked out from the report and have been made to emphasise that the Key Village Scheme has not at all achieved what it was supposed to have done. In our report all the shortcomings have been discussed in detail and suitable suggestions made to overcome these, wherever necessary. It is, however, incorrect to conclude that the Key Village Scheme has not achieved any results anywhere. On a thorough examination of the scheme and its working in various States we are convinced that this is the only correct approach to the improvement of the country's large cattle population and that the over-all progress of the scheme is satisfactory considering the difficulties under which animal husbandry is practised in this country. Though there have been some shortcomings—and they have already been pointed out in the report—we are convinced that by adopting the measures suggested in the report these can be overcome. As a matter of fact, Shri Reddy had endorsed all these recommendations during the discussions and in his letter forwarding his note of dissent also he states that he generally agrees with them. Therefore, there appears to be no point in his repeating the defects in his note of dissent. Moreover, we find that he has not made any new suggestions for the improvement of the working of the scheme.

The question of over-all availability of feed and fodder has been mentioned. Since, according to the terms of reference of the Committee, we were required to go into the working of the feed and fodder scheme as contained in the Key Village Scheme, there was no question of the Committee examining the over-all position as it exists in the country today. However, the data presented in the note of dissent and the conclusions drawn on the basis of these data do not give a complete picture of the present position. There is, of course, no denying the fact that there is in the country an acute shortage of both roughages and concentrates for sustaining the large cattle population. The question of reducing the number of animals in the country was positively outside the purview of the Committee and hence no recommendations have been made in this regard.

A specific reference to the cost of the Key Village Scheme has been made. In this connection it is mentioned that the jeeps are used for transport of semen alone. This is not so as the jeeps have not only been provided for quick transport of semen, but whenever necessary also for the effective supervision of the scheme and the quick movement of the staff for various purposes. This point has been examined in detail and we are convinced that in the present age of scientific development provision of a jeep for the proper implementation of the Key Village Scheme is extremely essential and without this the scheme work will receive a very serious setback.

Under marketing we have already recommended the establishment of Co-operative Marketing Societies for the rural areas. Any opinion on large sized dairies, like those at Bombay and Delhi, was clearly out of the scope of the Committee.

Keeping in view the basic objective of the Key Village scheme, it would perhaps not be correct to think that the work could be transferred to the Community Development blocks, where only one Veterinary Officer has been provided per block. The Key Village Scheme is meant for intensive development in localised areas and it would not be right to expect these Officers, who have to look not only to cattle but all other activities concerning animal husbandry in the blocks, to do any justice to the working of the Key Village Scheme. It would, therefore, be a very great mistake to hand over this work to the Veterinary Officers in the C.D. blocks.

The question of adopting cross-breeding in the urban areas has been examined by the Committee and adoption of this policy has already been suggested. It would, however, not be correct to recommend that cross breeding should be adopted indiscriminately in all the urban areas of the country. Cross breeding of cattle in the hilly areas is the accepted policy of the Government and already some work is being done in this direction. In the Third Five Year Plan it is proposed to extend this work and take up an intensive cattle development scheme in which cross breeding would be the main plan of work.

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