

Profitability of Paddy Cultivation under Different Level of Mechanization in Mandya District of Karnataka

Satishkumar, M.^{1*} and K. B. Umesh²

¹Dept. of Agricultural Economics, College of Agriculture, Bheemaranagudi, University of Agriculture Science - Raichur, Karnataka (585 287), India

²Dept. of Agricultural Economics, GKVK, University of Agricultural Sciences, Bangalore, Karnataka (560 065), India



Open Access

Corresponding Author

Satishkumar, M.
e-mail: sati.4855@gmail.com

Keywords

Harvesting, Mechanization, Net returns, Profitability

How to cite this article?

Satishkumar and Umesh, 2021. Profitability of Paddy Cultivation under Different Level of Mechanization in Mandya District of Karnataka. *Research Biotica* 3(1), 25-27.

Abstract

This study was carried out to assess the comparative cost structure and profitability of paddy cultivation under different level of mechanization in Cauvery command area of Karnataka. 120 respondents were selected randomly and the sample respondents were post-stratified based on the level of farm mechanization. The results revealed that, the cost of cultivation of paddy in the study areas was lower in case of farmers harvesting and threshing using combine harvester (Rs. 75,583.00 /ha), followed by harvesting manually and threshing mechanically (Rs. 76,239.00 /ha), harvesting and threshing manually (Rs. 78,125.00 /ha), respectively. The farmers using combine harvester for harvesting realized increase in net returns in paddy cultivation. The mechanization index in paddy was about 10-40 percent in study area based on the level of farm mechanization. The results clearly depicted the importance of the farm mechanization in realizing additional profit to the farmers.

1. Introduction

Paddy is one of the most important staple food crops widely cultivated in India. The traditional methods of cultivating are prominent. The machineries are used to carry out primary and secondary tillage operations for obtaining ideal soil conditions for the growth of crop (Satishkumar and Umesh, 2018). The farmers are moving towards farm mechanization to carry out different agricultural operations due to labour shortage problems. Farm mechanization helps to reduce the human drudgery and enhance the agricultural productivity (Verma, 2008). The conventional methods are used for harvesting paddy still today. But, advanced agricultural technology has made farmers feel the need of improved machinery for harvesting the crop. Therefore this study was carried out to assess the comparative cost structure and profitability of paddy cultivation under different level of mechanization.

2. Materials and Methods

2.1 Sampling Procedure

Mandya taluk of Mandya district was selected based on the extent of net irrigated area under canal. 120 respondents from the taluk were selected randomly. The sample respondents

were post-stratified into different groups based on the degree of farm mechanization.

- **Traditional Farms:** Harvesting and threshing by human labours.
- **Partially mechanized farms:** Harvesting through traditional method using human labours and threshing by threshers.
- **Mechanized farms:** Harvesting of paddy crop using combine harvester.

2.2 Analytical Tools Employed

2.2.1 Cost and Returns

The cost and returns concepts were employed in analyzing the data. Costs were categorized under fixed and variable cost. Output quantity was multiplied with the price realized to arrive at Gross Income (GI). Net Income (NI) was calculated by deducting total cost from Gross Income. Gross Income was divided by the total cost to arrive at return per rupee of expenditure. Similar method was used by Satishkumar and Umesh (2018) in their study.

2.2.2 Mechanization Index

A mechanization index based on the matrix of use of animate and mechanical energy inputs could be given by incorporating

Article History

RECEIVED on 08th January 2021 RECEIVED in revised form 24th February 2021 ACCEPTED in final form 25th February 2021

cost factors into an Equation:

$$I_{mi} = \frac{C_{EMi}}{C_{EHi} + C_{EAi} + C_{EMi}} \times 100$$

Where,

- I_{mi} is the mechanization index of the i^{th} crop;
- C_{EMi} is the cost of use of machinery in the i^{th} crop;
- C_{EHi} is the cost of use of human labour in the i^{th} crop;
- C_{EAi} is the cost of use of animal labour in the i^{th} crop.

3. Results and Discussion

3.1 Cost Structure and Profitability of Paddy

Cost and return analysis of paddy cultivation (Table 1) revealed that, gross return per hectare was Rs. 1,11,505.00, Rs. 1,16,092.00 and Rs. 1,19,178.00 in traditional, partially mechanized and mechanized paddy farms, respectively. The net return was more in mechanized (Rs. 43,595.00 / ha) paddy farms to the tune of Rs. 3,741.00 per hectare compared to partially mechanized (Rs. 39,854.00 /ha) paddy

farms and Rs. 10,216.00 per hectare compared to traditional (Rs. 33,379.00) paddy farms and this was due to the fact that the yield was more in mechanized (74.95 q/ha) than partially mechanized (71.44 q/ha) and traditional (68.28 q/ha) paddy farms. Though the growing region was almost same, yield was more in mechanized farms because of the reduced harvesting losses which was more in case of manually harvested paddy. Similarly, Satishkumar and Umesh (2018) reported that the mechanized method of sowing has resulted in increase in grain yield of jowar and bengalgram in their study. Returns per rupee of expenditure were greater than one in all types of paddy farms. Thus it was evident from the analysis that, mechanization of paddy cultivation would increase the farmer’s net return, yield and decreases the cost of cultivation.

The cost of production was Rs. 1,144.00 /q in traditional farms, Rs. 1,067.00 /q in partially mechanized and Rs. 1,008.00 /q in mechanized farms. The mechanized cultivation of paddy was more beneficial and it would boost up the overall productivity and production with the lowest cost of production (Sahaya, 2015).

Table 1: Cost and returns of paddy cultivation in Mandya taluk (Rs./ha)

Particulars	Traditional farms		Partially Mechanized Farms		Mechanized Farms	
	Qty	Cost (Rs.)	Qty	Cost (Rs.)	Qty	Cost (Rs.)
A. Cost						
Variable cost		52,731.00		50,226.00		49,073.00
Fixed cost		25,394.00		26,013.00		26,510.00
Total cost of cultivation		78,125.00		76,239.00		75,583.00
B. Returns						
Main product (q)	68.28	99,005.00	71.44	1,03,592.00	74.95	1,08,678.00
Byproduct		12,500.00		11,250.00		9,500.00
Gross returns		1,11,505.00		1,16,092.00		1,19,178.00
Net returns		33,379.00		39,854.00		43,595.00
Cost of production		1,144.00		1,067.00		1,008.00
Returns over variable cost		2.11		2.31		2.43
Returns per rupee of expenditure		1.43		1.52		1.58

3.2 Mechanization Index Based on the Cost of Use of Machinery

The share of mechanization input to total cost of cultivation and mechanization index are presented in Table 2. The mechanization index (39.27%) of mechanized cultivation of paddy was more compared to partially mechanized farms (24.87%) and traditional farms (10.12%), respectively. The mechanization index was more in paddy mechanized farms compared to other farms because the major operation of harvesting was carried out using mechanical power in mechanized farms. The share of mechanization input to total cost of cultivation was more in mechanized farms (16.37%).

3.3 Quality of Crop Output in Mechanized Cultivation over Partially Mechanized Cultivation

The use of machineries in harvesting and threshing operations will result in variation in both quality and quantity parameters of the crop. Hence, Table 3 presented to know the perception of farmers on yield and quality variations of crop output by use of machineries over traditional practices in harvesting and threshing operations elicited through opinion survey. Majority of the farmers reported increase in output of main product of paddy crop by mechanical harvesting and threshing over traditional practices in the taluks. It is mainly because of very low wastage of grains at the time harvesting as well threshing using machineries compared to traditional methods and also it paves way for timely operations during rainy times. Only 24.17 percent of sample farmers in study area

Table 2: Mechanization index and share of mechanization input to total cost of cultivation

Crop	Type of Cultivation	Cost of cultivation (Rs./ha)	Component of the cost of cultivation (Rs./ha)			Mechanization index
			Manual labour	Animal labour	Machine labour	
Paddy	Traditional	78,125.00	24,337.00 (31.15)	7,250.00 (9.28)	3,558.00 (4.55)	10.12
	Partially mechanized	76,239.00	19,846.00 (26.03)	4,789.00 (6.28)	8,155.00 (10.70)	24.87
	Mechanized	75,583.00	15,670.00 (20.73)	3,470.00 (4.59)	12,375.00 (16.37)	39.27

Table 3: Farmer’s perception towards quality of crop output in mechanized cultivation over partially mechanized cultivation in the study areas

Sl. No.	Particulars	Parameters of variation	Mandya taluk (n=120)
1	Main product	Increase in yield	82 (68.33)
		High breakage %	29 (24.17)
2	Byproduct	Decrease in fodder length	120 (100)
		Poor storability	97 (80.83)
		Decrease in fodder output	120 (100)
		Palatability of fodder	21 (17.50)

Note: Figures in parentheses indicate percent to total sample respondents

reported the breakage of grains while milling was relatively high in mechanically harvested paddy. Similarly, Tanveer *et al.*, (2016) reported that milling quality in terms of head rice recovery has been low due to paddy harvesting at higher moisture content by combine harvesters. Cent percent sample farmers reported decrease in fodder length as well quantity in mechanized farms. Majority of farmers reported storability of the fodder is poor in farms using mechanized operations due to disturbance of the structure of fodder which makes difficulty to heap. If it rains, the rain water penetrates inside the heap and rotting of fodder takes place and keeping quality reduces. A few sample farmers reported the palatability of fodder in mechanized operations is relatively high.

4. Conclusion

The study examined the profitability of paddy cultivation under different level of mechanization in mandya taluk. The results showed that the net return was more in mechanized

farms compared to traditional and partially mechanized farms. Majority of the farmers reported increase in output of main product of crop and decrease in fodder length as well quantity by mechanical harvesting and threshing over traditional practices. The results clearly depicted the importance of the farm mechanization in realizing additional profit to the farmers.

5. References

Ch. Kalpalatha, Ramana Reddy, N.R.V., 2018. Impact of agricultural machinery and equipment on paddy production (A study on Nellore district of Andhra Pradesh). *Journal of Humanities and Social Science* 23(10), 17-24.

Sahaya Mary Christina, J., 2015. Economics of cultivating paddy in mechanized and non mechanised farmers in Tirunelveli district. *Golden Research Thoughts* 4(7), 1-6.

Satishkumar, M., Umesh, K.B., 2018. Supply-demand gap analysis of agricultural labour in Northern and Southern Dry Zone of Karnataka, India. International Conference of Agricultural Economists, July 28- August 2, 2018, Vancouver.

Satishkumar M., Umesh K.B., 2018. An economic analysis of mechanized sowing of rabi crops using tractor drawn seed-cum-fertilizer drill in Raichur district of Karnataka. *International Journal of Agriculture Sciences* 10(3), 5088-5091.

Tanveer, A., Mahmood, H.S., Ali, Z., 2016. Effect of paddy harvesting methods on rice quality and head rice recovery. *Journal of Engineering and Applied Sciences* 11(24), 14519-14523.

Verma, S.R., 2008. Impact of agricultural mechanization on production, productivity, cropping intensity income generation and employment of labour. Status of farm mechanization in India (Report).