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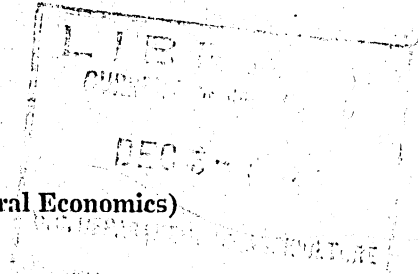
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CONTENTS

	PAGE
Notes and Comments	1
Land Problems of Gujarat (Part I)—C. D. Kavi	7
Agricultural Statistics—N. S. R. Sastry	22
The contribution of Statistics to Farm Management—H. S. Azariah	31
Post-War Plan of Agricultural Reconstruction of the Bombay Province—R. D. Rege	37
Exploring Tomorrow's Agriculture (A Review)—V. M. Jakhade	51
Notes on Government Publications—M. L. Dantwala	66
Co-operation in Rayalascema (Madras)—K. C. Ramakrishnan	74
Additions to our Library—B. S. Mavinkurve	76

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THE INDIAN SOCIETY OF AGRICULTURAL ECONOMICS

AIMS AND OBJECTS

To promote the investigation, study and improvement of the economic and social conditions of agriculture and rural life through

- (a) periodical conferences for the discussion of problems ;
- (b) the publication of papers, separately or collectively ; or in a periodical which may be issued under the auspices of the Society ;
- (c) co-operation with other institutions having similar objects, such as the International Conference of Agricultural Economists and the Indian Economic Association, etc.

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POST WAR PLAN OF AGRICULTURAL RECONSTRUCTION OF THE BOMBAY PROVINCE

BY

RAO BAHADUR DR. R. D. REGE

The post-war plan of the Bombay Province for agricultural reconstruction is primarily framed with a view to raise substantially the economic level of the countryside by rapid development of the agricultural and livestock industries of the Province. With this object in view the Government of Bombay has prepared development and reconstruction schemes costing about Rs. 10 crores for a period of 5 years. For convenience, these schemes are classified under the following appropriate headings :—

1. Agricultural propaganda, demonstration and extension.
2. Supply of improved seed and manures.
3. Horticultural development—vegetable and fruit cultivation.
4. Land improvement—anti-erosion measures and extension of improved dry farming methods.
5. Agricultural Engineering—mechanical cultivation, well and tank improvement, boring, etc.
6. Animal husbandry and livestock improvement.
7. Agricultural research.
8. Agricultural education and technical training.

The schemes coming under each heading are described very briefly in the following few pages.

1. Agricultural propaganda, demonstration and extension.

Although numerous improvements of great practical value have been evolved as a result of scientific research work hitherto carried out by the Agricultural Department in varied problems of agriculture and animal husbandry of the Province, there remains a great gap to be bridged between such scientific achievements and their wholesale introduction and extension on the fields of the cultivators. Sir John Russell in his report on "Applying Science to Crop Production in India" has stated that at the Government Experimental Stations the yields are 50 or even 100 per cent greater than those obtained by the surrounding cultivators. It must be, therefore, admitted that in order to bridge the gulf between these experimental stations and the cultivators it would be essential to accelerate the process of the introduction

of all agricultural improvements on as wide a scale and within as short a period as possible. In order to realise this objective, the following schemes will be taken up.

(a) *Establishment of Taluka Demonstration Centres in selected villages.* To acquaint cultivators with the successful results of scientific research work in crop improvement, agronomy, manuring, etc., by demonstrating the economic value of such improvements on their own lands, 214 Taluka Demonstration Centres have already been established, practically one in each taluka, in various districts of the Province. These centres are located on the lands of the selected cultivators, who possess economic holdings and who have agreed to cultivate their holdings under the direction of the departmental staff. A departmental trained kamgar is stationed at each such centre to advise the cultivator in the improved methods and to give him all possible assistance in cultivating his land according to all suitable improved agricultural methods recommended by the Agricultural Department. These centres are utilized by the departmental staff as practical propaganda and demonstration centres for the surrounding villages by arranging periodical demonstrations of the crops grown under these improved methods. The produce of the land so cultivated remains the property of the land owner. A small seed and implement depot is maintained at each Demonstration Centre for the supply of improved seeds, manures, hire of implements, etc., to neighbouring cultivators at the cheapest possible cost. Under this scheme it is proposed to establish 50 such additional Demonstration Centres each year for a period of 5 years, i.e., 250 in all.

(b) *Introduction of mixed farming.* With a view to investigate into the economics and the agricultural benefits such as the improvement of soil fertility by the introduction of mixed farming, i.e., of a suitable combination of crop and animal husbandry and to demonstrate these advantages to the cultivators it is proposed to select 10 zones in the Province and to establish 20 Demonstration Mixed Farming Centres in each zone. These centres will be located on the holdings of selected cultivators representative of the average size of the farm and system of agriculture prevalent in each zone. On each such holding 2 to 5 milch cattle will be introduced and the Government will provide (i) half the cost of the cattle, (ii) annual subsidy in the form of concentrates e.g. groundnut cake, cotton seed, etc., to the value of Rs. 50 in the first year and Rs. 30 in the next two years, (iii) expert staff on zonal basis to assist and advise the cultivators and to keep accurate record of the expenditure and receipts of the holding and (iv) interest free tagai loans to cultivators to meet the other half of the cost of cattle.

(c) *Provision of adequate staff and contingencies for the district work of the Agricultural Department.* At present the staff of the Agricultural Department in the districts consists of four territorial Deputy Directors of

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Agriculture, one each in the Northern, Central, Southern and Konkan divisions and one Divisional Superintendent of Agriculture for the Deccan Canals tract. Also there is approximately one District Agricultural Officer (Graduate) and two Agricultural Assistants for each revenue district of the Province.

It will be realised that in order to accelerate the process of the introduction of all agricultural improvements on a very wide scale within the shortest time possible and to carry out a large number of district schemes under the various heads mentioned above, a provision of a considerably increased supervisory and executive staff will be necessary. Under this scheme it is, therefore, proposed to have one senior officer at the district headquarters who will be assisted by one Agricultural Officer in each Taluka. Besides there will be Agricultural Assistants and Kamgars in each taluka to carry out propaganda and extension work and to supply to the cultivators their requirements of improved seed, manure, etc. Thus there will be 19 District Agricultural Officers, 188 Taluka Agricultural Officers, 327 Agricultural Assistants and 260 Kamgars for the whole of the Province. Such a staff is considered to be minimum necessary for ensuring that the proposed extended programme of district work in connection with agricultural improvement and development will be carried out efficiently throughout the Province. The District Agricultural Officer will work as the Secretary of the newly re-organized District Rural Development Board under whose guidance all the district work of propaganda and extension will be carried out.

(d) *Extension of Publicity and Propaganda for Rural Development.*

Except the publication of leaflets by the Agricultural Department on various improved methods and the holding of exhibitions, cattle shows, etc., there have been no properly organized efforts so far to develop publicity in order to bridge the gulf between the research stations and the village fields. It is, therefore, proposed to establish a separate section of Publicity and Propaganda which will be responsible for propaganda on all aspects of rural uplift including agricultural and livestock improvements as well as such other subjects as sanitation, education, medical help, village industries, etc. The following will be some of the important activities of this section :—

(i) Publication of a monthly magazine in the regional languages which will be ultimately supplied free of cost to each village.

(ii) Publication of leaflets on important improvements in agricultural, livestock and other subjects for free distribution among the villagers interested in these improvements.

(iii) The exhibition of silent and sound films (shorts) relating to various aspects of Rural Development—one van for each district.

(iv) Periodical lectures by experienced speakers who would tour the villages and deliver talks specially on occasions of religious and seasonal festivities, fairs, etc.

(v) The holding of special exhibitions, cattle shows, etc., from time to time.

2. Supply of Improved Seed and Manures

As a result of botanical research work and of field experiments on the genetic improvement of crops, considerable success has already been achieved in the evolution of improved high yielding or better quality varieties of cotton, wheat, rice, bajri, jowar and other crops. In addition much useful information has been obtained for some of the tracts of this Province with regard to the economic use of manures, both organic and inorganic in increasing crop production. Some of these improved varieties specially in the case of cotton have been already extended into general cultivation by organized seed multiplication and distribution schemes. The district work of the Department also consisted of demonstration of profitable systems of crop manuring to increase production. In order to intensify this work especially in connection with food crops a series of schemes for (a) seed multiplication and distribution and (b) introduction and extension of manuring have been prepared which are already in operation in connection with "Grow More Food" Campaign.

(a) *Seed multiplication and distribution schemes.* Intensive work in multiplication and distribution of seeds of improved varieties of crops, mainly cereal food crops has been organized by a series of 5 schemes for different tracts of the province suitable for the extension of such improved varieties. These schemes pertain to (i) improved varieties of paddy in the Dharwar and Belgaum districts, (ii) improved varieties of paddy in the North Konkan i.e., Thana, Kolaba and Bombay Suburban districts, (iii) improved bajri (Nadiad-207) in Ahmedabad and Kaira districts of Gujarat, and (iv) improved varieties of bajri, rabi jowar, wheat and gram in the "scarcity areas" of the Deccan and Karnatak. The two rice schemes aim at covering 4½ lakh acres with improved paddy varieties, out of which 1½ lakh acres will be in Dharwar and Belgaum districts and 3 lakh acres in the North Konkan. The other schemes will extend improved varieties of bajri over 3 lakh acres in Gujarat and at replacing the inferior types of rabi jowar, wheat, bajri and gram over about 70 lakh acres in the "scarcity tract" of the Deccan and Karnatak by improved high yielding varieties. The operation of all these schemes will take approximately 5 to 6 years. It is estimated that when these schemes are carried out fully and successfully, an additional production of 115 lakh maunds of food grains will be available annually in the areas concerned.

As these cereal crops are generally highly cross pollinated crops these improved strains are required to be maintained at a high level of purity free from contamination. It is, therefore, considered necessary to produce under adequate departmental supervision considerable quantity of pure seed of various crops needed as a basis for the above mentioned schemes for seed multiplication and distribution in the districts. Accordingly a scheme for the production of nucleus seed of the improved strains has been prepared and the work will be carried out entirely under the direct supervision of the Agricultural Department.

(b) *Extension of manures and manuring.* Under this scheme it is proposed to expand and intensify the practice of groundnut cake manuring of paddy, irrigated wheat and irrigated jowar crops in particular areas of the province where experience and experiment have proved that such manurial applications are of much advantage in the economic increase in yield of these crops. In order to encourage the cultivators to go in for this type of manuring, the price of groundnut cake will be controlled by Government not exceeding Rs. 60 per ton ex-mill with second-hand gunnies and this groundnut cake will be supplied to them at a concession rate by giving subsidy on a sliding scale from Rs. 10 in the 1st year and Rs. 5 in the 2nd year per ton of the groundnut cake. No subsidy will be given from third year onwards. The manuring of paddy will be done mainly in the Karnatak and Konkan districts and of irrigated wheat and jowar in the Deccan districts. On the basis of increased yields resulting from such groundnut cake manuring it is estimated that over 60 lakh maunds of these food grains will be obtained over normal yields in a five year period representing an additional income of over 11 crores of rupees to cultivators.

In order to increase potato production in Poona and Satara districts, it is proposed to prepare a manure mixture consisting of ammonium sulphate, bonemeal and groundnut cake for distribution to the potato growers. The scheme is estimated to increase potato production in the areas in which it is operated by at least 9 lakh mds. over a five year period resulting in increase in income to the potato growers of approximately Rs. 6,00,000.

(c) *Extension of compost making.* With a view to utilize the farm wastes and town refuse for the preparation of bulky manures such as composts, the following three schemes have been included in the post war plan :—

- (1) Compost making by individual farmers in villages round Taluka Demonstration Centres.
- (2) Compost making on collective basis in selected areas (canal and forest zones), and
- (3) Composting of town refuse by municipalities.

In the first two schemes Government will give subsidy to facilitate the digging of the pits and filling them with farm wastes. In the case of the third scheme it is proposed to train the sanitary staff of the municipalities and the village panchayats with a population of 5000 and above in the Bangalore process of composting town waste and night soil with the ultimate object of introducing this system of composting in the areas operated by Municipalities and village panchayats. The sale of the manures so produced will be expedited by arranging for the transport of the manure either in Government trucks or by subsidising private agencies. As a result of the operation of all these three schemes, it is estimated to increase production of food crops by over 70 lakh mds. in a 5 year period representing an additional income of over 15 crores of rupees.

3. Horticultural Development—Vegetable and Fruit Cultivation

The possibilities of the development and expansion of fruit and vegetable cultivation are very great in almost every district of the province and with the anticipated increase and improvement of transport facilities in the post-war period the cultivation of orchard and garden produce on a commercial scale is certain to be extremely profitable to the agriculturists. In the case of vegetable cultivation much pioneer work has been done in connection with the supply of vegetables to the military by two special schemes viz. (i) Potato Storage and Supply (Military) Scheme and (ii) Vegetable Extension and Supply (Military) Scheme. In order to intensify and expand the fruit and vegetable cultivation in the post-war period, the following 2 schemes have been prepared :

(a) *Extension and organization of fruit and vegetable cultivation.* This scheme provides for the development and extension of fruit and vegetable cultivation in the province by (i) the provision of the necessary specialized district staff to advise and assist fruit and vegetable growers, (ii) further scientific research work in horticultural problems, (iii) establishment of district fruit and vegetable nurseries to supply seed, seedling plants, manures, insecticides, etc., to the cultivators and (iv) additional experimental work on the preservation, utilization and marketing of fruit and vegetable products. In addition the scheme will include arrangements for the organization of fruit and vegetable growers, probably in co-operative societies and for assisting in the orderly regulated and advantageous marketing of their produce.

(b) *Organization of vegetable cultivation in suitable areas.* With the cessation of military demand for vegetable it is proposed to switch over the Vegetable Extension and Supply (Military) Scheme to the civil needs and to intensify its activities with a view to meet the vegetable requirement of the civil population according to the nutrition standard. At present the supply of vegetables is just sufficient to satisfy only about 35 per cent of the require-

ment of the civil population according to nutrition standard, and there is thus a great need of a special scheme for the expansion of vegetable cultivation. Under this scheme it is proposed to extend the areas in suitable districts where water facilities are available and to increase yield per acre by maintaining a special staff to advise and assist the cultivators. In the beginning the scheme will be restricted to Poona, Ahmednagar, Satara, Nasik, East and West Khandesh, Surat, Thana, Dharwar and Belgaum districts.

4. Land Improvement—anti-erosion measures and extension of improved dry farming methods

With a view to check the enormous damage to cultivators' lands caused by rain erosion and to obtain good crops even in years of short and badly distributed rainfall, the work of Land Improvement formed one of the most important activities of the Agricultural Department during recent years. The work consisted of large scale contour bunding on units of complete water sheds, gully plugging and on forest and waste lands, contour trenching and reafforestation. In addition the scientific method of dry farming based upon the successful experimental work carried out at the Dry Farming Research Stations at Sholapur and Bijapur are being introduced and extended over the bunded areas. The schemes noted below are intended to intensify and expand this work during the next five year period so as to increase the acreage under land improvement to 10,00,000 acres by the end of that period. A special committee has been appointed to review the work so far done under land improvement and to make recommendations for improvement and expansion of these activities and on the basis of the report of this Committee there will be some modifications in the schemes described below.

(a) *Land Development and Improvement (Scarcity Areas)*. This scheme provides for the progressive and permanent improvement and development of agricultural, forest and waste lands in the districts of the Province most liable to famine and scarcity conditions by the extension of land development and improvement work designed to check soil erosion and to ensure the fullest use of available rain water in crop production. The work includes large scale contour bunding of cultivable lands, contour trenching and reafforestation of forest and waste lands, gully plugging, etc., and for the rapid extension of scientific dry farming methods on the contour bunded cultivable areas. At the conservative estimate the average increase in crop production per annum on the areas developed under the scheme may be taken at 25 per cent. The capital cost of the land improvement work including dry farming will be met by Government but the owners of the lands coming under improvement will be required to contribute their share of the cost by instalments over a number of years in accordance with arrangements made by Government.

(b) *Establishment of Land Improvement Research Section, Sholapur.* With the progress of land improvement work described under (a) above number of soil and engineering problems specially about the breaches in the contour bunds have arisen which require investigation and accordingly a Land Improvement Research Section has been established (1) to investigate the relation between soil properties and soil erosion in different tracts, (2) to maintain surveys of bunded and trenched areas in order to determine the factors causing breaching and other type of damage in relation to rainfall, gradient, soil type, etc., and the durability of completed anti-erosion works and (3) to investigate engineering aspects of anti-erosion measures with the object of improving technical efficiency and reducing cost of construction and maintenance.

(c) *Research on contour strip-cropping in areas under land improvement.* Cover crops have been found to be very useful in other countries as a preventive remedy against erosion and accordingly it is proposed to find out the most suitable economic cover crops including perennial grasses, shrubs, etc., for different tracts and under varying soil climatic complexes in the province particularly in areas in which Land Improvement section is operating. These investigations are essential for securing the maximum out-turn of crops in bunded areas without any damage to the soil.

5. Agricultural Engineering—Mechanical Cultivation, Well and Tank Improvement, Boring, etc.

The work of the Agricultural Department in connection with Agricultural Engineering is now divided into 2 sections viz., a Mechanical Cultivation Section under the Mechanical Cultivation Engineer and an Agricultural Engineering Section including well and tank construction under the Agricultural Engineer to Government. In order to expand and intensify the activities of these two sections, six schemes have been prepared which are summarised below.

(a) *Mechanical Cultivation.* This scheme provides for the establishment of the tractor section under the Mechanical Cultivation Engineer for (i) deep ploughing of lands infested with hariali and other deep rooted weeds, (ii) seasonal ploughing in order to increase food crop production especially in areas suffering from shortage of draught cattle and (iii) work in connection with land development and improvement project e.g. terrace construction, etc. It is proposed to establish a tractor fleet of 88 tractors with necessary equipment and staff, mobile maintaining units, central store, work-shop, facilities for training of tractor drivers, etc. Tractor ploughing will be done on a contract basis and the work will be carried out throughout the province.

(b) *Expansion of irrigation facilities by (1) construction and improvement of wells.* The provision of additional irrigation facilities to the cultivators is one of the most important and effective methods of increasing crop

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production and accordingly it is proposed to increase the area under irrigation in the province by subsidising and assisting the cultivators to construct new wells and to improve old wells by either repairing, cleaning and deepening them. The assistance to cultivators will take the form of (i) subsidies and (ii) tagavi loans. The tagavi loans will be free of interest and will be repayable in 10 annual equal instalments, the first instalment being payable at the end of the period of 12 months after the construction of well has been completed. It is proposed to construct 10,000 new wells and improve 2000 old wells during the year 1947-48.

(c) *Revival of Boring Section.* The Agricultural Engineering Section of the Agricultural Department used formerly to maintain and operate for the benefit of the cultivators in the province a fleet of boring machines which were made available on hire or worked departmentally on the lands of agriculturists desirous of obtaining new sources of irrigation water. These activities were however stopped in 1936 due to financial stringency. Under this scheme it is proposed to revive and expand the boring section under the Agricultural Engineer and to provide the necessary staff, machines and equipment with a view to place this service once again at the disposal of the cultivators of the province. At present there are in all 18 boring machines (8 power and 10 hand machines) being worked in 11 districts of the province. As the hand boring machines require manual labour for working them which the public find it very difficult to procure at present there is generally a great demand from them for power boring machines. Accordingly it is now proposed to increase the power boring machines to 33 during the five year period of the scheme. 12 power boring machines will be purchased during the year 1947-48.

(d) *Research work in urgent problems connected with Agricultural Engineering.* This scheme provides the necessary staff and equipment to enable the Agricultural Engineer to carry out much incentive research work on the design and economic manufacture of improved agricultural implements and to investigate the possibility of the more effective use of mechanical appliances and apparatus in increasing crop production and saving cost of labour, time, etc., required for agricultural operations.

(e) *Establishment of workshops for the manufacture of and repairs of agricultural machinery and implements.* As at present cultivators are finding great difficulty in securing the requisite number of agricultural implements and machines it is proposed to establish workshops which would take up the work of manufacturing implements on mass production basis and of repairs of implements and power machines such as engines, pumps, chaff-cutters, etc. These workshops will be also equipped for moulding, welding, turning, cutting and fitting operations. Another function of these workshops will be also equipped for moulding, welding, turning, cutting and fitting

operations. Another function of these workshops will be to train the village artisans in the improved methods of manufacture of agricultural implements and the production of implements designed by the Agricultural Engineer. It is proposed to establish during the next five years five such workshops in Kaira, Ahmednagar, Surat, Nasik and Belgaum districts where the power machines are much in use.

(f) *Expansion of the district and headquarters staff of the Agricultural Engineer.* This scheme provides for the augmentation of the district and headquarter staff of the Agricultural Engineer required to cope with the increased activities in connection with the agricultural engineering development and a result of the schemes mentioned above. In addition to these specific schemes, the work of the Agricultural Engineer will also be considerably increased as a result of the expansion of the work of other sections of the Agricultural Department.

6. Animal Husbandry and Livestock Improvement

The breeds of cattle in the Bombay Province are equal to the best in India and the Livestock Section of the Agricultural Department has done a great deal of pioneer work in developing and improving these breeds in all areas of the province to the great benefit of the cultivators and cattle owners. Similarly many tracts of the province are eminently suitable for the establishment of the profitable sheep and wool industry and beginning has already been made in this direction by the establishment of a Sheep and Wool Research Station, at Poona with sub-stations in various districts. Further the expansion of poultry keeping in the villages would result in increased profit to the cultivators especially if the improvement in egg laying capacity, size of eggs, etc., resulting from the use of improved breeding stock can be extended and suitable organization for marketing poultry produce established in the district. Accordingly four schemes have been framed for the development of animal husbandry and for livestock improvement which are summarised below :

(e) *Extensive work in livestock improvement (districts).* This scheme which is already in operation aims at intensifying the work of the Livestock Section in cattle improvement by providing 60 "Supplementary Breeding Centres" in the districts for the production of breeding stock which is required for the improvement of the Khilar, Amritmahal, and Kankrej breeds of cattle. Each centre will consist of 5 villages in selected tracts and at each centre 50 selected cows and 5 breeding bulls will be placed with approved cultivators on specific terms framed to ensure the use of their progeny for further distribution. 12 such centres will be organized annually depending on the availability of the stock. In addition the scheme provides for the rapid increase of the present "Premium Bull" and "Premium Cow"

schemes now being operated by the Livestock Section by increasing the annual issue of such selected breeding stock of various breeds to 400 bulls and 1,200 cows annually at the end of the five year period. Simultaneously with these schemes provision is made to raise the standard of the feeding of the cattle in the province by production and storage of fodder on a large scale especially in scarcity areas, the distribution of seed of improved fodder crops, and encouragement of the manufacture of silage.

(b) *Extensive work in livestock improvement (Farms)*. The scheme provides for the establishment of Government cattle breeding farms for (i) the Dangi breed in Nasik and Ratnagiri districts and (ii) the Gir breed in Poona district. At present there are no Government farms for these important breeds of cattle and accordingly much difficulty is experienced in obtaining suitable breeding stock for distribution in the districts. These farms will also be used as demonstration centres to educate the cultivators and cattle owners in the areas in which they are situated in improved methods of cattle management, feeding, etc.

(c) *Establishment of Sheep Breeding Centres*. Under this scheme provision has been made for the expansion of the work in connection with sheep breeding and improvement and the production, utilization and marketing of wool. It is proposed to open sheep breeding sub-stations in Khandesh, Ahmedabad, Satara, and Dharwar districts and to institute "Rural Sheep Breeding Centres" in addition to the existing sub-stations at Poona, Javala (Sholapur district), Bagalkot (Bijapur district) and at Nagardale (Belgaum district). The main objective of these sub-stations is to evolve strains of sheep best suited to the local environment, to study the problems of feeding and management of flocks and finally to produce the stud sheep required for distribution in the areas where these farms will be located. Simultaneously with the establishment of the sheep-breeding sub-stations the Rural Sheep Breeding Centres will be also opened in order to spread fine woolled sheep in villages by (1) locating selected rams among the flock owners, (2) establishing controlled flocks among the shepherds to serve as rural stud producing units by offering subsidy for the selected ewes, (3) introducing method of "Collective breeding" and (4) organizing breeders' and spinners' societies.

(d) *Establishment of poultry breeding centres*. At present there are Government Poultry Farms at (1) Kirkee, (2) Dharwar and (3) Dhulia, all of which are utilized fully in the production of improved breeding stock for issue to cultivators in the districts. It is proposed to extend this work by establishing 17 more poultry farms so as to enable the work of district poultry keeping to be expanded and intensified throughout the Province. Already Government have sanctioned 3 poultry farms in Satara, Nasik and

Surat districts. These farms will also be centres where cultivators can obtain advice, instruction and assistance in poultry husbandry and where courses of training in this subject can be organized regularly.

7. Agricultural Research

Simultaneously with the schemes of extension of the practical results of the scientific research work hitherto carried out by the Agricultural Department in connection with problems of Agriculture and Animal Husbandry the research and experimental work will be also intensified. There are at present 35 research stations, sub-stations and experimental farms in the Bombay Province at which work on various aspects of crop improvement both as regards yield, quality and disease resistance is being carried out. Such work includes genetic improvement of crops, experimentation on improved cultural methods, manuring and irrigation technique, crop rotations, insect pests and plant diseases, etc. This research work has necessarily and mainly for reasons of finance been confined to a few important crops of the province and restricted to the more obvious and pressing problems connected with these crops and the environmental conditions under which they are produced. It is now proposed to intensify and expand the field of such scientific work and put it on a sound organization for which the comprehensive undernoted schemes have been prepared :

(a) *Expansion of agricultural research.* Under this scheme it is proposed to establish a number of additional research stations or sub-stations for all-round scientific work on crop improvement for important cereal and pulse crops in order to increase both yield and quality of these crops. In addition, the scheme provides for extending the facilities and scope for such work now available at existing research stations, sub-stations and Government Experimental Farms in the province so as to enable a wider and more comprehensive programme of agricultural research work to be undertaken in all areas of the Province. At these crop research stations scientific work will be done not only on the botanical improvement of the crops assigned to each but also to devise improved methods for increasing their production under cultivators' conditions and such other aspects as preparation of the produce for marketing.

Other subjects which will be tackled under this scheme are (1) co-ordinated experimental work on various local soil problems of much economic importance to agriculturists in many districts of the province, e.g. the reclamation and improvement of karl lands in the Karnatak, Bhal lands in Gujarat, salt and alkali affected areas, etc., (2) a fertility survey of the cultivable lands of the province upon which further measures for increased crop production can be based, (3) further important research work on the chemical

and physical aspects of organic and inorganic manuring and the economic utility of such treatments, (4) investigations into mineral nutrition of crops and (5) scientific work on a number of minor agricultural problems, e.g. improvement in the quality of gul, nutritive value of different fodder crops, control of insect pests and plant diseases on field crops, pests of stored grains, etc. Finally the scheme includes provision for the establishment of an Agrisilvicultural Research Station in Kanara district for scientific investigation into the various inter-connected problems relating to the co-ordinated production of field, forest and garden crops in the important upghat coastal tracts of the South Konkan areas.

8. Agricultural Education and Technical Training

It must be obvious that in order to carry out satisfactorily and efficiently the considerable additional work involved in the schemes detailed under the various heads above, a large number of trained staff of all grades will be required in addition to the present staff of the Agricultural Department. Accordingly arrangements have to be made to obtain suitable recruits and to give them the necessary training and experience needed to fit them for technical duties. It is estimated that in order to put into force the post-war expansion programme of the Agricultural Department described above about 206 additional Agricultural Officers (Graduates), 537 Agricultural Assistants and 1,655 Kamgars, technical assistants such as Surveyors, Mechanics, Fieldmen, etc., will be required. To begin with, therefore, special priority has to be given to arrangements for procuring and training such additional staff and two important schemes have been prepared and put into operation already.

(a) *Expansion of agricultural education especially the Agricultural College, Poona.* This training scheme provides for the expansion of the Agricultural College, Poona, and for the increased building, staff, equipment, etc., necessitated thereby in order to enable 250 students to be admitted annually to the degree [B.Sc. (Agri.)] instead of 100 admitted previously. In addition, it is proposed to establish two more agricultural colleges, one at Anand in Gujarat and another at Dharwar in the Southern Division.

(b) *Establishment of Departmental Training Centre for staff in Agriculture, Land Improvement and Animal Husbandry.* As a very large number of subordinate training staff, i.e. Agricultural Assistants, Fieldmen, Kamgars, etc., will be required to implement the departmental programme for development of agriculture, Land Improvement and Animal Husbandry this scheme which is already in force makes provision for the establishment of 6 departmental training centres at Manjri, (Poona district), Dhulia (West Khandesh district), Devihosur (Dharwar district), Bhuva (Broach district), Sholapur

and Bijapur, at which such men can receive practical training in courses lasting over 12 months. At the latter two training centres, in addition to the general agricultural training, specialized training will be given in land improvement work and dry farming. With the full expansion of the departmental training centres mentioned above about 500 to 600 trained staff would become available annually for subordinate posts in different departmental activities under these post war schemes. Facilities already exist for training in poultry keeping and horticulture which will be expanded as found necessary.

Besides the large number of schemes mentioned above under different heads Government have under consideration schemes for the provision of subsidiary industries to the cultivators such as the development of apiary and dairy industries. A special post of Dairy Development Officer has been recently created for locating the areas suitable for dairy development and preparation of the schemes. In order to bring about an all round improvement in the life of the villagers it is proposed to maintain a village guide at each village for which a scheme for training of suitable candidates in agriculture, co-operation, hygiene and village industries is under preparation.

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