

EXTENT OF MECHANISATION ON PADDYCULTIVATION IN KERALA

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ABSTRACT

Farm mechanization is widely adopted in the field of paddy cultivation. Farmers are adopting mechanization, mainly for the purpose of land preparation, transplanting and harvesting. Among these operations, mechanized transplanting service is provided by Agro Machinery Service Centres (AMSCs) and other mechanized services, that are available from private agencies. The extent of mechanization in paddy cultivation is studied, with the help of a mechanization index. The study found that, tractors and harvesters are the frequently used farm implements, by the farmers. The waterlogged nature of land held by some farmers, preventing them from the adoption of mechanized transplanting in their fields. The computation of mechanization index revealed that, forty percent of paddy cultivation is mechanized and sixty percent is labour oriented. Hence, it could be conclude that, higher the mechanization lower will be the dependence on laboures.

KEYWORDS: Mechanization, Land Preparation, Transplanting, Harvesting, AMSCs

INTRODUCTION

Paddy is one of the major crop cultivated everywhere in Kerala. Traditionally, all agricultural operations like land preparation, transplanting, manuring and harvesting were done manually and also by animals. The system of manual operations is becoming increasingly expensive and farmers also face the difficulty of getting labourers, for their farm operations. Among these operations, transplanting and harvesting demands more labourers. Nowadays labourers become very costly, hence farmers go for mechanization in their farms. Mechanized transplanting and harvesting are very common in paddy cultivation. The Agro Machinery Service Centres set up in Kerala provides mechanized transplanting services, to the farmers. Mechanization brings lots of benefits to paddy farmers. Mechanized transplanting can cover more area with less labour thus, reducing the burden of high labour cost with the advantage of uniformity in spacing and density of plants. This also helps the seedlings to have better growth. By using machine harvesters, farmers can save labour, cost as well as the time required for harvesting.

STATEMENT OF THE PROBLEM

The backbone of Indian economy is agriculture. In order to undertake agricultural operations, labour is an inevitable input. But the availability and cost of agricultural labour is a major problem, faced by the farmers of Kerala. Eventhough mechanization of agriculture was recommended and adopted by many states in India years back; it was not replicated in Kerala, due to the small size of farm holdings. But, now a situation has come where agricultural operations including harvesting have been abandoned in Kerala, due to the lack and high cost of labour. Mechanisation of agricultural operations is the only solution to the problem faced by farmers, in Kerala. The role of Agro Machinery Service Centres

(AMSCs) in the mechanisation of farming operations is assuming importance, in this scenario. Agro machinery service centres are service providers, where all agro machinery operation services, with respect to crop production are rendered on contract basis. The service shall be either for operator or machine rental or altogether for operational service as such AMSCs, have been set up in many panchayats of the State and the process of mechanisation of farming operations is getting popularized, among farming community. Of the various crops, mechanization is more popular in the case of paddy. In this context an evaluation of extend of mechanization on paddy cultivation in Keralais quite pertinent.

METHODOLOGY

The study based on primary data collected, from 90 paddy farmers of Thrissur district, using a structured interview schedule. The extent of mechanization in paddy cultivation is studied, by taking in to account the usage of selected farm implements such as tractor, transplanter, harvesters and sprayers. A mechanisation index is constructed in the study, for measuring the extent of mechanisation in paddy cultivation. Mechanization index studies the relationship of mechanisation costs to sum of labour cost, animal usage cost and machine usage cost.

$$MI = CM / (CH + CA + CM)$$

Where

MI = Mechanisation index

CM = Cost of use of machinery

CH = Cost of use of human labour

CA = Cost of using animal power

RESULTS AND DISCUSSIONS

The extent of mechanization adopted in paddy cultivation, by the farmer respondents is analyzed with the help of a usage index of farm implements. For the construction of this index, farmers were asked to rate the extent of usage of each implement on a three point scale i.e. Always, Occasional and No usage. The opinions of farmers were assigned the scores of 2, 1 and 0. The score of all the farm implements were summed up to arrive at the total score. The total score obtained by each farm implement was then divided by the maximum possible score, for that farm implement to obtain the index of usage of that farm implement.

Table 1: Usage Index of Farm Implements by Farmers

Sl. No	Farm implements	Index
1.	Tractor	100
2.	Transplanter	66.67
3.	Harvester	100
4.	Sprayers	90.74
	Composite index	89.35

Source: Compiled from primary data

The major use of tractors is for preparing land before sowing. All the farmers are using tractors for land preparation and hence, the composite index is 100. Power tiller is another implement, used for land preparation instead of

tractors. It is economical than tractor and can be easily used in wet areas. But no farmer in the study area is using tillers. It also inferred that, 66.67 percent of farmers are applying mechanised transplanting in their fields. As result of this, the use of labour in the field gradually reduced. They are also enjoying the benefits of mechanised transplanting i.e., uniformity in spacing and more number of seedlings per row. In the case of some farmers, they are not adopting mechanised transplanting, because of the water logged nature of the field. So they have to engage more labour at a high wage rate. The farmers adopt cent percent mechanised harvesters in their field. They find economies of scale in the use of harvesters compared to manual labour. Further, harvesting operations are to be done in a timely manner, to avoid wastage and losses of grain. Mechanised harvesters offer solution to labour scarcity for timely harvesting of paddy. It is interested to note that, sprayers are the most commonly purchased farm implement by farmers and the usage index is 90.74 percent. Recently, farmers are trying to adopt organic methods of cultivation, by reducing chemicals. It reduces the use of sprayers by the farmers to some extent.

Measurement of Mechanisation of Farmers

The sustainable development of an area is possible, through development in agriculture. But, over the years people were demotivated to undertake agricultural activities, due to severe labour shortage. The adoption of mechanisation became a revolutionary model in agriculture sector. Mechanisation of agriculture is an important factor promoting higher output of the agricultural farm and thereby, increasing profitability of the farming practices (Ghosh, 2012). In this context, measurement of the extent of adoption of mechanization, by farmers gains more importance, which is measured in the study using mechanisation index. A mechanisation index based on the ratio of cost of use of machinery, to the total cost of use of human labour, draught animals and machinery has been suggested for estimation and the details are discussed in Table 2.

Table 2: Overall Mechanization Index for Paddy Farming

Sl. No	Mechanisation index	No. of respondents
1.	0 to 20	5
2.	20 to 40	35
3.	40 to 60	22
4.	60 to 80	28
	Total	90

Source: Compiled from primary data

As revealed by Table 2, the mechanisation index of most of the farmers is between 20 to 40 percent. It means that, out of the total farm operations, 40 percent is done with the help of machines and 60 percent is labourers. Farmers are seeking the help of Agro Machinery Service Centres (AMSCs) and Private agencies for their mechanisation needs. Mechanised Transplanting services in paddy cultivation are provided by AMSCs and harvesting, land preparations are by private agencies. Hence, more the mechanisation index less would be the labour cost incurred for the farmers.

Mechanisation index of usage of AMSC Service

AMSCs are mainly providing the transplanting service to the farmers. In order to, compute the mechanisation index for usage of services of Agro Machinery Service Centres, their transplanting services alone is taken into account. The index helps to understand the effect of using such services, in replacing the overall labour costs incurred in farm operations. This index is the ratio of mechanised transplanting cost to total labour cost and machine cost. The index is also

useful to understand the contribution of such services, to overall mechanisation of paddy farming.

Table 3: Mechanization Index of Usage of Services of AMSCs

Sl. No.	Mechanisation index	No. of farmers	Average index	Proportion of AMSC charges to total mechanisation cost
1.	0 to 15	45	26.39	45.68
2.	15 to 30	15	30.05	52.73
3.	30 to 45	30	30.93	50.19
	Total	0	29.48	51.40

Source: Compiled from primary data

For most of the farmers, the mechanisation index of usage of services of AMSCs lies between 15 to 30 percent. The average mechanisation index of usage of AMSC is estimated at 29.48 percent. It means that, out of the total labour and machine cost of users, the cost incurred for using AMSC services of transplantation is almost 30 percent. i.e., the cost incurred by non – users (included in 0 to 15 categories), over and above this 30 percent for transplantation can be saved, if they shift to mechanisation of transplantation. It is also found that, the share of transplantation costs to total mechanisation costs of land preparation, transplantation and harvesting of users is nearly 51 percent. This implies that, out of the total mechanisation costs, 51 percent is contributed by AMSCs by the way of transplanting cost.

CONCLUSIONS

It can be concluded that, paddy is the main crop which has been mechanised and major portion of paddy land holdings are mechanised. Traditionally cultivation of paddy was highly labour oriented. But, at present scarcity of labour and high wage rate has demotivated people to continue with paddy cultivation. The introduction of machines displaces labour at certain stages of cultivation, especially preparation of land, transplanting and harvesting. The major farm implements used are tractors, transplanters, pumpsets and sprayers with a usage index of 89 percent. However, purchase of major implements by farmers is not feasible. Introduction of AMSCs is a boon to the farmers at this level, where they can avail mechanised farm operations, by a skilled crew using specialised implements, which will ensure timely operations and offer first hand solutions to the problems of labour scarcity, for farm operations. The extent of mechanisation adopted in paddy cultivation is around 40 percent and is a giving an indication that, farmers are adopting mechanisation in a better way than the traditional periods.

REFERENCES

1. Ghosh, B. K. 2010. Determinants of farm mechanisation in modern agriculture: a case study of Burdwan districts of West Bengal. *Int. J. Agric. Res.*, **5**: 1107-1115.
2. Jaikumar, U., Joseph, S. and Nair, S. 2012. AMOSCs – Kerala model for agro machinery operation services. *FSASCDP Keralam – Bull.No. 6*. Agricultural Research Station. Kerala Agricultural University
3. Rasouli, F., Sadighi, H. and Minaei, S. 2009. Factors affecting agricultural mechanisation: a case study of sunflower farms in Iran. *J. Agric. Sci. and Techno.*, Vol**11**: 39-48.
4. Purnima Saikia et al., Factors Influencing Adoption of Recommended Boro Paddy Cultivation Practices-A Study in Assam, International Journal of Agricultural Science and Research (IJASR), Volume 7, Issue 4, July-August

2017, pp. 257-262

5. Sidhu, R. S. and Vatta, K. 2012. Improving economic viability of farming: A study of cooperative agro machinery service centres in Punjab. *Agric. Econ. Res. Rev.*, Vol25: 427-434.
6. Wanjiku, J., Manyengo, J. U., Oluoch-Kosura, W. and Krugia, J. T. 2007. Gender differentiation in the analysis of alternative farm mechanisation choices on small farms, Kenya. *Res. Pap. No. 2007/15*. United Nations University.

