

**INTERIM REPORT
OF THE
NATIONAL COMMISSION ON
AGRICULTURE**

ON

**POULTRY, SHEEP AND PIG
PRODUCTION THROUGH SMALL
AND MARGINAL FARMERS AND
AGRICULTURAL LABOURERS FOR
SUPPLEMENTING THEIR INCOME**



सत्यमेव जयते

**GOVERNMENT OF INDIA
Ministry of Agriculture
NEW DELHI
AUGUST, 1973**

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SUMMARY OF RECOMMENDATIONS

Need for Augmentation of Animal Products

1. There is at present a large gap between requirements and availability of animal products such as meat, eggs and wool in the country. Therefore, animal production should receive priority attention under the Five Year Plans. (Paragraph 2.7)
Scope of Poultry, Sheep and Pig Production through Small and Marginal Farmers and Agricultural Labourers

2. Poultry keeping has certain special features which favour its large scale adoption by small and marginal farmers and agricultural labourers. The rearing of sheep is similarly confined exclusively to rural areas and a large percentage of sheep flockowners are small and marginal farmers and agricultural labourers. Pig keeping is also mainly in the hands of the poorer sections of the people in the villages. Improvement in the productivity of livestock available with the weaker sections of the people in the rural areas would ameliorate their economic lot. It is, therefore, considered necessary to formulate and implement intensive poultry, sheep and pig development projects, which should be market-oriented and supported with adequate inputs and services to benefit small and marginal farmers and agricultural labourers. (Paragraphs 1.3, 3.2, 3.4 and 3.5).

POULTRY PRODUCTION PROGRAMMES

3. Poultry production and marketing programmes in the districts selected to assist the small and marginal farmers and agricultural labourers should be organised on a package basis, somewhat on the lines of Intensive Egg & Poultry Production-cum-Marketing projects providing for all such inputs as adequate infrastructure, supply of high quality birds, balanced feeds and concentrates, health cover, extension services, storage, processing and marketing. Financial assistance of any kind from government should be primarily directed to the small and marginal farmers and agricultural labourers. (Paragraphs 4.1 and 4.2)

Districts to be Included for Poultry Programmes and Number of Farm Families to be Assisted

4. The State Governments should expand the scope and accelerate the operation of Intensive Poultry Development Projects already functioning in SFDA/MFAL districts with a view

to organising poultry production through as large a number of small and marginal farmers and agricultural labourers as possible. They should examine the extent to which these projects need to be strengthened in respect of technical and extension staff and inputs, such as hatchery facilities, feed supply, cold storage, transport, health cover, and provide these as early as possible. Similar poultry development programmes should be taken up in SFDA/MFAL districts which could be linked up with Intensive Poultry Development Projects functioning in the nearby areas and in districts which offer scope for poultry production and marketing. The State Governments should also take up poultry production programmes with a view to assisting small and marginal farmers and agricultural labourers in a number of districts which are not covered by SFDA/MFAL projects but offer good scope for poultry production and marketing in large cities and towns and/or industrial areas located in or near these districts. The State Governments should study in detail the feasibility of poultry production in these districts and formulate projects for implementation. In each of the districts, selected the programme should envisage assistance to at least 3,000 families of small and marginal farmers and agricultural labourers. If poultry programmes are implemented in 167 districts recommended in this Report, nearly half a million families of small and marginal farmers and agricultural labourers could be assisted to supplement their income and improve their economic status. (*Paragraphs 4.8 and 4.9*)

Size of Unit

5. The size of poultry units to be started by each family should be such that it would ensure reasonable financial returns to the farm families and at the same time enable enrolment of as large a number of farm families as possible. It is recommended that, in general, assistance should be extended for starting units of 50 layers with each family of small and marginal farmers and agricultural labourers. It is further recommended that medium term loans for poultry enterprise should be at least for a period of five years. (*Paragraph 4.11*)

Production and Supply of Birds

6. Each project should work out in advance the approximate requirement of birds of different age groups that would be needed by farmers likely to be identified and enrolled. The State Departments of Animal Husbandry should take necessary steps for the production and rearing of adequate number of

birds and making them available to the farmers at the appropriate time. For this purpose, the State Departments of Animal Husbandry should strengthen the existing poultry farms with additional facilities in terms of personnel, buildings, equipments, funds etc. The possibilities of entrusting the production of poultry birds of different age groups to reliable progressive private poultry breeders should also be explored. (*Paragraphs 4.13, 4.14 and 4.15*)

Health Cover

7. In order to advise the farmers how to maintain proper health and sanitation of the poultry units and minimise losses due to diseases, it would be necessary to strengthen the veterinary services in these project areas by posting extension veterinarians specially trained in poultry diseases. The poultry disease investigation staff of the Departments of Animal Husbandry should periodically visit these project areas to identify disease problems so as to take effective steps to check infection and poultry losses. (*Paragraphs 4.24, 4.25 and 4.26*)

Training of Farmers

8. The training of farmers identified for poultry rearing should be arranged in batches in a suitable farm/extension centre. Special training should be arranged for womenfolk from the families of poultry farmers. The training should be backed with intensive extension support to advise farmers on their own farms. (*Paragraph 4.27*)

Financial Assistance

9. The farmers who are advised to start the poultry operation with day-old chicks should be provided with subsidy and loan to meet the cost of feeding young chicks up to the laying stage. Financial assistance in the form of loan and subsidy should also be provided to these farmers at the end of one year to enable them to invest on the production of the second batch of birds up to the laying stage, so that they will be ready by the time the first batch of birds are disposed after one year's lay. (*Paragraphs 4.28, 4.29 and 4.30*)

10. Any programme implemented for sustaining small and marginal farmers and agricultural labourers in poultry raising should have an inbuilt mechanism to keep a watch over the feed cost and egg price and to help them maintain a suitable feed cost/egg price ratio. This means that whenever there is

an abnormally high rise in feed price but no corresponding rise in egg price, the feed supply to these farmers should be adequately subsidised. (*Paragraph 4.31*)

Poultry Cooperatives—Functions and Assistance Needed.

11. Poultry Farmers' Cooperative Societies should be formed on a block/tehsil level basis with the enrolment of small and marginal farmers and agricultural labourers as members with the aim of organising poultry production in contiguous blocks of villages which are linked by all-weather roads. These Societies should look after functions relating to all aspects of poultry production and marketing. They should have a close liaison with the Farmers' Service Societies (as recommended in the Interim Report on 'Credit Services for Small and Marginal Farmers and Agricultural Labourers') so that the latter could take care of short and medium term credit requirements, while the poultry cooperatives would undertake the recovery of loans from sale proceeds. A district Union comprising the Poultry Producers' Societies may be organised to provide them with marketing assistance and to look after supervision and coordination. (*Paragraph 4.33*)

12. The Poultry Farmers' Cooperative Societies should, as far as possible, utilise the transport facilities, cold storage and distribution centres already developed by the dairy organisations in the districts, because such an arrangement would greatly economise on overhead costs on transport, storage, retail marketing etc. These Societies should also explore various possibilities for promotion of egg consumption and for increasing market demands for eggs and poultry. (*Paragraph 4.34*)

13. The Poultry Farmers' Cooperative Societies should be provided with financial assistance by the Government and credit giving agencies in the form of credit and subsidy to meet capital costs, working capital, operational expenditure on marketing, salary of managerial staff and loans to members for poultry production. (*Paragraphs 4.35 and 4.36*)

SHEEP PRODUCTION PROGRAMMES

14. Programmes for improving the quality and productivity of sheep in regard to wool production with the small and marginal farmers and agricultural labourers should primarily aim at replacement of indigenous types of sheep with crossbred progenies having exotic inheritance produced by the farmers themselves and/or to a limited extent by supply of crossbred ewes and rams from other sources. (*Paragraphs 5.5 and 5.6*)

Sheep Breeding Policy

15. The breeding policy, breeds of exotic sheep that should be used for crossbreeding and the level of exotic inheritance to be fixed in the resultant progenies would vary in the different agro-climatic regions of the country. The policy would broadly include crossbreeding with exotic breeds for fine wool production in certain areas and for production of dual purpose sheep in some others. Selective breeding within indigenous sheep should be encouraged in areas where sheep are known for their carpet quality wool. Improvements in mutton type sheep should be through grading up or selective breeding within the indigenous breeds in the initial stages which could later on be changed to crossbreeding with suitable exotic mutton breeds. (Paragraphs 5.6, 5.7 and 5.8)

16. As the studies so far made and experiences gained on crossbreeding of sheep for mutton production are very meagre, it is recommended that research programmes should be initiated in different regions of the country to find out the suitability of a number of exotic breeds of sheep for crossbreeding with local types for improving mutton production. Experimental studies may also be taken up in a number of large sheep breeding farms of the Animal Husbandry Departments. (Paragraph 5.7)

Districts to be Included for Sheep Programme and Number of Farm Families to be Assisted

17. Intensive sheep development programmes through small and marginal farmers and agricultural labourers should be taken up in SFDA/MFAL districts located in sheep breeding tracts and/or in those districts which can be easily linked up with Wool Grading and Disposal Centres and/or large mutton consuming markets in cities and large towns. Sheep production programmes with a view to assisting the small and marginal farmers and agricultural labourers should also be taken up in a number of districts other than SFDA/MFAL districts which offer good scope for sheep production and marketing of wool and mutton. The State Governments should study in detail the feasibility of sheep production in these districts and formulate suitable projects providing the necessary infrastructure, inputs and services. In each of the districts selected, the programme should envisage assistance to at least 3,000 families of small and marginal farmers and agricultural labourers. If sheep programmes are taken up for implementation in 140 districts recommended in this Report, nearly 4,20,000 families of small and marginal farmers and agricultural labourers could

be assisted to supplement their income and improve their economic status. (*Paragraphs 5.9, 5.10 and 5.11*)

Production and Supply of Improved Quality Sheep

18. The programmes proposed above would need a large number of improved indigenous ewes and rams and also pure-bred exotic and crossbred sheep with different levels of exotic inheritance. The State Departments of Animal Husbandry should work out the actual requirements of these types of ewes and rams and assess their likely availability from various sources. To meet the gap between the demand and availability of woolly sheep, special programmes should be taken up for cross-breeding of sheep in selected sheep breeding tracts such as Jammu & Kashmir, Himachal Pradesh, hilly regions of U.P., Rajasthan and Gujarat. For mutton type sheep, intensive selective breeding should be adopted in the States of Mysore, Tamil Nadu and Andhra Pradesh. (*Paragraphs 5.13 and 5.14*)

19. Special attempts should be made for improving the quality of grasslands used for grazing sheep in the districts where sheep development is proposed to be undertaken. The village panchayats should be given adequate financial assistance and technical guidance by the State Governments for developing the grasslands through fencing, reseeding and application of fertilizer. Wherever necessary, the panchayats may be urged upon to hand over common village grasslands to the concerned State Department for development. The grasslands after development may be returned to the panchayats for maintenance. Attention to this important aspect of development of grazing lands should be paid especially in the States of Rajasthan, Gujarat, Mysore and in the hilly areas of Jammu & Kashmir, Himachal Pradesh and Uttar Pradesh. (*Paragraph 5.15*)

20. It has been estimated that for increased production of wool and mutton the quality of pastures available in the country may not be adequate and supplementation of concentrate feeds or good legume fodder would be necessary. Having noted that sufficient information is not at present available on the economics of supplemental feeding for sheep, the Commission recommends that detailed studies should be taken up on this aspect so that sheep flockowners could be convinced of the economic benefits or otherwise of increasing wool and mutton production with such supplementary feeding. (*Paragraph 5.16*)

Health Cover

21. Implementation of intensive sheep rearing programmes involving large numbers of improved indigenous and crossbred sheep would need an effective health coverage. In order to facilitate timely detection and control of sheep diseases, extension veterinarians posted in these districts should have received specialised training in the diagnosis and control of sheep diseases. They should be assisted by the disease investigation staff of the Departments of Animal Husbandry from time to time in identifying the special disease problems and taking effective control measures. (*Paragraph 5.17*)

Training of Farmers

22. It would be necessary to arrange for the special training of farmers who are identified for sheep production programmes. This training should include, apart from breeding and management practices, improved methods of shearing, classification and grading of wool for the market. (*Paragraph 5.19*).

Marketing Facilities

23. As production of quality wool progressively increases, arrangements should be made for its maximum utilisation in the districts themselves through local cottage industries. Equipments, machinery and development of intermediate technology for utilisation of improved wool, should be arranged by the State Small Scale Industries Departments. Production of woollen goods and handwoven woollen carpets should be linked up with the schemes of Handicrafts or the Khadi Boards functioning in these areas. These Boards could give advice on the types and patterns of goods to be produced and assist in the marketing of products. (*Paragraph 5.20*)

Breeders' Cooperatives

24. Sheep Breeding-cum-wool Marketing Cooperative Societies should be organised at the primary level with the small and marginal farmers and agricultural labourers enrolled as members. The functions of these Societies should cover every phase of activity of sheep production and marketing of wool and/or mutton. These primary Societies may be federated into a Union at the district level. As recommended in the case of poultry breeders' cooperatives, the Government and other credit

giving agencies for agriculture should provide financial assistance and production credit to the sheep breeders' cooperatives. (*Paragraphs 5.21, 5.22 and 5.23*)

PIG PRODUCTION PROGRAMMES

25. Pig production through small and marginal farmers and agricultural labourers can be made more remunerative if the local types of pigs owned by them could be gradually replaced by crossbred or purebred exotic stock. As far as possible, the replacement of indigenous pigs should be aimed at through production of crossbred pigs by these farmers themselves. (*Paragraphs 6.5 and 6.6*)

Districts to be Included for Pig Production Programme and Number of Farm Families to be Assisted

26. Intensive pig production programmes through small and marginal farmers and agricultural labourers should be taken up in SFDA/MFAL districts which could be linked up with the existing bacon factories and/or to the proposed new bacon factories under the Fifth Five Year Plan. Such of the SFDA/MFAL districts as offer good scope for piggery development by virtue of being located in areas of pork consumption should also be identified for intensive piggery programme. In addition to the SFDA/MFAL districts, the State Governments should initiate pig production programmes in a number of districts which offer good scope for pig production and marketing of pork and pork products with a view to assisting small and marginal farmers and agricultural labourers. The State Governments should study in detail the feasibility of pig production in these districts and formulate detailed projects with provision for necessary inputs, services and infrastructure. In each of these districts the programme should provide assistance for about 2,000 families of small and marginal farmers and agricultural labourers. If intensive pig production programmes are taken up for implementation in 100 districts recommended in this Report, nearly two lakh families of small and marginal farmers and agricultural labourers could be assisted to supplement their income and improve their economic status. (*Paragraph 6.8*)

Production and Supply of Improved Pigstock

27. The State Governments should assess the requirement of improved pigs for these projects and the present production capacity of the pig breeding farms and centres. For meeting the

additional requirements of pigs, the State Government Farms should be adequately strengthened with stock, buildings, equipments, personnel and funds. It is recommended that special programmes should be implemented for intensive crossbreeding of pigs with exotic breeds in areas where pig rearing is already popular, such as Haryana, Andhra Pradesh, Uttar Pradesh, Coorg and Goa. (*Paragraph 6.9*)

28. In the hilly areas of the north-eastern region where pig production and pork consumption are popular, there is shortage of black breeds of pigs, preferred by the local people for breeding purposes. The Ministry of Agriculture should, therefore, pay special attention to arrange for importation of black exotic breeds of pigs on priority basis and arrange for their multiplication in farms located in this region. (*Paragraph 6.11*)

Feed Supply

29. The pig farmers should be educated and induced to rear and feed their pigs in an hygienic manner. They should be induced to feed their stock with locally available feed stuffs such as kitchen wastes, seeds, chunis, whey etc. supplemented with concentrate feed mixtures, so that the pigs would show optimum growth and production. The feed mixing plants manufacturing poultry and/or cattle feeds should undertake preparation of pig feeds and their supply to the farmers at reasonable prices. (*Paragraph 6.14*)

Health Cover

30. Adequate measures are required to be taken up to protect improved types of pigs against foot and mouth disease. It is reported that the vaccine available for protection of cattle against foot and mouth disease is not quite efficacious for protecting pigs. Therefore, the Indian Veterinary Research Institute should intensify researches on foot and mouth disease in pigs and on the production of an efficacious and inexpensive vaccine. (*Paragraph 6.16*)

31. The State Governments should plan for (a) establishment of small pork processing plants, (b) improvement in the facilities for slaughter of pigs in the existing slaughter houses and/or (c) construction of separate pig slaughter houses in pig breeding districts to facilitate marketing of pork. (*Paragraphs 6.20 and 6.21*)

Cooperation and Marketing

32. In order to avoid exploitation of the poor pig breeders by middlemen traders it is necessary that the breeders should be organised to form Pig Producers'-cum-Marketing Cooperative Societies to ensure at the initial stages better breeding and feeding of stock and collection and marketing of pigs owned by society members. At a latter stage, these cooperatives could jointly undertake slaughtering of pigs and processing of pork and pork products. (*Paragraphs 6.22 and 6.23*)

33. The State Governments should assist Pig Producers Cooperative Societies by providing technical staff and managerial competence and extend financial assistance on a special basis to meet capital costs and operational expenditure on marketing management. (*Paragraphs 6.23 and 6.24*)

Coverage, Credit and Organisation

34. It is understood that the Cooperative Banks have agreed to extend on personal surety medium term loans upto Rs. 2,000 for dairying and poultry and upto 1,000 for other purposes. This credit limit would not be sufficient to cover completely the capital costs required for the starting of sheep and pig units recommended for small and marginal farmers and agricultural labourers. The Cooperative Banks should consider enhancing the medium term loan on personal surety upto Rs. 2,000 for sheep and pig producers also. (*Paragraph 7.3*)

35. Animal husbandry programmes recommended for assisting small and marginal farmers and agricultural labourers should be implemented as separate projects in the districts proposed. The responsibility for organising and guiding the programmes should be vested with the State Animal Husbandry Departments which should work in close liaison with the Development Agencies for small and marginal farmers and agricultural labourers, wherever they exist. For proper formulation of projects and successful implementation, there should be special project cells both in the State headquarters of Animal Husbandry Departments and in the Animal Husbandry Division of the Union Ministry of Agriculture. (*Paragraph 7.4*)

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SECTION I

INTRODUCTION

1.1 The terms of reference of the National Commission on Agriculture, *inter alia*, include the 'development of animal husbandry both for providing nutritious diet to the population, draft power for agricultural operations and income and employment opportunities to the rural population'. The Commission is examining the overall development of animal husbandry envisaged in this term of reference in depth covering various aspects and will present detailed observations in its Final Report. The Commission is, however, required to make interim recommendation to the Government on another term of reference. This relates to the study of 'the problems of small farmers and agricultural labourers viewed in the context of social justice and equality of opportunity and as a factor in securing effective participation of the bulk of the Indian peasantry in stepping up agricultural production'. Therefore, it has become expedient to study, in advance, the scope and the need for developing animal husbandry to improve the economic lot of small and marginal farmers and agricultural labourers. The Commission has already given an Interim Report on 'Milk Production through Small and Marginal Farmers and Agricultural Labourers' and in this Report other aspects of livestock production such as poultry raising, sheep rearing and pig keeping are dealt with.

1.2 Livestock rearing has remained mainly as an occupation of the rural areas in the country and it is practised as a mixed farming complement along with crop production. It is well known that Indian agriculture is dependent on bullock power in the major part of the country. Milk production has been largely a byproduct industry in the rural areas. Poultry keeping is also a rural occupation except for the recent commercialisation of this industry around a number of cities and towns. Rearing of sheep is also confined exclusively to rural areas.

Pig keeping though in a sadly neglected stage, still continues to be mainly in the hands of the poorer sections of the people in the villages. Most of the people engaged in raising of cattle, poultry, sheep and pigs in the rural areas are having incomes which are hardly sufficient to enable them to obtain even the minimum necessities of life. The members of their families are mostly unemployed or under-employed and they could take up subsidiary occupations to supplement their meagre income, if opportunities are created. Therefore, dairying, poultry keeping, sheep rearing and pig raising could be encouraged as suitable subsidiary occupations with these sections of people to enable them to augment their income and bring them above the poverty line. It is, however, to be realised that the existing traditional systems of animal husbandry production are not always remunerative because of low productivity of the stock maintained by these farmers at present. However, with the adoption of improved methods of animal husbandry such as better breeding and feeding, proper management and disease control measures and remunerative marketing of produce these occupations will become more remunerative. No doubt, the cost of better feeding and raising of improved stock will be higher but the returns will also be proportionately larger. The Commission, therefore, considers that improvement in the productivity of livestock and their raising through the weaker sections of people in rural areas can be relied upon as a major instrument for effecting social change by improving the income of these people. Further, increased livestock production will occur mainly in the rural areas resulting in additional income in rural sector. This will help in reducing the disparities between the per capita incomes in the rural and urban sectors. The Commission has already submitted an Interim Report on 'Milk Production through Small and Marginal Farmers and Agricultural Labourers'. In view of the great scope offered by other livestock occupations such as poultry raising, sheep rearing and pig keeping in improving the economy of small and marginal farmers, the Commission decided to deal with these aspects of livestock production through small and marginal farmers and agricultural labourers in a separate Interim Report.

1.3 Development of poultry, sheep and pigs would, apart from improving the availability of livestock products, such as eggs and poultry for table, wool and mutton, pork and other pig products, offers great potentiality in providing employment to the producers and members of their families and village artisans provided the programmes are properly organised and supported with adequate inputs and services for improved breeding, better feeding and adequate animal health cover. Even at

present, livestock enterprise in India is, by its very nature of functioning, labour distributive. In every farmer's family the various aspects of livestock work are looked after by different members of the family. Even in the processing and marketing of the products more persons are involved in this country than abroad. As a result, the benefits from livestock enterprise get distributed over a large number of persons.

1.4 The income elasticity of demand for the livestock products mentioned above is high and it is likely that this demand will grow at a faster rate. With the advancement in the technology relating to livestock husbandry, a rapid growth in the production of these products can be anticipated. Within the overall rate of growth, it should be the aim of the economic policies and programmes to ensure that the small and marginal farmers and agricultural labourers who are below the poverty line share larger proportion of this benefit. One more important consideration that has to be kept in view is the availability of all the year round market for livestock products. However, unlike in the case of milk, the demand for some of these products, viz., eggs and meat would have certain limitations and fluctuations even in large cities and industrial townships. The programmes meant particularly for helping the small and marginal farmers and agricultural labourers have to be evolved and formulated keeping this aspect in view. No doubt, efforts should be made for improving the market for these products. But at the same time, the programmes should be carefully drawn up so that the production keeps pace with the market demands.

1.5 The Commission collected through a questionnaire from the State Governments available information regarding programmes on poultry, sheep and pig development under the Small Farmers and Marginal Farmers Development Agencies *vide* Appendix I. The Commission also studied the progress achieved by the Surat District Poultry Cooperative Society. Discussions were also held with a number of officers concerned with poultry, piggery and sheep development in the Government of India, Indian Council of Agricultural Research and the State Governments. Based on the discussions held and the information collected, the Commission has analysed the potential and scope offered by poultry, sheep and pig rearing as suitable occupations for supplementing the income of small and marginal farmers and agricultural labourers. Various suggestions and several recommendations have been made in this Report which if implemented early will result in an additionality of income to the weaker sections of farmers and labourers in rural areas which is the social objective aimed under five year plans.

SECTION II

NEED FOR AUGMENTATION OF PRODUCTION OF EGGS AND POULTRY, MUTTON AND WOOL AND PORK AND PORK PRODUCTS

2.1 The problem of undernutrition and malnutrition in our country has already been dealt with in some detail in Section II of the Interim Report of the Commission on 'Milk Production through Small and Marginal Farmers and Agricultural Labourers'. Malnutrition is almost endemic in many parts of rural India. Studies made at the National Institute of Nutrition, Hyderabad, have shown that it is mostly a case of protein-calorie malnutrition. In the diets of the poorer sections of people in the rural areas, the shortage is mainly of animal protein. Apart from the inadequacy of total proteins, there is also deficiency of some of the essential proteins necessary for making the diet balanced. There is an urgent need for augmenting the production of foods of animal origin which are rich in proteins of high biological value. These constitute foods like milk, meat, eggs, fish etc. The position regarding the availability of milk in the country, the likely demand for milk in the coming decades and the programmes that are needed for narrowing this gap have also been dealt with in some detail in the Commission's Interim Report on Milk Production. In the present Report, the need for augmenting other animal products such as eggs, poultry, mutton, pork and pork products is emphasised.

Present Availability and Targets for Egg Production

2.2 Eggs and poultry meat are well known as foods of high biological value. In the recent past, there has been considerable increase in poultry population in India. According to the Indian Livestock Census, there were 94.75 million poultry in 1956. This number rose to 115 million in 1966. The proportion of improved types of birds also rose by a little over 100% i.e., from 4.245 million in 1961 to 8.880 million in 1966. According to the Report on the Fourth Five Year Plan the production of eggs increased from 4,100 million in 1965-66 to 5,300 million in 1968-69. It has been estimated that the production of eggs in 1971-72 was 6,040 million. It is anticipated that the programmes now in operation may enable a production of 8,000 million eggs in 1973-74. When this target is achieved the annual per capita availability would be

about 12 eggs. A demand projection for eggs on the basis of income elasticity and other factors has been attempted by the Commission's Working Group on 'Projections of Demand and Supply for Selected Agricultural Commodities'. According to the calculation of this Group, if per capita consumption of eggs in the year 1971 is taken as 100 in rural and urban areas, the rural index in 1981 will be 159 and the urban index will be 202. The consumption of eggs in 1981 will, therefore, be about 17.5 eggs per head per year in rural areas and will be about 22.2 in urban areas. For an expected human population of 493 millions in rural areas and 167 millions in the urban areas in 1981, the total annual requirements of eggs would be about 12,500 million. This would leave a gap of 4,500 million eggs between the anticipated production in 1973-74 and the projected demand in 1981. Therefore, the main thrust under poultry development in the Fifth Five Year Plan will have to be directed towards achieving this production target.

Present Availability and Targets for Mutton Production

2.3 According to the Nutrition Advisory Committee of the Indian Council of Medical Research, three ounces or 85.2 gm of fish and meat is the minimum requirement for a balanced diet. An attempt has been made to make an empirical study* on the present availability and projected demand of mutton during the Fifth Plan period. It has been estimated on certain assumptions regarding the percentage of non-vegetarian population, the proportion of mutton in the non-vegetarian part of the diet, elasticity co-efficient, consumption expenditure, contemplated average income growth and other factors that the effective economic demand for mutton and goat meat in 1979 will be about 1.94 kg per capita per annum. This works out to a total annual requirement of 646.0 million kg of which mutton from sheep would be 258.4 million kg and of goat meat 387.6 million kg. It has been estimated that in 1972 the production of mutton from sheep would have been around 114.84 million kg and of goat meat about 255.39 million kg. This indicates the large gap between the anticipated demand in 1979 and the actual availability in 1972 of meat from sheep and goats.

2.4 Pigs have been an important source of meat in a number of thickly populated developing countries in South East Asia and in many other affluent countries in the West. But in India pork and pork products are estimated to constitute less than 10

*Note prepared by Agricultural and Irrigation Division of the Planning Commission, Government of India.

per cent of the total meat production in the country. Increased pork production would go a long way in our efforts in narrowing down the gap between the availability and demand for meat and meat products. Pork, like all lean meats, is an important source of high quality protein and provides a considerable amount of iron and niacin. Pork is also specially important for its thiamine content. A 3½ oz (99.4 g) serving of cooked pork (without bones) provides about one-fourth of the protein and iron, about half of the thiamine and two-fifths of the niacin equivalent recommended as the daily allowance for a young male adult. Consumption of pork could be popularised if pig rearing is undertaken under proper sanitary conditions.

Present Availability and Targets for Wool Production

2.5 Another important animal product which contributes a large share to the rural economy and rural employment is wool. The sheep population and the estimated wool production from 1951 are given in table below :

Year	Sheep population according to Live-stock Census (Million)*	Estimated wool production (million kg)@
1951	38·96	27·54
1956	39·26	28·74
1961	40·22	32·72
1966	42·01	34·96
1971 (Projected)	44·00	37·14

2.6 Of the wool produced in the country 43% is of apparel type and 57% of carpet quality. Of the 43% apparel quality wool, only 15% is of the combing type and 28% is useful for woollen apparel. Though the country is self-sufficient with regard to wool for carpet and khadi and woollen manufactures, there is a great shortage of wool of apparel quality. The Sub-Group of the Commission on Sheep and Goat Development has estimated the future requirement of scoured wool for the worsted sector based on

*Indian Agriculture in Brief, Eleventh Edition, 1971 Directorate of Economics and Statistics, Ministry of Agriculture, New Delhi.

@Directorate of Marketing and Inspection, Ministry of Agriculture (unpublished data).

utilisation of installed capacity on a two-shift basis to be around 34 million kg against the present availability from internal production of 3.6 million kg of wool of combing quality. The gap would, therefore, be of the order of 30 million kg.

2.7 From what has been mentioned above, it would be obvious that there is large gap between requirements and availability of animal products such as eggs, poultry for table, mutton and wool. The Commission, therefore, recommends that animal production in the country should receive priority attention and massive programmes for increasing the productivity of poultry, sheep and pigs should be planned and implemented as early as possible. Such efforts, if implemented through small and marginal farmers on a mixed farming basis, will help in achieving the twin objectives of diversification of agriculture and improving the economic lot of these people. This has to be considered in the light of the disquieting fact that a large proportion of rural families in the country is forced to have a living much below what can be taken as a minimum need level. Dr. V. M. Dandekar and Nilakantha Rath* have pointed out that 40% of the rural population is having an income which does not allow them to meet the minimum need level. This minimum level itself is fairly low. Elimination of poverty has been assigned the highest priority in the 'Approach to the Fifth Five Year Plan'. This requires that the large number of people living below the poverty level must be enabled to have access to the minimum private consumption estimated at about Rs. 37 per capita per month at 1971-72 prices.

*V.M. Dandekar and Nilakantha Rath—'Poverty in India'—1971.

SECTION III

SCOPE OF POULTRY, SHEEP AND PIG PRODUCTION FOR PROVIDING SUPPLEMENTARY INCOME TO SMALL AND MARGINAL FARMERS AND AGRICULTURAL LABOURERS

Scope for Poultry Production through Small and Marginal Farmers and Agricultural Labourers

3.1 Poultry production offers great scope and has a large potentiality for quickly increasing the supply of quality protein in the dietary of our people as poultry population could be increased quantitatively and improved qualitatively in a comparatively short time. Organised poultry development on commercial lines has so far been mainly restricted to areas in and around large cities and towns. This is due to the fact that increased demand and consumption have been in urban areas and industrial townships. This has encouraged comparatively rich and commercial minded entrepreneurs to take up poultry raising on a large scale. But the bulk of poultry population in the country is still in the rural areas and in the hands of poor peasants and agricultural labourers who keep small flocks of 5 to 10 birds. The birds with them are usually of 'desi' type yielding 50 to 60 eggs a year. These are mainly kept for meeting farm family requirements of egg and poultry meat and for sale in the local markets to supplement their income. A suitable programme of improved poultry production through a large number of small and marginal farmers and agricultural labourers in the rural areas would go a long way in improving their economic lot. Such a programme would help in augmenting the production of eggs and poultry meat for which there is an increasing demand in the urban areas and industrial townships. Poultry farming offers opportunities for utilising farm family labour for their economic benefits. Increased production of egg and poultry meat in rural areas would, to some extent, help in their increased consumption by the rural folk thus improving their dietary. Small sized and broken eggs as well as unthrifty birds produced would be difficult to market and could be used only for home consumption by the producers. The consumption is also expected to increase with the easy availability at hand.

3.2 Poultry farming has certain special features which favour its large scale adoption by small and marginal farmers and agricultural labourers. Land required for poultry farming is very little; the capital investment for starting a poultry unit is not very

large and poultry farming can be started on a small scale and expanded gradually. Poultry could be raised successfully under all agro-climatic conditions in the country. Poultry farming has a greater flexibility, and can be adjusted as per market situation without very much upsetting other programmes of the farmers. The influences of varying physical environmental conditions on poultry raising are not very large and these could be reduced to a large extent by adopting suitable management systems. Poultry housing can be built with locally available materials and equipments for feeding, watering etc., could be manufactured in the villages with the help of local artisans. Brooding equipments are also easily available within the country. With rapid improvements being made in private and government poultry farms, quality stock of different ages such as day-old chicks, grower-pullets and ready-to-lay birds are easily available in large numbers. Poultry could make use of coarse grains and agricultural byproducts such as rice polish, bran etc., as feed. Good progress is being made within the country in the manufacture and distribution of balanced feeds and concentrate mixtures. An additional advantage in poultry farming is that the capital invested starts paying back within a short interval. This enterprise ensures a steady income throughout the year. Deep litter system of poultry raising would make available valuable manure. As farmers and agricultural labourers have some experience of keeping poultry they could be trained to manage successfully small units of improved birds under proper system of feeding, rearing etc. When the production of coarse food-grains is increased to a considerable extent as a result of intensive agricultural practices, poultry farming offers an outlet for their profitable utilisation.

Scope of Sheep Production through Small and Marginal Farmers and agricultural labourers

3.3 The surveys conducted by the Institute of Agricultural Research Statistics on the estimation of wool production in different regions of the country have shown that a large percentage of the sheep flockowners fall under the category of small and marginal farmers and landless people. The detailed break-up showing the percentage of flockowners possessing different sizes of land in the States of Gujarat, Himachal Pradesh, Andhra Pradesh, Mysore and Rajasthan is furnished in Appendix II. In Joria region of Gujarat State (1964-65) 66.4% of the flockowners had no land and 17.8% had land up to 3.2 hectares each. In the sheep breeding areas of Himachal Pradesh (1962-63) 4.7% of the flockowners were landless while 75.5% possessed 2 hectares or less. In Andhra Pradesh (1963-64) 10.6% of the flockowners

were landless while 39.8% possessed 2 hectares or less. In Rajasthan (1960-61) 4.9% of the flockowners were landless and 41.5% had 4 hectares or less. In Mysore (1961-62) 5.6% of the sheep flockowners had no land and 42.9% possessed 2 hectares or less.

3.4 The Commission obtained information on the status of sheep rearing as a subsidiary occupation in the districts covered by SFDA/MFAL projects and on various schemes prepared under these projects to help these sections of people to improve their sheep raising practices. From the information received, it is observed that sheep rearing is mostly in the hands of backward classes of people like Gadarias, Rabaries, Gujars, Yadavs, Bhils, Bharwars, Kurumbars etc. Majority of these shepherds are landless in States like Haryana and Punjab. It has already been mentioned that the productive capacity of their sheep, whether woolly or mutton type, is low. Therefore, an intensive development programme to improve the quality of their sheep by the adoption of better breeding, feeding, management and disease control practices supported with facilities for proper utilisation and marketing of wool and mutton would go a long way in improving their economic lot. In addition, small and marginal farmers could also be induced to take to sheep raising as a subsidiary occupation on a mixed farming basis to supplement their income. Sheep rearing can easily be introduced in a mixed farming operation as sheep are well adapted to different agro-climatic regions excepting heavy rainfall areas. Sheep give two kinds of produce every year, namely, wool and lambs for market. Wool unlike milk and eggs, can be stored and held in stock, if necessary for favourable market prices. Lambs could be marketed at the age of 6 to 8 months thereby bringing quick returns. Sheep are capable of consuming different kinds of herbage and they are good consumers of weeds. Sheep droppings improve the fertility of soil considerably and penning of sheep in harvested fields brings in additional income to the flockowners. Sheep rearing does not require any large investment in buildings and equipment and therefore, offers good scope for exploitation by the small and marginal farmers and agricultural labourers.

Scope for Pig Production through Small and Marginal Farmers and Agricultural Labourers

3.5 Pigs are good converters of farm byproducts and kitchen wastes and with some supplemental feeding with coarse grains they are capable of producing quality pork. Improved pig rearing could, therefore, be made into a profitable subsidiary occupation for improving the lot of a large number of economically

backward families in the rural areas. The Questionnaire sent by the Commission to all State Governments included pig rearing in the districts covered by SFDA/MFAL projects. It called for information on piggery schemes proposed under these projects to assist small and marginal farmers and agricultural labourers. The Questionnaire relating to pig rearing is given in Appendix I(c). The replies received confirm the fact that at present pig keeping is mainly in the hands of backward communities such as Balmikis, Harijans, Sweepers, Dhammans, Voddars and with the tribals. Most of these families already own small herds of pigs of local nondescript types. The Commission is of the view that if a suitable programme is undertaken to replace the nondescript pigs by improved types it would go a long way in ensuring better economic returns to these people.

SECTION IV

POULTRY PRODUCTION PROGRAMMES

Prerequisites for a Successful Poultry Programme

4.1 From what has been mentioned in the previous Sections, it would be clear that poultry raising has potentialities as a subsidiary occupation to improve the economic lot of a large number of small and marginal farmers and agricultural labourers. However, it is imperative that any project recommended for encouraging these sections of farmers to take to poultry raising should ensure remunerative returns. This would be possible only if each project is linked up with a ready and remunerative market for eggs and poultry. The absorption capacity of the market would determine the size and extent to which poultry raising could be introduced in the rural areas. In such areas it would be necessary to avoid competition from large commercial type poultry operations. As far as possible, financial assistance extended from government sources should be directed to the small and marginal farmers and agricultural labourers. The size of the poultry unit with each of these farmers should be such that it could largely utilise the surplus farm family labour and also ensure a level of income which would enable them to pay back the credit obtained and leave a reasonable surplus for their own family use. Another important prerequisite for the success of this programme is to ensure supply of highly productive stock adaptable to rural conditions. It would also be necessary to evolve suitable economic feeding programmes for poultry. As far as possible, maximum use of locally available surplus coarse grains and agricultural and industrial byproducts should be made. As deep litter system should largely be adopted, supply of balanced feed and/or poultry feed concentrates in adequate quantities throughout the year is a must. The programme should include adequate arrangements to prevent losses in poultry through diseases. Above all, it would be necessary to organise or strengthen egg collection, storage, processing and marketing facilities. Such an integrated approach to poultry farming would profit the producers to the maximum extent, if organised on co-operative lines. Such an approach has already led to some success in Surat (Gujarat); Ajmer and Udaipur (Rajasthan) and Hubli-Dharwar (Mysore).

Surat District Poultry Producers' Co-operative Society—a Brief Review

4.2 In Surat District, egg production and marketing have been organised in a large way through the Surat District Poultry

Farmers' Cooperative Society Limited. This Society started functioning in November 1970 and by 1972 it had about 225 members located in nearly 90 villages. Even though the members have not been classified as marginal farmers, small farmers and big farmers, it has been reported that about 100 members fall in the category of small and marginal farmers. Every member is expected to be a poultry producer and the share capital per member has been fixed at Rs. 100. The main activity undertaken by the Society is extension of short term credit to members, collection and marketing of eggs and supply of mixed poultry feed. This Society has taken over the sole distributorship in Surat district for sale of poultry feed prepared by the Surat Milk Union Ltd., popularly known as SUMUL. Eggs are collected once in every 2 or 3 days with the help of the trucks owned by the Society. The average storage period of eggs in the godowns of the Society located at the village Chaulthan is about 3 days. The Society arranges to send eggs in bulk to Bombay market every other day. It was transporting only about 20,000 eggs a day during November 1970 which increased to about half a lakh eggs a day in October 1972. During the year 1971-72, the turnover of the Society included Rs. 24 lakhs by sale of eggs and Rs. 2 lakhs by sale of feed and medicines. In 1972-73, in the course of a period of four months alone, sale of eggs went upto 30 lakhs of rupees and it was expected that a turnover of one crore of rupees might be reached within the year. As it is able to command a fairly good share of the Bombay market, the Society feels that in course of time it could collect and despatch one lakh eggs a day. The payment to the producers is made once in every 10 days and the members are able to share the profit as bonus on the basis of total birds and eggs supplied to the Society for marketing.

4.3 The share capital of the Society is Rs. 1,17,000 and it has a fixed deposit of Rs. 1,27,000 and it has been sanctioned an overdraft limit from the Central Cooperative Bank up to Rs. 6 lakhs. The Society has, in additions, investments as shares in the Central Cooperative Bank to the tune of Rs. 44,600. The State Government has so far provided Rs. 40,000 as share capital and a nominal subsidy of Rs. 1,000 to meet managerial costs. It has obtained a medium term loan for purchase of 5 trucks. The Small Farmers Development Agency authorities have provided Rs. 60,000 for purchase of 2 trucks on the condition that the Society arranges collection and transport of eggs from the Small Farmers Cooperative Society free of cost. It arranges for purchase, transport and sale of culled poultry but has not undertaken so far the responsibility of purchase and supply of birds for rearing to the members because such a necessity has not arisen. However,

it will be seen from the progressive improvement made by the Society that it has been able to provide a market for the eggs produced by its members throughout the year. This has in a big way helped the producers to expand their poultry operations.

Linking up SFDA/MFAL Poultry Programmes with Intensive Poultry Development Projects

4.4 Poultry raising has been included as one of the subsidiary occupations to be encouraged under SFDA/MFAL projects. This occupation would receive bulk of the inputs and assistance particularly under the MFAL project which is mainly market based and employment oriented. The guidelines issued from the Union Ministry of Agriculture emphasise that the subsidiary occupations should be restricted to those families living in places which are conveniently situated for the marketing of produce. The Commission emphasises that marketing facilities should determine the number of farm families to be supported and the size of operation to be recommended for each family.

4.5 A study of the programmes proposed by various states to promote poultry farming under SFDA/MFAL agencies shows that the projects would help in providing loans and subsidies for purchase of stock, equipments and poultry housing and in some cases loans for feeding of chicks up to the laying stage. In most of the SFDA/MFAL projects 200 to 500 families in each district are proposed to be identified for poultry programmes. In some of these projects, proposals have been made to organise poultry producers' cooperatives for production and marketing of eggs. Neither has sufficient emphasis been laid nor have any special programmes been formulated in most of the projects to ensure production and supply of poultry feeds, training of farmers, adequate poultry health cover and proper extension support. Arrangements for organising marketing facilities for egg and poultry have not received due consideration. The Commission is, therefore, of the opinion that poultry production as proposed in SFDA/MFAL projects will not make any sizable impact on the general economy of small and marginal farmers and agricultural labourers. If any tangible results are to be achieved, poultry production and marketing in these districts will have to be organised in a large way on a package basis, somewhat on the lines of the Intensive Egg and Poultry Production-cum-Marketing Projects (commonly known as IPDP) recommended in the Five Year Plans.

Intensive Poultry Development Projects—Objectives and Programmes

4.6 The Intensive Egg & Poultry Production-cum-Marketing Project aims at promoting poultry farming around cities and industrial townships. It envisages simultaneous provision of inputs and services such as supply of quality breeding stock and balanced poultry feed, prevention of poultry losses, extension of technical guidance and information, and organised marketing facilities. This project envisages production of eggs and poultry through participant farmers in addition to the existing channels of production and sales of eggs and poultry to the growing urban markets. The programme takes into consideration the number of chicks to be raised for supply to these farmers and incubation and hatchery facilities required for producing them. Similarly, consideration has been given for the production and distribution of balanced poultry feed. As marketing forms an important part of the poultry programme, adequate provision has been made for collection transport and cold storage of eggs. Special staff trained in poultry science are provided in the project to lend intensive extension support and prevent poultry diseases.

4.7 The general approach in the matter of organisation is to encourage formation of farmers' cooperatives which would undertake the supply of credit and feed and ensure collection and marketing of eggs. The possibility of obtaining institutional finance for the poultry operations is to be explored to the maximum. The procedure for disbursement of loans and the manner in which assistance for the collection, grading and sale of eggs and poultry is to be received, would be adopted in consultation with the State Departments of Cooperation, in order to ensure that no financial loss is incurred by Government as a result of faulty operation of the scheme. A copy of the project showing the objectives and technical programme is given in Appendix III. By the end of the Fourth Five Year Plan, 125 Intensive Poultry Development Projects are expected to be in operation and the Working Group on Animal Husbandry and Dairying for the Fifth Five Year Plan has recommended the establishment of 150 additional Intensive Poultry Development Projects during the Fifth Plan period. Further, such of those projects as have not been provided with necessary infrastructure and in which cooperatives have not been organised will be suitably strengthened and financed. The new projects should be drawn up on the lines suggested for poultry development in this Report to assist a large number of small and marginal farmers and agricultural labourers.

4.8 From the above description of the Intensive Poultry Development Project and the requirements detailed in para 4.1, it will become evident that the poultry development programme under the SFDA and MFAL should be planned and implemented as a separate comprehensive project with a package approach ensuring simultaneous provision of all inputs and creation of the necessary infrastructure. From Appendix IV it will be seen that Intensive Poultry Development Projects are already in operation in twenty four SFDA/MFAL districts. These could be geared to improve the economy of as large a number of small and marginal farmers and agricultural labourers as possible in their respective districts. The State Governments should examine the extent to which these projects needed strengthening in respect of technical and extension staff; inputs, such as hatchery facilities, feed supply, cold storage, transport, health cover; and provide these as early as possible. There are fourteen SFDA/MFAL districts where intensive poultry production could be taken up by linking up these programmes with an Intensive Poultry Development Project already functioning in a nearby area (Appendix V). There are thirty one SFDA/MFAL districts which offer scope for poultry production and marketing and in which programmes similar to the I.P.D.P. should be taken up mainly to assist the small and marginal farmers and agricultural labourers (Appendix VI). For this purpose, the State Departments of Animal Husbandry should study in detail the feasibility of poultry production in these districts and formulate projects on the lines detailed in this Report for implementation. The poultry programme in each SFDA/MFAL district should identify at least 3,000 farm families. In such of these districts as have more than one urban consuming market and/or from where eggs could be sent to metropolitan cities like Bombay, Calcutta, Madras and Delhi, additional farmers could be identified and assisted through the poultry programme. In six SFDA/MFAL districts poultry production could be organised on a limited scale to meet local market demands only (Appendix VII).

4.9 The Commission is of the opinion that there are a number of districts which are not covered by SFDA/MFAL projects but offer good scope for poultry production and marketing in view of large cities and towns and industrial areas in or near these districts. It is, therefore, recommended that the small and marginal farmers and agricultural labourers in these districts should also be assisted by poultry production programme as this would enable a large number of such families to be economically benefited through supplementary income. A total of ninety-two districts have been further identified and recommended for

intensive poultry development work with a view to assisting about 3,000 families of small and marginal farmers and agricultural labourers in each of these districts. A list of these districts with location of cities and towns with a population of over one lakh and between 50,000 and one lakh is detailed in Appendix VIII. The Commission recommends that during the Fifth Five Year Plan, intensive poultry programme should be taken up through the small and marginal farmers and agricultural labourers in 167 districts to benefit nearly half a million families of these weaker sections of farming community. When the above programme is implemented in all its aspects it is anticipated that egg production through small and marginal farmers and agricultural labourers in these 167 districts alone would be about 4000 million eggs. In addition to this there would also be sizable increase in the production of eggs through larger farmers and commercial poultry producers. Theoretically speaking egg production may outstrip the projected demand of eggs by the end of the Fifth Five Year Plan. However, it can be assumed that increase in production and availability of egg would automatically increase consumption rate to some extent. Further as the rate of consumption of eggs would be still very much low in the country even with the proposed production, measures would have to be taken for developing demand as well.

Proposed Programmes, Inputs etc.

4.10 The identification of farmers should be made in a careful manner so that there should be no egg collection and marketing problems. Selected blocks/groups of villages should be identified, where farmers have shown interest or can be enthused in poultry raising. As far as possible, such villages should be selected as have communication facilities and easy accessibility throughout the year from the focal point of operation of the programme.

Size of Unit

4.11 The size of poultry unit to be started by each farm family should be such that it should ensure a reasonable financial return to the family and should enable enrolment of as large a number of families as possible. Assistance could be extended to start units of 50 layers with small and marginal farmers and agricultural labourers. The requirements and economics of a 50 layers unit under optimum conditions would be as per details given in Appendix IX. Such a unit is anticipated to give an income of the order of Rs. 940 every year after accounting for all operational costs. If the period of repayment of medium term loan is 3 years, the farmer would be left with very little income to meet his family

expenditure. It is, therefore, recommended that the medium term loans for poultry operations should be at least for a period of 5 years. If this is done, he would be left with a net annual income of Rs. 612.

Type of Stock

4.12 As many of the farmers would be taking to rearing poultry for the first time on scientific basis on a size mentioned above, it would be necessary to ensure that the birds supplied to them for rearing are of high production capacity and have the ability to withstand stress and strains of village environmental conditions. It is advisable that, to start with, crossbred poultry should be provided to these farmers.

4.13 The crossbred poultry recommended for rearing by smaller farmers and agricultural labourers should be obtained by crossing White Leghorn males and Australorps or Rhode Island Red females drawn from high-laying strains. Such crossbred birds have reportedly shown greater adaptability to climatic variations and higher survival rate than the purebred birds and hence do well in all areas. Crossbreds grow quicker than purebreds, particularly up to 12 weeks of age; being stronger and more vigorous, crossbreds are easier to rear. The crossbred hens when finished for laying and young cockerels which attain an average body weight of 1.5 kg. at twelve weeks of age make excellent table birds. Weighing much more than purebred cockerels at this stage, crossbreds produced by using certain imported strains of White Leghorn and Australorps have given good performance. In the Random Sample Laying Test for egg production conducted in 1971-72 at Hessarghatta centre, there were six entries of crossbred poultry which reportedly averaged a production level of 186.6 eggs in 11 months.

4.14 The farmers can be encouraged after they have gained some experience to change over to high productive hybrid birds produced at Government and commercial poultry breeding farms, if found economically better than the crossbred ones. To the extent possible, agricultural labourers and small and marginal farmers should be supplied with ready-to-lay pullets in the first year. If it is not possible, the small and marginal farmers and agricultural labourers should be provided with 2 to 3 month old pullets. Such a system would help these farmers to learn rearing of large sized flocks of poultry of good laying capacity during the first year and gain confidence in rearing day-old chicks later. The authorities implementing the poultry programme should work

out in advance the approximate requirements of birds of different age groups that would be needed by the enrolled farmers in each district. They should take adequate steps for rearing of birds and making them available to the farmers at the appropriate time in consultation with the State Departments of Animal Husbandry.

4.15 In order to cope up with this task, the State Departments of Animal Husbandry should strengthen the existing poultry farms with additional facilities such as stock, equipments, housing, personnel, funds for feeding and rearing etc. Wherever possible, government poultry farms and extension centres should be given the responsibility of rearing chicks up to 8-12 weeks of age or up to pullet stage for distribution in the district. If a large number of birds are required in a district, reliable private poultry breeders could also be selected and entrusted with this function, laying down certain firm conditions of contract in advance.

System of Rearing

4.16 As far as possible, the farmers should be encouraged to adopt the 'deep litter system' of poultry raising. Advantages of this system are fairly well known. It requires very little space and the birds are maintained in proper health and good laying capacity. The risk of poultry losses through predators is also minimised to a large extent in this system.

4.17 Another very big advantage of the deep litter system is that poultry could be easily managed without much difficulty by the farmers' family members using their spare time as deep litter poultry units do not require whole time attention. The deep litter built over a year or so in the poultry sheds becomes a very useful type of manure. This manure contains about 3% nitrogen, 2% phosphorus and 2% potash plus some trace elements. It has been estimated that 40 birds supply about one ton of deep litter in a year. If the small farmer uses this manure on his own land, it would help him increase the output of his land*.

4.18 As a special case, however, in some areas where farmers are not able to adopt deep litter system in view of small size flocks non-availability of balanced feed etc., they may be encouraged to adopt a free range system under which the birds are provided night shelter and they are allowed to roam about in the enclosed field during the day time. Such a practice may be adopted only

*Allan A. McArdle and J.N. Panda, A Hand Book for Poultry Officers in India—page 28 (1968).

in remote village areas. For this type of rearing also, the use of crossbred poultry is recommended but the flock size may be small, say, 25 layers only. Even though the birds would be allowed to range for themselves to pick up as much feed as possible, the flockowners will have to ensure that the poultry get adequate nutrition for optimum growth and production. This will have to be done by providing poultry feed concentrates supplemented with locally available coarse cereals and grain byproducts. Otherwise, the production of birds would go down considerably. The economics of such a system of rearing is given in Appendix X.

4.19 For each region it will have to be determined separately as to which part of the year the poultry should be brought to lay for maximum production. For most of the areas in northern Indian plains it would be advantageous if the pullets start laying eggs from the month of September after the summer. In order to enable this, the farmers should start off with day-old chicks around March. The usual practice would be to continue with the layers for about a year. It has been observed that demand and price for eggs are high during the winter months but fall considerably during the summer. In such a situation, poultry farmers should be advised to reduce the flock size taking into consideration the cost of feed and the price of eggs. To avoid undue losses on summer production of eggs, the farmers in the villages may be encouraged to adopt a system of allowing layers to produce eggs for about 7 months of the year only. Such a system has two advantages. It requires only one deep litter shed which could be used for the rearing of chicks for about five months and for laying for another seven months: secondly, such farmers will not face depression of demand and price of eggs in summer months. The economics of egg production through a unit of 50 layers adopting this system is presented in Appendix IX. The above mentioned seven months laying system could be encouraged wherever conditions warrant it.

4.20 Complete stoppage of egg production during the summer months by all the producers in an area would also lead to certain difficulties and problems. Firstly, the market would not get supply of eggs and even the limited consuming population during this season would be denied their requirements. Secondly, the egg collection and marketing cooperatives or other agencies would find their infrastructural facilities such as transport, processing, cold storage etc., underutilised and staff being underemployed during such periods. Therefore, as an alternative, poultry farmers could be advised to reduce their layer strength during summer months. When birds have been in lay for about 6-7 months,

flockowners should be advised by the extension staff as to whether it would be more paying to dispose of the birds or allow them to continue in lay. The decision would depend upon the rate of egg production in the flock, the price of eggs and the cost of feeds. If the egg price/feed cost ratio becomes unfavourable, the flock size should be reduced through intensive culling so that a rate of 50 per cent or more of lay could be maintained. The economics of running units of 50 birds in lay for seven months followed by 25 birds in lay for further five months is shown in Appendix IX.

4.21 In hilly districts, it would be most economical to have rearing programmes which would ensure maximum production during the summer months when conditions would be favourable for high production and market demand for eggs is high. Even though the cost of rearing may be slightly high in winter months, it is advisable to start with day-old chicks from September-October and have pullets ready to lay during February-March in these areas. In other parts of the country where there are no such extremes of climate and market variations in the demand for eggs, the production pattern could be modified to suit local convenience and needs.

Housing and Equipment

4.22. The farmers and agricultural labourers should be assisted in the construction of cheap but efficient type of poultry houses that would ensure proper ventilation, protection from driving rains and maintenance of deep litter in dry conditions. The project staff should develop suitable economic designs for poultry houses suiting local requirements. They should also make use, as far as possible, of locally available building material for such construction. To start with, some model poultry houses could be constructed at the local poultry farms/extension centres and a few poultry houses should also be erected by the project staff with the help of some of the participating farmers/agricultural labourers using the farmers' own surplus labour in order to reduce construction costs. Such extension assistance would encourage more and more farmers to participate under the poultry programme. As far as possible equipments required should be got prepared through the village artisans, who should be assisted with sample specifications and supply of raw materials. This will create additional employment opportunities in the villages.

Feed Supply

4.23 Balanced ready mixed feed is a basic requirement for the success of the deep litter system of poultry raising. It should

be made available in adequate quantities all the year round without break. Ready mixed feeds should be obtained from the co-operatives or state run projects or corporations or from reputed commercial manufacturers, if available at reasonable cost consistent with quality. It is recommended that whenever feed mixing plants are established, they should be multipurpose in their objectives and they should as far as possible undertake the manufacture of all livestock (cattle, poultry, pigs etc.) feeds in quantities required by the farmers in the area. If poultry feed could not be obtained from these sources, the possibility of manufacture of good quality poultry feeds should be made as a part of the project itself. Preferably, manufacture and distribution of feeds should be entrusted to the poultry farmers' cooperatives which may be assisted in the shape of credit, technical advice, selection of plants etc. This way, the cooperatives would be able to utilise locally available feed ingredients to a large extent. In the alternative, locally available coarse grains and by products like rice bran, wheat bran etc., should be mixed with feed concentrates to be obtained from other sources. Such a procedure may considerably reduce the cost of feeding the livestock including poultry in certain areas and ensure proper and profitable utilisation of the coarse grains and byproducts available in the villages.

Health Cover

4.24 The prevention of avoidable losses caused by poor hygiene and disease is of paramount importance for the success of poultry production. Since highly effective vaccines, antibiotics and chemotherapeutic agents against practically all the commonly occurring serious poultry diseases are now available, it should not be difficult to safeguard the health of the birds adequately. The farmers should be advised to obtain their chicks and birds from hatcheries/poultry farms which are known to be free from pullorum disease and fowl typhoid infections and from diseases like avian mycoplasmosis (C.R.D.) and Marek's disease.

4.25 When grown up birds are purchased, they should have been protected against diseases like Ranikhet disease and fowl pox. If they had not been vaccinated against these diseases at the poultry farms/hatcheries or when day-old chicks are obtained, arrangements will have to be made for the following vaccination programmes:

A. Ranikhet disease

All the chicks from 1 to 7 days of age should be protected with freeze-dried Ranikhet disease vaccine 'F' strain. Then, at 8

weeks' of age, they should be given freeze-dried Ranikhet disease vaccine (Mukteswar R₂B strain). No further vaccination against this disease would be normally necessary in the lifetime of the birds.

B. *Fowl pox*

All the pullets should be vaccinated with freeze-dried egg-adapted fowl pox vaccine after one or two weeks of vaccination against Ranikhet disease with R₂B vaccine strain. However, if at any time, the young chicks are threatened with an outbreak of fowl pox, freeze-dried pigeon pox virus vaccine may be used.

4.26 In order to have a regular check-up of the health of birds and to minimise their losses due to diseases, it would be necessary to strengthen the veterinary service in the project areas by posting extension veterinarians specially trained in poultry diseases and ensuring an adequate supply of medicines and vaccines. The poultry disease investigation staff of the Department of Animal Husbandry as well as the extension veterinarians should pay regular visits to the poultry farms for examining the health of the birds and for identifying disease problems so that timely and effective steps could be taken to check infections and minimise losses. The above recommendations are made in the light of our present knowledge. The extension veterinary staff will have to keep themselves uptodate with the developments being made in the field of poultry disease research and should use the latest techniques and the most efficacious biological products.

Training of Farmers

4.27 As large number of farmers identified would be taking for the first time, to deep litter system of poultry raising with improved types of birds, it is very necessary that they are given practical training in poultry raising in small batches of 15 to 20 before they start poultry units of their own. This training could be arranged in the existing state poultry farms/extension centres. The training may be of adequate duration ranging from two weeks to a month and should lay particular emphasis on practical management. For this purpose, poultry farms/extension centres should be adequately strengthened with staff, funds, training materials, hostels and other requirements. The farmers should be encouraged to attend short refresher courses from time to time to update their knowledge and improve the efficiency of their operations. A visit by these farmers to I.P.D.P. areas either within the state or outside may be helpful. Special training should also be

arranged for womenfolk belonging to the families of poultry farmers. The extension staff should be in constant touch with these poultry farmers, to identify the deficiencies in feeding, management and disease control methods and advise them to take suitable measures in time to remedy these faults. Unless the programme is backed up with a strong extension support, the farmers may perhaps find it difficult to make poultry raising a profitable proposition.

Financial Assistance

4.28 Most of the SFDA/MFAL projects already provide subsidy (at 25% for small farmers and at 33½% for marginal farmers and agricultural labourers) and loans for purchase of birds and equipment and for constructing poultry houses. In some of the projects, credit is also being extended to meet the cost of feeding day-old chicks up to the laying stage. It is apparent that there is a case for extending subsidy to meet the cost of feeding of chicks during rearing day-old chicks up to the laying stage. It has been earlier recommended that, to start with, the farmers could be provided with 8 to 12 weeks' old pullets. In this case also, it would be necessary to extend the loan and subsidy to meet the cost of feeding young pullets up to the laying stage. The loans and subsidy for feed should be extended always in the form of balanced feed and cash assistance discouraged. The above principle of extending subsidy to the small and marginal farmers and agricultural labourers for taking up poultry rearing should be adopted for the poultry programmes recommended in this Report.

4.29 The farmers are expected to start either with day-old chicks or 8 to 12 week old pullets. The actual production stage would commence when the birds reach about 22 to 24 weeks of age. These birds will generally be kept in lay for a period of one year after which they will be disposed of. Thus, the entire operation will be extended to about 16 to 18 months. If continuous egg production has to be maintained, the next batch of the day-old chicks or 8 to 12 week old pullets will have to be obtained at the end of 12 months or 15 months period, so that the second batch of birds will be at laying stage when the first batch is culled out after one year's lay. From the calculations furnished in Appendix IX, it will be seen that a poultry farmer would need an outlay of Rs. 607 to enable him to have 50 pullets at the laying stage. If he pays back a part of the loan and the annual interest from the income from the first batch of birds, very little would be left behind. Therefore, it would be difficult for the small and

marginal farmers and agricultural labourers to regenerate sufficient funds to invest on the purchase and rearing of the second instalment of day-old chicks or 8 week pullets. It would, therefore, be necessary to provide financial assistance in the form of credit and subsidy at this stage as well. In order to ensure that only farmers and agricultural labourers who are really interested in the operation receive this second instalment of assistance, conditions should be laid down that the farmers would become eligible for this assistance only if they had successfully reared the poultry during the first year and had commenced regular repayment of loans during the first six months of lay of their birds.

4.30 From the calculations made on estimated operational costs and anticipated receipts given in Appendix IX, it would be seen that from a unit of 50 layers the farmers would get only Rs. 942 over a period of 18 months and from this amount he will have to arrange for repayment of loan. If the operation of a unit of 50 birds has to leave him at least Rs. 500 the medium term loan should be at least for a five year period. The projects should while working out the credit and subsidy requirements, take these aspects into consideration. It is advisable to assist such small and marginal farmers and agricultural labourers who have shown real interest and progress with additional credit to expand their poultry units to 100 or 200 layer capacities. This would make other farmers and agricultural labourers in the area appreciate the profitability of taking to poultry rearing as a subsidiary occupation.

4.31. Feeds account for about 70 per cent of the total cost on egg production and about 60 per cent on poultry meat production. For successful poultry production not only the quality of feed should be good but its cost should also be within reasonable limits. For the energy content of the poultry ration one has to depend on cereal grains. Larger percentage of cereal grains can be used in poultry ration if such grains are available in plenty and the prices are reasonable. At present the availability of cereal grains is hardly sufficient to meet human needs and it is futile to expect large scale availability of such grains at reasonable cost for feeding livestock. It is, therefore, necessary to find out suitable substitutes for incorporation in the poultry feeds without affecting the quality of the feeds. The Commission, therefore, recommends that researches should be conducted to find out such suitable substitutes and for their production on a large scale. Grains which are not used for human consumption but are suitable for poultry feeds such as dent maize, should be grown

wherever possible; The State Governments should make available rice bran to meet the full requirements of the project at a price based on the cost of production by procuring the same from the rice mills using powers under Essential Commodities Act. The State Governments of Haryana and Punjab have already taken steps on the above lines. The Government of India have authorised supply of damaged foodgrains to the State Animal Husbandry Departments for livestock feeding without observing formal tender enquiry and have prescribed a price fixation formula based on percentage of good grain. The State Governments should accord priority to these projects in allocation of such grains. Similarly, molasses should also be made available for manufacturing balanced feeds. Large scale production of livestock feeds from byproducts from slaughter houses and carcass utilisation centres should be taken up by the State Animal Husbandry Departments. Such measures would help to a large extent in bringing down the feed costs and would be very useful particularly in times of high prices of cereal grains and the normal ingredients of poultry feeds. The poultry farmers should also use extreme care in avoiding wastage of feed. However, the poultry farmers have no means to control the cost price of feed, which depends on various other factors. The economics of egg production depends on the price that the eggs will fetch in the market. In other words, there has to be a favourable feed cost/egg price ratio. In the very recent past, it has been observed that the feed cost has been rising very sharply while the price of eggs has remained almost steady. It would not be realistic to anticipate that the sale price of eggs would keep pace with the rise in feed prices. Any steep rise in egg prices would immediately result in less intake of eggs by the market and this would hamper poultry production. Poultry farmers with small units would be the first to be hit by a rise in feed cost. Therefore, any programme to be implemented for sustaining small and marginal farmers and agricultural labourers in poultry raising should have an inbuilt mechanism to keep a watch over feed and egg prices and to help them maintain a suitable feed cost/egg price ratio. This means that whenever there is an abnormally high rise in feed prices but no corresponding rise in egg prices, the feed supplied to the farmers should be adequately subsidised.

Credit and Marketing

4.32 The small and marginal farmers and agricultural labourers enrolled for the poultry production programme will have to be provided with necessary credit, both medium and short term, for initial investment on the poultry units and to meet opera-

tional costs on production. Medium term credit would be needed to meet expenditure on cost of birds, construction of poultry houses and purchase of equipments. Short term credit will have to be given for purchase of feed, feed supplements, medicines etc. It would be necessary that credit is made available in adequate amount and at the appropriate time. This is essential because purchase of birds will have to be so timed that the birds come to lay when market demand for eggs is at its highest. Before starting poultry farms, necessary arrangements have to be made for construction of housing, purchase of equipment etc. As these operations have to be completed in time, timely credit in adequate amount is very important.

4.33 The Working Group on Dairy and Animal Husbandry Cooperatives set up by the Ministry of Agriculture (1962) had recommended in its Report that it would be advantageous to form separate poultry farmers' cooperative societies, wherever they could be organised on an economically viable basis. Keeping this in view, the Commission recommends that a two tier structure of cooperatives of small and marginal farmers and agricultural labourers, enrolled for participation in the poultry production programme in these special projects may be adopted. At the ground level, Poultry Producers' Cooperative Societies may be organised at the rate of one for each block/tehsil. These societies should undertake such functions as extension of credit and technical guidance, provision of inputs like birds, feeds, medicines, poultry house materials, equipments and services for collection and marketing of eggs and poultry. It should be insisted that membership of the societies is restricted only to farmers and labourers who keep poultry. The membership of these societies could be thrown open to larger poultry producers also but it should be ensured that the poultry owned by large producers should not exceed one third of the total poultry owned by all members put together and that on their managing committees, the small members have (at least two third) a comfortable majority. It should be impressed upon the members to construct poultry houses according to the standard design and raise poultry on sound scientific lines. The members will be required to market their eggs and poultry only through the society. In the Commission's Interim Report on Credit Services for Small and Marginal Farmers and Agricultural Labourers, it has been recommended that a Farmers' Service Society should be organised at the tehsil/block level which should take over the responsibility for organising short, medium and long term credit for its members. The Poultry Producers' Cooperative Societies should have a close liaison with the Farmers' Service Society, so that the Farmers' Service Society could

take care of short and medium term credit requirements of poultry farmers while the poultry cooperatives could undertake the recovery of loans from the price of eggs and poultry of the members marketed through the societies. The producers' societies may federate into a district union with the specific objective of arranging suitable marketing facilities to the best advantage of the farmers. Wherever necessary, the district Union should assist the societies in procuring feed ingredients in bulk at economic prices, manufacture of ready mixed feeds and their distribution. The District Poultry Producers' Union could undertake the manufacture of balanced feeds in association with District Unions of Milk producers, Sheep farmers and Pig producers. As far as possible, the feed manufacturing plants in a district should be jointly owned by the District Cooperative Organisations of different livestock producers. The Union may also be entrusted with any other responsibility requiring coordination in the working of the societies or with outside agencies for ensuring provision of inputs to the farmers including training and veterinary services.

4.34 The Poultry Producers' Cooperatives should arrange for storage, processing and marketing of eggs in the urban markets in the district and outside. The cooperatives should explore various methods and procedures for promotion of egg consumption and improvements in the market demand particularly in industrial townships. The consumer necessities of industrial labour are increasingly being organised through cooperative stores or canteens. From information gathered in Coimbatore which has a large textile industrial complex, it is understood that the textile labourers were willing to buy eggs regularly if supplied on credit basis through their cooperatives which could adjust the dues every month from their pay packets. If such a system could be encouraged, sale of eggs could be pushed up considerably through such consumer cooperatives of industrial labour. The Poultry Producers' Cooperatives should organise such a marketing procedure with some help for ways and means finance either from the cooperative sector or the banking sector. It could also undertake other functions such as production and distribution of balanced poultry feeds and poultry feed concentrates and manufacture of simple poultry equipments. Ultimately, these societies should undertake supply of chicks/grown-up stock through hatcheries and poultry rearing farms for the benefit of members. It is recommended that the Poultry Societies should, as far as possible, utilise for transport of poultry feed, eggs and other inputs the transport facilities already developed in the district through the dairy organisations. This would help in reducing the cost of overheads and in utilising the available transport facilities of the dairies. Similarly, storage of eggs during surplus seasons could be

arranged making use of the cold storage facilities available with the dairy plants. For this purpose, certain modifications may be made in the space allotted for egg storage in cold storages of the milk plant so that the optimum requirements of egg storage could be ensured. The rates for utilisation of the transport and surplus cold storage space could be on a mutually agreed basis. Retail sale of the eggs to consumers should also be arranged at the rural milk collection and disposal centres and at the urban milk booths of the dairy projects. Such a system would greatly economise on overheads on retail marketing and would, at the same time, push up sale of eggs considerably. Such a link up between poultry and dairy cooperatives/organisations would be ultimately of mutual benefit to the member producers. There are already organised dairy schemes functioning in/approved for most of the districts where large scale poultry production has been recommended through small and marginal farmers and agricultural labourers. It is anticipated that dairy schemes would be established in some of the districts proposed for poultry programmes in pursuance of the recommendations contained in our Interim Report on Milk Production. The district Poultry Producers' Cooperative Union should undertake at a later stage the running of poultry processing plants and marketing of raw and frozen poultry meat. The District Poultry Producers' Union should also enrol themselves as members of the State Cooperative Egg Marketing Federations proposed to be established during the Fifth Five Year Plan. This would facilitate their obtaining assistance in the marketing of eggs surplus to the districts in outside markets.

4.35 For all the activities explained above, the Poultry Producers' Cooperative Union would need adequate finances. The cooperatives would have to construct/hire buildings for collection, grading, processing of eggs, godowns for feed storage, obtain transport for regular collection and despatch of eggs, establish feed mixing plants, create facilities for hatchery and for the rearing of birds etc.

4.36 The capacity of cooperatives, consisting as they are of small poultry producers, to raise resources for the above mentioned activities is obviously limited. These cooperatives would, therefore, have to be assisted in raising sufficient finances from various agencies. Government should consider their case on a separate footing and provide financial assistance to increase their share capital to meet capital costs and provide sufficient funds to meet running costs. This may be provided progressively as the cooperatives take up more and more responsibilities. The amount of assistance could be partly in the form of loans and partly in

the form of subsidy. In addition, the cooperatives should be assisted during the initial years by the Government for meeting the cost of management on a sliding scale. Institutional finances should be made available from Agricultural Refinance Corporation, Central Cooperative Banks, etc., to these cooperatives in the form of long term credit for capital expenditure and medium/short term credit for working capital.

SECTION V

SHEEP PRODUCTION PROGRAMMES

5.1 Sheep rearing is a major rural occupation with certain farming communities in our country and it contributes a large part of their income, particularly in sheep breeding tracts. Sheep husbandry constitutes an important facet of the livestock industry of India. Sheep are reared for producing wool and/or mutton. Wool production serves two important purposes, *viz.*, meeting the needs of the indigenous industry and export to foreign countries thus playing an important role in earning/saving foreign exchange. Along with goat meat, mutton is the chief source of meat supply in the country.

5.2 Sheep production on organised basis had received very little attention till the advent of the Five Year Development Plans. There has, however, been a progressive increase in the sheep population and the annual production of wool since 1951. Major portion of this increase is attributable to natural causes and only a small fraction of the increase to planned developmental efforts made under the Five Year Plans.

5.3 India stands sixth among the countries of the world in sheep population.* There is a wide variation in the types of sheep found in different parts of the country. In the temperate Himalayan region and the dry western region, sheep are of woolly type. In the southern and eastern regions, sheep are mainly of the hairy type and are bred for mutton production. The average wool and mutton production of Indian sheep, is however, low. For instance, Rajasthani sheep give on an average about 1.4 kg wool a year while in countries like Australia, New Zealand and U. K., the fine wool breeds of sheep produce annually 5 to 6 kg wool. The quality of wool from Indian sheep is also inferior. Indian sheep are inferior in size to many exotic breeds. The rams and ewes of Indian breeds of sheep weigh between 27 and 36 kg and between 18 and 27 kg respectively, whereas purebred rams of many exotic breeds weigh between 60 and 113 kg and ewes between 54 and 74 kg respectively†. Therefore, the yield of mutton from Indian sheep is low in comparison with that of exotic sheep. The above position is mainly due to the fact that sheep industry is

†FAO Production Year Book 1971.

‡Daroga Singh, M. Rajagopalan and J.S. Maini Monograph on estimation of wool production (ICAR) New Delhi.

in the hands of traditional sheep farmers in the remote villages whose occupation and welfare did not receive proper attention in the past. These farmers are mostly illiterate and economically backward. These farmers are not acquainted with the methods of improved breeding, feeding and management and moreover no planned selection in the flocks was carried out for increasing production. The rearing of sheep flocks is rarely undertaken by progressive farming communities. The progressive shrinkage of grasslands as well as their low carrying capacity has contributed to the non-availability of sufficient pasturage to the migratory flocks.

5.4 In sheep, there is good scope for effecting genetic improvement for increased production of wool and mutton. It has been shown that these characters are highly heritable. Furthermore the generation interval in sheep being comparatively shorter than in cattle, genetic improvement for wool and mutton production could be brought about fairly quickly through the adoption of a sound selective breeding programme. Several breeding programmes so far undertaken in the country adopting selection and/or cross breeding have shown that under proper care and management conditions, the Indian sheep has potentiality for improvement.

Approach to Sheep and Wool Development through Small and Marginal Farmers and Agricultural Labourers

5.5 The sheep development programme for the small and marginal farmers and agricultural labourers should aim at improving the productive capacity of the flocks already owned by them and/or introduction of good quality sheep with the farmers as a mixed farming system. It is estimated that we have about 24 breeds of sheep* of which only 5 can be considered as medium or fine wool breeds, 14 as coarse carpet quality wool breeds and the rest as mutton breeds†. Increasing the productivity of sheep in India could be attempted in three ways namely (i) improving the yield and uniformity of carpet quality wool; (ii) improving the yield of mutton in meat type indigenous breeds particularly in the south; and (iii) developing new fine wool and mutton breeds well adapted for the different agro-climatic regions in the country through cross-breeding of indigenous sheep with exotic breeds. Attempts were made earlier to evolve strains of indigenous sheep with uniform non-hairy fleece of finer quality

*Some of these have not been clearly defined and are of purely local importance.

†Review of Research in Sheep and Wool Production—Central Sheep and Wool Research Institute, Avikanagar 1972.

through selection against medulation percentage. The results of a number of Indian Council of Agricultural Research projects on improvement of sheep and wool showed that there had been improvement in quality but the overall improvement was not very encouraging. Similarly, selection for improving meat production was also tried under an ICAR project and again the results were not encouraging. Such a lack of positive response to selection in these experiments could possibly be due to small number of breeding animals included in the studies, unsatisfactory recording of performance data and defective utilisation of information in the selection of prospective breeders.

5.6 Recently, an analysis made on the productive performance of some of the important indigenous breeds of sheep by the Central Sheep & Wool Research Institute showed that in them characters like rate of growth, survivability and reproductive efficiency were poor. However, carpet wool breeds, especially Magra, have higher body weights. The average for wool yield, fibre diameter, staple lengths and medulation percentage in carpet wool breeds range from 0.6 kg to 1.97 kg, 28.48 to 50.56 micron, 4.99 to 11.0 cm (6 monthly clip) and 18.74 to 89.14% respectively. These wools are of medium to coarse carpet quality. Some trials have been made to study the result of cross breeding indigenous breeds with exotic fine wool breeds for improving wool production. Breeds such as Merino, Rambouillet, Polworth etc. have been used for cross breeding. Fine wool sheep in the country, such as Hissardale, Kashmir Merino, Deccani Merino and Nilgiris were evolved from such crosses. The results on the performance of the crosses indicate their superiority in body weight, survivability, wool yield and quality, over the indigenous breeds. Out of the various cross-breeds studied, it has been found that the Rambouillet crosses performed better. Though a progressive increase in the level of exotic inheritance in the crosses improved wool yield and quality but it tended to result in decreased survivability and disease resistance. Results from recent experiments indicate that introduction of 50% exotic inheritance from fine wool breeds produces animals with almost double the quantity of wool of around 50^s to 60^s quality. These crossbreds with 50% exotic inheritance did not pose any serious problems like disease susceptibility and high mortality. Therefore, in areas other than the hills, the programmes for developing woolly sheep with the small and marginal farmers and agricultural labourers should, for the present, aim at production of crossbred sheep with 50% exotic inheritance.

5.7 Nearly twentyfour million sheep in the country are in the southern and eastern regions and are kept mainly for mutton production. The sheep in these areas have little or no wool on

them. It is important to take up measures for augmenting mutton production in these areas under sheep development programmes through the small and marginal farmers and agricultural labourers. Some work on selective breeding for improving meat production was undertaken in Maharashtra, Andhra Pradesh and Tamil Nadu as a coordinated project of the Indian Council of Agricultural Research. Under this project, Mandya and Nellore breeds were taken up for such studies but the results were not found to be very encouraging. Sheep for profitable mutton production should show good growth rate to market weight, efficient feed utilization, feed conversion efficiency and carcass quality. The exotic mutton or dual purpose breeds generally excel in all these qualities and it might be desirable to introduce exotic inheritance in the indigenous sheep. But studies so far made on crossbreeding for mutton production are very meagre and it would not be possible at this stage to recommend any definite crossbreeding programme through the introduction of exotic breeds which will be suitable for different regions for increasing meat production. The Commission, therefore, is of the opinion that research programmes should be initiated in different regions of the country to study the suitability of a number of exotic breeds of sheep for crossbreeding with local types for improving mutton production. Experimental studies may also be taken in a number of large sheep breeding farms of the Animal Husbandry Departments.

5.8 The programme for developing sheep with the small and marginal farmers and agricultural labourers in the different parts of the country should be attempted broadly in the following ways. In the northern temperate regions such as Jammu & Kashmir, Himachal Pradesh and hilly areas of Uttar Pradesh where sheep are reared mainly for wool production, progressive crossbreeding with fine wool exotic breeds such as Rambouillet and Merinos should be popularised and the exotic inheritance taken up to 75% as has already been successfully done in Kashmir Valley. In addition, in these areas wherever there is scope for the raising of sheep in orchards as a mixed farming practice, introduction of purebred or crossbred Corriedale sheep should be encouraged. In the northern plains and western arid zones, crossbreeding with breeds like Rambouillet and Merinos for production of superior quality wool suitable for apparel production should be adopted particularly in areas of Rajasthan, Gujarat and Haryana where Chokla or Nali or Patanwadi breeds of sheep are reared. It may not be safe to increase the exotic inheritance in the sheep in these areas beyond 50% before the performance of higher grades has been critically studied. In areas where cultivation of crops is more

intensive and where irrigation facilities are comparatively better, such as in the districts of Chittorgarh, Bhilwara and Udaipur where Sonadi and Malpura sheep predominate and in similar parts of Haryana and Punjab, crossbreeding with Corriedale breed could be adopted to produce dual purpose sheep with improved wool, higher growth rate and better body weight. In these areas, the objective should be to improve the yield and quality of wool and simultaneously to improve the growth rate and body weight. Besides, in areas where there are types of sheep producing good carpet quality wool, the policy should be to encourage selective breeding for improvement in body weight and wool yield of uniform quality. In the southern region, breeds like Deccani, Bellary and Coimbatore could be advantageously crossbred with Corriedale breed for improving both wool and mutton yields. In the other areas, selective breeding or grading up local sheep with breeds like Mandya, Nellore, Madras Red etc. should be carried out since the experience available so far on crossbreeding of some of the south Indian mutton breeds with exotic breeds like Dorset horn and Southdown carried out on a small scale has not been encouraging. This programme later on may be changed to crossbreeding with suitable exotic breeds like Dorsets, Suffolk, Border Leicester etc. when experimental results show promise for such introduction.

5.9 Intensive sheep development programme through small and marginal farmers and agricultural labourers should be taken up only in such SFDA/MFAL districts as lie in sheep breeding tracts and project districts which could be easily linked up with Wool Grading & Disposal Centres, large cities and towns or large mutton consuming centres.

5.10 Intensive sheep production programmes could be undertaken on the above lines in nineteen SFDA/MFAL districts which could be linked up with Wool Grading and Disposal Centres established under the UNDP assisted projects in the States of Jammu & Kashmir, Punjab, Haryana, Himachal Pradesh, Rajasthan, Uttar Pradesh, Gujarat, Maharashtra and Mysore (Appendix XI). Similar programmes could be taken up in seven SFDA/MFAL districts as they happen to lie in the breeding tracts of indigenous wool/mutton breeds of sheep (Appendix XII). Thirty SFDA/MFAL districts also offer scope for sheep development as they are located near markets for wool and mutton (Appendix XIII). The Commission is of the view that there are quite a number of districts which are not covered by SFDA/MFAL projects but offer good scope for development of sheep for wool and/or mutton in the country in view of their location in sheep breeding

tracts, nearness to Wool Grading and Disposal Centres and accessibility to meat markets. It is, therefore, recommended that sheep production programme should be taken up in these districts also with a view to assisting the small and marginal farmers and agricultural labourers. This would enable a large number of such people in the country to benefit economically. A total of eightyfour districts have been further identified and are recommended for intensive sheep development work (Appendix XIV).

5.11 Replies received from the State Governments in response to the questionnaire (Appendix I-B) issued by the Commission show that in a number of SFDA/MFAL projects, the promotion of sheep rearing as a subsidiary occupation has not been contemplated. The programmes of sheep rearing proposed indicate that no definite approach has been finalised for their implementation. In most instances, the number of families identified for assistance varies from 200 to 500 families. The Commission is of the view that with these limited efforts no substantial progress could be made in assisting a large number of small and marginal farmers and agricultural labourers through sheep rearing. In view of the fact that the traditional sheep farming communities largely belong to the group of small and marginal farmers or landless labourers, it is recommended wherever this programme is taken up at least 3000 families should be identified for assistance in each district for improving the quality of sheep and thereby their economy. If the sheep development programmes are organised on the lines suggested above, a total of 4,20,000 families of small and marginal farmers and agricultural labourers in 140 districts would be assisted to improve their economic lot.

Size of Unit vis-a-vis Type of Migration

5.12 Each identified farmer/agricultural labourer should be assisted to own a flock of 20 improved ewes and one improved ram. Such of those flockowners as own flocks of about 50 or more local type ewes may be induced to cull and dispose of the inferior ewes and rams and replace them with improved ewes and rams provided under the programme. Those who possess smaller flocks may be encouraged to strengthen their flocks with the addition of improved sheep. It is anticipated that the above two categories of shepherds would be practising partial migration of their flocks within limited areas in the district itself. Such of those small farmers as come forward to take to sheep rearing on a mixed farming basis on their land may be advised to start the unit with 10 improved sheep in the first year and add another 10 in the next year. The requirements and economics of rearing a unit of 20 sheep for wool and mutton are given in Appendix XV.

Breeding System

5.13 In areas where crossbreeding with exotic breeds is to be adopted for fine wool production or for production of dual purpose sheep, a planned programme should be chalked out beforehand for gradually changing the genetic makeup of the sheep flocks and to ultimately produce a uniform sheep population with the desired percentage of exotic inheritance in them. In temperate regions, if a sufficient number of crossbred sheep with 75% exotic inheritance become available, units of 20 such sheep and a ram could be straightaway supplied to the indentified farmers. Otherwise, halfbred ewes with 50% exotic inheritance and purebred exotic rams could be supplied to them. This would help the farmers to produce three-fourth bred ewes in the next generation and simultaneously enable them to mate local types ewes already with them with purebred exotic rams. In the plains where the climate is hot and the availability of grasses and forage is limited, it is not considered advisable to give purebred exotic rams to the shepherds. Along with the supply of improved ewes, the shepherds may be provided during the first year with crossbred rams with 50% exotic inheritance. After two or three seasons of mating the flockowners would have raised crossbred sheep with 25% exotic inheritance. At this stage they should be supplied with crossbred rams with 75% exotic inheritance. This would enable ultimately the replacement of his local type sheep with crossbred sheep having about 50% exotic inheritance. In the districts of the southern and eastern regions where sheep are mainly raised for mutton production, the identified farmers may be given units of superior local mutton breeds such as Mandya, Nellore, Madras Red etc. At a later stage, the supply of purebred rams of exotic mutton breeds or crossbred rams for crossbreeding could be considered if and when results of research indicate their suitability for different regions of the country.

Production and Supply of Improved Sheep

5.14 For the implementation of the programmes proposed above, a large number of improved ewes would be required. It would be necessary to have not only a large number of purebred indigenous and exotic rams but also crossbreds with different levels of exotic inheritance. The State Departments of Animal Husbandry should work out the actual requirements of ewes and rams and assess their present availability from government farms and private sources. The State Government Farms should undertake the responsibility of supplying stud rams to the sheep breeders. To meet the demand of improved ewes special programmes should

be launched for crossbreeding of sheep in selected sheep breeding tracts such as Jammu & Kashmir, Himachal Pradesh, Hilly regions of Uttar Pradesh, Rajasthan and Gujarat for woolly sheep and intensive selective breeding in the States of Mysore, Tamil Nadu, Andhra Pradesh for mutton type sheep. The intensive sheep development projects proposed under the Fifth Five Year Plan should first be introduced in these areas. This would enable the production of a large number of superior sheep required for the sheep programmes with small and marginal farmers and agricultural labourers.

Feed and Fodder Supply

5.15 With the introduction of sheep of improved quality and progressive improvement in the quality of the local sheep by better breeding, it will become necessary to make improvements in the quality and quantity of grasses and forage crops for the sheep flocks. Small farmers owning units of improved sheep should be assisted in the production of leguminous and other types of forage crops for hay making. Good quality hay can replace supplementary feeding with grains and other concentrates and thus reduce considerably the cost of raising sheep. Special attempts should be made for improving the quality of grasslands used for grazing sheep. The village panchayats should be induced upon and assisted by the State Governments to protect village grasslands through administrative regulation, ditching and bunding, mud walling, live hedges, wire fencing etc. according to the area and development through reseeding and fertilising the grasslands. In places where the village panchayats are unable to undertake the development of village grasslands by themselves, they may be impressed upon to hand over these lands to the department concerned who should provide necessary funds and undertake suitable measures suggested above. Such a practice should receive special attention in the sheep grazing areas in the States of Rajasthan, Gujarat, Mysore and the Valleys and the alpine pastures of Jammu & Kashmir, Himachal Pradesh and Uttar Pradesh.

5.16 In a review* prepared by the Central Sheep & Wool Research Institute on sheep nutrition research, it has been estimated that for increased production of wool and mutton in sheep, the natural pasture available in the country is not adequate and supplementation of concentrate mixture or good legume fodder would be necessary. Therefore, the sheep farmers with improved

*Patnayak B.C. and Manohar Singh—Sheep Nutrition Research in India (Review of research in sheep and wool production) Central Sheep & Wool Research Institute, Rajasthan—September, 1972.

type of sheep should be advised to provide sufficient supplemental feed for their sheep to obtain satisfactory growth rate and increased quantities of quality wool. Mortality could be reduced to a large extent by such supplementation. The Commission has noted that sufficient information is not at present available on the economics of supplemental feeding of sheep especially during growing stages, breeding seasons, gestation periods etc. and therefore, recommends that detailed studies should be taken up by the Indian Council of Agricultural Research and Agricultural Universities on this aspect, so that the sheep flockowners could be convinced of the economic benefits or otherwise of increasing wool and mutton production with supplementary feeding.

Health Cover

5.17 The implementation of an intensive sheep rearing programme involving a large number of improved indigenous and crossbred sheep will need an effective health coverage for its success. The following measures should be adopted for preventing avoidable losses due to diseases and for ensuring optimum production.

A. Prophylactic Vaccination

(a) Sheep pox is one of the most serious diseases causing mortality and morbidity. It is reported that the live vaccine that is being produced at present in the biological products units of our country is not very effective in controlling losses due to this infection. The Indian Veterinary Research Institute and the Institute of Preventive Veterinary Medicine, Ranipet have intensified research work for the development of a suitable vaccine, especially for the exotic and crossbred stock. The Indian Veterinary Research Institute has recently produced a small quantity of inactivated sheep pox vaccine on an experimental basis adopting the Russian method, which has given good results with laboratory as well as field trials. Its large scale production should be taken up immediately and this inactivated vaccine should be used in sheep project districts till a more effective vaccine becomes available.

(b) Enterotoxaemia (*Clostridium welchii* type D) is another serious disease in our country which takes a fairly heavy toll of sheep. As such, all sheep in the project districts should be vaccinated annually with enterotoxaemia vaccine (Cl. *Welchii* type D toxoid), which confers a satisfactory degree of immunity for about a year. It is understood that this vaccine is already

being manufactured by eight biological product centres in the country and the additional requirement of sheep project districts can be met easily.

B. Control of Worm Infestations

Gastro-intestinal parasites, liver flukes and lung worm infection are very common among sheep in this country and are responsible for devitalizing them, reducing their productivity and for causing fairly heavy mortality. For the prevention of such losses, the extension veterinarians should visit the sheep flocks frequently to carry out necessary microscopic examinations and for undertaking periodic drenching of sheep. Broad spectrum anthelmintics as well as specific ones are now available and their judicious administration would considerably reduce the losses due to worm infestations.

C. Control of Ecto-Parasites

In order to reduce losses due to external parasites of sheep, it would be necessary to provide sheep dipping baths. The extension veterinarians should visit the sheep flocks frequently and arrange for dipping of sheep at the appropriate seasons under their personal supervision.

5.18 The extension veterinarians posted in the sheep project areas should be those who had special training in the diagnosis and control of sheep diseases. The disease investigation staff of the Department of Animal Husbandry should pay regular visits to the sheep flocks for examining the health of the sheep and for identifying disease problems so that timely and effective steps could be taken to check the infections and to minimise losses.

Training of Farmers

5.19 It would be necessary to arrange for special training of the identified farmers in improved sheep rearing practices and in particular in the breeding and management of crossbred and purebred exotic sheep. The training should give special attention to improved methods of shearing and classifying and grading wool for the market. The trained farmers should be provided with improved shearing equipments. The farmers should be shown the advantages of practices like dipping sheep. Adequate financial provision should be made for this important requirement for the success of the programme.

Marketing Facilities

5.20 The increased production of better quality wool under these projects will have to be supported simultaneously with arrangements for remunerative marketing. As indicated earlier, these project districts should be linked, wherever possible, with the Wool Grading & Disposal Centres set up under the UNDP assisted sheep development projects in the States. In these projects there is already special sheep extension staff who advise and assist the sheep breeders in adopting improved shearing practices and grading of wool. In this way, they are able to obtain reasonable prices based on the quality of the wool. In other areas, such special extension staff should be provided to organise these farmers into sheep producers' cooperatives and educate them on proper shearing, classification of wool and wool grading practices. The Commission is of the view that as the production of quality wool progressively increases over the year, it would be more advantageous for the producer if arrangements are made for its maximum utilization in the district itself through local cottage industries. For this purpose, service units for preliminary processes like scouring, carding etc. should be started. This would call for facilities in the form of equipments, machinery and development of intermediate technology and knowhow for processing such improved wools for use locally. Special arrangements should be made in these areas for training younger educated artisans in the villages in the latest spinning and weaving methods making use of better quality wool. When this is achieved, the sheep farmers would be able to get a good price for their wool and a number of villagers would get gainful employment. The Small Scale Industries Departments in the States should provide these facilities. Wool production and manufacture of woollen goods and hand woven carpets should be tied up with schemes of the Handicrafts Board or the Khadi Board functioning in the areas for providing advice on the types and patterns of goods to be produced and assisting in the marketing of the products in or outside the State.

Credit and Cooperation

5.21 At present the entire internal trade of wool is in the hands of a number of middlemen and a few dealers, who take away a large percentage of the profits. The breeders of sheep are mostly ignorant of the price which their wool would fetch in the market. Similarly, the present practice of sale of sheep for meat markets is also not favourable for the sheep breeders. Sheep for slaughter are purchased by middlemen who are least

interested in the economic well being of the flockowners. Several processes involved in the preparation of wool for the market are at present carried out through paid labour. These could be organised by the producers themselves without much difficulty and with a little investment. For profitable marketing of wool, elimination of nonessential intermediaries and consequent reduction in costs of marketing is considered as an essential step. If the breeders of sheep are to receive full benefits from their production of wool and lambs for the market, there is no better alternative than organising Sheep Breeders Cooperatives. The Working Group on Dairy and Animal Husbandry Cooperatives set up by the Union Ministry of Agriculture in 1962 had also recommended that cooperatives should be closely associated with sheep and wool development schemes and that the functions of these cooperatives should cover every phase of activity of production and marketing. This Working Group suggested that these functions should broadly include supply of breeding stock, establishment of sheep shearing centres, extension of technical assistance and guidance on sheep production, disease control and services such as grading of wool, warehousing of wool, collection and marketing of wool and sheep. Regarding the pattern and organisation of these cooperatives, it was suggested that primary wool marketing cooperatives each covering a compact area with a sheep population of 45 to 50 thousand might be organised and that each primary society might have 20 to 30 wool collection centres. These centres should be equipped with shearing sheds, shearing implements and hand baling presses and facilities for washing sheep. It was recommended that these Societies should provide production credit to the members. These cooperatives should receive liberal financial assistance to meet capital costs required for construction of godowns, sheep rearing and wool grading centres and other capital investments. These wool marketing cooperatives would also need both clean cash credit accommodation as well as credit from the banks on pledge of wool. It was also suggested that the primary cooperative marketing societies could be federated into a Union, in course of time which could undertake marketing of wool on behalf of the primary marketing societies.

5.22 The Commission considers the above suggestions of the Working Group as very important and essential and recommends organisation of Sheep Breeders' cum Wool Marketing Cooperatives. It is suggested that primary cooperatives could be organised at each collection centres, comprising about 100 to 150 members drawn mainly from small and marginal farmers and agricultural labourers owning sheep. All the primaries in the district may be federated into a district Union,

5.23 As suggested by the Working Group on Dairy and Animal Husbandry Cooperatives referred to above, Sheep Breeders' cum Marketing Cooperative Societies will have to be assisted in raising funds for meeting capital costs, operational expenditure and extension activities. As mentioned in the case of poultry breeders cooperatives, Government should consider providing financial assistance to Sheep Breeders' Cooperatives. These Cooperatives should also be provided with production credit from banking institutions and agricultural financing agencies such as Agricultural Refinancing Corporation, Commercial banks, Central Cooperative Banks and others. The Central and State Warehousing Corporation could render help to these co-operatives in storing and in obtaining credit facilities on the basis of warehouse receipts.

5.24 The credit requirements of the sheep farmers should be taken care of by the Farmers Service Societies as recommended in the Commission's Interim Report on 'Credit Services to Small and Marginal Farmers and Agricultural Labourers'. There should be a close liaison and working arrangements between the Sheep Producers' cum Wool Marketing Cooperatives and Farmers' Service Societies so that the sheep farmers get easy and timely credit and the repayment of the loan is ensured by the marketing cooperatives which undertake the sale of wool and sheep for meat markets.

SECTION VI

PIG PRODUCTION PROGRAMMES

6.1 Pigs are another species of animals which can be multiplied rapidly as they are prolific breeders. In view of the comparatively shorter generation interval in this species genetic improvement in production characters could also be effected quickly in pigs.

6.2 In India pig production did not receive any attention till the recent past. According to the livestock census there were 4.93 million pigs in the country in 1956 and 4.98 million pigs in 1966. Thus the population of pigs in the country has remained more or less at the same level, *viz.*, around 5 million which is less than 1% of the world's pig population. The pig population in Denmark is about 8.6 million, in U.K. about 8.7 million, in U.S.A. about 67.5 million and in Japan about 6.9 million. Pork production is estimated to be around 760 thousand tonnes in Denmark, 1018 thousand tonnes in U.K., about 6500 thousand tonnes in U.S.A. and 670 thousand tonnes in Japan*. In India it is only about 50 thousand tonnes. It is evident from the above that pig as an important source of meat has not been properly exploited in our country so far. Pigs are considered fit only to be reared on garbage and they are generally allowed to remain as scavenging animals in the towns and villages. This is mainly due to the fact that pig rearing was looked down upon and was not considered a respectable farming operation. Because of this, pig rearing was relegated to the hands of socially backward and economically weaker sections of people. Due to very meagre resources and lack of knowledge with these people for improving the productive capacity, indigenous pigs reared by them mainly consist of poor nondescript types.

6.3 Consumption of pork is to be popularised among the different sections of people who have at present a general dislike towards it. This could be achieved if only pig rearing is undertaken under proper sanitary conditions and slaughter of pigs and marketing of pork are done under hygienic conditions. The quality of indigenous pigs could be improved in a systematic and rapid manner by adopting a suitable crossbreeding programme using exotic breeds.

*FAO Production Year Book (1971).

6.4 From the information received from the State Governments in response to the Questionnaire sent by the Commission, it is observed that in a number of SFDA/MFAL projects no piggery programme has been proposed and in a few others the possibility of supporting pig raising is still under consideration of the project authorities. Even in projects where a pig programme has been accepted for extension of subsidy and loan, the number of beneficiaries to be enrolled is very small ranging from as low as 50 to 500 families. The replies received indicate that a considerable headway has yet to be made in developing pig rearing as a subsidiary occupation even in areas where there is scope for this development. Planned approach has been visualised so as to ensure supply of good quality stock well-adapted to village conditions, breeding facilities, supply of supplemental feeds, improved management practices, health cover, training and extension, link up with marketing centres such as bacon/pork processing plants or urban slaughter houses and organisation of pig breeders' cooperatives.

Approach to Pig Production Through Small and Marginal Farmers and Agricultural Labourers

6.5 The experience so far gained from a decade of piggery development work emphasises the need for the gradual replacement of indigenous type of pigs by crossbreds or purebred exotic animals if pig rearing has to be profitable. The piggery programme for the small and marginal farmers and agricultural labourers should, therefore, aim at replacement of their indigenous pigs with crossbred pigs produced by the farmers themselves or by supply of purebred exotic or crossbred pigs to them from other reliable sources. While recommending any of the above alternatives, a careful study of the agricultural conditions of the area and the level of competence of the farmers and agricultural labourers will have to be taken into consideration. No doubt, the rearing of purebred varieties of exotic pigs offers the maximum return but it should be realised that such stock needs a very efficient system of feeding and management regime, if they have to exhibit to the full their productive characteristics, such as early breeding, large litter size, mothering ability, rate of gain, feed conversion efficiency etc. If these are not provided, the farmers will have more problems than benefits. It is, therefore, recommended that introduction of purebred exotic pigs should be restricted only to those small farmers who are capable of providing proper housing and feeding.

6.6 A programme envisaging replacement of indigenous pigs by crossbred pigs should form the main plank for improving

the economy of small and marginal farmers and agricultural labourers through pig rearing. This could be achieved in two ways. Crossbred pigs could be produced at State pig breeding farms or purchased from areas where development of pigs has been undertaken earlier through crossbreeding. Availability of good type crossbred pigs for breeding and rearing in large numbers may, however, be a problem for some years. Distribution of crossbred pigs on subsidised basis could be encouraged to the extent possible with such of the small and marginal farmers as have facilities for rearing and proper feeding of improved pigs.

6.7 By and large, pig development through small and marginal farmers and agricultural labourers should be aimed at by undertaking a crash programme of crossbreeding their indigenous pigs with exotic breeds of pigs. These people are usually so poor that they would hardly be expected to provide the necessary managerial and other conditions for successful rearing of crossbred or purebred exotic pigs. Programmes for gradually replacing their local stock by crossbred pigs produced by themselves would be more successful. The crossbred pigs produced in this way would have better chances of survival and would be capable of adapting themselves to the local environmental and management conditions which are not expected to be optimum. The pig farmers would then be able to improve their pig rearing practices gradually and as a result the quality and production of the crossbred progenies would be better year after year. By such an approach it would be possible to extend the benefit of the scheme over a large number of small and marginal farmers and agricultural labourers.

Linking up Pig Production to Bacon Factories, Urban Markets

6.8 Intensive pig production through small and marginal farmers and agricultural labourers is recommended only in such SFDA/MFAL districts which could be linked up with large consuming centres, existing bacon factories and those proposed by the Working Group on Animal Husbandry and Dairying in the Fifth Five Year Plan and in districts located in States where pork consumption has been fairly high. Pig production could be undertaken in twelve SFDA/MFAL districts which could be linked with the existing bacon factories at Haringhata, Borivili, Gannavaram, Ranchi, Aligarh, Alwar, Chandigarh and Kuthattukulam (Appendix XVI). Thirteen more SFDA/MFAL districts could be connected to the 8 bacon factories proposed to be established in the Fifth Plan in the States of Madhya Pradesh, Mysore, Orissa, Tamil Nadu, Meghalaya, Nagaland, Haryana

and Goa (Appendix XVII). Twentytwo SFDA/MFAL districts offer good scope for piggery development as they are located in areas where pork consumption is popular such as Assam, Meghalaya, Darjeeling in West Bengal, Goa and Manipur (Appendix XVIII). The Commission is of the view that there are quite a number of districts which are not covered by SFDA/MFAL projects but offer very good scope for development of pigs. It is, therefore, considered necessary that pig production programmes should be taken up in these districts also with a view to assisting small and marginal farmers and agricultural labourers. This would help a large number of such people to benefit from supplementary income through pig rearing. Additional fiftythree districts have been identified and are recommended for intensive pig development work (Appendix XIX). It is recommended that in each of these districts about 200 small farmers may be carefully selected for subsidized distribution of purebred exotic pigs. About 800 small and marginal farmers may be enrolled for subsidized distribution of crossbred pigs. One thousand or more marginal farmers and agricultural labourers may be identified for undertaking crossbreeding of local nondescript pigs with a suitable exotic breed. While selecting farmers for subsidized distribution of pigs preference should be given to those farmers who are already keeping pigs. After their requirements are met, the requests of other small farmers who come forward to take up pig rearing for the first time may be considered. If the piggery scheme is organised on the basis suggested above, a total of 2 lakh families of small and marginal farmers and agricultural labourers in 100 districts would be assisted to improve their economic status.

Inputs & Services

(a) Production of Breeding Stock

6.9 The programme proposed above would need a regular and large scale supply of purebred and crossbred sows and boars for distribution to the identified farmers and labourers. The State Departments of Animal Husbandry should make a realistic estimate of the requirements of improved pigs and assess the present production capacity of their pig breeding centres/farms. For meeting the additional requirements the State farms should be adequately strengthened with stock, buildings and personnel, and provided with funds for feeding the expanded herd. Provision for feeding and rearing could be made through a revolving fund allotted to these farms which might be recouped through sale of pigs on a no-profit no-loss basis. The commission recommends that special programmes should be taken up for

crossbreeding pigs with exotic breeds of pigs in areas where pig rearing is already popular such as Punjab, Haryana, Andhra Pradesh, Uttar Pradesh, Coorg in Mysore, Goa etc. These areas would then be able to produce and supply crossbred pigs for breeding and rearing.

(b) *Unit Size*

6.10 Each farmer/agricultural labourer may be assisted to raise a herd of 3 improved breeding sows. The economics of maintaining a unit of 3 sows is given in Appendix XV. Under rural conditions such a unit could provide an income of Rs. 1190 every year. During the first year each identified farmer may be given 3 pigs and if his performance is satisfactory he may be assisted to add two or more during the next year. If the identified farmer has 10 or more breeding sows (purebred, crossbred and indigenous) he may also be provided with one boar for breeding.

(c) *Type of Stock*

6.11 Experience so far obtained in the pig breeding farms and piggery development blocks shows that exotic breeds like Middle White Yorkshire, Large White Yorkshire and Landrace could be used successfully over wide areas in the plains. As a result of various measures taken in the recent past to stock and multiply these breeds of pigs in a number of government farms, the requirements of boars and sows of these white breeds could be largely met from within the country itself. In the hilly areas particularly of Darjeeling, Assam, Meghalaya, Nagaland etc. the local people prefer black breeds of pigs. In these areas it would be advisable to use breeds such as Hampshire, Saddleback, Large Black Yorkshire etc. for crossbreeding. There is shortage of these breeds of pigs for breeding purposes in the country, particularly in the States like Meghalaya and Nagaland, where it is reported that extension of piggery development with small and marginal farmers had to be restricted because of nonavailability of black breeds of pigs. The Ministry of Agriculture should, therefore, pay special attention to arrange for importation on a priority basis of black breeds of pigs and arrange for their multiplication in farms located in the eastern Himalayan region. The pigs could be distributed to farmers and labourers at the age of 3 to 6 months depending upon local environmental conditions. It is advisable not to distribute the piglets immediately after weaning as they need special care in feeding at least for a month after they are separated from their mothers. The farmers should be assisted with subsidy on feeding the sows upto the time of farrowing or till the pigs reach

an age of 15 months whichever is earlier. As the farmers start getting returns only after the first litter has grown to market weight, it would be necessary to assist these farmers with loans for feeding the sows and their progeny till they are marketed. Such an assistance would be needed for a period of about six months. As far as possible, feed loans and subsidy should be extended in the form of balanced feed and cash loan should be discouraged.

(d) Crossbreeding

6.12 The main emphasis of the programme would be, however, on extensive crossbreeding of the indigenous pigs maintained by the small and marginal farmers and agricultural labourers with exotic breeds and gradual replacement of their indigenous pigstock with crossbred pigs. As already mentioned, such of those farmers and agricultural labourers as have 10 or more breeding sows may be supplied with a young boar (6-12 months of age) at a nominal charge (say of Rs. 10 per boar). The rest of the cost of the boar should be subsidized. To encourage these farmers and labourers to rear crossbred sows for breeding (for replacing their original indigenous sows) they may be assisted with subsidy and loan to meet the cost of feeding upto three crossbred gilts to farrowing age. When once this cycle is completed, the programme would have placed these farmers and agricultural labourers in a position to continue pig production with better stock ensuring additional income to them.

6.13 In the case of marginal farmers and agricultural labourers who own less than 10 sows each, it would be necessary to group a number of farmers in a village and one young boar for breeding should be allotted to each such group as own about 30 to 40 sows in all. The maintenance of the boar should be entrusted to one amongst them and he may be paid a maintenance subsidy for that boar. The identified farmers may be provided with the feed subsidy and loan for 3 crossbred gilts till they reach farrowing stage. Wherever pig breeders' cooperative societies could be formed, the supply of boar and the extension of loan and subsidy for feeding could be routed through these societies.

(e) Feed Supply

6.14 The usual practice in the villages is to feed pigs with kitchen wastes obtained from rural households. Some feed cheaply available feeding stuff, such as whey tamarind seeds, chunis, brans etc. Pigs are generally allowed to roam about particular in urban

and suburban areas to eat garbage, nightsoil etc. Efforts should be made to discourage owners from raising pigs under such unhygienic methods. Such feeding practices allow the pigs to contract various parasitic diseases which consequently affect the carcasses making them unsafe for human consumption. Moreover, such a feeding practice would not be sufficient to ensure optimum growth and production in improved types of pigs. It would be necessary to educate and induce the pig farmers to feed their pigs with locally available foodstuffs supplemented with concentrate mixtures, so that they are raised on adequate and balanced feeds. To economise feed costs pig owners should make every effort to collect kitchen wastes from neighbouring households and from hotels for feeding pigs. In such cases, these materials should be properly cooked before feeding. The feed mixing plants catering to the needs of cattle and poultry should also undertake to formulate and produce suitable balanced feed for pigs making the maximum use of locally available feed ingredients, such as various cakes, chunis, bran, broken grains and byproducts from slaughter houses and carcass utilisation centres. This has already been emphasised in paragraph 4.23. In areas served by bacon factories, the plant management should have an extension service for the supply and use of balanced feed so that these plants would obtain pigs of desired weight and quality.

(f) *Housing*

6.15 In our country the village pigs are generally kept in open enclosures or a small dark low roofed katcha dingy house with a few wooden bars acting as partition and blocking the doorway. A farrowing sow is generally provided with an underground room with a dome shaped roof and a doorway opening above the ground. These conditions are unsatisfactory and insanitary and improved crossbred types cannot be properly reared under such conditions. For improved pigs the styes should be constructed with pucca bricks and flooring should also be properly paved with bricks or other flooring material. There should be suitable troughs for seed and water and a separate room for farrowing. The housing should be clean, sanitary and provide protection against excessive heat, cold, rain and dust. The projects should, therefore, design suitable economic housing for pigs as far as possible using locally available building materials. Construction cost should be subsidized on the usual basis for the small and marginal farmers and agricultural labourers. Some model sheds should be got constructed in the initial stages using labour from the farmers' families to reduce costs.

(g) *Health Cover*

6.16 The implementation of an intensive piggery production programme involving a large number of crossbred pigs would need an effective health coverage for its success. The following measures should be adopted for preventing avoidable losses due to diseases and for ensuring optimum production:

A. Swine Fever

All pigs, adult as well as young stock, should be vaccinated with freeze-dried lapinised swine fever vaccine, which gives good grade of immunity for a period of about one year against the Indian strain of swine fever. The vaccination should be repeated at yearly intervals to reinforce the degree of protection against the disease.

B. Foot and Mouth Disease

Foot and mouth disease is another serious scourge causing heavy mortality and morbidity in pigs. Crossbreds and purebred exotic pigs are more susceptible to this disease and suffer serious losses and therefore, adequate measures should be taken to protect them. It is understood that the vaccine available for protection of cattle against foot and mouth disease may not be quite efficacious when used to protect pigs. The Commission, therefore, recommends that the Indian Veterinary Research Institute should intensify researches on foot and mouth disease in pigs and take early steps for production of an efficacious and inexpensive vaccine.

C. Control of Worm Infestations

Worm infestations may cause considerable economic losses by devitalizing pigs and depriving them of essential feed nutrients with associated illeffects of unthriftiness, stunted growth, emaciation etc. For prevention of such losses the extension veterinarians should visit the pig units frequently to carry out necessary microscopic examinations and for undertaking preventive measures and curative treatments.

6.17 The disease investigation staff of the Department of Animal Husbandry should pay regular visits to the pig farms for examining the health of the pigs and for identifying disease problems so that timely and effective measures could be taken to check infections and to minimise losses.

Training

6.18 It would be a great advantage if the farmers identified for pig production programme are given special practical training on better pig rearing practices at the State pig breeding institutions and pork processing plants. This would go a long way in educating pig farmers in adopting better breeding, feeding and management practices for profitable production. Adequate financial provision should be made for this important prerequisite for the success of the programme.

Credit and Marketing

6.19 Due to the lack of any organised channels for marketing the pig farmers in the rural areas do not obtain a reasonable price for their pigs. Pig dealers operate in certain States like Uttar Pradesh, Madhya Pradesh, West Bengal and they buy pigs from the farmers directly or through their agents. These middlemen offer very low prices for the pigs. Regular pork processing establishments also do not offer reasonable prices. It is estimated that from a 70 kg pig, a bacon factory processing ham, bacon, sausages etc. could obtain easily about Rs. 320 from sale of processed and unprocessed products. Even when such a pig is slaughtered and pork and carcass products are sold fresh in the meat market it will fetch nearly Rs. 250. It is clear that pig producers could hope to obtain about Rs. 3 per kg of live weight of pigs but they do not get such a price in most of the places. Thus, bulk of the advantages in the marketing of pigs are taken away by middlemen operators or processing establishments. The pig breeders are in such an unorganised state that they have no other option than to dispose of their pigs at distress prices. Thus, efforts for better production of pigs get discouraged. The position could be changed for the better if only the pig breeders are helped to organise themselves into cooperatives. These cooperatives will then be able to bargain for a better price for the pigs.

6.20 The existing and the additional bacon factories proposed to be set up by the Department of Animal Husbandry should have an extension wing to help the pig breeders to organise themselves into cooperatives and offer them suitable prices for their pig stock according to type, condition of carcasses etc. In the other districts, the State Governments should assist in the improvement of slaughter facilities for pigs in the existing city/town slaughter houses. The local bodies may be given special assistance to construct separate slaughter sections for pigs and, wherever necessary, separate slaughter houses could be started so that pigs are slaughtered in a humane manner under hygienic conditions and good quality pork marketed through meat shops.

6.21 In the present stage of development of pig farming and pork production in India, it is more important to place emphasis on the production of fresh pork to meet the requirements of the consumers at a reasonable price and to popularise the consumption of pork. The production of chilled fresh pork, edible offals, sausages, hams, shoulder and bacon (smoked) will have to be given priority initially. When the handling capacity of the plant has sufficiently increased, canning of products could be taken up. The State Governments should, therefore, explore possibilities of progressively developing small pork processing plants on the above lines in the districts where pig production will be organised in a big way to provide for an all the year round market for pigs.

Cooperatives and Marketing

6.22 The Working Group on Dairy and Animal Husbandry cooperatives set up by the Union Ministry of Agriculture in 1962 had emphasised that the formation of Producers'-cum-Marketing Cooperatives of small pig producers would go a long way in improving the quality and value of the stock with the pig producers, overcome the influence of middlemen in marketing of their pigs and ensure better returns for the pig owners. This Group suggested that piggery cooperatives could be started with a number of pig breeders in compact areas. The activities of the cooperatives could, in the initial stages, be confined to improvement in the quality of the pig stock owned by the members through better breeding, feeding and marketing of the pigs. The Cooperatives should also arrange for breeding stock and balanced rations for feeding pigs at reasonable prices. They should arrange for collective marketing of superior pigs to the bacon factories and meat markets. It was suggested that at a later stage, these Cooperatives having gained sufficient experience, could take up slaughtering of pigs and processing of pork products. This Group observed that because of the generally poor economic conditions of the pig producers, these cooperatives should receive substantial financial assistance from the Government towards share capital, working capital, development of infrastructure, managerial assistance and technical guidance.

6.23 The Commission considers that the recommendations of the above mentioned Working Group are very important and essential, and that pig breeders' Cooperatives should be organised on a priority basis in the districts where pig production programmes through small and marginal farmers and agricultural labourers are taken up. To start with, Pig Producers'-cum-Marketing Cooperatives could be formed as primary societies in different parts of the districts, with groups of about 100 small pig breeders in

compact areas. These primary cooperatives could be federated into a district Union. The primary cooperatives could look after the functions such as, distribution of breeding stock, supply of balanced feeds, collective marketing of pigs, extension of services such as disease control etc. The district Union could assist the primary cooperatives in the collection, transport and marketing of stock to large consuming markets such as bacon factories, slaughter houses in big cities and towns located in or outside the districts. At a later stage, it could even be envisaged that the district Unions can take over and run the bacon factories or slaughter houses as a cooperative endeavour of the small producers. They should arrange for manufacture and distribution of balanced feeds through the primaries. The credit requirements of the pig farmers should be taken care of by the Farmers' Service Societies as recommended in the Commission's Interim Report on Credit Services to Small and Marginal Farmers and Agricultural Labourers. However, there should be a close liaison and working arrangement between the Pig Producers-cum-Marketing Cooperatives and the Farmers' Service Societies so that pig farmers get easy and timely credit and the repayment of the loans is ensured by the Pig Producers' Marketing Cooperatives which will undertake the sale of pigs for slaughter houses and meat markets.

6.24 The Commission recommends that the State Governments should provide initial financial assistance, technical staff and managerial competence. Otherwise, it would be a very difficult task to organise pig breeding as a profitable subsidiary occupation to benefit families of these weaker sections of the rural community.

SECTION VII

COVERAGE, CREDIT AND ORGANISATION

7.1 In the Chapters IV, V and VI intensive programmes of poultry production in 167 districts, sheep production in 140 districts and pig production in 100 districts through small and marginal farmers and agricultural labourers have been recommended. The list of these districts is given in Appendix XXI. It will be seen that all the three programmes have been proposed in 41 districts, two in 78 districts and one in 132 districts. The total number of districts where one or more of these programmes have been recommended for implementation comes to 251. The Commission had earlier recommended in its Interim Report on 'Milk Production' that milk production through small and marginal farmers and agricultural labourers should be undertaken in 107 districts. Taking these also into consideration the total number of districts in which one or more of livestock production programmes would be implemented comes to 262.

7.2 When poultry, sheep and pig production programmes as recommended in this Report are fully implemented a total of 1.12 million families of small and marginal farmers and agricultural labourers would be assisted to supplement their income during the Fifth Plan period. On the assumption that an equal number of small farmers and marginal farmers and agricultural labourers would be enrolled for assistance, the average subsidy for each family works out to around Rs. 640 for poultry production, Rs. 700 for sheep production and Rs. 500 for pig production. The subsidy content for the poultry programmes would be of the order of Rs. 32 Crores, for the sheep programmes Rs. 29.40 Crores and for pig production programmes Rs. 10 Crores. Thus, the total subsidy for all the three programmes would amount to Rs. 71.40 Crores.

7.3 It is understood that arrangements for institutional credit for animal husbandry programmes for the benefit of small and marginal farmers and agricultural labourers are being progressively liberalised. The Agricultural Refinance Corporation has agreed to extend cent per cent refinance for schemes benefiting small and marginal farmers and agricultural labourers in the project districts while its refinance is normally 75% to 90% only. The ARC Act is being amended to enable the Corporation to refinance schemes particularly for weaker sections without insisting upon mortgage of land. The Commercial Banks have been advised

by the Reserve Bank of India to relax the normal margin and security requirements in favour of small and marginal farmers and to extend credit support for the programmes in the SFDA/MFAL Project areas. The Cooperatives are increasingly reorienting their policies and procedures in favour of the weaker sections of farmers. The Cooperatives have accepted to extend medium term loans on personal surety for dairying and poultry upto Rs. 2000 and for other purposes upto Rs. 1000 provided the producers have adequate arrangements for marketing. It will be seen from the estimates worked out on the economics of poultry, sheep and pig units recommended in this Report that credit requirements would be of the order of Rs. 2200 for a poultry unit of 50 layers, Rs. 2000 for a sheep unit of 20 ewes and Rs. 1700 (excluding credit for operational costs) for a unit of 3 sows. In the case of pig rearing the farmers would need loans towards working capital to a tune of about Rs. 2000 per unit. The present quantum of loans admissible for these sections of people on personal surety is not, therefore, quite adequate. It is necessary that the cooperatives and other credit extending institutions for animal husbandry should extend larger production credit on personal surety Rs. 2000 for sheep and pig producers also.

7.4 The animal husbandry programmes recommended in this Report envisage large coverage of participant farmers and have to look after all aspects of production and marketing. These programmes should, therefore, as suggested earlier be formulated on a package basis. Because of extensive coverage envisaged and comprehensive technical support required, these programmes in each district should be implemented as a separate project. The responsibility of organising and successfully guiding the programmes may have to be vested in the State Departments of Animal Husbandry. However, in such of the districts as already have or will have Development Agencies for small and marginal farmers and agricultural labourers* there should be a close liaison between these agencies and the Animal Husbandry Department authorities overseeing the project. The project officers of the animal husbandry programmes in these districts should also be coopted as members of these Development Agencies. In these districts these Agencies should assist in identification of the farmers and organisation of producers' cooperatives and linking up these cooperatives with credit extending agencies. For proper formulation of projects

*In the Commission's Interim Report on 'Reorientation of Programmes of Small Farmers and Marginal Farmers and Agricultural Labourers Development Agencies' it has been recommended that distinction between SFDA and MFAL should be abolished and in future each Agency should cover small farmers, marginal farmers and agricultural labourers in the same area.

in respect of each district and successful implementation of the programmes, there should be a special Project Cell in the headquarters of the State Animal Husbandry Departments. Similarly, there should be a Technical Cell attached to the Animal Husbandry Division in the Union Ministry of Agriculture which could help in formulating project proposals, guiding the implementation and also act as a monitoring and watchdog agency for the successful implementation of the various aspects of the programme.

SECTION VIII

ACKNOWLEDGEMENTS

8.1 The Commission takes this opportunity of thanking individuals, institutions and officers of the Government of India, Indian Council of Agricultural Research and State Governments for their valuable suggestions either through correspondence or personal discussions. We wish to thank also the Chairman of the Surat District Poultry Breeders' Cooperative Society Limited for making arrangements in connection with the study of the working of the Society and for supplying relevant information.

8.2 We also wish to place on record our special appreciation of the valuable work done by Shri T. Narayanan, Specialist (Animal Husbandry) in the Commission who had collected and analysed data received from various sources and has given valuable help in the preparation of the Report. The Commission would like to make a special mention of the suggestions and assistance given in the preparation of the Report by Shri J. N. Panda, Joint Commissioner (Poultry), Dr. O. N. Singh, Joint Commissioner (Livestock Production), Late Dr. M. R. Jalihal, Joint Commissioner (Sheep Development) and Shri S. Krishnamurthy, Animal Husbandry Specialist of the Department of Agriculture, Dr. R. N. Acharya, Director Central Sheep and Wool Research Institute, Shri P. N. Balagopal, Assistant Scientist (Sheep & Wool) of the Indian Council of Agricultural Research and Shri J. M. Lall, Specialist (Livestock Health) in the Commission. Mention must be made of the untiring assistance and help given by Shri R. S. Sangwan, Assistant Director (Agrl. Sciences) in the Commission in the various stages of the preparation of the Report.

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Member-Secretary

New Delhi

August 3, 1973.

NATIONAL COMMISSION ON AGRICULTURE
QUESTIONNAIRE ON
POULTRY FARMING, SHEEP AND GOAT REARING,
PIG PRODUCTION AND VEGETABLE
GROWING IN SFDA AND MFAL DISTRICTS

State :
Name of the Project : (SFDA/MFAL)
Name of the Project Officer

A

1. POULTRY FARMING

1.1 What is the total population in the district? What percentage of the population comprises of improved birds such as White Leghorn, Rhode Island Red, Australorps, Crossbreds etc.?

1.2 What is the system of poultry keeping (free range, semi-intensive, intensive or deep litter) predominantly followed in rural, semi-urban and urban areas? What would be the relative coverage of the different systems?

1.3 What type of poultry housing is common in the district? What is the average cost of construction of these poultry houses?

1.4 What are the common sizes of poultry units or farms in the district (e.g. units of 10 to 25 birds, small farms of 50 to 100 laying birds, large farms with over 100 laying birds etc.)? How many such units have been identified in the district?

1.5 What are the sources of supply of chicks, pullets, laying birds? What are their prices? Are the farmers familiar with rearing of day old chicks?

1.6 What are the sources of supply of balanced poultry feed or feed concentrates? Specify the sources (e.g. government, cooperatives, private dealers etc.) At what prices (including the cost of transport) these are available to the farmers?

1.7 What is the extension agency available for assisting the farmers in disease control, routine vaccination and treatment and proper management of poultry farms?

- 1.8 Are the extension officers suitably trained in poultry husbandry?
- 1.9 What are the existing marketing arrangements in the district for egg and poultry? Name the important townships where eggs and poultry from the district can be marketed and indicate their population and the likely consumption of eggs. A district map showing these locations may be enclosed.
- 1.10 What is the price pattern of eggs and poultry in these townships and how does it vary as between winter and summer seasons?
- 1.11 What are the government poultry farms, poultry extension centres, intensive egg and poultry production-cum-marketing centres functioning in the district? A note on the activity of each of these institutions may please be furnished.
- 1.12 How are the credit requirements of the poultry farmers being met at present? What are the terms of repayment and the rates of interest fixed by the different credit agencies?
- 1.13 Is there any school feeding programme? Is egg included in such a programme? Please give details.
- 1.14 Is egg and poultry eating a taboo in the district or is it so only for certain classes of people? What will be the percentage of such population?
- 1.15 What are the details of the poultry component of the SFDA and MFAL Projects?
- 1.16 From what sources is it proposed to draw supplies of chicks, birds, feed and equipment?
- 1.17 What is the size of the poultry unit proposed for a small farmer, marginal farmer or agricultural labourer? How many farmers are likely to be assisted under the existing project?
- 1.18 What is the economics of the functioning of these poultry units? Please give details.
- 1.19 What is the financial assistance (credit and subsidy) proposed to be given to each of these units?
- 1.20 What are the arrangements proposed for the marketing of eggs and poultry produced by these farmers and agricultural labourers?
- 1.21 Is there any proposal to train these farmers in poultry raising?
- 1.22 Is it proposed to strengthen the existing poultry extension organisation?
- 1.23 What is the financial assistance extended to the cooperatives of poultry farmers in the district?
- 1.24 Are poultry farmers encouraged to form cooperative societies of their own? If so, please give details of the number of societies existing and their location.

1.25 Is there any milk supply organisation/scheme in the district? What is the scope for marketing eggs also through these organisations?

1.26 Have you any other information to furnish relevant to this enquiry?

NB: If duck rearing is popular in the district, information asked for above may be furnished in respect of ducks also.

B

2. SHEEP AND GOAT REARING

2.1 What is the population of sheep and goats in the district?

2.2 What is the breed/type of sheep (mutton, coarse wool, medium wool, fine wool etc.) and goats (meat, milch) predominantly found in the district? State the average yields of wool per year obtained from the sheep and milk yield in goats.

2.3 What is the lambing/kidding percentage and mortality among adults and lambs/kids?

2.4 What is the usual frequency of obtaining lamb crop, i.e., one lambing a year or 3 lambings in 2 years etc.?

2.5 What is the age and weight at which sheep/goats are slaughtered and the average dressed weight obtained?

2.6 Which are the principal towns in the district where sheep are slaughtered? Indicate the average number of sheep/goats slaughtered every day at these places.

2.7 Is there any market within the district or outside for the marketing of wool produced in the district?

2.8 What is the price that is obtained for wool/mutton in the district? What is the type of marketing practised for sale of wool/mutton?

2.9 What is the usual practice for rearing sheep in the district? Is any supplementary feeding followed? State whether the flocks are migratory or stationary.

2.10 If migration is practised, what is the total sheep migrating and what is the proportion of owners of migratory flocks? What is the type and extent of movement of flocks?

2.11 Which class of farmers are predominantly engaged in sheep rearing? Is sheep rearing undertaken as a whole time operation or as a subsidiary to cultivation?

2.12 State the average size of flock owned by the farmer/sheep breeder in the district.

2.13 What is the breeding policy adopted by the State Department for sheep and wool development in the district?

2.14 What are the specific Plan schemes under operation for sheep and wool development in the district? Please give broad details of these schemes and indicate the approximate number of beneficiaries.

2.15 Do the schemes envisage arrangements for marketing of wool, market lamb and mutton? Is the district linked up or can it be linked up to the sheep shearing and wool grading centres in the State or elsewhere?

2.16 Are there any arrangements for construction of stockyards in the district?

2.17 Have any cooperatives been formed at village/taluk/district level for the benefit of the sheep farmers?

2.18 Have any estimates been made of the requirements of stud rams (indigenous or exotic) for improved breeding of sheep in the district? If so, what are the phased requirements for the next five years and how are these proposed to be met?

2.19 Is any credit scheme in operation to benefit sheep farmers in the district? Please give details.

2.20 What are the common sheep diseases encountered in the district? Mention seasonality of occurrence, mortality and morbidity experienced.

2.21 What are the arrangements in the district for providing adequate health cover for the improved sheep?

2.22 Has any special programme for sheep rearing been proposed for assisting the small and marginal farmers? Please give details.

2.23 What is the unit size of the flock that will be introduced with each of the small farmers and agricultural labourers? Please give details.

2.24 Has any economics been worked out before arriving at the unit size? Please give details.

2.25 What is the production performance that should be achieved in the blocks by the beneficiaries?

2.26 What is the total number of farmers likely to be covered under the scheme in the district?

2.27 What are the arrangements proposed for supplying or developing high producing sheep (ewes and rams) with these farmers?

2.28 Has any special breeding programmes including supply of rams been contemplated? If so, please give details.

2.29 What is the quantum of financial assistance (Loan, subsidy etc.) proposed for each farmer for purchase and rearing of sheep and other requisites?

2.30 Is there provision to give assistance to farmers for land development, fodder production, pasture improvement, supplementary feeding of stocks, feeding of market lambs etc.?

2.31 Have any tentative estimates been made as to the increased returns for each farm family? If so, please give details of costs and returns per farmer.

2.32 Have you any other information to furnish relevant to the enquiry?

C

3. PIG PRODUCTION

3.1 What is the population of pigs in the district?

3.2 What is the breed/type of pigs predominantly found in the district?

3.3 What is the frequency of farrowing obtained and the average size of litter per farrowing?

3.4 What is the age and weight at which pigs are slaughtered and the average dressed weight obtained? What is the price paid to the producers on liveweight basis for pigs sold for slaughter?

3.5 What are the large towns in the district where there is scope for slaughter of pigs and consumption of pork? Indicate the average number of pigs slaughtered every day. Also indicate whether there are any separate slaughter houses for pigs in the district. What is the average price of pork?

3.6 What is the system of marketing adopted for the sale of pigs for slaughter?

3.7 Are pigs in the district also kept for production of bristles? If so, what are the marketing arrangements and prices obtained?

3.8 What is the usual practice of rearing pigs in the district? To what extent stall feeding or special feeding of pigs is undertaken?

3.9 Which are the classes of people predominantly engaged in raising pigs in the district? Are there any organised piggery units run by progressive farmers? If so, what is the average number of pigs maintained by these farmers?

3.10 Is pork generally a popular meat in the district? Indicate the extent to which it is acceptable to different classes of people.

3.11 What are the specific schemes currently in operation for development of pigs in the district? Please give details including breeding programmes, balanced feed distribution, training of farmers, marketing of pigs, health cover etc.

3.12 Has any cooperative been formed for the benefit of pig farmers in the district?

3.13 Has any special programme for pig development been proposed for assisting small and marginal farmers and agricultural labourers? If so, what are the broad details of these schemes?

3.14 What is the unit size of pig herd proposed to be developed with these sections of farmers?

3.15 Has any economics been worked out before arriving at this unit size in terms of inputs and output per unit? If so, please give details.

3.16 What is the number of beneficiaries who are expected to be assisted under these programmes in the districts?

3.17 What kind of breeding stock is proposed to be supplied and what are the arrangements and sources of supply for such quality breeding stock (sows and boars)?

3.18 What are the different items for which financial assistance in the form of loan, subsidy etc. has been proposed for each of these farmers?

3.19 Is there any organised bacon factory, pork processing unit, slaughter house in the district for marketing of pigs for slaughter purposes? If so, please give full details regarding handling capacity, prices paid to the producers etc.

3.20 What are the arrangements if any for transportation of pig stock from the rural areas to these processing centres?

3.21 Are the veterinary organisations adequate in the district to provide health cover for improved pigs in the district?

3.22 Have you any other information to furnish relevant to the enquiry?

4. VEGETABLE GROWING

4.1 What is the total area under vegetables in the district and what proportion of it is under cultivation by small/marginal farmers?

4.2 To what extent are vegetables grown in rotation with other crops and form part of cropping pattern in the district?

4.3 Has any development scheme been introduced for increasing vegetable production in the district? Please indicate the types of vegetables grown, the economics of their cultivation and the number of farmers covered by the project.

4.4 In so far as, vegetable growing needs adequate water support, it is obvious that only farmers already having irrigation facilities or only those who are likely to benefit from the planned extension of irrigation facilities under the Project could take to vegetable growing as a source of supplementary income. Please give details of (i) the number of farmers taking to vegetable cultivation who have irrigation facilities already and (ii) the additional number likely to get water from new irrigation sources.

4.5 A small plot of land devoted to a kitchen garden can, with good husbandry and active involvement of family labour, produce a reasonable supplementary income particularly to a marginal farmer/agricultural labourer. Is there a scheme to promote kitchen gardening in the SFDA/MFAL areas? Please give details.

4.6 What is the source of supply of vegetable seeds/seedlings in the district?

4.7 What is the extension support available to advise and assist farmers in the cultivation of vegetable including the adoption of preventive and curative methods of pest and disease control?

4.8 What are the transport and marketing arrangements contemplated to assist the farmers in disposing of their production in nearby areas at remunerative prices? Please indicate the important consuming areas, their population and the estimated consumption of vegetables.

NOTE: 1. The replies to the Questionnaire may please be given separately for each of the SFDA/MFAL districts in the State.

2. Where SFDA and MFAL Projects are under implementation in one and the same district, replies to the questionnaire may please be recorded separately for the SFDA and MFAL Schemes in order that the programme content of the respective projects could be brought out clearly.

APPENDIX II

Table showing percentage of flockowners possessing different sizes of land in Andhra Pradesh, Gujarat, Himachal Pradesh and Mysore State

Andhra Pradesh

Percentage number of flockowners possessing different sizes of land

Size (in acres)*	Percentage of flockmasters possessing		
	Stationary type	Migratory type	Over-all
Nil	10.4	17.4	10.6
Less than 1	3.4	3.7	3.4
1—5	35.9	54.7	36.4
6—10	20.2	14.1	20.0
11—15	9.9	2.0	9.7
16—20	5.6	2.7	5.6
21—25	3.7	0.7	3.6
26—30	2.3	1.3	2.3
31 and above	8.6	3.4	8.4
Average (in acres)	9	5	9

Study of feeding and rearing practices of Sheep and yield of wool—
Andhra Pradesh, 1963-64.

Rajasthan

Percentage number of flockmasters possessing different sizes of land

Size (in acres)*	Percentage of flockmasters possessing		
	Stationary type	Migratory type	Over-all
1	2	3	4
Nil	4.8	6.1	4.9
1—10	45.4	11.7	41.5
11—20	12.1	21.4	13.2
21—30	8.8	16.5	9.7
31—40	9.8	17.9	10.8
41—50	4.7	5.4	4.8

Rajasthan—Contd.

1	2	3	4
51—60	4.0	5.9	4.2
61—70	2.5	2.4	2.5
71—80	2.2	4.9	2.5
81—90	0.8	1.8	0.9
91—100	1.3	1.1	1.3
101 and above	3.6	4.9	3.7
Average (in acres)	26	47	29

Study of feeding and rearing practices of sheep and yield of wool—
Rajasthan State, 1960-61.

Gujarat

Percentage number of flockmasters possessing different sizes of land in Joria
region of Gujarat State—1964-65.

Size (in acres)*	Percentage number of flockmasters possessing		
	Stationary type	Migratory type	Over-all
Nil	64.6	79.9	66.4
0—2	2.0	2.0	2.0
2—4	5.4	5.7	5.5
4—6	7.1	4.2	6.8
6—8	3.8	1.5	3.5
8—10	3.2	2.0	3.1
10—12	3.0	0.4	2.7
12—14	1.6	1.3	1.6
14—16	1.6	0.5	1.5
16—18	1.5	0.4	1.3
18—20	0.3	0.2	0.2
20—22	1.5	0.4	1.3
22 and above	4.4	1.5	4.1
Average extent of land (in acres)	10	7	10

Himachal Pradesh

Percentage number of flockmasters cultivating different sizes of land

Size (in acres)*	Percentage of flockmasters possessing		
	Stationary type	Migratory type	Over-all
Nil	4.2	12.5	4.7
1—5	76.2	66.5	75.5
6—10	14.2	15.5	14.3
1—15	3.6	4.7	3.7
16—20	0.9	0.4	0.9
21—25	0.5	0.4	0.5
26 and above	0.4	—	0.4
Average (in acres)	4	4	4

Study of feeding and rearing practices of sheep and yield of wool—
Himachal Pradesh and Kangra district of Punjab State, 1962-63.

Mysore

Percentage number of flockmasters possessing different sizes of land in Mysore State, 1961-62

Size (in acres)*	Percentage of flockmasters possessing		
	Stationary type	Migratory type	Over-all
1	2	3	4
Nil	5.5	6.7	5.6
1—5	42.5	46.9	42.9
6—10	26.2	21.4	25.8
11—15	10.2	9.6	10.2
16—20	5.8	6.9	5.9
21—25	2.8	3.3	2.9
26—30	2.0	1.2	1.9
31—35	1.8	1.3	1.3

Mysore—Contd.

1	2	3	4
36—40	0·8	1·2	0·8
41—45	0·4	0·2	0·4
46—50	0·5	—	0·4
51 and above	2·0	1·3	1·9
Average (in acres)	10	9	10

*1 acre=0·4 hectares

SOURCE :—Note on Statewise Estimates of Annual Wool Production based on Sample Surveys for Estimating Wool Production and for collecting information on sheep keeping practices—Institute of Agricultural Research Statistics—1969.

*Model Scheme for the setting up of an intensive Egg and Poultry
Production-cum-Marketing Centre*

Introduction

Poultry farming has been completely revolutionised with the invention of incubators and the adoption of artificial methods of raising chickens all over the world. It is no longer dependent upon the vagaries of nature and the slow economically inefficient natural process and traditional methods. It can now be produced and multiplied to order with the aid of mechanical means of incubation and rearing equipment. As the intensive agricultural production depends upon the quality of land, irrigation facilities available, good seed, fertilizers and protection from pests and diseases, so intensification of poultry production also depends upon identical conditions, i.e. facilities for the supply of quality breeding stock, balanced poultry feeds, technical guidance in rearing the birds, protection from infectious diseases and organised marketing facilities to provide remunerative and uniform prices for the produce all the year round. All these conditions, however, do not exist simultaneously in this country at present. It has, therefore, been considered essential to provide all these facilities at one and the same time so that the poultry producers may be able to devote their full attention for increasing the production.

Object

It is estimated that the present demand in an average town of one lakh population is in the neighbourhood of 10,000 eggs and 300 table birds per day. Based on this, the object is to produce 10,000 eggs and 300 table birds per day to start with through poultry farmers with a view to provide one egg per capita per day for at least 10% of the population, against 50% of potential consumers of eggs and poultry in a town or city of one lakh population. This supply will be over and above normally available through various channels at present. The scheme will incidentally provide gainful occupation to a large number of poultry keepers, popularise commercial poultry farming against traditional methods of poultry keeping and provide consumers with good quality product at reasonable price.

Location of the project

The project will be implemented around large towns and cities having a human population of one lakh or more in view of ready market available near at hand also considering the difficulty in bringing eggs and poultry from long distances due to lack of satisfactory long distance transport facilities and adequate cold storage and refrigeration facilities available in the country at present.

Selection of area

Apart from the nearness to a town or city, interest of the local people in poultry farming and availability of electricity for adopting modern

methods of poultry farming will also be taken into consideration in selecting the area. An area is considered suitable if 50% people are already keeping poultry or they have no sentimental or religious objection to keeping the same.

The salient features of the scheme are:

- (i) The project will remove on commercial lines on self-supporting basis through cooperatives.
- (ii) All necessary requirements of the farmers, viz. supply of improved stock, mixed poultry feed and feed supplements, equipments, technical guidance, loans and subsidy, disease control programmes and finally the collection, grading and marketing of the produce, will be provided simultaneously.
- (iii) It will stimulate growth of commercial enterprise and gainful occupation to about 300 poultry farmers with a monthly income ranging from Rs. 50—100.
- (iv) It will popularise rearing of day old chicks by the poultry farmers themselves—a base for development of sound poultry industry in the country.
- (v) It will provide the consumers with fresh, clean and good quality eggs and poultry at reasonable price.

With proper management, better feeding and housing, it is expected that each hen will lay at least 144 eggs in a year against the present average production of 60 eggs per bird per annum in the country. Based on this, 25,000 laying birds will be required to produce 10,000 eggs per day. It usually takes 2½ to 3 chicks to raise one laying hen. Based on the fact that half the number of chicks will be males and there will be some mortality and culling of poor birds, 75,000 day old chicks will be required in the first year to produce 25,000 laying hens. As the economic value of the laying hens is usually one laying per year, almost 100% stock will have to be replaced each year. For the production of 75,000 chicks per annum, 15,000 egg capacity incubators will be required to be installed. In addition to 25,000 laying hens, 30,000 male and 5,000 culled female birds will be available for table with an average of about 100 birds per day. In order to produce 200 table birds per day or 75,000 per annum, 85,000 day old chicks of meat type will be required. For the production of the same, another unit of 15,000 eggs capacity incubators will have to be installed.

Seventyfive thousand day old chicks will consume 400 tons of poultry feed upto 12 weeks of age based on the average consumption of 10 lbs per chick. At this age, all male birds except retained for breeding will be sold for table. 30,000 birds will be further raised upto 24 weeks of age and will consume 200 tons of poultry feed based on the average consumption of 14 lbs per chick. Each laying hen will consume 80 lbs of poultry feed per annum and thus 25,000 laying hens will consume another 400 tons of poultry feed. 85,000 meat type chickens when raised upto 10-12 weeks of age will consume 1,000 tons of poultry feed based on an average consumption of 10 lbs of feed per chick upto this age. Thus 2,000 tons of poultry feed in a year or about 6 tons per day will have to be processed and supplied to the poultry farmers.

Ten thousand eggs and about 300 table birds will be required to be collected from the individual farmers each day, graded according to quality and size and distributed to the consumers. Poultry will either be sold for meat as live or as dressed, depending upon the demand and the facilities available for processing. A large quantity of minor poultry equipment such as feeding hoppers, water utensils, brooders, laying nests etc. will be required which may either be purchased or manufactured at the workshop proposed to be set up.

Requirements

In order to produce 10,000 eggs and 300 birds per day, it is necessary to have the following requirements:

(i) Land—5 acres. It will be required for putting up necessary building for different units mentioned below and for holding live poultry for marketing. The land will be provided by the State Government concerned free of cost.	
(ii) Buildings	Rs.
(a) An incubator room (40' × 20') with attached egg testing and holding rooms (15' × 20')	20,000
(b) Feed store comprising of 3 rooms for storage of feed ingredients, mixing room and for storage of mixed feed	25,000
(c) Egg and poultry marketing unit comprising of one egg collection room, one egg candling and grading room, one cold store room, one sale room and one room with deep freeze arrangements for storage of dressed poultry	40,000
(d) One Poultry dressed room and one shed for holding live poultry	20,000
(e) One office block comprising of four rooms. This will be preferably combined with the incubator room	25,000
	1,30,000

Implementation of the project will be undertaken by taking the necessary buildings on rental basis to start with.

(iii) Electricity requirement 400 KV

(iv) Equipments	Rs.
(a) Incubator of 30,000 eggs capacity	40,000
(b) Feed grinder—1 ton capacity	2,500
(c) Feed mixer—1 ton capacity	2,000
(d) Platform weighing scale	1,500
(e) Egg room coolers—3 Nos.	6,000

(f) Electric grader and candler—2 Nos.	• • • • •	3,000
(g) Electric egg washer	• • • • •	1,000
(h) Fillers and flats—10,000	• • • • •	800
(i) Egg cartons—10,000	• • • • •	200
(j) Scalder—1 No.	• • • • •	750
(k) Picker—1 No.	• • • • •	800
(l) Deep freeze cabinets—2 Nos.	• • • • •	8,000
(m) Debeakers with spare blades—2 Nos.	• • • • •	300
(n) Workshop tools	• • • • •	3,000
(o) Jeep	• • • • •	15,000
(p) Truck	• • • • •	30,000
(q) Misc. and unforeseen expenses	• • • • •	2,000
		1,16,850

Justification of the requirement of equipment has been explained above.

(v) Staff (Technical)	For one year Rs.
(a) One Project Officer Class II (Rs. 350—900)	4,000
(b) Two Assistant Project Officers (Rs. 250—500)	6,000
(c) Five Poultry Assistants (Rs. 130—212)	7,860
(d) One Electrician-cum-Mechanic (Rs. 130—212)	1,560
(e) One Carpenter-cum-Blacksmith (Rs. 80—110)	960
(f) Two Drivers (Rs. 110—131)	2,640
(g) Staff (Non-technical)	
(1) One Head Clerk (Rs. 210—380)	2,520
(2) One Accountant (Rs. 168—300)	2,016
(3) Two Storekeepers (Rs. 110—180)	2,640
(4) Two L.D.Cs (Rs. 110—180)	2,640
(5) One Peon (Rs. 70—85)	840
(6) Two Chowkidars (Rs. 70—85)	1,680
(7) Ten Attendants (Rs. 80 fixed)	9,600
	44,696

The Project Officer will be overall in charge of the scheme. He will be assisted by one Assistant Project Officer at the headquarters for running the hatchery, feed mixing unit and grading and marketing of eggs and poultry and one Assistant Project Officer for providing extension service to the Poultry farmers in respect of supply of stock, feed, control

of diseases, technical guidance and collection of eggs and poultry. Three Poultry Assistants will work in the field for assisting the Assistant Project Officer. Two drives are required for one jeep and one truck. One Electrician-cum-Mechanic will be required to look after the machinery part of the equipment such as incubators, feed mixers, grinders, egg and poultry marketing equipment etc. One Carpenter-cum-Smith will work in the workshop for the manufacture and repair of minor poultry equipments such as feed hoppers, watering equipment, nests etc. Of the two storekeepers, one will be in charge of poultry feed and the other will be in charge of eggs and poultry for marketing. Ten attendants will be needed for working in the hatchery, feed manufacturing and egg grading and poultry processing units.

(vi) *Working Capital*

Working capital will be needed for providing credit facilities to the poultry farmers in the form of chicks, feed, equipment, medicines etc. production of chicks, manufacture of poultry feed, collection, grading and marketing of eggs and poultry. Break-up of the same is given below.

(A farmer rearing and maintaining 100 layers will need credit facilities of about Rs. 1,500).

	Rs.
Production of mixed poultry feed and supply to the farmers	3,35,000
Collection, grading and marketing of eggs and storage etc.	1,00,000
	<hr/> 4,35,000 <hr/>
Loans @ Rs. 1,500 per person for 300 farmers	4,50,000

Plan of action

Step No. 1

Selection of suitable area and appointment of Project Officer with transport facilities will be the first requisite for starting the project.

Step No. 2

About 300 persons interested in poultry keeping will be selected within a radius of 25 miles who would be assisted with loans and integrated services under the scheme on the conditions that they would:

- (a) Maintain a unit of 100 layers to make it financially worthwhile.
- (b) Set up a poultry house according to the prescribed design preferably from their own resources. Loans will also be given for this purpose, if required. Weaker sections of the farmers may, however, be given 50% subsidy in addition to loans for setting up the poultry houses.

- (c) Follow instructions as may be given by the technical staff from time to time with regard to rearing, feeding, housing management, diseases etc.
- (d) Purchase their requirements in respect of chicks, feed, drugs, vaccines, housing equipment etc. through the organisation.
- (e) Market their products, eggs and poultry, only through the organisation.

Step No. 3

Each farmer will then be given 300-500 day old chicks, feed, equipment (brooders, feed hoppers, egg laying nests) medicines on credit which will be recovered through sale of eggs and table birds, within a period of 18 months. The chicks required for distribution will be obtained from Government or private hatcheries. This will be followed by setting up a cooperative breeding farm to feed the hatchery.

Step No. 4

The staff will pay frequent visits to the premises of the individual farmers at least once a week for giving them proper guidance in management practices and also carry out prevention and control measures against diseases.

Step No. 5

The poultry farmers will be encouraged to form cooperatives and will be associated with the running of the project from the very beginning especially for providing credit facilities, feed supply to the members and collection and marketing of eggs and poultry. In view of most of the work being of technical nature the project will be run departmentally purely on *ad-hoc* basis and as an agency of the cooperative till such a time as the cooperatives are in a position to run the project on their own.

The integrated production cum marketing centre with the following facilities will be set up at a centrally located place in each town and city simultaneously along with the other steps mentioned above:

- (i) A hatching centre with a capacity of about 30,000 eggs incubator with a view to produce about 2 lakhs day old chicks each year.
- (ii) A feed manufacturing unit with a capacity to produce one ton of feed per hour with a view to meet the annual requirement of about 2,000 tons of poultry feed.
- (iii) Egg and poultry grading and marketing units to handle 10,000 eggs and 300 table birds per day.
- (iv) A workshop to manufacture and repair small poultry equipment like brooders, feed hoppers, nests etc. for supply to the poultry farmers on cost basis.

In the initial stages, necessary buildings will be taken on rent till such time project's own buildings are put up.

Step No. 6

Department of Cooperation will be associated with the project from the very beginning for assisting in forming cooperative societies and checking and auditing their accounts.

It will be necessary to complete all the steps mentioned above during the first three months of satisfactory and smooth working.

Step No. 7

Recovery of loan from the members through sale of eggs and poultry will form the working capital of the organisation to be utilised again and again for expansion of the existing units or advancing loans for new units.

The procedure for disbursement of loans and the manner in which assistance for the collection, grading and sale of eggs and poultry would be adopted in consultation with the Department of Cooperation in order to ensure that no financial loss is imposed on the Government as a result of the operation of the scheme.

A statement showing the financial implications of the scheme is given below:

(Rs. in lakhs)

Capital Investment

(i) Land (to be provided by the State Government)	
(ii) Buildings	1·30
(iii) Equipment	1·17
(iv) Working capital	8·85
	<hr/>
	11·32
Staff	0·450
	<hr/>
Total	11·770
	<hr/>

Expenditure (for one year)

(i) Interest on capital investment of Rs. 6·47 lakhs @ 5% per annum	0·323
(ii) Depreciation charges on Rs. 1·30 lakhs of buildings @5%	0·065
(iii) Depreciation charges on Rs. 1·17 lakhs of equipment @ 10%	0·117
(iv) Staff	0·450
(v) Electricity and water supply	0·100
(vi) Petrol and maintenance charges of the transport	0·500
(vii) Contingencies	0·080
	<hr/>
	1·635
	<hr/>

<i>Receipts</i>	(Rs. in Lakhs)
(i) Servicing charges on marketing of eggs @ Rs. 2 per 100 eggs	0.730
(ii) Servicing charges on marketing of table birds @Rs. 100 per 300 birds	0.365
(iii) Servicing charges of feed supply @ Re. 1 per 100 lbs	0.400
(iv) Hatching charges @ 5 p! per egg	0.150
	1.645

Notes:

- i. The scheme will be self-supporting after the complete establishment of the project.
- ii. Eggs will be sold to the consumers at the flat rate of Rs. 2.25 per dozen and will be purchased from the producers @ Rs. 2 per dozen.
- iii. Table birds will be produced @ Rs. 1.12 per lb live-weight and sold to the consumers @ Rs. 1.125 per lb live-weight or its equivalent in dressed weight.
- iv. The marketing of eggs and poultry has been specially linked with the credit facilities so that the money loaned to the poultry farmers could be easily recovered and the farmers assured of fair return for their produce.

*List of SFDA/MFAL Districts in which Intensive Poultry Production
Projects are already functioning*

Sl. No.	Name of State	Name of District	Location of I.P.D.P.
(A) <i>S.F.D.A.</i>			
1.	Bihar	1. Patna	Patna
2.	Gujarat	2. Surat	Surat
		3. Junagarh	Junagarh
3.	Jammu & Kashmir	4. Jammu	Jammu
4.	Maharashtra	5. Nasik	Nasik
		6. Ratnagiri*	Chiplun
		7. Satara*	Satara
5.	Mysore	8. Mysore	Mysore
6.	Rajasthan	9. Bharatpur	Bharatpur
		10. Alwar	Alwar
		11. Udaipur	Udaipur
7.	West Bengal	12. Hooghly	Calcutta
8.	Punjab	13. Patiala	Patiala
(B) <i>M.F.A.L.</i>			
1.	Andhra Pradesh	1. Visakhapatnam	Visakhapatnam
2.	Assam	2. Kamrup	Khanapara
3.	Bihar	3. Ranchi	Ranchi
4.	Maharashtra	4. Ratnagiri*	Chiplun
		5. Satara*	Satara
		6. Parbhani	Parbhani
5.	Orissa	7. Cuttack	Cuttack- Bhubaneswar
6.	Punjab	8. Jullundur	Jullundur
7.	Rajasthan	9. Ajmer	Ajmer
		10. Bhilwara	Bhilwara
8.	Delhi	11. Delhi	Delhi
9.	Goa	12. Goa	Goa (Panaji)
10.	Pondicherry	13. Pondicherry	Pondicherry

*These districts are common for SFDA and MFAL projects.

List of SFDA/MFAL Districts which could be linked up to a nearby Intensive Poultry Development Project.

Sl. No.	Name of the State	Name of project district	Nearby I.P.D.P. to be linked
(A) S.F.D.A.			
1.	Andhra Pradesh	1. Nalgonda*	Hyderabad
		2. Srikakulam	Visakhapatnam
2.	Assam	3. Nowgong	Khanapara
3.	Jammu & Kashmir	4. Anantnag	Srinagar
		5. Kathua	Jammu
4.	Kerala	6. Quilon*	Chenganur
5.	Madhya Pradesh	7. Ratlam	Indore
		8. Ujjain	-do-
		9. Bilaspur	Raipur
6.	Orissa	10. Dhenkanal	Bhubaneswar
(B) M.F.A.L.			
1.	Andhra Pradesh	1. Nalgonda*	Hyderabad
2.	Bihar	2. Shahabad	Patna
3.	Jammu & Kashmir	3. Baramula	Srinagar
4.	Kerala	4. Quilon*	Chenganur
5.	Madhya Pradesh	5. Durg	Raipur
6.	Mysore	6. Tumkur	Bangalore

*These districts are common for SFDA and MFAL projects.

List of SFDA/MFAL districts where new Intensive Poultry Development Projects (Expanded Basis) could be started and the location of consuming markets -

Sl. No.	State	Name of District	Consuming market(s) to be linked up
(A) S.F.D.A.			
1.	Assam	1. Goalpara	Gauhati
2.	Haryana	2. Ambala*	Ambala, Delhi
		3. Gurgaon	Delhi
3.	Himachal Pradesh	4. Sirmur	Chandigarh/Delhi
4.	Kerala	5. Cannanore*	Calicut/Ernakulam/Cochin Complex
5.	Maharashtra	6. Thana	Bombay
		7. Bhandara	Nagpur
6.	Mysore	8. Bidar	Hyderabad
7.	Nagaland	9. Nagaland*	Kohima
8.	Orissa	10. Ganjam	Berhampur Gopalpur-on-sea
9.	Punjab	11. Sangrur	Patiala/Delhi
		12. Amritsar	Amritsar
		13. Ferozepur	Ferozepur
10.	Tamil Nadu	14. South Arcot	Madras
		15. Madurai	Madurai
11.	West Bengal	16. Darjeeling	Darjeeling/Siliguri
(B) M.F.A.L.			
1.	Gujarat	1. Bulsar	Bombay
		2. Baroda	Baroda/Ahmedabad
2.	Haryana	3. Ambala*	Ambala/Delhi
		4. Hissar	Hissar/Delhi
3.	Himachal Pradesh	5. Simla	Simla
4.	Kerala	6. Cannanore*	Calicut/Ernakulam/Cochin Complex
5.	Madhya Pradesh	7. Raisen	Bhopal
		8. Sehore	Bhopal
6.	Meghalaya	9. K & J Hills	Shillong
		10. Garo Hills	Shillong
7.	Nagaland	11. Nagaland*	Kohima

(B) *M.F.A.L.*—Contd.

APPENDIX VI

Sl. No. State	Name of District	Consuming market(s) to be linked up
8. Orissa	12. Keonjhar	Barbil
9. Punjab	13. Hoshiarpur	Jullundur/Hoshiarpur
10. Uttar Pradesh	14. Mathura	Delhi
11. Tamil Nadu	15. North Arcot	Vellore, Madras
	16. Salem	Bangalore, Salem, Mettur
12. West Bengal	17. Purulia	Asansol, Bokaro, Ranchi, Dhanbad
	18. Bankura	Durgapur

*These districts are common for SFDA and MFAL projects.

APPENDIX VII

List of SFDA/MFAL districts which have limited scope for poultry development

S.No.	Name of the State	Name of the Project/District
(A) <i>S.F.D.A.</i>		
1.	Andhra Pradesh	1. Cuddapah
2.	Bihar	2. Purnea
3.	Tamil Nadu	3. Tirunelveli
(B) <i>M.F.A.L.</i>		
1.	Mysore	1. Bijapur
2.	Manipur	2. Manipur
3.	Tripura	3. Tripura

APPENDIX VIII

List of districts other than SFDA/MFAL districts recommended for Intensive Poultry Development for assisting Small and Marginal Farmers and Agricultural Labourers.

Name of State	Name of districts	Towns with a population of 1 lakh and over	Towns with a population of 50,000 to 1 lakh
1	2	3	4
1. ANDHRA PRADESH	1. East Godavari*	Rajahmundry Kakinada	
	2. West Godavari*	Eluru	Bheemavaram
	3. Krishna*	Vijayawada Machilipatnam	Gudivada
	4. Guntur*	Guntur Tenali	Chirala
	5. Nellore*	Nellore	—
	6. Kurnool*	Kurnool	Adoni Nandyal
	7. Cuddapah	—	Cuddapah Proddutur
	8. Hyderabad	Hyderabad	—
	9. Nizambad*	Nizamabad	—
	10. Warangal*	Warangal	—
2. ASSAM	11. Lakhimpur*	—	Dibrugarh Tinsukia
3. BIHAR	12. Gaya	Gaya	—
	13. Muzaffarpur	Muzaffarpur	—
	14. Darbhanga	Darbhanga	—
	15. Monghyr	Monghyr	Jamalpur
	16. Bhagalpur	Bhagalpur	—
	17. Dhanbad*	Dhanbad Bokaro	—
	18. Singbhum*	Jamshedpur	—
	4. GUJARAT	19. Ahmedabad*	Ahmedabad
20. Kaira		Nadiad	Anand Camsay
21. Mehsana		—	Mehsana Patan Kalan

APPENDIX VIII—Contd.

1	2	3	4
	22. Rajkot	Rajkot	Dhoraji Porbander Gondal
	23. Jamnagar	Jamnagar	Morvi
5. HARYANA	24. Rohtak	Rohtak	—
	25. Karnal	—	Karnal Panipat
6. HIMACHAL PRADESH	—	—	—
7. JAMMU & KASHMIR	26. Srinagar*	Srinagar	—
8. KERALA	27. Kozhikode	Calicut	—
	28. Palghat	—	Palghat
	29. Trichur	—	Trichur
	30. Ernakulam	Cochin	—
	31. Alleppey	Alleppey	—
	32. Trivandrum*	Trivandrum	—
9. MADHYA PRADESH	33. Raipur*	Raipur	—
	34. Gwalior*	Gwalior	—
	35. Indore*	Indore	Mhow
	36. Saugar	Saugar	—
	37. Jabalpur*	Jabalpur	—
10. MAHARASHTRA	38. Dhulia	Dhulia	—
	39. Jalagaon	Jalagaon	—
	40. Ahmednagar*	Ahmednagar	—
	41. Poona	Poona	Poona Cantt. Pimpri Kirkee
	42. Sangli*	Sangli	—
	43. Sholapur*	Sholapur	Pandharpur Barsi
	44. Kolhapur	Kolhapur	—
	45. Akola*	Akola	Nandurbar
	46. Amravati	Amravati	—
	47. Nagpur	Nagpur	Kamptee
11. MYSORE	48. Bangalore*	Bangalore	—
	49. Belgaum	Belgaum	—

APPENDIX VIII

1	2	3	4
	50. Bellary	Bellary	Hospet
	51. Chitradurga	Devangere	Chitradurga
	52. Dharwar*	Hubli-Dharwar	Gadak
	53. Shimoga	Shimoga Bhadravati	—
	54. South Kanara	Mangalore	—
12. ORISSA	55. Puri	—	Puri
	56. Sambalpur	—	Sambalpur
	57. Sundargarh*	Rourkela	—
13. PUNJAB	58. Ludhiana	Ludhiana	—
	59. Gurdaspur	—	Pathankot Batala
14. RAJASTHAN	60. Bikaner	Bikaner	—
	61. Jaipur*	Jaipur	—
	62. Jodhpur*	Jodhpur	—
	63. Kota*	Kota	—
15. TAMIL NADU	64. Chenglepet	Madras	Avadi Tambaram Tiruvattiyur Pallavaram
	65. Coimbatore	Erode Coimbatore Tiruppur Singanallur	Valparai Pollachi
	66. Tirichirapalli	Tirichirapalli	Srirangam Pudukottai Palayamkottai Karur
	67. Thanjavur	Thanjavur Kumbakonam	Nagapattinam Mayuram
	68. Kanyakumari	Nagarcoil	—
16. UTTAR PRADESH	69. Dehradun*	Dehradun	—
	70. Saharanpur	Saharanpur	Hardwar Roorkee
	71. Muzaffarnagar	Muzaffarnagar	—
	72. Meerut	Meerut Ghaziabad	Hapur
	73. Bulandshahar	—	Bulandshahar Khurja
	74. Aligarh*	Aligarh	Hathras
	75. Agra*	Agra	—

APPENDIX V

1	2	3	4
	76. Bareilly*	Bareilly	—
	77. Moradabad	Moradabad	Chandausi Sambhaoli Amroha
	78. Shahjahanpur	Shahjahanpur	—
	79. Rampur	Rampur	—
	80. Ferrukhabad	Ferrukhabad	—
	81. Kanpur*	Kanpur	—
	82. Allahabad	Allahabad	—
	83. Jhansi	Jhansi	—
	84. Varanasi*	Varanasi	—
	85. Mirzapur	Mirzapur	—
	86. Gorakhpur*	Gorakhpur	—
	87. Lucknow*	Lucknow	—
	88. Faizabad	Faizabad	—
17. WEST BENGAL	89. 24-Parganas*	Calcutta	Bashirhat Badpara Kumarhatti Halisahar
	90. Nadia	—	Krishnanagar Navdecp Santipur
	91. Howrah*	Howrah	Bansbaria
	92. Jalpaiguri	—	Jalpaiguri Siliguri

*The districts with the asterik mark have already one Intensive Poultry Development Project functioning.

*Comparative Statement showing estimated expenditure and returns from
a Poultry Unit of 50 layers under different systems of rearing*

	50 layers (One year produc- tion)	50 layers- 7 months produc- tion; 6 months rearing	50 layers for 7 months and 25 layers for 5 months
	1	2	3
	Rs.	Rs.	Rs.
I. Capital Investment :			
1. Housing—One Poultry house (deep litter) covering a plinth area of 150 sq. ft. and one house for growers with a plinth area of 75 sq. ft. cement floor, 2 ft. wall all round, wire netting on sides, wooden trusses, thatched roof or with corrugated iron sheets or asbestos roofing @Rs. 6 per sq. ft. (part utilisation of farmer's own labour).	1,350	900 (one poultry house of 150 sq. ft. only)	1,350
2. Equipments (feeders, waterers, nests, floor brooders, egg boxes etc.).	200	200	200
3. Lighting and water connections etc.	40	40	40
4. Cost of 60 sexed day old chicks at Rs. 3.50 each.	210	210	210
5. Cost of feeding 60 day old chicks upto 12 weeks at 3.5 kg per chick and at feed cost of Rs. 70 per quintal.	147	147	147
6. Cost of feeding 55 pullets from 12 to 24 weeks @7 Kg. per chick and feed at Rs. 65 per quintal.	250	250	250
	2,197	1,747	2,197
Or say	2,200	1,750	2,200
(Of this 25% will be subsidised under SFDA and 33-1/3% under MFAL agency).			
25% subsidy	550	436	550
75% loan	1,650	1,312	1,650

APPENDIX IX

	1	2	3
	Rs.	Rs.	Rs.
II. Operational Costs :			
1. Cost of feeding 50 layers for 12 months @40 kg/bird and feed cost @ Rs. 65 per quintal.	1,300	764 (feeding cost for 7 months)	*1,032
2. Cost of deep litter material, medicines, feed supplements etc.	25	25	25
3. Contingent expenses on kerosene, electricity, water charges etc.	50	50	50
4. Interest on loan of Rs. 1,650 @ 9% (for 12 months).	148	117 (interest on Rs. 1,300 only)	148
5. Depreciation on maintenance of buildings @ 5%.	65	48 (one building only)	65
6. Depreciation or replacement on equipment @ Rs. 10%.	20	20	20
	1,608	1,021	1,340
III. Receipts :			
1. Sale of 9,000 eggs on an average price @ Rs. 25 for 100 (at a production of 180 eggs per bird per year).	2,250	**1,736	***2,018
2. Sale of deep litter manure	75	75	75
3. Sale of 45 hens at Rs. 5 per bird	225	225	225
	2,550	2,036	2,318
Anticipated income over expenditure will be.	942	1,015	978
Less repayment of 1/5th of medium term loan.	330	260	330
	612	755	648

*Feeding cost of 50 layers for 7 months 25 layers for remaining 5 months.

**Sale of 6,200 eggs @ 124 eggs per bird in 7 months.

***Rs. 1,736 as sale of 6,200 eggs @ Rs. 28 per 100 eggs with a production rate of 124 eggs for 7 months and Rs. 280 as sale of 1,400 eggs @ Rs. 20 per 100 eggs with a production rate of 56 eggs for 5 months.

- N.B.*—1. Part utilisation of farmer's family labour assumed in the construction of poultry houses.
2. In operational costs, cost of labour not included; the idle labour capacity with the family of small and marginal farmers and agricultural labourers will be utilised.
3. 25% of investment cost has been shown as subsidy and interest calculated only on 75% of capital costs.

Economics of a 25-layer poultry unit under range/semi-intensive rearing conditions

	Rs.
1. Poultry House for 25 birds as night shelter at Rs. 6 per sq. ft. (25 sq. ft.).	150
2. Equipments (feeders, waterers, floor brooders etc.) • •	50
3. Cost of 60 unsexed day old chicks @ Re. 1 each	60
4. (a) Cost of feed concentrates for 60 chicks upto 12 weeks, at 1 kg. per bird.	54
(b) Cost of local grains and grain byproduct at 1 kg./bird	30
5. (a) Cost of concentrate feed for 30 chicks upto 24 weeks of age @ 2.0 kg. per bird.	54
(b) Cost of local grains and grain byproducts at 2.5 kg. per bird	38
	436

(Of this, 25% will be subsidised under SFDA and 33-1/3% under MFAL)

25% subsidy = Rs. 109

75% loan = Rs. 327

OPERATIONAL COST

	Rs.
1. Cost of feed concentrate for 25 pullets for 12 months @ 12 kg. each bird.	270
2. Cost of supplemental grain and grain byproducts at 14 kg. per bird.	175
3. Contingencies • • • • • • • • •	15
4. Interest on loan at 9% • • • • • • •	30
	Rs. 490

	Rs.
RECEIPTS	
1. 2,500 eggs for 25 birds at 100 eggs per bird per year @ Rs. 20 per hundred.	500
2. Sale of 20 birds at end of lay @ Rs. 4	80
3. Sale of 25 cockerels for table Rs. 4	100
	680
Anticipated income (Rs. 680 minus Rs. 490)	= Rs. 190
Repayment of 1/5th of medium-term loan	= Rs. 66

- NOTE:—(1) Price of poultry feed concentrate assumed @ Rs. 90/- per qtl.
 (2) Price of Supplemental grains and grain byproducts assumed @ Rs. 50/- per qtl.
 (3) Birds are expected to collect above one-third of feed required through foraging.

APPENDIX XI

List of SFDA/MFAL Districts where Sheep & Wool Production Programmes could be linked up with Wool Grading and Disposal Centres under the U.N.D.P. assisted Projects in States

Sl. No.	Name of State	Location of existing Wool Grading & Disposal Centre	Name of SFDA Project districts	Name of MFAL Project districts
1.	Gujarat	1. Jamnagar 2. Bhuj	1. Junagarh	—
2.	Haryana	3. Loharu	2. Gurgaon	1. Hissar
3.	Himachal Pradesh	4. Simla 5. Chamba		2. Simla
4.	Jammu & Kashmir	6. Jammu 7. Srinagar	3. Jammu 4. Kathua 5. Anantnag	3. Baramula
5.	Madhya Pradesh	8. Shivpuri		
6.	Maharashtra	9. Poona (N.A.)	6. Thana 7. Nasik	—
7.	Mysore			
8.	Punjab	10. Ludhiana	8. Amritsar 9. Ferozepur	4. Hoshiarpur
9.	Rajasthan	11. Jaipur 12. Bikaner	10. Alwar 11. Bharatpur —	5. Ajmer
		13. Jodhpur	12. Udaipur	
10.	Uttar Pradesh	14. Dehradun 15. Allahabad	13. Pratapgarh 14. Rae Bareilly	

List of SFDA/MFAL districts which lie in sheep breeding tracts

Sl. No.	Name of the State	Name of SFDA Project districts	Name of MFAL Project districts
1.	Andhra Pradesh	1. Cuddapah	—
2.	Bihar	2. Patna	1. Shahabad
3.	Mysore	3. Mysore	—
4.	Tamil Nadu	4. Tirunelveli 5. Madurai	2. Salem

List of SFDA/MFAL Districts which could be linked up with a wool/mutton consuming market

Sl. No.	Name of the State	Name of SFDA Project district	Name of MFAL Project district
1.	Andhra Pradesh	1. Nalgonda*	1. Nalgonda*
		2. Srikakulam	2. Visakhapatnam
2.	Assam	3. Goalpara	3. Kamrup
3.	Bihar	—	4. Ranchi
4.	Gujarat	—	5. Baroda
5.	Haryana	4. Ambala*	6. Ambala*
6.	Himachal Pradesh	5. Sirmur	—
7.	Madhya Pradesh	6. Bilaspur	7. Durg
8.	Maharashtra	7. Bhandara	—
		8. Satara*	8. Satara*
		9. Bidar	9. Tumkur
9.	Mysore	—	10. Bijapur
		10. Dhenkanal	11. Cuttack
10.	Orissa	11. Bolangir	12. Keonjhar
		12. Ganjam	—
		13. Sangrur	13. Jullundur
11.	Punjab	14. Patiala	—
		—	14. Bhilwara
12.	Rajasthan	—	15. North Arcot
13.	Tamil Nadu	15. South Arcot	—
14.	Uttar Pradesh	—	16. Mathura
15.	West Bengal	—	17. Bankura
		—	18. Purulia

*These districts are common to both SFDA and MFAL Projects.

List of districts other than SFDA/MFAL districts which have good scope for sheep development and which are recommended for intensive sheep development programmes for assisting small farmers, marginal farmers and agricultural labourers

Name of State	Name of District
1. Andhra Pradesh	1. Nellore 2. Kurnool 3. Anantapur 4. Chittoor 5. Medak 6. Mehboobnagar 7. Kamam 8. Karimnagar
2. Bihar	9. Gaya 10. Santhal Parganas 11. Palamau 12. Singhbhum 13. Dhanbad
3. Gujarat	14. Amreli 15. Bhavnagar 16. Kutch 17. Rajkot 18. Surendranagar 19. Jamnagar
4. Haryana	20. Karnal 21. Mahendergarh
5. Himachal Pradesh	22. Chamba 23. Kangra 24. Kulu 25. Kinnaur 26. Mahasu 27. Mandi
6. Jammu & Kashmir	28. Srinagar 29. Ladakh (Leh) 30. Udampur 31. Doda
7. Madhya Pradesh	32. Shivpuri

Name of State	Name of District
8. Maharashtra	33. Mandsaur 34. Tikamgarh 35. Chattarpur 36. Ahmednagar 37. Poona 38. Sangli 39. Sholapur 40. Kolhapur
9. Mysore	41. Bangalore 42. Belgaum 43. Bellary 44. Chitradurga 45. Dharwar 46. Gulbarga 47. Hassan 48. Kolar 49. Mandya 50. Raichur
10. Orissa	51. Kalahandi 52. Koraput 53. Mayurbhanj 54. Puri
11. Punjab	55. Bhatinda
12. Rajasthan	56. Barmer 57. Bikaner 58. Chittorgarh 59. Churu 60. Dungarpur 61. Ganganagar 62. Jaipur 63. Jaisalmer 64. Jalore 65. Jhunjhunu 66. Jodhpur 67. Nagaur 68. Pali 69. Sikar

APPENDIX XIV

Name of State	Name of District
13. Tamil Nadu	70. Tonk 71. Chinglepet 72. Dharmapuri 73. Coimbatore 74. Tiruchirapally 75. Ramanathapuram
14. Uttar Pradesh	76. Allahabad 77. Jhansi 78. Varanasi 79. Jaunpur 80. Garhwal 81. Uttar Kashi 82. Chamoli 83. Azamgarh
15. West Bengal	84. 24 Parganas

*Estimated expenditure and returns from a Sheep Unit of 20 ewes under
SFDA/MFAL Projects*

A. Unit of Sheep for Wool*Capital Investment :*

	Rs.
(i) Sheep pen-katcha with thatch roofing 250 sq. ft. (Approx) .	150
(ii) Equipments (Feed, troughs, buckets, hand shears etc.) .	50
(iii) Livestock:	
(a) 20 good quality ewes (crossbred or indigenous) at Rs. 100 each.	2,000
(b) 1 superior ram at Rs. 200	200
Total .	2,400

(Of this 25% will be subsidised under SFDA and 33-1/3% under MFAL agency)

25% subsidy	Rs. 600
Loan	Rs. 1,800

Operational Costs :

(i) Cost of supplementary feeding for the rams for 150 days at $\frac{1}{4}$ kg per day at 0.60 paise per kg.	Rs. 45
(ii) Cost of supplementary feeding for 20 ewes at $\frac{1}{4}$ kg per day for 50 days @ 0.60 paise per kg.	Rs. 150
(iii) Cost of supplementary feeding for 7 ram lambs for 60 days at 1/8 kg each per day @ 0.60 paise per kg.	Rs. 32
(iv) Interest on loan of Rs. 1,800 @ 9%	Rs. 162
	Rs. 389

Anticipated Receipts :

(i) By sale of 7 ram lambs for market @ Rs. 35 each	Rs. 245
(ii) By sale of wool—45.5 kg @ Rs. 6 per kg (1.5 kg per ewe, 2 kg per ram and 0.6 kg per lamb).	Rs. 273
(iii) By sale of skins of dead animals (3 x 2 Rs. each)	Rs. 6
(iv) From manure/folding of sheep	Rs. 25
(v) Value of 7 yearling ewe lambs @ Rs. 60 each	Rs. 420
	Rs. 969

Anticipated income over expenditure : Rs. 580

N.B.

1. Lambing percentage has been assumed @ 85%. The shepherds would be advised to breed ewes in two seasons so that ewes not covered in the first would be bred during the following season.

APPENDIX XV—*Contd.*

2. Supplementary feed cost could be reduced to less than half if the farmers are able to provide good hay or leguminous fodder. This would be done by growing cowpea, guar, horse gram etc. in about 1/2 acre under rainfed conditions.

3. The annual income would progressively increase from year to year as the quality of stock is improved through use of improved rams. Yield of wool and quality would improve and consequently the income from sale of wool.

B. Unit of Sheep for Mutton

Capital cost: Same as for (A) above.

Operation cost: Same as for (A) above.

Anticipated Receipts :

(i) By sale of 7 ram lambs for mutton @ Rs. 50 each	Rs.	350
(ii) By sale of skins of dead animals (3 × 3 each)	Rs.	9
(iii) Manure/folding charges	Rs.	30
(iv) Value of 7 yearling ewe lambs at Rs. 60 each	Rs.	420
		809
Anticipated income over expenditure	Rs.	420

N.B.

1. Lambing percentage assumed as under (A) above.
2. Supplementary feeding could be replaced by migratory grazing and cultivation of leguminous fodders for feeding as hay.
3. The quality of progenies would improve in the successive generations and hence income from sale of lambs for meat would also increase considerably.

List of SFDA/MFAL Districts where Pig Production could be linked to an existing Bacon Factory

Sl. No.	Name of State	Location of Bacon Factory	Name of SFDA Project	Name of MFAL Project
1.	Andhra Pradesh	Gannavaram	—	—
2.	Bihar	Ranchi	—	1. Ranchi
3.	Kerala	Koothattukulam	1. Quilon*	2. Quilon*
4.	Punjab	Khair	—	3. Hoshiarpur 4. Ropar
5.	Maharashtra	Borivilli	2. Thana 3. Nasik	— —
6.	Uttar Pradesh	Aligarh	4. Badaun	5. Mathura
7.	Rajasthan	Alwar	5. Alwar 6. Bharatpur	— —
8.	West Bengal	Haringhata	7. Hooghly	6. Bankura

*This district is common for SFDA and MFAL Projects.

APPENDIX XVII

List of SFDA/MFAL Districts where Pig Production could be linked up with the proposed new Bacon Factories under the Fifth Five Year Plan.

Sl. No.	State	Possible location of the proposed bacon factories	SFDA Project	MFAL Project
1.	Haryana	Ambala	1. Ambala*	1. Ambala*
2.	Goa	Panjim	—	2. Goa
3.	Madhya Pradesh	Raipur	—	3. Durg
4.	Meghalaya	Shillong	—	4. K & J Hills 5. Garo Hills
5.	Mysore	Bangalore	2. Mysore	6. Tumkur
6.	Nagaland	Kohima	3. Kohima* 4. Tuensang* 5. Mokukuchang*	7. Kohima* 8. Tuensang* 9. Mokukuchang*
7.	Tamil Nadu	Madras	6. South Arcot	10. North Arcot
8.	Orissa	Rourkela	7. Keonjhar	

*These districts are common to both SFDA and MFAL projects.

APPENDIX XVIII

*List of SFDA/MFAL districts which offer good scope for Pig production
for meeting local demand*

Sl. No.	State	SFDA Project	MFAL Project
1.	Andhra Pradesh	—	1. Visakhapatnam
2.	Assam	1. Nowgong	2. Mikir Hills 3. Kamrup
3.	Bihar	2. Patna	—
4.	Haryana	3. Gurgaon	—
5.	Himachal Pradesh	4. Sirmur	4. Simla
6.	Kerala	5. Cannanore*	5. Cannanore*
7.	Punjab	6. Amritsar	6. Jullundur
		7. Ferozepur	—
		8. Sangrur	—
		9. Patiala	—
8.	Delhi	—	7. Delhi
9.	Tamil Nadu	10. Madurai	8. Salem
10.	West Bengal	11. Darjeeling	—
11.	Manipur	—	9. Manipur
12.	Uttar Pradesh	12. Rae Bareilly	
		13. Fatchpur	
		14. Pratapgarh	

*This district is common to both SFDA and MFAL Projects.

List of Districts (not covered by SFDA/MFAL Projects) which offer scope for Intensive Pig Production Through Small and Marginal Farmers and Agricultural Labourers

Sl. No.	Name of the State	Name of the District
1.	Andhra Pradesh	1. Srikakulam
		2. West Godavari
		3. Krishna
2.	Assam	4. Guntur
		5. Goalpara
3.	Bihar	6. North Cachar Hills
		7. Gaya
		8. Purnea
		9. Palamau
		10. Hazaribagh
		11. Singhbhum
4.	Haryana	12. Rohtak
		13. Karnal
5.	Kerala	14. Ernakulam
		15. Kottayam
6.	Madhya Pradesh	16. Sarguja
		17. Jabalpur
		18. Rewa
		19. Satna
		20. Bangalore
		21. Chikmangalur
7.	Mysore	22. Coorg
		23. Mandya
		24. South Kanara
		25. Kolar
		26. Koraput
		27. Sundargarh
		28. Mayurbhanj
		29. Phulbani
8.	Orissa	30. Chinglepet
		31. Coimbatore
		32. Tiruchirapalli
		32. Tiruchirapalli

Sl. No.	Name of the State	Name of the District
10. Uttar Pradesh	· · · · ·	33. Meerut
		34. Aligarh
		35. Kanpur
		36. Basti
		37. Unnao
		38. Sitapur
		39. Hardoi
		40. Gorakhpur
		41. Allahabad
		42. Faizabad
		43. Sultanpur
		44. Lucknow
		45. Barabanki
		46. Azamgarh
11. West Bengal	· · · · ·	47. Malda
12. Arunachal Pradesh	· · · · ·	48. Kameng
		49. Subansiri
		50. Siang
		51. Lohit
		52. Tirap
13. Mizoram	· · · · ·	53. Mizoram

*Estimated expenditure and returns from a Piggery Unit of 3 Sows under
SFDA/MFAL Projects*

I. *Capital Investment*

1. *Housing*

(a) Farrowing pen (30 sq. ft.)—one	}	Rs. 1,050
(b) Styes for 2 Sows (30 sq. ft.)—one		
(c) Pens for 15 growers (150 sq. ft.) in 2 sections—one 210 sq. ft. at Rs. 5 per sq. ft.		

2. Equipments (Feed troughs, buckets etc.) Rs. 50

3. *Livestock*

(a) Cost of 3 Sows at Rs. 200 each	Rs. 600
	Rs. 1,700

(Of this 25% will be subsidised under SFDA and 33-1/3% under MFAL agency) Rs. 425

Loan	Rs. 1,275
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II. *Operational costs*

1. *Cost of feeding*

(a) 3 Sows for 1 year at 2 Kg. per day each	Rs. 1,095
(b) Extra feed cost (50 kg each for 3 nursing sows)	Rs. 75
(c) Creep feed for 30 piglets at 8 kg. each from 21 days to weaning.	Rs. 120
(d) 30 Growers from weaning to 70 kg. liveweight	Rs. 3,300
(e) Medicines etc.	Rs. 50
	Rs. 4,640

2. Interest on capital cost of Rs. 1,275 @ 9% per annum Rs. 115

3. Interest on working capital (cost of feeding) of Rs. 2,000 at 9% per annum. Rs. 180

	Rs. 4,935
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III. *Anticipated Receipts*

1. Sale of 30 fatteners at 70 kg. liveweight at Rs. 2.75 per kg.	Rs. 5,775
2. Sale of pig manure at Rs. 5 per pig	Rs. 150
3. Sale of 1 culled adult pig at 100 kg. liveweight at Rs. 2 per kg.	Rs. 200
	Rs. 6,125
Anticipated income over expenditure	Rs. 1,190
Repayment of 1/3 part of loan	Rs. 425
Net income	Rs. 765

N.B.

1. The feed conversion efficiency has been assumed to be 4 kg of feed for 1 kg. gain in live weight from weaning to finishing.

2. Feed cost is placed at Re. 0.50 per kg. of balanced feed.

3. Usual subsidy of different patterns for the purchase of stock available in different States under Piggery Development Schemes has not been taken into consideration in these estimates.

Statement showing the list of Districts (Statewise) in which programmes for Milk Production, Poultry Production, Sheep Production and Pig Production through small and marginal Farmers and Agricultural Labourers are Recommended

Name of State and Districts	Recommended for milk production programmes	Recommended for poultry production programmes	Recommended for sheep production programmes	Recommended for pig production programmes
1	2	3	4	5
(1) ANDHRA PRADESH				
1. Srikakulam*	M	P	S	Pi
2. Visakhapatnam**	M	P	S	Pi
3. East Godavari	M	P	—	—
4. Krishna	M	P	—	Pi
5. Guntur	M	P	—	Pi
6. Nellore	—	P	S	—
7. Kurnool	—	P	S	—
8. Anantpur	—	—	S	—
9. Cuddapah*	—	P	S	—
10. Chittoor	—	—	S	—
11. Hyderabad	—	P	—	—
12. Nizamabad	—	P	—	—
13. Medak	—	—	S	—
14. Mahbubnagar	—	—	S	—
15. Nalgonda*/**	M	P	S	—
16. Warangal	—	P	—	—
17. Karimnagar	—	—	S	—
18. Khammam	—	—	S	—
19. West Godavari	M	P	—	Pi
(2) ASSAM				
20. Goalpara*	M	P	S	Pi
21. Kamrup**	M	P	S	Pi
22. Nowgong*	M	P	—	Pi
23. Lakhimpur	—	P	—	—
24. Mikir Hills**	—	—	—	Pi
25. N.C. Hills	—	—	—	Pi

1	2 (Milk)	3 (Poultry)	4 (Sheep)	5 (Pigs)
(3) BIHAR				
26. Patna*	M	P	S	Pi
27. Gaya	M	P	S	Pi
28. Shahabad**	M	P	S	—
29. Muzaffarpur	—	P	—	—
30. Darbhanga	—	P	—	—
31. Monghyr	—	P	—	—
32. Bhagalpur	—	P	—	—
33. Purnea*	M	P	—	Pi
34. Santhal Parganas	—	—	S	—
35. Chapra	M	—	—	—
36. Hazaribagh	—	—	—	Pi
37. Ranchi**	M	P	S	Pi
38. Palamau	—	—	S	Pi
39. Dhanbad	—	P	S	—
40. Singhbhum	—	P	S	Pi
(4) GUJARAT				
41. Ahmedabad	M	P	—	—
42. Banaskantha	M	—	—	—
43. Baroda**	M	P	S	—
44. Bular**	M	P	—	—
45. Kaira	M	P	—	—
46. Mehsana	M	P	—	—
47. Sabarkantha*	M	—	—	—
48. Surat*	M	P	—	—
49. Amreli	—	—	S	—
50. Bhavnagar	—	—	S	—
51. Jamnagar	—	P	S	—
52. Junagarh*	M	P	S	—
53. Kutch	—	—	S	—
54. Rajkot	—	P	S	—
55. Surendernagar	—	—	S	—
(5) HARYANA				
56. Hissar**	M	P	S	—
57. Rohtak	M	P	—	Pi
58. Gurgaon*	M	P	S	Pi

APPENDIX XXI

1	2 (Milk)	3 (Poultry)	4 (Sheep)	5 (Pigs)
59. Karnal . . .	M	P	S	Pi
60. Ambala*/** . . .	M	P	S	Pi
61. Mahendergarh . . .	—	—	S	—
(6) HIMACHAL PRADESH				
62. Chamba . . .	—	—	S	—
63. Kangra . . .	—	—	S	—
64. Kulu . . .	—	—	S	—
65. Kinaur . . .	—	—	S	—
66. Mahasu . . .	—	—	S	—
67. Mandi . . .	—	—	S	—
68. Simla** . . .	M	P	S	Pi
69. Sirmur . . .	M	P	S	Pi
(7) JAMMU & KASHMIR				
70. Srinagar . . .	—	P	S	—
71. Anantnag* . . .	M	P	S	—
72. Baramulla** . . .	M	P	S	—
73. Ladakh (Leh) . . .	—	—	S	—
74. Jammu* . . .	M	P	S	—
75. Udhampur . . .	—	—	S	—
76. Kathua* . . .	M	P	S	—
77. Doda . . .	—	—	S	—
(8) KERALA				
78. Quilon*/** . . .	M	P	—	Pi
79. Kozhikode . . .	—	P	—	—
80. Palghat . . .	—	P	—	—
81. Trichur . . .	—	P	—	—
82. Ernakulam . . .	—	P	—	Pi
83. Alleppey . . .	—	P	—	—
84. Trivandrum . . .	—	P	—	—
85. Kottayam . . .	—	—	—	Pi
86. Cannanore*/** . . .	M	P	—	Pi
(9) MADHYA PRADESH				
87. Raipur . . .	—	P	—	—
88. Bilaspur* . . .	M	P	S	—
89. Surguja . . .	—	—	—	Pi

1	2 (Milk)	3 (Poultry)	4 (Sheep)	5 (Pigs)
90. Gwalior . . .	—	P	—	—
91. Shivpuri . . .	—	—	S	—
92. Ujain* . . .	M	P	—	—
93. Ratlam* . . .	M	P	—	—
94. Mandsaur . . .	—	—	S	—
95. Indore . . .	—	P	—	—
96. Rewa . . .	—	—	—	Pi
97. Satna . . .	—	—	—	Pi
98. Durg** . . .	M	P	S	Pi
99. Saugar . . .	—	P	—	—
100. Jabalpur . . .	—	P	—	Pi
101. Tikamgarh . . .	—	—	S	—
102. Chattarpur . . .	—	—	S	—
103. Sehore** . . .	M	P	—	—
104. Raisen** . . .	M	P	—	—
✓(10) MAHARASHTRA				
105. Greater Bombay . . .	—	P	—	—
106. Thana* . . .	M	P	S	Pi
107. Colaba . . .	M	—	—	—
108. Ratnagiri*/** . . .	M	P	—	—
109. Nasik* . . .	M	P	S	Pi
110. Dhulia . . .	M	P	—	—
111. Jalgaon . . .	M	P	—	—
112. Ahmednagar . . .	—	P	S	—
113. Poona . . .	M	P	S	—
114. Satara*/** . . .	M	P	S	—
115. Sangli . . .	M	P	S	—
116. Sholapur . . .	—	P	S	—
✓117. Kolhapur . . .	M	P	S	—
118. Parbhani** . . .	—	P	—	—
119. Akola . . .	—	P	—	—
120. Amravati . . .	—	P	—	—
121. Nagpur . . .	—	P	—	—
122. Bhandara* . . .	M	P	S	—
(11) 123. MANIPUR** . . .	M	P	—	Pi

APPENDIX XXI

1	2 (Milk)	3 (Poultry)	4 (Sheep)	5 (Pigs)
(12) 124. MEGHALAYA UNITED K & J HILLS**	M	P	—	Pi
125. GARO HILLS**	M	P	—	Pi
(13) MYSORE				
126. Bangalore	—	P	S	Pi
127. Belgaum	—	P	S	—
128. Bellary	—	P	S	—
129. Bidar*	M	P	S	—
130. Bijapur**	—	P	S	—
131. Chikmangalur	—	—	—	Pi
132. Chitradurga	—	P	S	—
133. Coorg	—	—	—	Pi
134. Dharwar	—	P	S	—
135. Gulbarga	—	—	S	—
136. Hassan	—	—	S	—
137. Kolar	—	—	S	Pi
138. Mandya	—	—	S	Pi
139. Mysore*	M	P	S	Pi
140. North Kanara*	M	—	—	—
141. Raichur	—	—	S	—
142. South Kanara	—	P	—	Pi
143. Tumkur**	M	P	S	Pi
144. Shimoga	—	P	—	—
(14) NAGALAND				
145. Kohima*/**	M	P	—	Pi
146. Tuensang*/**	—	—	—	Pi
147. Mokokuchung*/**	—	—	—	Pi
(15) ORISSA				
148. Bolangir*	—	—	S	—
149. Cuttack**	M	P	S	—
150. Dhenkanal*	M	P	S	—
151. Ganjam*	—	P	S	—
152. Kalahandi	—	—	S	—
153. Keonjhar**	M	P	S	Pi
154. Mayurbhanj	—	—	S	Pi
155. Phulbani	—	—	—	Pi
156. Puri	—	P	S	—

1	2 (Milk)	3 (Poultry)	4 (Sheep)	5 (Pigs)
157. Sambalpur . . .	—	P	—	—
158. Sundargarh . . .	—	P	—	Pi
159. Koraput . . .	—	—	S	Pi
(16) PUNJAB				
160. Hoshiarpur** . . .	M	P	S	Pi
161. Jullundur** . . .	M	P	S	Pi
162. Ludhiana . . .	M	P	—	—
163. Ferozepur* . . .	M	P	S	Pi
164. Amritsar* . . .	M	P	S	Pi
165. Gurdaspur . . .	M	P	—	—
166. Bhatinda . . .	M	—	S	—
167. Patiala* . . .	M	P	S	Pi
168. Sangrur* . . .	M	P	S	Pi
169. Rupar** . . .	—	—	—	Pi
(17) RAJASTHAN				
170. Ajmer** . . .	M	P	S	—
171. Alwar* . . .	M	P	S	Pi
172. Bharatpur* . . .	M	P	S	Pi
173. Barmer . . .	—	—	S	—
174. Bhilwara** . . .	—	P	S	—
175. Bikaner . . .	M	P	S	—
176. Chittorgarh . . .	—	—	S	—
177. Churu . . .	—	—	S	—
178. Dungarpur . . .	—	—	S	—
179. Ganganagar . . .	—	—	S	—
180. Jaipur . . .	—	P	S	—
181. Jaisalmer . . .	—	—	S	—
182. Jalore . . .	—	—	S	—
183. Jhunjhunu . . .	—	—	S	—
184. Jodhpur . . .	—	P	S	—
185. Kotah . . .	—	P	—	—
186. Nagaur . . .	—	—	S	—
187. Pali . . .	—	—	S	—
188. Sikar . . .	—	—	S	—
189. Tonk . . .	—	—	S	—
190. Udaipur* . . .	M	P	S	—

APPENDIX XXI

1	2 (Milk)	3 (Poultry)	4 (Sheep)	5 (Pigs)
(18) TAMIL NADU				
191. Chenglepet . . .	—	P	S	Pi
192. South Arcot* . . .	M	P	S	Pi
193. North Arcot** . . .	M	P	S	Pi
194. Salem** . . .	M	P	S	Pi
195. Dharampuri . . .	—	—	S	—
196. Coimbatore . . .	M	P	S	Pi
197. Tiruchirapalli . . .	M	P	S	Pi
198. Thanjavur . . .	M	P	—	—
199. Madurai* . . .	M	P	S	Pi
200. Ramanathapuram . . .	—	—	S	—
201. Tirunelveli* . . .	—	P	S	—
202. Kanyakumari . . .	—	P	—	—
(19) 203. TRIPURA** . . .	M	P	—	—
(20) UTTAR PRADESH				
204. Dehradun . . .	—	P	—	—
205. Saharanpur . . .	—	P	—	—
206. Mazaffarnagar . . .	M	P	—	—
207. Meerut . . .	M	P	—	Pi
208. Bulandshahar . . .	M	P	—	—
209. Aligarh . . .	—	P	—	Pi
210. Mathura** . . .	M	P	S	Pi
211. Rae Bareilly* . . .	M	P(Bareilly)	S	Pi
212. Badaun* . . .	M	—	—	Pi
213. Moradabad . . .	—	P	—	—
214. Shahjahanpur . . .	—	P	—	—
215. Rampur . . .	—	P	—	—
216. Fatehpur* . . .	M	—	—	Pi
217. Allahabad . . .	—	P	S	Pi
218. Jhansi . . .	—	P	S	—
219. Varanasi . . .	M	P	S	—
220. Mirzapur . . .	M	P	—	—
221. Ghazipur . . .	M	—	—	—
222. Balia** . . .	M	—	—	—
223. Gorakhpur . . .	—	P	—	Pi
224. Basti . . .	—	—	—	Pi
225. Azamgarh . . .	—	—	S	Pi

1	2 (Milk)	3 (Poultry)	4 (Sheep)	5 (Pigs)
226. Lucknow . . .	—	P	—	Pi
227. Unnao . . .	—	—	—	Pi
228. Sitapur . . .	—	—	—	Pi
229. Hardoi . . .	—	—	—	Pi
230. Kanpur . . .	—	P	—	Pi
231. Faizabad . . .	—	P	—	Pi
232. Sultanpur . . .	—	—	—	Pi
233. Partapgarh* . . .	—	—	S	Pi
234. Barabanki . . .	—	—	—	Pi
235. Garhwal . . .	—	—	S	—
236. Uttar Kashi . . .	—	—	S	—
237. Chamoli . . .	—	—	S	—
238. Agra . . .	—	P	—	—
239. Farrukhabad . . .	—	P	—	—
240. Jaunpur . . .	—	—	S	—
(21) WEST BENGAL				
241. 24 Parganas . . .	M	P	S	—
242. Nadia . . .	M	P	—	—
243. Murshidabad . . .	M	—	—	—
244. Burdwan . . .	M	—	—	—
245. Bankura** . . .	M	P	S	Pi
246. Midnapur . . .	M	—	—	—
247. Hooghly . . .	M	P	—	Pi
248. Howrah . . .	M	P	—	—
249. Jalpaiguri . . .	—	P	—	—
250. Darjeeling* . . .	M	P	—	Pi
251. Malda . . .	M	—	—	Pi
252. West Dinajpur* . . .	M	—	—	—
253. Purulia** . . .	M	P	S	—
(22) ARUNACHAL PRADESH				
254. Kemeng . . .	—	—	—	Pi
255. Subansiri . . .	—	—	—	Pi
256. Siang . . .	—	—	—	Pi
257. Luhit . . .	—	—	—	Pi
258. Tirap . . .	—	—	—	Pi

APPENDIX XXI

1	2 (Milk)	3 (Poultry)	4 (Sheep)	5 (Pigs)
(23) 259. DELHI Delhi**	—	P	—	Pi
(24) 260. GOA, DAMAN & DIU Goa**	M	P	—	Pi
(25) 261. MIZORAM	—	—	—	Pi
(26) 262. PONDICHERRY Pondicherry**	M	P	—	—

*Denotes S.F.D.A. District

**Denotes M.F.A.L. District

M — District recommended for Milk programme

P — District recommended for Poultry programme

S — District recommended for Sheep programme

Pi — District recommended for Pig programme