

Demonstration-farms on co-operative lines on the model of the one at Lalgudy, under the guidance and supervision of the Agricultural department should be started in as many centres, particularly in all taluq headquarters where there is a constant concourse of villagers for purposes of business, both official and trade. Agricultural societies should be started in large numbers for the supply of good seeds, manures, and implements, and the loans granted to members for the purchase of the above should only be disbursed in kind from such societies. Loan and sale business should be done in the same society and for the marketing business, it should be connected with a Wholesale society at the top, managed by experienced and business-knowing persons thus completing the structure.

The Government may train men doing honorary work by giving them agricultural education and giving them training in organization work, and they in turn may be entrusted with doing a lot of preliminary work, as it is being done in the case of co-operative and village panchayat movements. A beginning could be made by training the office-bearers of the co-operative unions and societies. In the various co-operative training institutes now being conducted in the Madras presidency, the students may be given training in agriculture from 4 to 6 months at least, as the present-day business training is not sufficient to equip persons who are to work in the villages. Besides, when the plague of unemployment visits such institutions as it has done in the case of so many schools and colleges, the students trained in such institutes may have the confidence to stand on their own legs by forming agricultural co-operative societies and working for them.

Similarly, co-operative training could be given to the students and officers in the Agricultural, Industrial and Dairy departments, since hereafter non-credit activities have to be entrusted to experts in the particular line so as to be sure of the success and continued progress. A liberal and forward step to meet the situation is what is necessary at the present moment.

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## NEED FOR AGRICULTURAL IMPROVEMENTS AND WHAT THEY ARE WITH SPECIAL REFERENCE TO SOUTH KANARA

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To improve the position of the farmer either with regard to his economic position or health—two inter-dependent factors—is the problem on hand. I shall in this paper attempt to place before you certain hard facts which every ryot in the country, especially in the West Coast, has to care for to improve his agricultural programme. We have to remember at the outset that the prosperity of the country with about 80 per cent of its population engaged in agriculture, must be identical with the advance that the country will make in economic farming, in providing food for the increasing population and in supplying raw materials for the industries at

<sup>1</sup>Extracts from a paper read before the Fourth Agricultural and Industrial Exhibition, Mangalore—January 1931

home and abroad so that the farmer may increase his purchasing and earning capacity.

Communications have improved and transport facilities have increased, so that whatever we produce has, in fact, to be placed in the world market to compete with the produce of highly organized scientific farmers of more advanced countries. The economy in production must, therefore, be by way of reduction in the cost per unit produced. Increased production has, by itself, little value unless it ensures, along with it, reduced cost of production. One has to practise economy day in and day out, particularly in the following instances :—(1) Prevent waste, (2) utilize the waste products and try to make a capital out of them, (3) increase the production of such materials as are now imported from other countries, especially for food purposes, and (4) diversify cropping so as to maintain the intrinsic fertility of the soil, defying adverse weather conditions; this last will make the farmer more self-contained than he is now and enable him to have some saleable commodity throughout the year to meet his cash requirements. In the economy of a farm, diversity of cropping, perhaps, will count higher than anything else to make the owner successful in the business side of farming. The rearing of livestock of all sorts will also be one of the aspects of diversified farming incidentally helping the farmer to better utilization of waste.

For a moment let us look at the amount of food-stuffs that we import into this Presidency. We had, within the last one year, imported about 10,000 cwts. of dairy products mostly condensed milk, about 100,000 cwts. of sugar, and about 40,000 cwts. of starches like sago, etc. On the West-Coast, though we have ample rainfall for six months and consequently luxurious growth of grass on our hill slopes, our cattle are starved to death during the hot months. If any, with tenacity of life, luckily survive the hot weather, they cannot but be the half-starved poor specimens which the West Coast cattle now are. They yield little or no milk. To maintain poor animals is itself bad economy. It is very imperative that we should improve our animals as fast as we can. Milk food is becoming more and more popular and is being recognized as an important article of diet. The shortage of its supply is a cause for national degeneration. Stronger and better working animals are also necessary factors for economic farming. Without losing any more time, we have to start work with regard to improvement of our livestock, by paying attention to better feeding, breeding and housing of our animals. We must arrange to conserve the large quantity of hill grass which is now practically wasted, by converting it into silage, for later use in hot weather. Silage is as good as green stuff for cattle, and can be made from hill grass by cutting it when in tender flowers, packing well and preserving under ground. I am very grateful, in this connection, to Mr. and Mrs. Sreshta and to the Mission Farm at Moodbidri, for the very valuable demonstration they have made for silage making on their estates. Besides this, a farmer must be able to grow fodder crops as well. Chulam and the various pulse crops are well suited for this purpose. Even under shade of coconuts we have been able to produce 8,000 lbs. of green stuff per acre in Kasargod, and in the open ground it must yield more. I wish to lay emphasis on the fact that the grower of the coconut must, in particular, devote attention to produce some crop between the rows of the trees and a fodder crop of cholam must certainly find its place in the rotation. Guinea grass and elephant grass can also be cultivated in all places where there are facilities for irrigation during the hot weather. If better

milkers are kept, it will pay the owner to feed them with cotton seeds, oil cakes and the like, in addition to fodder.

As regards breeding, we have got only half a dozen bulls of the right type on the West Coast. I wish that every village had its own breeding bull which, if maintained properly and made to serve not less than 40 cows a year, will be paid a premium of Rs. 100 a year by the Government. The bulls can be worked in the fields for half the day as they want exercise. Therefore, if a farmer maintains a pair of them for part-time work as well, he will be able to derive the full benefit out of them and make it an economic proposition. The two bulls now stationed at Mangalore are serving a large number of cows, but the progeny do not all receive the better feeding and attention they deserve. I am grateful to the District Advancement Association for the interest they have shown in this affair by having given housing facilities for these bulls. Let me add that goats, pigs and poultry are also necessary for every farm. They will, if properly managed, contribute, in no small measure, to the prevention of waste.

Next we come to the enormous import of sugar into a country that has large areas under sugar-cane. Even with the present area under sugar-cane we can in due course double the yields of sugar and approach the Java yields of 6 tons of sugar per acre which are only the result of improvements in varietal, manurial and cultural methods. When sugar-cane becomes a more paying crop it will certainly spread over a larger area and help us to keep down the import.

As regards starchy foods, the cultivation of tapioca, plantains, sweet potatoes and various other root-crops, will certainly augment the food-supply and money return to the farmer. Groundnut as a money-crop is in no way unimportant. Cambodia cotton grown as a dry-land crop in the Pattambi Research Station promises to be a paying crop of the future. Mention may here be made also of both pepper and coconut in suitable areas.

The extensive dry lands now lying waste can be gradually devoted to cashewnuts which are expected to give an average income of Rs. 50 per acre from fruits alone besides supplying fuel. The cultivation of fuel trees of all sorts must be encouraged in the rural economy of the country so that the large supply of cheap fuel available will put a stop to the vicious habit of burning cattle-dung as fuel. It is a serious mistake to think that the burning of any dry stuff will convert it into valuable manure. On the other hand, the organic matter which is a very valuable ingredient in any soil for improving its water-holding capacity and its drainage, is fully lost when any stuff fit for manure is burnt, not to speak of the loss of nitrogen. Therefore, I have to appeal to you, farmers of the West Coast, to have a compost-pit or two in the immediate vicinity of your dwelling house and deposit in them any sort of waste organic matter (animal or vegetable) including the leaves on which you eat, the skins or ribs of vegetables carved for the kitchen, etc., with intervening layers of cow-dung and keep it covered with a layer of earth. Sweepings of the yard or threshing floor, waste straw, plant stubbles, etc., not fit for litter, can all go into this pit. In the course of a couple of months, this deposit of very valuable capital will begin to pay you interest, when you are able to use it as manure. This is the most important way to prevent waste in the rural areas. In the urban parts there is more of such wastes and less of cultivation, but it is grievous

to note that even a small fraction of this waste is not properly utilized by the neighbouring farmers for manuring purposes. The night-soil dumping grounds of this Municipality must be able to produce plenty of good fodder to serve also as a source of profit to the Municipality, if the area can be enclosed and leased out for the purpose. Vegetables also may gradually take the place of fodder in the dumping grounds. The sewage of our town is itself a very rich manure, if we can only utilize it. In the interior villages also, bore-hole latrines must help to preserve the human excreta within the soil to form manure in the near future. The dumping of well-preserved cattle-manure in the open without even a layer of earth is a practice which should be condemned. The proper conservation and utilization of the excreta of all farm animals is as important an item in the utilization of waste as it is from a sanitary point of view.

If waste is prevented by the above method we are in a position to augment our manure supply by the use of more concentrated manures like bonemeal, oil-cakes, etc., which are now largely exported. This is in fact a drain on our resources. The amount of export of these materials for this Presidency alone is 115,630 tons of oil cakes, (including that sent in the shape of oil-seeds), 7,429 tons of bones and 1,000 tons of other organic manures. If we begin to use more of these things, we shall be helping to maintain the fertility of our soils. We may export all the cotton lint and oil beyond our requirements as they do not carry with them our soil fertility. The use of chemical manures is a step after adopting the above procedure in maintaining the fertility of our lands. They must be applied judiciously with great care and in suitable mixtures, only to supplement the bulky organic manures. By adopting the more economic method of conserving bulky manures and utilizing wastes of all sorts, the Chinese have been able to maintain the fertility of their soils for the past several scores of centuries. The Chinese get an average yield of 4,000 lbs. of paddy and Japan about 6,000 lbs. per acre, while 2,500 lbs. will be considered a heavy yield in South Kanara and the average yield is only about 1,500 lbs. per acre. Yet we pretend to be some of the best rice-cultivators of the world!

Every one knows that the cost of cultivation for raising a pure or mixed crop will not vary much but in the outturn, the pure seed will certainly beat down the other. This is how the plant-breeder helps the farmer to realize better profits. Seeds like G. E. B. 24 and other selections of paddy, for instance, bear bigger ear-heads, mature more uniformly and yield better quality of rice with less of husk and therefore they are really more profitable than the local ones. Again in situations of shortage of water-supply, where the local varieties have failed, G. E. B. 24 has given a satisfactory second crop. Even with the local varieties, the simple method of bulk selection (selection of ear-heads) has proved to ensure heavier yields and when proper manuring is adopted, these heavier yields won't affect the soil fertility at all. In some places of South Kanara where the continuous cultivation of green-manure crops has tended to increase chaff in paddy, the land must receive a corrective application of bonemeal of about 2 cwts. per acre per year. Amongst sugar-cane varieties, Fiji B. for instance, stands better manuring. I have come across certain plots of red cane and Fiji B, manured purely with chemical manures. The crop is good this year, but it is a great damage done to the land and to future crop, as the ryot has not added enough organic manures to the fields. Besides this, sugar-cane comes into the same field once in two years. I wish there should be at least 3 years' interval

between two sugar-cane crops in the same field. As we do not adopt these principles in our cultivation, we have been damaging our crops and deteriorating our lands.

Efficient implements will require slightly higher investments than inefficient ones, but the profits will in the long run out-weigh the increased investments several times. An implement like the Meston plough is really a more efficient one as it moves the whole surface soil in one operation. A guntaka of the type exhibited here by a cultivator, to stir the soil, to collect weeds and to break clods, is worth the investment on it. A *mammotti* fork that pulverizes the seed-bed or digs out manure much sooner than an ordinary *mammotti* is a necessary investment to save the labour of the farmer. The iron mill, the introduction of which has been helped to a considerable extent by the District Advancement Association, has practically replaced the old sugar-cane mill throughout the sugar-cane area. So too, have the adoption of Sindewahe, Poona and Battery furnaces. They have considerably more room to spread, and to save fuel, which must necessarily go to replace the cow-dung cake of the kitchen.

Timely action to adopt preventive and remedial measures of fungus diseases or insect pests must be considered very important. Timely reports of such attacks will help in dealing with them and in saving the crop over large areas.

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