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Urbanisation promotes soil erosion. As urban prosperity is at the expense of the rural agriculturist, the burden of taxation should be shifted from the country to the town and from Agriculture to industry.

Land tenures. The system of tenures, on which land is held by communities, is responsible in some measure, for soil erosion. Southern Rhodesia has been a victim to it. Russia passed from Feudalism, Communal Field Farming, Capitalism and Collectivism, to Socialism. How far the last survives the earlier systems, on the steppes of Russia is yet to be seen.

The holdings of owner-cultivators are less liable for erosion than those under tenants. With the ease-loving habit of man, the strength of the owner-workers is falling and that of tenants increasing. Short term tenancy is a result of rack-renting and lands under this system are the worst liable for erosion The systems of tenures that should prevail, between land-lords and tenants, for soil conservancy and doing away with erosion are also subjects for the bureau of economic suggested for creation.

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Tenants' Needs and Departmental Limitations.*

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Introduction. This paper is based on my study of a few holdings in Malabar with regard to the economics of paddy cultivation. It has been my experience in the course of the investigation, which is being conducted under the auspices of the Madras University, to find the people mostly indifferent and sometimes critical about the doings of the Agricultural Department. The causes of such indifference, as I see them, are presented in this article.

General. Earnings in Agriculture may be generally poor but the level is particularly low in the conditions existing in the Malabar district. With no mixed cropping or rotation in crops, paddy is grown in wet lands year after year with the success of the crop depending largely on the south-west and north-east monsoon rains. The cultivation is further complicated by the

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system of land tenure peculiar to the tract. The ownership of land is vested in a comparatively small section of the people styled *Jenmis*, while cultivation is carried on by a large body of tenants and under-tenants. Rice is the staple food of the people; and the tenants who are mostly small-holders, bear the brunt of food productions.

Needs of the Tenant Farmer. The fields have to be prepared before sowing seed and the tillage operations involve the use of cattle and human labour. Implements have to be assembled and some provision made to meet the recurring expenditure till the maturity and harvest of the paddy crop. Lacking an alternative occupation, the Malabar farmer has taken to the plough and he is faced with the problem of cultivation. The owner generally pays the land revenue and the tenant-farmer need only raise the crop and remit the rent after harvest. The minimum expenditure on cultivation when approximately analysed, has been found as follows :—

Average calculated from 27 holdings examined in Ernad Taluk, Malabar District.

Area under rice cultivated by one pair of cattle.	Expenditure.		Remarks.
	Item.	Percentage.	
5·4 Acres	Cattle	33·3	
	Implements	4·2	
	Seed	13·2	
	Cultivation expenses	49·3	
	Total	100·0	

These average figures are, of course, misleading because a few big-sized farms exist beside a greater number of smaller ones. As a matter of fact the holdings are much smaller than the average area under paddy as indicated above. If the members of the tenant cultivator's family do all work on the farm, "cultivation expenses" could be considerably reduced. But he must perforce buy his cattle, plough and seed, and to find funds for all this is his main problem.

Nature of Government help Loans are granted to the agriculturists under the Land Improvement Loans Act of 1883 and the Agriculturists' Loans Act, 1884, for the construction of wells and tanks, and for the purchase of seed, grains, work cattle, implements and other agricultural operations. Such help is rendered by the Government through its various departments noted below.

(a) *Revenue.* Distribution of loans to the agriculturist, to help him with his primary requisites such as cattle, seeds, etc., is mainly the work of the Revenue Department. The loans are given on landed or personal security. The tenant-farmer, who is in the main a simple-lease holder for one year, has neither of these to offer. He is not credit-worthy enough to take advantage of such loans.

(b) *Co-operative.* The prosperity of the small holder may lie in the direction of co-operative institutions, but before much good can be expected,

the masses should be better educated in the principles of co-operative effort and more "Raiffiesens" should spring up even in interior villages.

(c) *Industries.* Loans are distributed by the Industries Department for the purchase of oil engines and pumps, but they do not figure prominently in the Malabar tenant farmer's economy.

(d) *Agricultural.* The Department exists for the welfare of the ryots and for improving agriculture by scientific means. But the poor tenant in Malabar cannot derive the full benefits of such improvements unless the departmental help extends beyond mere advice. It does not help him effectively as it has no powers to grant loans for the purchase of cattle, and seed. Loans are, of course, sanctioned by the Agricultural Officers for the purchase of implements, but in Malabar, the small-holder finds himself more at home with his cheap and native tools, which have stood the test of time, rather than with the improved machinery. With many tenants, manuring is a matter of capacity or convenience and few are able to pay the necessary attention to the fertilizing of the paddy fields. Whatever manure is available from his stock is applied to his fields and sometimes supplemented by green leaves and green manuring. With the rice cultivator the Department has established a name and is popular for its pure seeds of strains. But as he looks to the Department for fresh supplies of seed instead of multiplying it on his own farm, he is necessarily disappointed since only a fraction of his needs can be satisfied at present. Thus with limited scope for work among the poor paddy cultivators, the Agricultural Demonstrator in Malabar is constrained to restrict his sphere of activity still further because he is bound by rules to adopt the only procedure of "cash and carry".

Public Opinion. The views and opinions freely expressed by the public could be brought under two categories: (1) the "ill-informed" and (2) the "informed".

(1) *Ill-informed opinion.* The educated section of the public who have generally no interest in land or its cultivation is often guilty of such opinions. Their complaints are not often based on facts and could have been set aside but for the thought that every one of these educated critics, by propagating incorrect views about the Department creates an atmosphere which is not conducive to 'bridge the gulf' that exists between research and the ryot. They should have correct information before levelling their criticisms for then alone will their criticisms have real value. Much of this ill-informed opinion could be corrected if the Director of Agriculture, supported by this House, presses on the Government and the Universities the need to include "The Activities and Achievements of the Government Research Departments" in the text book of our educational institutions. Propaganda and publicity should be intensified on more modern lines and greater information made available to the public regarding the different branches of Agricultural Education and Research.

(2) *Informed opinion.* This should be welcomed by the Department. The Agriculturist expresses such informed opinion with a closer knowledge

of his difficulties which are mostly of a pecuniary nature. And when he finds that its advice has no financial backing, not only the Department but also the whole of Agricultural Research falls low in his estimation. Difficulty in getting money to begin cultivation and delay or absence of effective help in times of need tend to prejudice the agriculturists against the Department. And the incidence of droughts, pests and diseases in crops, should they occur, only aggravates the tendency. Much of his criticism is real. But, in despair, he forgets the scope and limitations of the Agricultural Department. It has, however, yet to be empowered to give him more material help before it could effectively assume the natural role of existing for the 'Sons of the Soil'. The problem is difficult and many aspects will have to be studied, but it should not be an impossible task to find out an arrangement whereby the department is given the responsibility with power for improving the lot of the agriculturists.

An analysis of the situation calls for the following remedial measures.

Granting loans. To win him over and gain his complete confidence may land the Government in much capital investment, but the Agricultural Department could be immediately helped to appear in brighter light if whatever loans are at present distributed by the Government are done by the Agricultural Officers themselves, or through them.

Avoiding delays. There are inevitable delays in administration which the ryots cannot often understand. If he does not get in time his seed remedies or prescriptions for pests and diseases for which he expects spectacular results, he drags the whole Department into the mire without considering the inadequacy of the present staff to cope with the heavy work. But it will be worth while for the Department to simplify its procedure or dispense with certain formalities to cater better to the needs of the farmer.

Affording Irrigation facilities. It might appear strange that in Malabar, crops fail for lack of water. But as they are entirely dependent on rainfall, the cultivation can only be "a gamble with the rain." The contour of the country is irregular, the rainfall unevenly distributed. Difficient precipitation, especially in the months of October and November, reduce the outturn of paddy considerably. It is poor consolation then that the average annual rainfall for the tract is 118 inches, nearly $2\frac{1}{2}$ times the average for the province. The starting of many minor irrigation works requires investigation and the agricultural officer should take an effective part in initiating such schemes.

Faith in Research. What has been said so far is only to indicate some probable ways of restoring the ryots' confidence in the Agricultural Department. It has been assumed that the agricultural research workers themselves have infinite faith in research and in the potential utility of their methods, for, without faith in themselves and in the work they do, they cannot hope to persuade others to take them seriously. The research

workers should also realise their responsibility as joint investors with the agriculturists and the administrators in national progress. They should be ever mindful of the fact that the ultimate test of their labours is in the fields of the farmer; success there is their reward; failure, their incentive.

Conclusion. I shall close my paper with an appeal that this Conference now and in all its future deliberations, may discuss this subject in all its aspects and reflect the hopes and fears, the needs and necessities of the man behind the plough. It should evolve ways and means of bringing the ryot and the research worker nearer It is my hope that the College Day and Conference of the Madras Agricultural Students' Union, will form the Central Observatory, where once a year rural observations and their bearing on the trials and triumphs of Research will be recorded.

Preliminary Observations on the Insect-free Storage of Grains.

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Introduction. The successful storage of his grains free from insects is a serious problem for the ryot. The grains have to be stored for some time, longer or shorter, before a ryot can dispose them off for food or for seed and during this period they are liable to be spoiled in various ways; their suitability for food may deteriorate or they may suffer in their germinating capacity; and insects contribute largely to this damage, the loss from which may amount to several lakhs of rupees in a year. It has been calculated that *cholam* (sorghum) grains alone are liable to damage upto 25 per cent during the course of storage for a year; in very bad cases it may be more. According to the Season and Crop Report for the year 1938—39 published by the Madras Government 1,265,300 tons of cholam were produced in this Presidency in that year, valued at Rs. 94,867,500. At a low estimate of 10 per cent the loss due to insects would come to $9\frac{1}{2}$ millions of rupees. This loss has been calculated to be caused by only one species of insect – the rice weevil. If we take into consideration also other insects that take their toll, we can easily imagine, how great the loss caused to *cholam* grains in our presidency would be due to insects. Insects attacking grains are many; this paper deals with observations regarding only two of these, viz, the rice weevil on *cholam* and the paddy-borer beetle on paddy. The rice weevil, though commonly so called, is more a serious pest of *cholam* grains here than of paddy.

Methods of Storage of Grains in this Presidency. Paddy and *cholam* grains are stored in different ways in various parts of the presidency. (1) In some places they are stored openly in the pials of cattlesheds and dwelling houses rarely covered over with a loose layer of straw; in many cases they are neither cleaned well nor dried before they are stored, so that the facilities for insect infestation are plenty; such simple methods of