ITEM WISE ANALYSIS OF KNOWLEDGE LEVEL AMONG RICE FARMERS TOWARDS MECHANIZATION IN RICE CULTIVATION

Abstract

The present investigation was done to study the knowledge level of rice farmers towards various farm machinery and implements used in rice cultivation in North Coastal Zone of Andhra Pradesh. The study was conducted in Srikakulam and Vizianagaram districts of North Coastal Region of Andhra Pradesh. Jalumuru, Nandigam, Santhabommali mandals from Srikakulam district and Bobbili, Gantyada, Santhakaviti mandals from Vizianagaram district were selected purposively based on the highest area under rice cultivation. The data were collected from 120 respondents and collected data were analyzed by using suitable statistical tools. Pertinent items were collected covering all aspects of farm machinery and implements used in rice cultivation. In order to assess the overall knowledge level on the mechanization by the rice farmers, necessary data were collected and the respondents were segregated into three groups *viz*., low, medium and high by using mean and standard deviation. To know the detailed and comprehensive idea on the knowledge level of rice framers on mechanization, an item wise response analysis was carried out.

Keywords: Knowledge**,** rice farmers, item analysis, Farm machinery and implements

Introduction

Agriculture is the 'art and science of growing plants and the raising of animals for food, other human need, or economic gain'. Indian economy is basically agrarian in nature. Agriculture has retained its pride place of being the backbone of the Indian economy. Mahatma Gandhi said, "India lives in villages and agriculture is the soul of Indian economy". Nearly two-thirds of its population depends directly on agriculture for its livelihood and sustenance. Rice is the major food grain crop in India. It is in fact the dominant crop of the country. India is one of the leading producers of rice crop accounting for 20 per cent of all world rice production. Rice is the staple food of the people of the eastern and southern parts of the country. The production of rice was the highest with over 135.54 million tons in fiscal year 2023 across India among the other food grains. It is the most important grain with regard to human nutrition and calorific intake, providing more than one fifth of the calories consumed by worldwide by the human species. Andhra Pradesh ranking 3rd position in production and produces 128.95 lakh tons of rice in India. It is a leading rice producer with a production of 12% of total rice produced in the country. Rice is the Principal food crop cultivated throughout the state providing food for its growing population, fodder to the cattle and employment to the rural masses. In Andhra Pradesh rice is the major crop cultivated in more than 22 lakh hectares during Kharif and Rabi seasons. The study area, Srikakulam and Vizianagaram districts are famous for its paddy fields and are the highest area under rice cultivation in North Coastal Zone.

Agricultural mechanization which entails the use of machines to perform several activities on the farm in order to save time, money spent on hiring of labour and most importantly increases the level of production which will automatically lead to a simultaneous increase in the farmer's

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3.Come up with a clear methodology,
4.Results sections with APA graphs and figures,
5.Discussion section with authors who found similar work and those who fund different findings and make an argument,
6.Conclusion per objectives,
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income. The main intention of this study was to identify the knowledge level of rice farmers about various farm machinery and implements used in rice cultivation.

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Material and Methods

The study was conducted in Srikakulam and Vizianagaram districts of Andhra Pradesh during the year 2022-23. Knowledge is an essential component for adoption of any innovation because it helps farmers to fully comprehend and appreciate the mechanization practices in rice cultivation. As a result, it is critical to assess farmers' level of knowledge on mechanization in rice cultivation. In the present study, knowledge had been operationalized as the body of information understood and possessed by the respondents on mechanization in rice cultivation. The overall knowledge level and response analysis of knowledge items by the rice farmers were studied and the findings were presented. The level of knowledge was measured by using 43 items derived from knowledge test developed for the study.

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Results and Discussion

In order to assess the overall knowledge level on the mechanization by the rice farmers, necessary data were collected and the respondents were segregated into three groups *viz*., low, medium and high by using mean and standard deviationand the results were illustrated in the table 1 and figure 1.

Table 1: Distribution of rice farmers according to their overall level of knowledge on farm mechanization in rice

(n=120)

S. No.	Category	Frequency	Percentage
1	Low level of knowledge	23	19.17
2	Medium level of knowledge	72	60.00
3	High level of knowledge	25	20.83
	Total	**120**	**100.00**
Mean: 27.63; SD: 7.10			

It is evident from table 1 and figure 1, more than half (60.00 %) of the respondents had medium level of knowledge followed by 20.83 and 19.17 per cent of respondents with high and low levels of knowledge respectively.

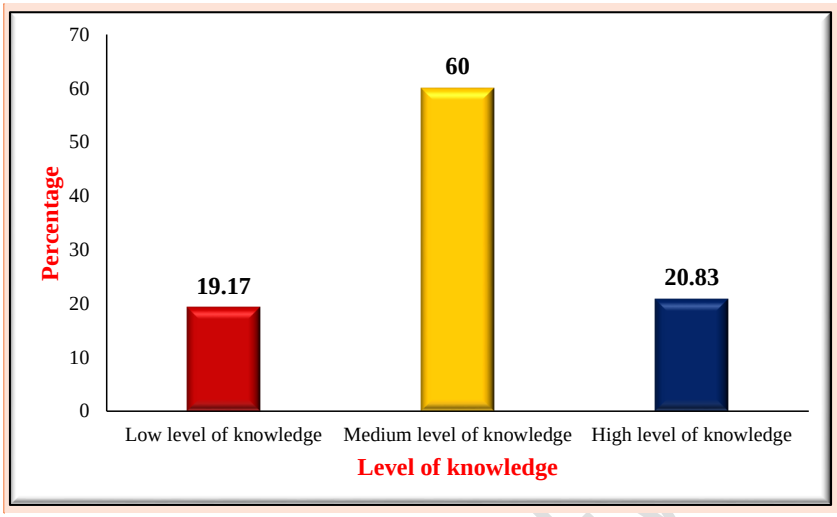

Fig 1: Distribution of rice farmers according to their level of knowledge

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Majority of the rice farmers were found to have medium to high level of knowledge on various farm machinery and implements used in rice cultivation. The probable reasons for above trend might be due to their experience in farming and paddy being labour intensive crop demands more labour which forced them to look for other alternatives.

Majority of rice farmers had an education level ranging from intermediate to graduate. This education level enabled farmers to access mass media and ICT tools, which in turn allowed them to gain knowledge about various farm mechanization implements such as mould board plough, harrow, cage wheels, puddler, rotavator, paddy drum seeder, seed drill, paddy transplanter, cono weeder, knapsack sprayer, combine harvester, paddy reaper, straw baler etc;

Further, this kind of implements were also available in custom hiring centers of the study area. Hence, the above trend of medium to high level of knowledge possessed by the majority of rice farmers on mechanization in rice cultivation.

Response analysis of knowledge items by the rice framers on mechanization in rice cultivation

To know the detailed and comprehensive idea on the knowledge level of rice framers on mechanization, an item wise response analysis was carried out and the results were presented in the table 2.

Table 2: Response analysis of knowledge items by the rice farmers on mechanization

S.No.	Item	Rice farmers (n=120)	
		Frequency	Percentage
1.	Whether animal drawn MB plough or tractor drawn is more used in the farmer's field? a) Only animal drawn MB b) Only tractor drawn MB c) Both a & b d) Don't Know	115	95.83
2.	MB plough is required to use every year? Yes/No if Yes, How many years? a) 3 b) 1 c) 2 d) Don't Know	101	84.17
3.	After using After using animal drawn plough at what extent the unploughed land land is left out? a) 0% b) <5% c) 5-10% d) 10-20%	81	67.50
4.	For what purpose harrow is used? a) Ploughing b) Smoothing of clods c) None d) Don't Know	113	94.17
5.	At w At what depth harrow operates? a) 5-10cm b) 10-20cm c) 20-30cm d) Don't Know	93	77.50
6.	What type of blade is used for harrow? a) Straight blade b) Curved blade c) Inclined blade d) None	77	64.17
7.	How many times harrow blade is cleaned during field operation? a) Every time at the end of the head land b) Two times in a row c) Cleaned when it is blocked with more weeds d) None	64	53.33
8.	How many gears are there in power tiller? a) 4 gear b) 3 forward & 1 reverse gear c) 5 gears d) None	87	72.50
9.	What type of implement can be used for power tiller? a) MB plough b) Rotary plough c) Disc plough d) All	99	82.50
10.	What are the types of cultivators? a) Ridge tyne type b) Spring tyne type c) Duck foot cultivator d) Don't Know	82	68.33

11.	What do you mean by half cage wheel? a) Its having width of one feet b) Its fitted with black tyre of tractor c) Its fitted with hub of the tractor wheel d) None	93	77.50
12.	Why the cage wheels are used? a) For puddling wet soil b)For puddling after harvesting of paddy c) Both a&b d) Don't Know	79	65.83
13.	Why puddler is used? a) To stir the soil b) To make favourable condition for Paddy c) To increase water holding capacity d) Don't Know	117	97.50
14.	What are the advantages of Rotavator? a) Used for ploughing b) Used for loosening of soils c) Used for crushing of crop residues d) Both b&c	114	95.00
15.	Have you seen animal drawn rotavator? (Yes/No)	120	100.00
16.	Which of the following operations is absent in Paddy drum seeder? a) Weeding b) Fertilizer application c) Land Preparation d) Nursery	101	84.17
17.	The cost of cultivation of Paddy Drum seeder is less than the cost of cultivation (Yes/No)	118	98.33
18.	What are the functions of seed drill? a) To carry the seeds b)To open furrows at uniform rates c) To meter the seeds d) To cover the seeds	91	75.83
19.	How many trays are required for one acre of transplantation in Paddy transplanter? a) 80 b) 100 c) 120 d) Don't Know	72	60.00
20.	Have you seen Cono weeder? a) Don't know about that b) Yes, seen in paddy fields c) Seen in university/TV d) Don't Know	80	66.67
21.	What is the tank capacity of Knapsack sprayer? a) 9-22.5 liter b) 10-15 liter c) 15-30 liter d) None	95	79.17
22.	What is the function of Combine harvester? a) Only threshing can be done b) Both harvesting and threshing can be done c) Only used for harvesting d) Don't Know	102	85.00

23.	Which is the first function of Combine harvester? a) Harvesting b) Threshing c) Winnowing d) Don't Know	100	83.33
24.	What is the purpose of Paddy reaper? a) Sowing b) Grain Harvesting c) Spraying d) None	60	50.00
25.	What type of crops can be threshed by olpad type thresher? a) Gram b) Wheat c) Both a&b d) None	67	55.83
26.	How tractor operated thresher works? a) It takes power from draw box b) It takes power for hydrolic c) It takes power from PTO d) Don't Know	72	60.00
27.	What is the working capacity of multicrop thresher? a) 1000kg/hr b) 200-2500kg/hr c) 2500kg/hr d) <300kg/hr	89	74.17
28.	What is the use of Straw baler? a) Intercultural operations b) Land protection c) Post harvest operation d) None	67	55.83
29.	Straw baler can reduce the impact of air pollution (Yes/No)	70	58.33
30.	Straw baler adds additional income to the farmer (Yes/No)	89	74.17
31.	Mention any one point that emphasizes the importance of mechanization----------	120	100.00
32.	Mention any one company that is worked with agricultural mechanization----------	120	100.00
33.	Mention any one machinery name that are used in harvesting and post harvesting----------	103	85.83
34.	Mention any one disadvantage of agricultural mechanization----------	120	100.00
35.	Mention any one location where farm machinery and tools are sold----------	120	100.00
36.	State any one major function of diesel engine----------	99	82.50
37.	Custom hiring model of farm implements for rice based farming farmin is useful is useful to the farming community (True/False)	100	83.33
38.	I feel the CHC farmer group concept can effectively So solve the problem of farm mechanization (True/False)	100	83.33

39.	Drum seeder/direct sowing method of paddy cultivation can reduce the cost of labour (True/False)	90	75.00
40.	Whether RBK's are useful for farm mechanization (True/False)	116	96.68
41.	Mechanization can lead to increased yields and profitability for farmers (True/False)	95	79.17
42.	Farm mechanization can have negative impact on environment (True/False)	105	87.50
43.	Power operated winnower is better than traditional method of winnowing? (Yes/No)	104	86.67

It is evident from the table 2, farmers possessed high knowledge on puddler, mould board plough, rotavator, harrow, combine harvester and paddy drum seeder. The reason for the above trend might be interestingly, the majority of rice farmers held a positive opinion about custom hiring centers and Rythu Barosa Kendras (RBK's), which provide mechanization services to the farming community on a rental basis with reasonable hiring charges. This indicates a favorable perception of such services among farmers, which showcases the potential for increased adoption of farm machinery and implements in the agricultural practices of rice farming.

However, their knowledge on cono weeder, thresher, paddy transplanter, straw baler and paddy reaper appeared to be relatively limited. The reason for the above trend might be that some agricultural machinery, such as the cono weeder, cage wheels, thresher, paddy transplanter, straw baler, and paddy reaper might be more intricate and require specialized knowledge to operate effectively and aslo lack of training and experience in handling such machinery was another reason for the above trend.

Further, the rice farmers might not having much exposure to these specific types of agricultural equipment. As a result, they might not be familiar with their functions, features and operation. In some cases, certain agricultural equipment might not be commonly used in a particular region. This kind of lack of exposure could lead to limited understanding and knowledge about these machinery.

The percentages with regard to knowledge of the respondents indicated that rice farmers had a limited understanding of the above mentioned agricultural equipment. This observation could have implications for the adoption and effective utilization of these machines in agricultural practices by the rice farmers. Further education, training and awareness-building efforts might be needed to improve their understanding and knowledge level which encourages the adoption of these technologies in their agricultural activities.

Nearly half of the respondents had medium extension contact and extension participation which forced them towards usage of some basic implements due to lack of information on improved farm machinery and implements. As the cost of paddy transplanter is very high i.e. about more than 4 lakhs and it is difficult for small farmer to use it. Further many farmers were not known about implements like cono-weeder, as majority of rice transplantation done by manually where there is no scope for row spacing. Hence, it is not possible to use cono-weeder in these situations with reference to machine transplanted paddy. In case of many paddy growing areas, apart from the rice farmers of this study region also not having knowledge on its mode of operation,

the method of preparation of seedling trays (80 trays/acre) and age of seedlings (14-15 days) to be transplanted.

Hence, all these circumstances could be enhanced by increasing the awareness and knowledge of the rice farmers on farm mechanization through conducting demonstrations, organizing training programmes, exposure visits to successful farm mechanization farms, presentation of success stories, promoting informal communication on farm mechanization through local opinion leaders.

Conclusion

The findings revealed that majority of the rice farmers were found to have medium to high level of knowledge on various farm machinery and implements used in rice cultivation and possessed high knowledge on puddler, mould board plough, rotavator, harrow, combine harvester and paddy drum seeder. However, their knowledge on cono weeder, thresher, paddy transplanter, straw baler and paddy reaper appeared to be relatively limited. The probable reason for above trend might be due to their experience in farming and paddy being labour intensive crop demands more labour which forced them to look for other alternatives. Majority of rice farmers had an education level ranging from intermediate to graduation. This education level enabled farmers to access mass media and ICT tools, which in turn allowed them to gain knowledge about various farm mechanization implements.

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