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## Impact of mechanization on cost of cultivation and production of paddy in Thrissur

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### Abstract

The impact of mechanization on cost of cultivation and production of paddy farming is measured by attempting a disaggregated analysis of different aspects of cost and production of rice. The paddy farmers of Thrissur district were the sample respondents of the study. The collected data were analyzed with the help of simple percentages and independent sample t-test. The study found that Mechanization in paddy cultivation has resulted in labour displacement, timely completion of farm operations and increased production with less cost of cultivation.

**Keywords:** Labour displacement, transplantation, cost of cultivation, production

### 1. Introduction

Paddy is an important crop of Thrissur. Most of the people were engaged in paddy cultivation as a source of their livelihood. But nowadays the cultivation cost is increasing tremendously due to increased labour cost. Farm mechanization is the only solution to this cost escalation where most of the farm operations are done with the help of machines. Land preparation, transplanting and harvesting are the major mechanized operations in paddy cultivation. Among these, mechanized transplanting services are provided by Agro Machinery Service Centres (AMSCs) located at panchayat level. The use of mechanization in farm operation lead to the displacement of manual labourers from many stages of paddy cultivation. This facilitates timely completion of farm operations in an economical way. Hence the present study is an attempt to study the impact of mechanization on cost of cultivation and production of paddy in Thrissur.

### 2. Methodology

The study is based on primary data collected from 90 paddy farmers of Thrissur district through a structured interview schedule. The farmers are grouped in to two viz., users of mechanization and non- users of mechanization. The collected data were analyzed with the help of simple percentages and independent sample t-test.

#### 2.1 Impact of mechanization on cost of cultivation

The cost of cultivation of paddy is the total of material costs, cost of labour, machine cost and miscellaneous expenses. In order to compute the cost of cultivation of paddy, the cost per Ha is calculated for each farmer respondent and put under class intervals ranging from Rs. 34,000 to above Rs 46000.

**Table 1:** Cost of cultivation of farmer respondents

Sl. No.	Cost of production/Ha (in Rs.)	Users	Non-users	Grand Total
1	34000 to 37000	1(2)	1 (2)	2 (2)
2	37000 to 40000	3(6)	1 (2)	4 (5)
3	40000 to 43000	17(38)	2 (5)	19(21)
4	43000 to 46000	16(36)	0	16(18)
5.	Above 46000	8(18)	41(91)	49(54)
	Total	45(100)	45(100)	90
	Average cost	42980	48360	41750

**Source:** Compiled from primary data

**Note:** Figures in parenthesis represents percentage share of each to category total

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Table 1 reveals that the average cost of cultivation per Ha is lower for users (Rs. 42980) compared to non – users (Rs 48360). The cost of cultivation of 54 per cent of farmers is more than Rs. 46000 per Ha. Ninety one per cent of non – users fall in this category, while it is only 18 per cent for the users. It is because non -users are mainly dependent on manual labourers, especially for transplanting due to the water logged nature of the land and adopt mechanization only for land preparation and harvesting. Apart from this, the non-users are adversely affected by weed problems, and

severe labour shortage because of the migration of agricultural labourers into MGNREG programme. As a result, cost of cultivation of non-users has increased considerably. In the case of users, they are using mechanized transplanting services, the cost of which is less than that of human labour. So users have the benefit of less cultivation cost than non-users. An independent sample t-test is performed to check whether there is any significant difference in the cost of cultivation between users and non-users and the result is depicted in Table 2.

**Table 2:** Independent sample t-test of cost of cultivation: Category wise

S. No	Variables	Mean	F	t statistic	p- value
1.	Users	43015.25	67.738**	-6.096**	0.000
2.	Non- users	55441.9768			

The t- statistic is significant at one per cent level. It indicates that there is significant difference in the cost of cultivation between users and non- users. i.e., non-users have to spend more by way of cultivation cost than the users.

## 2.2 Impact of mechanization on production of paddy

The production of paddy is based on various inputs such

as seeds, fertilizers, water management, weather conditions etc. If any of these fails to perform well, the production of paddy may be adversely affected. The yield is also dependent on the type of soil. The details of paddy production of the respondents, category – wise are given in Table 3

**Table 3:** Paddy production of farmer respondents: Category - wise

S. No.	Production (Kg/Ha)	Users of	Non-users	Grand Total
1	2000 to 3000	0	1(2)	1(1)
2	3000 to 4000	3(6)	15(33)	18(20)
3	4000 to 5000	6(13)	11(24)	17(19)
4	5000 to 6000	16(36)	17(39)	33(37)
5	6000 to 7000	12(27)	1(2)	13(14)
6	7000 to 8000	8(18)	0	8(9)
	Total	45(100)	45(100)	90(100)
	Average production	5775	5025	5905

**Source:** Compiled from primary data

**Note:** Figures in parenthesis represents percentage of each to total

Table 3 makes it clear that production of rice is higher for users than that of non – users. When the production of rice decreases, naturally the income from the same will also be less. The reason for the high production of users is the adoption of mechanization in the field. Mechanized transplanting ensures more growth per seedlings, more seed

density and less distance between seedlings resulting in more production than manual transplanting. Hence users have more production than non-users Independent sample t-test is performed to check whether there is any significant difference in the production of paddy between users and non-users. The result is depicted in Table 4.

**Table 4:** Independent sample t-test of paddy production: Farmer category – wise

S. No	Variables	Mean	F	t statistic	p- value
1.	Users	5823.6111	3.972*	8.170*	0.000
2.	Non- users	4374.7222			

The t-statistic is significant at five per cent level. It reveals that there is significant difference in the production of users and non-users i.e. users have more production than non-users. By adopting mechanized transplanting, in addition to other mechanized operations, users get more production with less grain loss than non-users.

## 3. Conclusion

Paddy is the main crop which has been mechanized in Kerala. Scarcity of Labour and high rate of available labour has demotivated farmers to continue with paddy cultivation. The use of machines in paddy farming, displaces labour at certain stages of cultivation especially preparation of land, transplanting and harvesting. The farmers who have paddy fields with puddle soil are unable to adopt mechanized

transplanting in paddy, leading to higher cost of cultivation. Hence use of mechanization, especially the transplanting services of AMSCs facilitates more production with less cultivation cost among users than the non-users.

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