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A Study on the Knowledge about Information and Communication Technology Tools of Paddy Growers in the Nuapada District of Odisha

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

The study was conducted in the Nuapada District of Odisha to assess the knowledge of information and communications technology (ICT) tools by Paddy growers the in Nuapada district of Odisha. A total number of 120 respondents were selected randomly from six villages under the Nuapada block because productivity, production, and area under rice cultivation were found to be maximum. The data were collected by personnel interview method by using a pre-structured interview schedule and later appropriate statistical analysis was done to find out the meaningful results. The findings of the study revealed that 54.16 percent of the respondents belonged to the middle-aged group, 59.16% of the respondents belonged to the OBC caste and the majority of the respondents belong to medium-level of annual income i.e., 50,000 – 1 lakh. Moreover, 45.83% of the respondents had medium-level knowledge about rice cultivation practices. The findings also

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revealed that 48.34 percent of respondents had medium-level knowledge about information and communications technology tools followed by 30 percent and 21.66 percent of the respondents with high and low levels of knowledge, respectively. It was found that independent variables like age, caste, and economic motivation were positively and significantly correlated with knowledge about ICT tools by the respondents.

Keywords: Knowledge; information; communications technology.

1. INTRODUCTION

"The use of ICT is an essential pillar of agricultural extension and in this present scenario of a rapidly changing world, it has been also recognized as an essential mechanism for delivering knowledge (advice) and information as an input for decision-making [1], in this case, for modern farming". "Information and Communications Technologies (ICTs) can create new opportunities to bridge the gap between information haves and information have-nots in developing countries. ICT tools serve as a unifying force that brings people together, regardless of caste, class, race, religion, sex, or political identity. The delivery of ICT-based information delivery has the potential to be timelier and directly reach more farmers" [2].

According to the Food and Agriculture Organization FAO (1993), "ICT was defined as those technologies used in collecting, processing, storing, retrieving, disseminating, and implementing data and information using microelectronics, optics, telecommunications, and computers".

"Information and Communications Technology (ICTs) are seen as a partial solution to rapidly disseminating information to the increasing number of farming families. ICTs have the potential to enable farmers to receive up-to-date knowledge and information about agricultural technologies, best practices, markets, price trends, consumer preferences, weather, and soil moisture conditions. ICTs-based information is crucial for the adoption of different technologies related to different crops for improving the yield and income of smallholder farmers" [3].

"ICT in the agriculture sector facilitates knowledge sharing within and among a variety of agriculture networks including researchers, exporters, extension services, and farmers. ICT enables vital information flows by linking rural agricultural communities to the internet, both in terms of accessing information and providing local content" [4]. "The developments in Information and Communications Technologies (ICTs) and the internet in particular have revolutionized the entire Agriculture field, generating new markets, changing the structure of theagriculture distribution channels, and re-engineering all processes. Agricultural extension which depends to a large extent on information exchange between and among farmers on the one hand and a broad range of other actors on the other, has been identified as one area in which ICTs can play a significant role" [5]. "Farmers also reported that mobile phones proved to be useful during health emergencies; information services on the availability of inputs, quality of inputs, and pest and disease management of crops were also used by the farmers through ICTs" [6].

"The use of ICT as a tool for enabling innovation in South Asia found that the potential of ICT as a communications tool had not been adequately utilized. They argue ICTs could better reach their potential by acknowledging and integrating the roles of intermediaries and their capacities for innovation, and by enabling networks so that communities can make use of the information provided" [7].

According to RLDC [8], "most rice farmers lack agricultural information mostly on farming practices and market prices; hence farmers end up using their experience and traditional ways of farming practices". "That results in low yields since they hardly change ways of farming and incur low prices because of less information about market prices. In African counties most farmers lack access to day-to-day agricultural information, which is needed to assist farmers in making decisions regards farming practices and market prices" [9].

2. RESEARCH METHODOLOGY

A descriptive research design was adopted for the study as it describes the characteristics or phenomena that are being studied. The present study was conducted in the Nuapada district of Odisha. Out of 6 blocks in the Nuapada district,

the Nuapada block is selected purposively based on the maximum area covered under rice cultivation. From the selected block, six villages were selected purposively based on the maximum area covered under rice cultivation.

A total number of 120 respondents were selected randomly from the six villages. Suitable statistical tools were used whereby Hejase et al. [10] contend that informed objective decisions are based on facts and numbers, real, realistic, and timely information. Furthermore, according to Hejase & Hejase [11], "descriptive statistics deals with describing a collection of data by condensing the amounts of data into simple representative numerical quantities or plots that can provide a better understanding of the collected data" (p. 272). Consequently, this research used frequencies and percentages depicted in tables and figures for simplicity.

3. RESULTS AND DISCUSSION

From Table 1, it is observed that 54.16% of respondents belong to the middle age group. It is also shown that 28.33% of the respondents had a primary level of education and 59.16% of the respondents belonged to the OBC caste. In terms of annual income, 52.50 percent of the respondents had medium-level of income of which 53.34 percent had a land holding of 1 ha to 2 ha. It is observed that the majority of the respondents lived in a nuclear family i.e., 61.66 percent and that 55.83 percent of the respondents possessed a medium level of Scientific orientation. It is seen that in terms of Economic motivation, 45.83% of the respondents possessed a medium level of Economic motivation and 55% of the respondents had a medium level of Mass media exposure. Lastly, 44.16 percent of the respondents had a medium level of extension contacts. Similar findings were also reported by Singh et al. [12].

Table 2 revealed that the majority of the respondents i.e., 45.84% used MTU 1001, MTU 1010, and Swarna varieties for the cultivation of rice. In the nursery bed preparation, 80.34% of the respondents possessed knowledge about the wet nursery, dry nursery, and mat nursery. The data also revealed that in land preparation 76.66% of the respondents possessed knowledge about the traditional method of ploughing, use of zero tillage machine, and surface seedling method. The majority of the respondents had knowledge about the time of transplanting the seedlings i.e. 55.83%. The data revealed that 48.34% of the respondents possessed a higher level of knowledge on fertilizer application in time might be due to their perception that applying fertilizers might enhance crop yield and gives more profit. 45% of respondents possessed knowledge about proper irrigation. This might be due to proper irrigation being given at stipulated intervals to grow the crops and save water during the water scarcity period. The majority of them had knowledge about weeding which leads to crop loss i.e.. 43.34%. It was evident that 49.17% of the respondents possessed knowledge about the diseases of rice. This result was due to the reason that they believed the pest and disease could result in lower yields. The majority of respondents possessed knowledge about the right time of harvesting i.e., 59.16%. The data also revealed that 47.50% of respondents have knowledge about enhancing the yield of rice this might be due to attending more campaigns and field visits have been organized by extension officials and KVK representatives.

Below Table 3 revealed that 45.83% of respondents had a medium level of knowledge about rice cultivation practices. A considerable percentage of rice farmers were found to have high 38.34% and low level of knowledge 15.83%, respectively. Similar findings were reported by Meena et al. [13].

Table 4 presents the data obtained regarding the knowledge of farmers about ICT tools. The majority of the respondents knew that TV (39.16%) and Mobile (43.34%) provide information regarding agriculture. It was observed that ICT tools provide retrievable information (47.50%). It was evident from the findings that ICT can provide information regarding crop production, protection, post-harvest technologies, and other allied activities i.e., (39.16%). It was also evident that ICT can provide marketing, storage-related information of agriculture, and weather information i.e., (45.00%) and (48.33%), respectively. The majority of the respondents i.e., 38.34% accepted that ICT tools provide information regarding crop insurance and other government programs. It was observed that the majority of them were not aware that Kisan Call Centre provides agriculture information (56.66%). A considerable percentage (35.00%) of the respondents knew that ICT tools are user-friendly. The majority of the respondents i.e., 40.00% of them considered that YouTube provides information related to agriculture.

Table 1. Socio-economic profile of the respondents

Sl. No.	Independent Variables	Category	Frequency	Percentage
1.	Age	Young age (Up to 35 years)	24	20.00
		Middle age (36-55 years)	65	54.16
		Old age (above 55 years)	31	25.84
2.	Educational Qualification	Illiterate	32	26.66
		Primary school	27	22.50
		Upper Primary school	22	18.34
		Higher Secondary	19	15.84
		Intermediate	12	10.00
		Graduate above	8	6.66
3.	Caste	General	22	18.34
		OBC	71	59.16
		SC & ST	27	22.50
4.	Annual Income	Low (below 50,000)	32	26.66
		Medium (50,000-1 lakh)	63	52.50
		High (Above 1 lakh)	25	20.84
5.	Type of house	Hut (Kuchha)	24	20.00
		Semi-cemented	64	53.34
		Cemented	32	26.66
6.	Type of Family	Nuclear family	74	61.66
		Joint family	46	38.34
7.	Size of Family	Small (1-4)	33	27.50
		Medium (5-8)	59	49.16
		Large (9 above)	28	23.34
8.	Land holding	Marginal (Up to 1 ha.)	18	15.00
		Small (1.01 to 2 ha.)	35	29.16
		Medium (2 to 4 ha.)	37	30.84
		Large (Above 4 ha.)	30	25.00
9.	Scientific orientation	Low (8-11)	28	23.34
		Medium (12-14)	67	55.83
		High (15-17)	25	20.83
10.	Economic motivation	Low (6-10)	34	28.34
		Medium (11-14)	55	45.83
		High (15-18)	31	25.83
11.	Mass media exposure	Low (5-7)	28	23.34
		Medium (8-9)	66	55.00
		High (10-11)	26	21.66

Sl. No.	Independent Variables	Category	Frequency	Percentage
12.	Extension contact	Low (6-8)	30	25.00
		Medium (9-10)	53	44.16
		High (11-12)	37	30.84

Table 2. Knowledge level of farmers about rice cultivation practices

Sl. No.	Statements	Evaluation		
		FC F (%)	PC F (%)	NC F (%)
1.	Varieties I. MTU 1001 II. MTU 1010 III. Swarna	44 (36.66%)	55 (45.84%)	21 (17.50%)
2.	Nursery bed preparation I. Wet nursery II. Dry nursery III. Mat nursery	97 (80.34%)	15 (12.50%)	8 (6.66%)
3.	Nursery sowing and raising	79 (65.83%)	28 (23.34%)	13(10.83%)
4.	Land preparation I. Traditional method- 2-3 times ploughing II. Use of zero tillage machine III. Surface seeding method	92 (76.66%)	16 (13.33%)	12(10.00%)
5.	Transplanting I. Random transplanting II. Straight row transplanting	67 (55.83%)	39 (32.51%)	14(11.66%)
6.	Fertilizer application I. 120:40:40 Kg NPK/ha II. 150:50:60 Kg NPK/ha III. 150:50:80 Kg NPK/ha	58 (48.34%)	43 (35.83%)	19(15.83%)
7.	Irrigation I. 2times II. 3times III. 6times IV. 10times	45 (37.50%)	54 (45.00%)	21(17.50%)
8.	Weeding I. 2times II. 3times III. 4times	49 (40.83%)	52 (43.34%)	19(15.83%)

Sl. No.	Statements	Evaluation		
		FC F (%)	PC F (%)	NC F (%)
9.	Disease I. Blast II. Brown Spot III. Sheath Blight IV. Khaira Disease	51 (42.50%)	59 (49.17%)	10 (8.33%)
10.	Harvesting I. 90-100days II. 100-110days III. 110-120days	71 (59.16%)	40 (33.33%)	9 (7.51%)
11.	Yield I. 40-50quintal/ha II. 50-60quintal/ha III. 60-70quintal/ha	42 (35.00%)	57 (47.50%)	21 (17.50%)

Table 3. Distribution of the respondents on the basis of the Knowledge level of farmers about rice cultivation practices

Sl. No.	Categories	Frequency	Percentage
1.	Low (19-23)	19	15.83
2.	Medium (24-27)	55	45.83
3.	High (28-31)	46	38.34
Total		**120**	**100.00**

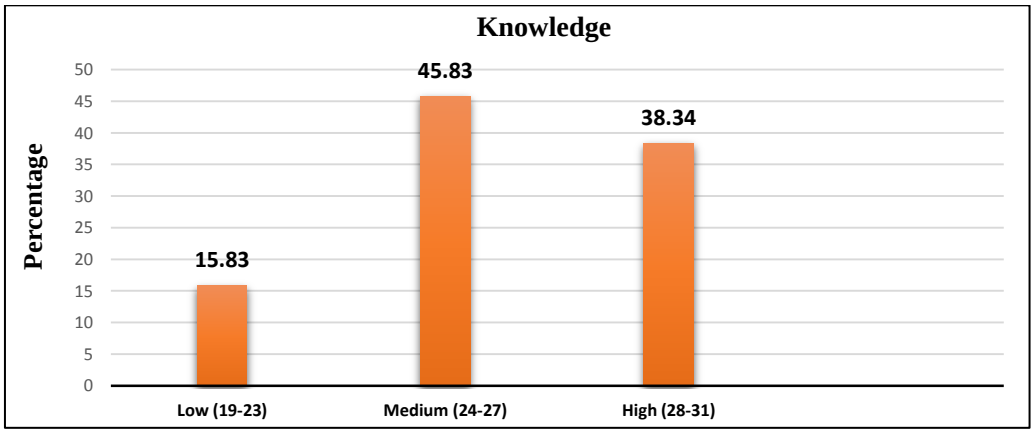

Fig. 1. Distribution of the respondents on the basis of the Knowledge level of farmers about rice cultivation practices

Table 4. Knowledge of farmers about information and communication technology (ICT) tools

Sl. No.	Knowledge	Evaluation		
		FCF (%)	PCF (%)	NCF (%)
1.	Television provides agricultural information	18 (15.00%)	47 (39.16%)	55 (45.84%)
2.	Mobile provides agricultural information	44 (36.66%)	52 (43.34%)	24 (20.00%)
3.	ICT tools provide retrievable information	32 (26.66%)	57 (47.50%)	31 (25.84%)
4.	ICT tools provide information regarding crop production, protection, post-harvest technologies and other allied activities	39 (32.50%)	47 (39.16%)	34 (28.34%)
5.	ICT tools provide marketing and storage information of agriculture.	23 (19.16%)	54 (45.00%)	43 (35.84%)
6.	ICT provides weather information	28 (23.33%)	58 (48.33%)	34 (28.34%)
7.	ICT provides information on crop insurance and other government programs.	35 (29.16%)	46 (38.34%)	39 (32.50%)
8.	Kisan Call Centre provide agriculture information	16 (13.33%)	36 (30.00%)	68 (56.66%)
9.	ICT tools are user friendly	25 (20.84%)	42 (35.00%)	53 (44.16%)
10.	YouTube provide agriculture information	38 (31.66%)	48 (40.00%)	34 (28.34%)

Table 5. Overall knowledge level of respondents about information and communication technology (ICT) tools

Sl. No.	Categories	Frequency	Percentage
1.	Low (11-16)	26	21.66
2.	Medium (17-21)	58	48.34
3.	High (22-26)	36	30.00
Total		**120**	**100.00**

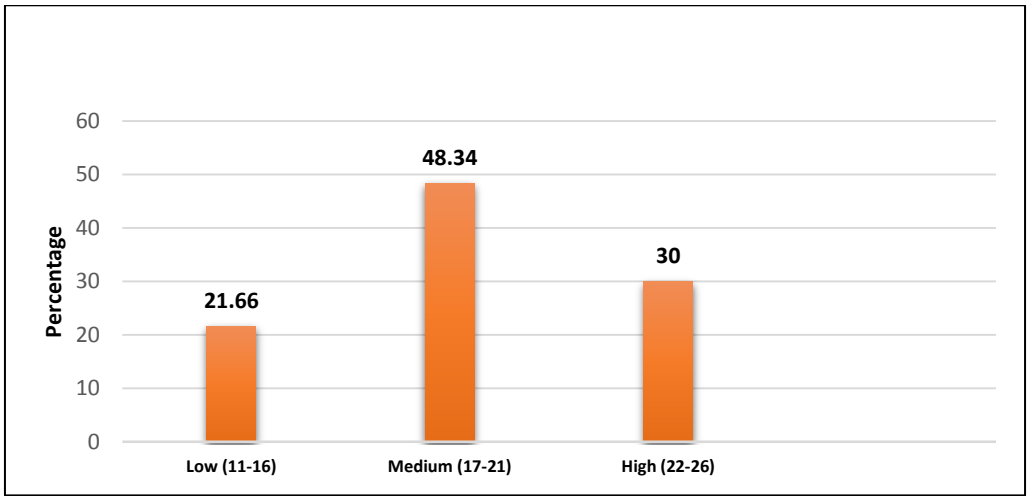

Fig. 2. Distribution of the respondents on the basis of knowledge about information and communications technology (ICT) tools

Table 6. Association between selected independent variables with knowledge about information and communication technology (ICT) tools

Sl. No.	Independent Variable	Correlation coefficient
1.	Age	0.988*
2.	Education	0.850*
3.	Caste	0.976*
4.	Annual income	0.884*
5.	Type of house	0.992*
6.	Type of family	-0.170**
7.	Size of family	0.895*
8.	Size of land holding	0.995*
9.	Scientific orientation	0.930*
10.	Economic motivation	0.910*
11.	Mass media exposure	0.937*
12.	Extension contact	0.999*

**= Correlation is significant at the 0.01% level of probability*
***= Correlation is significant at the 0.05% level of probability*

Table 5 And Fig. 2 show that the maximum number of respondents 48.34% had medium-level knowledge about information and communications technology tools followed by a high level 30%, a low level 21.66%, respectively. These findings are in conformity with the findings of Raghu Prasad et al. [14] and Devaraja [15].

Table 6 concluded that the independent variables i.e., Age, educational qualification, caste, annual income, type of house, size of family, size of land holding, scientific orientation, economic motivation, mass media exposure, and extension contact were positively with statistical significance correlated with the knowledge about ICT tools at 0.01% of probability. Therefore, the null hypothesis was rejected for these variable whereas as the variable type of family availed was negatively and significantly correlated with the knowledge about ICT tools at 0.05% of probability. Therefore, the null hypothesis was rejected for this variable.

4. CONCLUSION

It was found that the majority of the respondents belonged to the middle-aged group, having education up to the primary level and having medium-level annual income. Further, the majority of the respondents belonged to nuclear-type families with land holdings of more than 1 to 2 hectares and the majority of the respondents had medium levels of mass media exposure, extension contacts, and scientific orientation. It was observed that the Knowledge level of farmers about rice cultivation practices was found medium level, it was also observed that the Knowledge about information and communications technology (ICT) tools was found medium level. Moreover, it was found that

age, educational qualification, caste, annual income, type of house, size of family, size of land holding, scientific orientation, economic motivation, mass media exposure, and extension contacts were positively and significantly correlated with knowledge about information and communications technology. It is suggested that the government should provide regular training for operating advanced technology of gadgets.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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