Factors behind Poor Mechanization in Rice Cultivation in Orissa

S.K. Nath[1] and C. Satapathy[2]

Introduction

Orissa comprises of ten agro-climatic zones with a coast line of 420 kms. A major part of the land topography of the state is undulated being locked in mountains and hills. The Bay of Bengal, present on the border of ten districts, has affected its cropping pattern to a great extent. The North-Eastern coastal plain zone covers four revenue districts. Its soil varies from alluvial to sandy loam to laterite type. Rice, jute, groundnut, mustard, green gram, black gram and vegetables are main crops raised in this ecosystem. Rice-rice cropping pattern is followed in most irrigated areas. Rice – green gram, rice –black gram, rice-mustard, rice – groundnut and rice - vegetable are also practiced in some patches. Balasore is one among the four districts coming under this agro-climatic zone. All the 12 CD blocks of the district come under the North-Eastern coastal plain zone. Rice is the major crop cultivated here as per the district agricultural statistics, 2006. Of the total cultivated area of 250550 ha, 220830 ha is cultivated by rice only.

Though rice is the main crop of the area according to its share of cultivated land (88 per cent) and production level, the crop is no more an attractive option here. Farmers cultivate rice only due to non-availability of any alternative to the land type and as their ancestral profession. Seventy percent of the rice is almost cultivated by the share croppers, small and marginal farmers. As per the district agricultural statistics, 79.8 per cent of all holdings belong to small and marginal farmers. Mechanization in rice cultivation started after adoption of HYV cultivation; still a majority of the farming community is not acquainted with the use of machines. Machines save time, labor and reduce cost of production. According to Dr. G. Singh (1987), 25–30% energy is saved in mechanization over traditional practices as experienced in Cuttack of Orissa state. It is reported that crop yield can be increased up to 20 per cent due to mechanization in the cultivation process.

Objectives

The study was conducted to find out the causes behind poor-mechanization in the

[1]Deputy Project Director, ATMA, Balasore, Orissa

[2]Ex-Dean, Extension Education, OUAT, Bhubaneswar

highly developed rice productive North-Eastern coastal plain zone` of Orissa State with the following objectives:

(i) Collection of information on the present status of farm mechanization in rice based eco-system.

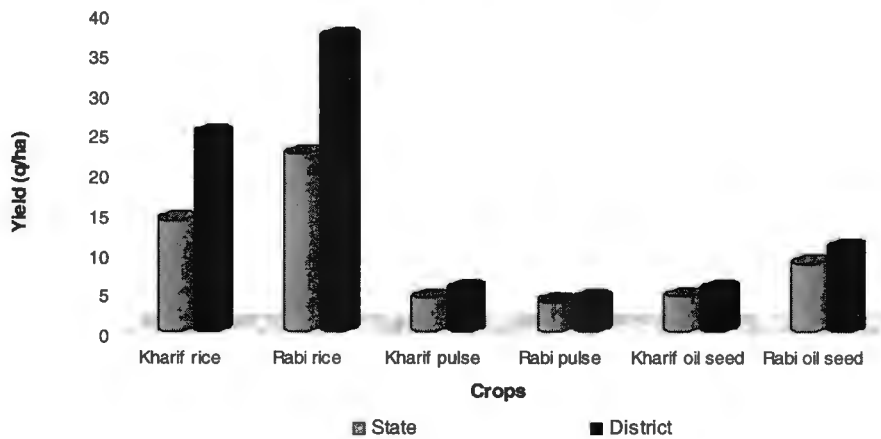
(ii) Factors behind poor mechanization in rice cultivation in this high productive zone.

(iii) Farmers' perception about the strategy for boosting up of proper mechanization.

Methodology

Balasore and parts of three other districts constitute the North-eastern coastal plain zone. Balasore district is selected purposively for finding out the problem as the productivity of the district is better than the state average (2003-04) in most of the crops as shown in graph– 1.

Graph-1 : Productivity of Major Crops of the district v/s state

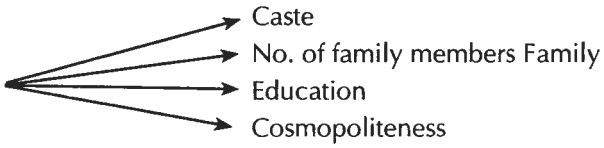


A survey was conducted taking 80 farmers from all the blocks, selected by proportionate random sampling method. The farmers were taken from different categories of rice cultivators like marginal farmers, small farmers, medium farmers and big farmers. They were selected in the category as per their land holdings.

Sl.No.	Category	Farm size (ha)
1	Marginal	<1
2	Small	1 – 2
3	Medium	2 – 5
4	Large	>5

A questionnaire was framed involving all the factors that are directly or indirectly related to farm mechanization.

(i) Farm size
(ii) Farmers Social condition
(iii) Labor utilization



(iv) Use of implements
(v) Timeliness of agricultural operations
(vi) Availability of repairing facilities and spare parts
(vii) Cultivation practice
(viii) Credit availability
(ix) Use of Implements
(x) Cause of non-mechanization
(xi) Prospective mechanization programme.

Results and Discussion

Basing on the feed back on adoption of machines, it was found that mechanization varies according to various factors. The extent of adoption of various machines is mentioned below in Table 1.

Table 1. Adoption Behaviour of Farmers

Sl. No.	Name of Implements	No. of Farmers using Machines (N = 80)	% of adoption
1	Iron Plough	56	70 %
2	Cultivator	12	15 %
3	Rotavator	04	05 %
4	Puddler	20	25%
5	Power Tiller	32	40 %
6	Knapsack sprayer	73	91 %
7	ULV sprayer	12	15 %
8	Trans planter	0	0 %
9	Reaper	4	5 %
10	Thresher (P.O)	36	45 %
11	Hand operated thresher	25	31 %
12	Winnower (P.O.)	10	13 %
13	Axle flow thresher	12	20 %
14	Tractor	17	22 %

It is found that farmers mostly use knapsack sprayer, iron plough, power tillers, power operated threshers and winnowers irrespective of their categories. As per the study of Syedul Aslam, Abdul Baqui and Abdul Quasem (2004), average drought power shortage is about 30 – 35 per cent and it rises up to 45 per cent during peak periods. This is the reason for use of power tillers by 40 per cent of the respondent farmers. Transplanter is not used at all by the farmers. Customer hiring process is adopted by most of the small, marginal and medium farmers for cultivation through power tillers and tractors. Rotavator, cultivator and reaper which are important labour and cost saving machines are not used as per the expectation. Farmers prefer power operated winnower to a hand operated one due to its working efficiency.

Constraints in mechanization in rice cultivation as available were collected on a 3 point continuum i.e. agree, partially agree, disagree with weigtage of 2, 1, 0 respectively. The collected information is given below in Table 2.

Table 2. Constraints as perceived by the Rice Growers (N= 80)

Sl. No.	Constraints perceived	Mean score	Rank
1.	Higher cost of machineries	1.75	I
2.	Non-availability of technical knowledge of using them	1.18	VI
3.	Not according to their need	1.20	V
4.	Less knowledge about the machinery	1.42	II
5.	Don't need the utility due to existing resources	1.25	IV
6.	Social taboos of not using machine	0.60	XI
7.	High hiring cost	1.38	III
8.	Non-availability of spare parts	1.13	VIII
9.	Non-availability of service center	1.10	IX
10.	Machines are not technically sound	1.09	X
11	Machines are not up to expectations	1.15	VII

It is seen that poor mechanization in a highly rice cropping intensive area like Balasore district is due to the

i) Low purchasing power of the farmers

ii) Less knowledge on farm machines

iii) Small farm size

iv) Non-availability of adequate service centres

Most of the farmers in the area do not have access to adequate credit facilities,

neither do they have their own resources to purchase the machines. The cost of the machine was found exorbitant. Some of the farmers have no knowledge on the machines, about their use, suitability to specific crops etc.. Another important factor which creates hurdles in the path of mechanization is the small farm size. Dr. D. Lenka opines that small tractors and power tillers, suitable for small holdings, is the requirement of agriculture in Orissa. As there is no consolidation of land, the smaller, fragmented lands are not fit for machines like cultivator, rotavator, puddler, reaper etc. Some farmers do not want machines as they have enough manpower available with their family and they don't have any alternative profession. Machines like high powered thresher cum winnower were found producing straws which can't be used further for covering the roofs. The chaffs also take some grains of rice which is not affordable for the farmers. They find these machines not technically fit. Non-availability of service center at their door step is another problem as S. Ganaspathy et. al opined that 27 per cent farmers complained about lack of availability of spare parts for machineries and tools. Some misgivings and feelings which are inherited from their previous generations like tractor threshed rice is not palatable, also act against mechanization.

Farmers opined that the government is not showing keen interest towards mechanization in rice cultivation though 88 per cent of the total cultivated area belongs to it. Further, time, money and energy consumption in it, is far ahead than any other profession. Moreover, the economy of about 70 per cent of people of the state depends on rice cultivation. According to them, the following steps should be taken up for boosting up of mechanization.

1) Land consolidation is a basic requirement for effective mechanization
2) Awareness among farmers is necessary. Mass campaign, exhibitions, farmers fair, display in public fairs can help in creating awareness about machines.
3) Front line demonstrations should be done extensively for improving awareness of farmers about the utility of machines.
4) There should be subsidies on various machines. Though there is provision of subsidy in many implements, farmers are not aware of it.
5) Extension system should popularize use of machines
6) Machines should be less costly and easy to transport.

Conclusion

Mechanization in the rice intensive cropped area like North-Eastern coastal plain zone of Orissa is necessary to increase crop productivity. Machines suitable to the land and affordable by marginal, small and medium farmers could help in mechanization in

rice cultivation. Mechanization not only reduces cost of cultivation but also drudgery of the farming community. It increases output of the farmer. Extension agencies should be geared up to increase awareness among the farmers for popularization of machines.

References

Aslam Md. S., Baqui Md. A. and Quasem Md. A. (2004) Present status and future strategy on farm mechanization and post harvest technology for rice production and processing in Bangladesh, AMA, 35 (2), pp. 59-66.

D. Lenka (2004) Agriculture in Orissa, Kalyani Publishers,Kolkata

Economic Survey (2005-06), Govt. of Orissa.

Ganapathy S. and Karunanithi, K. (2005) Farm mechanization in Lalgudi Taluk of South India, AMA, 36 (1), pp. 71-75.

Singh, G. (2006) Estimation of a mechanization index and its impact on production and economic factors- a cases study in India, Biosystems Engineering, 93 (1) 199-206.