INDIAN JOURNAL OF AGRICULTURAL ECONOMICS

COST AND PROFIT IN RELATION TO SIZE OF RICE FARMS IN BHUBANESWAR AREA (ORISSA)

Introduction

In Orissa monoculture of paddy is widespread. Out of 9.6 million acres occupied by paddy, winter paddy alone accounts for as much as 83.5 per cent. This paper relates to farms growing winter paddy only. In view of the predominance of this single unirrigated crop depending fully on the vagaries of monsoon for its successful production the region is subject to very unstable economy. Further, the prosperity of the area is very closely linked with the efficiency with which the crop is produced. Considering the importance of the crop an exploratory survey was undertaken during the year 1958-59 in the region mentioned above to study the economics of its production. The climate and rainfall of the region during the year was normal.

Sampling Technique

Two stage sampling procedure was adopted in this study where five villages were selected at random out of 91 with probability proportional to the cultivating population with replacement. The farms growing winter paddy alone[1] were picked up in the selected villages and were stratified into four size-groups. From each of the villages and from each of the size-groups, the farms were randomly allocated in proportion to their number in each. Thus altogether 32 farms were selected for the purpose of this study.

The items in the cost were depreciation, upkeep of livestock, dead stock, building and constructions, interest on owned capital and borrowed capital, human and animal labour, seeds, manures and rent on owned land.

Table I shows the cost in relation to the four size-group of farms.

TABLE I—SIZE-COST RELATIONSHIP IN RICE FARMS

Serial Number	Size-group (in acres)	Number of farms	Cost per acre (in rupees)
1	2	3	4
1.	0—8	14	145·96
2.	8—16	11	110·72
3.	16—24	4	86 99
4.	24 & above	3	118·05
		Mean	Rs. 122.92
		S. E.	Rs. 13.69

The coefficient of correlation between the size of farms and the cost per acre works out at —0.558 which is highly significant with thirty degrees of freedom

---

1. Other supplementary and complementary crops or enterprises included in the farms were of very minor importance and due allowance was given for them in calculating costs and returns.

and established the existence of a negative correlation between the two variables. Up to the third size-group, much economies in the cost of bullock labour and overhead costs occurred and therefore the cost per acre went down as the farm size increased up to a certain level. Because of the fuller employment of the equipment, buildings and other resources owned by an average farmer the optimum size of the farm appears to lie in the third size-group. Since farms do vary in size greatly for some type of farming, farm management data collected from many farms will indicate the most economic size of farms in any particular region having homogeneous type of farming.[2]

The coefficient of correlation between the size of farms in the first size-group and their cost per acre is estimated at —0.43. This is just not significant at 10 per cent level of probability. It may however be remembered that it is rarely possible to secure significance in a data of the character under study with only 14 number of observations. If larger number of farms are taken under each size group, it is likely that a significant negative correlation may be obtained within each size-group up to a certain level as the 't' value required for significance of the correlation coefficient diminishes with adequate number of degrees of freedom.

The above problem can be studied from a different angle also. The marginal economic return of the land has to be equated to its marginal cost to secure a size of rice farm which will maximise profit at the existing level of labour and capital use.

The Cobb-Douglas power function fitted to the data obtained from these 32 sample farms gives the following result :

$$Y = 22.81 x_1^{.213} x_2^{.379} x_3^{.283}$$

where Y = Gross income per farm
    x_1 = Area
    x_2 = Human and bullock labour charges
    x_3 = Value of depreciation, upkeep and interest on capital.

Table II shows the marginal value products[3] for different sizes of rice farms when other resources are kept constant at the geometric mean, viz., x_2= Rs. 437.50 and x_3=Rs. 366.70.

TABLE II

Serial Number	Size of farm (in acres)	Marginal value product (in rupees)
1	2	3
1.	12	25·64
2.	14	12·91
3.	16	4·50
4.	18	1·81

2. W. Y. Yang: Farm Management Investigations for Agricultural Improvement, p. 9.
3. Derived from the above production function study.

The average rent and taxes per acre of the locality on owned land comes to Rs. 3.00. It is found therefore a little more than 16 acres of land would maximize the profit when other factors are kept constant. But if these resources are kept constant at the arithmetic mean we would get a size a little higher than this as the arithmetic mean is greater than geometric mean.

Conclusion

From the viewpoint of minimum cost per acre and maximum profit the economic size of rice farm will lie in between 16 to 24 acres at the existing level of labour and capital use in the region stated above.

H. K. DASGUPTA[*]

SUPERVISED RURAL CREDIT[†]

Extension of credit to enable the small farmers to increase their agricultural production and levels of living is recognised to be an important plank in the system of agricultural finance. Several programmes to increase production and improve rural conditions have been undertaken. However, in almost every case the results have not been encouraging. The root cause of this malady is well-known. The marginal and sub-marginal farmers who constitute about one-third of the total farm families in India earn an income of about Rs. 175 per annum and find employment for about 100 days in the year.[1] The problems of the small and low-income farmers are so complex that they cannot be solved through simple and isolated measures. It is not merely a credit problem—though credit is a very essential part—nor merely a problem of education and extension. What is needed is an integrated programme of improvement in which credit, education and extension are combined as essential features. The basis of a sound rural credit policy is education, not only to teach the farmer better farming practices, but also to educate his entire family which must be regarded as the basic unit in rural progress. The main defect in the existing co-operative credit policy is that credit is given on the basis of the credit-worthiness of the borrowers and in amounts which are inadequate for their needs. This results in the exclusion of a large number of farmers from membership of co-operative credit society or if they are members they are restricted in availing themselves of the limited amount of credit. The co-operative policy does not directly concern itself with the improvement of the life of the whole man and his family, in short with "better farming, better business and better living."

The importance of a good system of supervised credit hardly needs emphasis. The bases of supervised credit programme constitute a well-thought out farm plan and supervision. When the latter is efficient, it constitutes the security. Under this system, the conventional test of credit-worthiness as a basis of providing aid is dispensed with and instead, the need of the cultivator according to the production plan and his ability to repay from increased production is taken as the criterion. When production programmes are well planned and supervision is efficient, the percentage of recovery of loans seems to be high. If the outstanding