Cost Structure and Production Pattern of Potato

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A study on cost structure and production pattern of potato was made at Nilgiris. The investigation showed that there was no significant difference between the different size groups, and also there was no relationship between productivity and the size of farms. Regarding the cost, bullock labour or small tractor drawn implements can be used wherever possible to reduce the human labour costs. The production function analysis revealed that there was scope for maximising the profit in the area studied by increased utilization of human labour, seeds, fertilizers and manures, plant protection and reorganisation of resources. To increase the production of potatoes, the farmers can get the services of the Indo-German Project in the adoption of package of practices for potato cultivation.

Potato is an important food crop and also used as industrial raw material. Hence maximisation of potato production is of paramount importance in the agricultural economy of the country. But the share of India both in acreage and production is small being 1.8 per cent and 1.3 per cent respectively at the world level. The acreage under potato in Tamilnadu is two per cent of India's acreage and mostly confined to hills.

Inquiries into the cost structure and production pattern of potato are important in assessing the problems in its production. Further there is a lacuna in the knowledge regarding production costs and resource-product behaviour pattern of the potato crop. Therefore a study of this kind based on the existing patterns of production and utilisation of resources would considerably help in indicating the deficiencies in the present mode of production and to suggest changes in desired directions. So the study aims to estimate the cost of production per hectare and cost per unit of potato (Main crop-rainfed) and also to evaluate the resource use pattern in the potato farms.

MATERIAL AND METHODS

Ootacamund taluk, Nilgiris District Tamilnadu State has been selected for the present study since out of 24,700 acres of total potato crop grown in the state 20,409, acres forming 83 per cent is concentrated in the Nilgiris District and out of the total potato area in this district 63.3 per cent is in Ootacamund taluk.

Five villages were selected at random in the taluk for the study. At second stage, the list of cultivators

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growing the main crop, was obtained for the villages selected. The number of sample holdings from each village was determined in probability proportional to the area under the main crop in the village to the total area. The holdings were classified into three size groups viz. small (0.01 to 2.50 acres), Medium (2.51 to 5 acres) and large (over 5.00 acres). From the five villages, a total of 90 holdings was selected for study.

In this study the total value of all the inputs in the potato crop was designated as cost 'C' which included all operational costs and over-head costs. The operation cost included seeds, manures and fertilizers human labour depreciation charges and miscellaneous charges. Over head cost included items such as 1. Rental Value and 2. interest on fixed capital. All these items of inputs were combined to form the cost of production 'C'.

The study of productivity and resource-use efficiency was carried out through the estimates of Gross Average value productivity, Residual Average productivity, input-output ratio, the cost perunit of output and the production function analysis. The form of the linear production function fitted was $Y = a + b1 \times 1 + b2 \times 2 \ldots \ldots \ldots bnxn$. where y refers to the output 'x' refers to the resource inputs specified 'b' refers to their regression coefficients and 'a' refers to a constant.

RESULTS AND DISCUSSION

Cost of Production Per Hectare

Cost of production constitutes all the direct costs incurred for the potato crop excluding market charges. The cost of production of potato per hectare amounted to Rs. 5954.19, Rs. 6,038.05 and Rs. 6,264.29 in small, medium and large size farms respectively.

The cost of production of potatoes per hectare tented to increase with increase in sizes of farms. This was due to (1) the initial expenditures on fixed capital was greater in large farms than in small farms (2) in large farms more caual labourers were employed than in small farms. (3) in small farms more family labourers were engaged and greater care was taken in the utilization of production elements like manures and fertilizers, seeds and plant protection chemicals which needed more capital.

In the large farms it was noticed that farm lands were scattered and fragmented. Therefore, for each farm operation the farmer and labour have to move from field to field for carrying out cultivation operations. This naturally increased the cost of production.

In the per hectare cost of production of potatoes, the most important item among the costs involved is the seed cost and the same constituted 29.89 per cent for the sample farms. The second major item of cost is manures and

fertilizers which constituted 28.93 per cent of the total cost of production. This is followed by the cost of preparatory cultivation, plant protection, harvesting, miscellaneous costs, land rent, intercultivation and sowing.

Unit Cost of Production

The unit cost of production of potatoes worked out to Rs. 49.07 Rs. 48.87 and Rs. 50.17 per quintal in small medium and large farms and the average for all the sample farms amounted to Rs. 49.37 per quintal.

Net Income

The net income of potato per hectare was carried out by deducting the total cost of production from the gross income. The net income per hectare was Rs. 1,326 81 in small farm Rs. 1,438.68 in medium farm and Rs. 1,227.22 in large farms. The average net income for all the farms worked out Rs. 1,329.90. The net income in large farms was lower than small and medium farms and the net income in medium farms was higher than small farms. Besides cost and yield variations, the variation in price of the produce might also contributed to the differences in net income. In sample farms studied all the farms were operating at a profit.

Resource Productivity

This part of the study evaluated the efficient use of resources. The knowledge obtained from the analysis of resource productivities provided information to the farmers in the use of resources in an efficient manner so as to get maximum returns. In this study the average productivities were estimated both in terms of gross productivities and in terms of residual productivities. The gross and residual average productivities of labour and non-labour capital, were worked out. The results showed that the average labour productivity was Rs. 21.18 and Rs. 20.88 in medium and large farms which has due to high investment i.e. Rs. 12.63 and 12.90 for medium and large farm respectively. Similarly the average labour productivity was Rs. 19.89 in small farm which was due to the investment of Rs. 11.70 per worker.

To get a fairly accurate measure of productivity of resources residual average productivity method was adopted. It could be observed that the low residual capital productivity in the case of large farms compared to small and medium showed that there was no proper utilization of capital resource in these farms.

Input-output ratio

The input output ratio forms a measure to estimate the aggregate productivity of all resources used together. The input-out ratio had been derived as 1.31, 1.32 and 1.27 for small medium and large farms respectively. It showed that in small

farms input-output ratio was high indicating high profit. However, the differences between the three size groups of farms were very small. High profits in small farms might be due to greater care bestowed on the resource use per unit of labour compared to medium and large size farms.

Functional Analysis

As the technique employed to test for difference between the three size groups revealed no significant difference in yield between the size-groups, was estimated.

In this study the dependent variable (y) was taken as the potato yield in quintals per hectare and the independent variables specified were rental value of land (x1), human labour in mandays (x2), value of seeds in rupees (x3), value of manures and fertilizers in rupees (x4), and value of plant protection chemicals in rupees (x5). The production function was estimated on per acre basis.

The estimated production function for the 90 farm is.

$$Y = -505.97 + 0.2928\,x1 + 0.4441\,X2 + 0.4531\,X3 + 0.4322\,X4 + 0.2349\,X5.$$

The constant (a) regression coefficient, standard errors 't' values, elasticit-

ies, coefficient of determination, AVP, MVP, and MC are also estimated. The coefficient determination R2 was estimated to be equal to 0.7643 and hence it was inferred that 76 percent of the variation in yield was explained by the variables specified in the function. It was found that all the factors specified in the function were significant at one per cent level. The regression coefficients were directly read as marginal physical products. The elasticities of input factors were worked out at the mean value of output and the resource factor under consideration. From the elasticities it is seen that for one per cent increase in land rent, output will increase by 0.62 per cent. Similar is the case with other resources.

By comparison of the marginal value productivities of all the input factors with their marginal cost, it can be concluded that the potato farmers in the area studied have not yet reached the stage of optimum utilization by their resources. The possible avenues of increased utilization of resources are through human labour, seeds, manures and fertilizers, and plant protection. Hence a judicious allocations of these resources, there is scope for potato cultivators to maximising their profits.