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maize and his cattle on half the produce of his farm. So he maintained himself and his family on one quarter of the farm and gave half to his cattle. Now we go even further, We divide the farm into five parts, one for wheat, one for maize, three for grass and fodder; and we find it pays. Cattle pay us, quite apart from milk products which we do not get on the dry farms. We reckon one-third of our total profits come from buying cattle as calves and selling as adults. The reduction of our wheat and maize areas have done us no harm. With more and better cattle and more cattle manure we plough and manure better and we get a bigger food crop yield from two-fifths of the land than we used to from half. Again and again I say without good cattle, agriculture will not flourish in India. The present Indian miserable breeds must be entirely replaced. The new breeds must be fed sufficiently, housed properly and restricted in their breeding. Aged cattle should not be kept at all and young cattle should not be allowed to breed.—(*The Statesman*.)

REVIEWS.

Season and Crop Report.

MADRAS PRESIDENCY 1924-25.

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This Report forms very interesting reading, bringing out prominently the inherent defects in the agricultural condition of this province. A close scrutiny of the statistics given would enable a student to understand clearly the rural economics of this presidency and the state of its agricultural condition. The aim in publishing this report seems to be to secure as far as possible accurate and reliable statistics of local agricultural conditions.

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The arrangement of the figures and of the statements are thoroughly satisfactory. What would take one year to understand the agricultural conditions of the country, can now be learnt in a short time by a careful study of the above statistics. For this the Director of Agriculture, Mr. Anstead, and his Statistical Assistant Mr. V. N. Viswanatha Rao deserve our thanks.

That the prosperity of the ryot depends upon the availability of water and manure requires no discussion. Owing to capricious monsoons 13.8 million acres of cultivable area has been allowed to lie fallow. If the ryot were able to sink wells in this vast area it could be brought under cultivation with benefit both to the cultivator and the country.

Out of a total population of $42\frac{1}{2}$ millions in this Presidency 33 millions or nearly 8% were engaged in cultivating 33 million acres. The total number of draught animals (bullocks and he-buffaloes) is $8\frac{1}{2}$ millions. $4\frac{1}{2}$ millions of ploughs, including 17,000 iron ploughs were in use. The report also gives us other interesting figures that there were 1.1 millions of country carts, 6 million young stock, 20 millions sheep and goats, 164 thousand other head of animals, 268 oil engines and 600,000 wells.

An analysis of the above figures gives us the result that there is one acre available for one man, that one pair of animals serves 8 acres that one plough is to do service for 16 acres and that one cart is available for serving 30 acres and that one well suffices for 3 acres of land and that for a population of $42\frac{1}{2}$ millions there are available $7\frac{3}{4}$ millions of cows and she-buffaloes. A further analysis exhibits that out of the 33 millions acres of arable land only 9 million acres get the benefit of irrigation either from canals, tanks or wells. It is also clear from the statements that the yield of crops on irrigated areas as compared with dry land is fourfold in the case of cotton and twofold in the case of cereals. It all the waters of the rivers in the Presidency that now run to waste can be utilised for irrigation purposes and if the sub-soil water also is made available by sinking more wells, the agricultural population of this presidency will find work all round the year without being put to the necessity of emigrating to other countries. They will also be enabled to produce more food for the teeming millions of this province.

We find that the $4\frac{1}{2}$ millions of ploughs used are wooden ploughs and one has to function for 16 acres and a plough on an average weighs about $1\frac{1}{3}$ c.w.t. It is common knowledge that wooden ploughs rarely last more than one agricultural season, viz., one year. To replace $4\frac{1}{2}$ millions of these ploughs it would require 75,000 tons of timber for which large numbers of trees have to be cut every year. If these ploughs could be replaced by cheap, simple wrought iron ploughs without castiron parts a great number of trees can be saved from destruction; and the scarcity for fuel and the wasteful use of cowdung may to a large extent be prevented. Further, conservation of a large number of trees would ensure supply in large quantities of fodder for sheep and goats and would greatly contribute to improve the climatic conditions of the country.

The source of power that is at present used for agricultural production is the bullock. During the cultivating season the total number of bullocks is found insufficient; while in the non-agricultural period the ryots are unable to find sufficient work for them with the result that they are underfed and starved. It is also common practice that the best pairs of bulls are used mainly for

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transport work, while only the inferior ones are used for agricultural operations. Further most agricultural implements and machines are very crude and inefficient. The need for better machines is keenly felt; and money spent in promoting inventions in this direction will be a great boon.

Coming to the question of manures, the chief sources are the refuse of all agricultural products such as husk, straw, oil cakes, the droppings of men animals, dead animals and their remains, such as fish, bones, hoof, blood etc., and mineral substances such as nitrates and phosphates. Much of the agricultural byproducts is not available to the villagers on account of the lack of simple, labour-saving machines that could be utilised with the available animal power, namely bullocks. No permanent benefit can be obtained by imposing heavy export duties on manures as such exports are mostly raw agricultural products. The only way by which the valuable manurial refuses can be saved for the country is by making the ryot use simple machines for dressing the produce for the market. By this process all the valuable by-products can be saved.

The report gives us figures for the number of cattle-deaths by disease. If along with this the total number slaughtered is also taken into account on a rough estimate something like 100,000 tons of bones are allowed to be exported out of the country. This enormous waste of manure can be prevented by a little educative propaganda among the ryots, drawing their attention to the manurial value of bones. If the ryots are only taught this they are not likely to allow boys and girls to steal away bones lying scattered in their fields.

The statements about the crop returns are very valuable and equally interesting. It is stated that $10\frac{1}{2}$ million acres of rice land produce $7\frac{1}{4}$ million tons of paddy which when dressed properly yields 5 million tons of rice. 14.8 million acres bearing other cereals such as kambu, cholam, ragi etc. gave a net yield of 3.5 million tons. So it will be seen that the total quantity of clean cereal grains-the staple food of the country-amounted to $8\frac{1}{2}$ million tons. This has to satisfy a population of $42\frac{1}{2}$ millions. On an average it works out to $\frac{1}{5}$ of a ton per head per year. For living in comfort at least $\frac{1}{4}$ ton, of food grains is necessary per man per year. We also see that there are $7\frac{3}{4}$ millions of cows and she-buffaloes. Of these 50 % may be considered to be with calf, so that only 4 millions of milch cattle have to meet the demands for $42\frac{1}{2}$ millions of people. That again shows that one cow has to produce for 11 people and supply them with milk, curds and ghee.

From the above paragraphs it will be clearly seen that the population of this Presidency is in a chronic state of starvation. It is therefore necessary that the ryot must be helped to produce more crops if the country is to remain healthy and produce healthy men and women. The ways and means by which this could be attained is by preventing the diversion of 1,00,000 tons of bones from going out of the country as also 3,00,000 tons of oil-cakes. The export of these valuable manures really saps the fertility of the soil and unless speedy steps are taken to prevent this unnatural denudation of the fertility of the soil, ere long the arable lands of this Presidency will be a mere Sahara,

The ryots should also be considerably helped in the matter of utilising the sub-soil water by being helped to dig more wells and be made less dependent upon the capricious monsoons. So, in fine what is most needed to improve the condition of the ryot population of this Presidency is to make available to them more manure and more water, This really is the magic for the improvement of the lot of the Indian Agriculturist.

It is hoped that in future reports the following additional information may be made available and would be welcomed by the public who are interested in reports relating to rural statistics :—1. A map showing the different kinds of soils available in this Presidency. 2. A map showing the cultivable lands available in the different districts, with the railway lines and the roads marked, if possible, as also information regarding the use to which these lands can be put to, such as cattle breeding, dairy farming, coconut plantation and so on. 3. A statement regarding the quantity and amount of subsidiary industrial occupations available for men and animals engaged in agriculture in the various districts, 4. A statement showing the number of live stock in each district classified according to the breeds to which they belong, 5. Information may also be made available with regard to the available portion of the reserve forests and fodder areas and also the extent of private pastures available in each district, 6. Statistics regarding the animals (cattle and sheep) slaughtered for food purposes, may, with advantage, be given.

Finally one suggestion is made to the Department that all this information may be summarised in vernacular and be made available for non-English knowing sections of the population.

S, RAMACHANDRA AIYER.