Appropriateness of Improved Rice Cultivation Technologies for Upland Ecosystem

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ABSTRACT

The data relating to need perception about rice cultivation technologies suitable for upland ecosystem were collected from 160 farmers and 40 extension personnel of Dhenkanal district. The need for 'training on scientific and recommended rice cultivation technologies' was perceived as the most important one by the farmers as well as by the extension personnel. Degree of appropriateness varied proportionally with the category of farmers on not appropriate to highly appropriate continuum. As far as overall RRCTs were concerned, these were somewhat appropriate to small farmers and appropriate to medium and large farmers. The small farmers perceived half of technologies as 'not appropriate' (MAS upto 2.05) whereas, medium farmers perceived three technologies as'not appropriate'. As far as large farmers were concerned most of the technologies were perceived as 'appropriate' or 'highly appropriate'. They did not feel any technology to be 'not appropriate'.

Key words: *Appropriateness; Need perception; Upland rice technology* **;**

Agriculture is a dominating factor in Indian economy, so a lot of technologies have been developed in this field and diffused to farmers. However, increase in agriculture production is not proportionate with respect to increase in population. In fact, in our country the problem is not technology development but its adoption. *Chandrakanandan (1995)* reported that in the present days the most important factor affecting the process of technology transfer and adoption is lack of availability of location specific and need based appropriate technology. Objectively about 70 per cent of the recommended technologies are not being adopted by the farmers. Some of the reasons are their inconsistency with the particular farm setting or their inappropriateness to the local resource endowment. Moreover, many technologies evolved by the researchers are more appropriate to resource rich farmers (*Chambers and Jiggins, 1986*) whereas most of the farmers in India are small and marginal. This fact magnifies the importance of studying farmers perception about the appropriateness of technologies and to what extent it effects the acceptance and adoption of recommended technologies.

Among the major food grain produced in India, rice plays an important role. A large number of recommended rice production technologies are either being adopted in piece-meal or not at all. The analysis of several studies conducted on the causes of non-adoption have revealed very interesting trends. While during the period of 1950-60s, the reasons for non-adoption of technologies by the farmers were explained in terms of "farmers ignorance" in 1970-80s they were explained in terms of various "farm level constraints". However, during 1990s the explanation was shifted and it is now explained in terms of "lack of appropriateness of technology". Rice cultivation technologies are not an exception to this phenomena for non-adoption. Rainfed upland rice constitute about 6.1 million hectare area in India of which about 4.3 million hectare falls under eastern region comprising the states of Assam, Orissa, Bihar, West Bengal, eastern U.P. and Madhya Pradesh with very low productivity of less than 1.0 tonne/hectare. In this context this study was undertaken with the following objectives:

1. To study the differential need perception about recommended rice cultivation technologies among farmers and development personnel.
2. To assess farmers perception about the appropriateness of rice cultivation technologies.

METHODOLOGY

The study was undertaken in Odapada block of Dhenkanal district of Orissa. Four villages from the selected block were taken by random sampling. To study need perception a total of 160 farmers and 40 extension personnel were selected by random sampling. The two sets of questionnaires for farmers and extension personnel were developed after discussion with the scientists and extension personnel. Fourteen recommended rice cultivation technologies suitable for uplands were selected for this study.

Appropriateness of recommended rice cultivation technologies suitable for uplands was judged by applying four criteria i.e., simplicity-complexity, profitability, compatibility and need. For each selected practice, farmer's response was taken on these criteria. Scores were assigned accordingly and subsequently mean appropriate score was computed. The mean appropriate score of all the selected practices for each individual were further averaged to arrive at overall mean appropriate score of the recommended rice cultivation technologies (RRCTs) for each farmer. The following categories of appropriateness were made:

S. No.	Category	Mean Appropriate Score
1.	Not Appropriate	Upto2.05
2.	Somewhat Appropriate	2.06-2.25
3.	Appropriate	2.26-2.45
4.	Highly Appropriate	more than 2.45

RESULTS AND DISCUSSION

The data relating to need perception about rice cultivation technology suitable for upland ecosystem were collected from 160 farmers and 40 extension personnel of Dhenkanal district (Table-1). The study revealed that farmers had identified the need for 'training on scientific, recommended rice cultivation technologies', 'organizing campaign, group discussion etc. on new technologies' as the most important ones. Similarly the Extension Personnel perceived the need for 'training on scientific, recommended rice cultivation technologies' as the most important followed by 'demonstration before introducing a new technology' and 'availability of marketing facilities after harvesting' as the prior ones. The development personnel may have felt the need fortrainings and demonstrations as the major because

Table 1: Need perception of farmers and Development Personnel about improved rice farming (N=200)

S. No.	Needs	Farmers (n=160)		Development Personnel (n=40)	
		MS	Rank	MS	Rank
1.	Location of block headquarters within the radius of 5 km. from the village	9.47	XII	8.00	IX
2.	Testing of soil before sowing	6.47	VI	4.45	IV
3.	Demonstration before introducing a new technology	6.30	V	3.30	II
4.	Availability of fertilizers and pesticides at proper time	8.37	X	9.55	XII
5.	Getting fertilizer and pesticides at reasonable rates	4.75	III	8.35	X
6.	Organizing campaign, group discussion etc. on new technologies	5.90	IV	7.65	VII
7.	Training on scientific, recommended rice cultivation technologies	3.90	I	2.65	I
8.	Prompt measure against the insect and diseases through chemicals	6.77	VIII	8.75	XI
9.	Functioning of cooperative societies in the village	6.87	IX	7.20	VI
10.	Availability of bank services and loan facilities in the area	6.52	VII	6.20	V
11.	Encouragement to the farmers for HYV cultivation	8.67	XI	7.70	VIII
12.	Availability of marketing facilities after harvesting	4.43	II	4.20	III

MS=Mean Score

Table 2. Distribution of farmers according to the perceived appropriateness of the recommended rice cultivation technologies for uplands

S. No.	Degree of Appropriateness *(in Mean Appropriate Score)*	Category of the Farmers			
		Small (n=70)	Medium (n=64)	Large (n=26)	Total (N=160)
1.	Not Appropriate (upto 2.05)	18 (25.7)	02 (3.1)	00 (0.0)	20 (12.5)
2.	Somewhat appropriate (2.06-2.25)	44 (62.8)	24 (37.5)	06 (23.1)	74 (46.3)
3.	Appropriate (2.26-2.45)	08 (11.4)	32 (50.0)	06 (23.1)	46 (28.8)
4.	Highly appropriate (more than 2.45)	00 (0.0)	06 (9.4)	14 (53.8)	20 (12.5)

(Figures in the parentheses indicate percentage)

Table 3. Perceived appropriateness of the recommended rice cultivation technologies for uplands by the different categories of farmers

S. No.	Recommended Technologies	Category of the Farmers			
		Small (n=70)	Medium (n=64)	Large (n=26)	Total (N=160)
1.	Using recommended varieties of early and very early duration (70-105 days) based on land situation	2.40	2.41	2.56	2.43
2.	Using seed rate of - a) 30-35 kg/ac for dibbling/line seeding b) 40-45 kg/ac for broadcasting	2.31	2.39	2.44	2.37
3.	a. Treatment of seeds with recommended fungicide like Bavistin @ 2gm/kg of seeds before sowing b. Areas where termite is a problem, seed treatment with chlorpyriphos @ 0.75kg/ha	1.73	2.08	2.06	1.92
4.	Sowing should be completed during second fortnight of June after onset of monsoon	2.51	2.69	2.88	2.64
5.	a. Spacing of 20 cm 10-15cm for dibbling b. 20 cm apart in rows for line seeding	2.01	2.34	2.42	2.21
6.	N:P:K at 40:20:20 kg/ha (16:8:8 kg/acre) 'N' in 3 splits (1/2) at 20DAS, (at 40 DAS and rest at 60 DAS) 'P' in basal and 'K' in 2 splits (2/3 before sowing, 1/3 at 60 DAS)	1.87	2.23	2.25	2.08
7.	Applying organic manure@ 2-5 t/ha	2.32	2.44	2.53	2.40
8.	Integration of two or more methods of weed control gives better result a) Pre-emergence application of recommended herbicides like Butachlor (1.25 kg a.i./ha), Pretilachlor (0.8 kg a.i./ha) combined with at least one hand weeding at 40-45 DAS	1.61	2.04	2.12	1.86
b)	Using finger weeder/wheel hoes at 15-20 DAS combined with at least one hand weeding at 40-45 DAS				
9.	Need based plant protection against termite, gundhibug, brownspot and blast	0.79	1.83	2.06	1.84
10.	Deep summer ploughing immediately after harvest of previous crops to control weeds & pests, to conserve soil moisture and to promote root growth	2.64	2.69	2.78	2.68
11.	Use of 1st dose of Nitrogen after weeding	2.24	2.36	2.66	2.36
12.	Bunding around the field of at least 30 cm height for insitu rain water conservation	2.17	2.35	2.39	2.28
13.	Intercropping system of rice and pigeonpea (4:1) could be more suitable and remunerative under upland system	2.01	2.09	2.25	2.08
14.	Integrated Crop Management in rainfed uplands (Variety + Line seeding behind the plough + Balanced nutrition i.e, 40:20:20 + Integrated Weed Management)	1.78	1.77	2.10	1.83

(Figures in the table represent the mean average score for each technology)

they provided these as part of their job requirement. Similarly farmers also felt these needs as important but according to them the extension personnel rarely visited villages to conduct trainings and demonstrations.

The findings relating to perceived appropriateness of the recommended rice cultivation technologies for uplands (Table-2) revealed that majority of small farmers (62.8%) perceived recommended rice cultivation technologies (RRCTs) as somewhat appropriate. On the other hand half of the medium farmers perceived RRCTs as appropriate. Among the large farmers, about 54 per cent perceived recommended technologies as highly appropriate. Degree of appropriateness varied proportionally with the category of farmers on not appropriate to highly appropriate continuum. As far as overall RRCTs were concerned, these were somewhat appropriate to small farmers and appropriate to medium and large farmers.

A perusal of Table 3 indicates that small farmers perceived half of technologies as 'not appropriate' (MAS upto 2.05) whereas, they perceived only two technologies i.e., 'sowing should be completed during second fortnight of June after onset of monsoon' and 'deep summer ploughing immediately after harvest of previous crop to control weeds & pests, to conserve soil moisture and to promote root growth' as 'highly appropriate'. Medium farmers perceived three technologies i.e., 'integration of two or more methods of weed control gives better result', 'need based plant protection against termite, gundhibug, brownspot and blast' and 'integrated crop management in rainfed uplands' as 'not appropriate'. They perceived six technologies as 'appropriate' and two technologies as 'highly appropriate'. As far as large farmers were concerned most of the technologies were perceived as 'appropriate' or 'highly appropriate'. They did not feel any technology to be 'not appropriate'. Some of the results of this study are in line with the findings of studies undertaken by *Singh (1995*), *Ganguly and Hazra (1995), Das(1996) and Hansra 1996*)

CONCLUSION

The adoption of technologies depends on the perception of farmers about the characteristics of technology such as simplicity, cost, profitability, physical and cultural compatibility which are indicators of the appropriateness of technology. This has great importance whether the technologies recommended and transferred by the scientists and developmental personnel are as per the needs of the farmers or not. So, the perception of scientists, extension personnel and farmers towards the appropriateness of recommended technologies can be ascertained and matched. They should form a common forum to assess, refine and modify the technologies so that they may find an appropriate place in the farming community.

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