Knowledge Empowerment through Participatory Trials in Rainfed Rice Ecosystem

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ABSTRACT

A study was undertaken to assess the impact of farmers' participatory trials on Integrated Crop Management (ICM) technology on the knowledge level of rice growing farmers under rainfed rice based cropping system in Koderma district of Jharkhand. The knowledge level of the farmers was measured on three major parameters of ICM viz., a) improved crop management practices, b) improved pest management practices, and c) improved weed and rodent management practices. The results indicated that there was remarkable change in the knowledge level and attitude of the rice growing farmers in all the three aspects of ICM after on-farm trials. The mean knowledge level was increased from 22.66% (pre-exposure) to 81.66% (after exposure) indicating a change of 59.0% in the overall knowledge level of the farmers about ICM.

Key words : *Farmers participatory; Integrated crop management; Knowledge level*

Developing suitable technologies for rainfed farming forms a major thrust area of rice research. The rainfed rice area is about 24.4 million hectare with low productivity of less than 0.98 tones/hectare, due to uncertainty of available water. It is a fragile ecology and divided in sub-ecologies viz., rainfed uplands (plain area and high altitude hill rice), deep water, semi-deep water and shallow rainfed (drought prone, lowland favourable and submerged prone) and coastal saline rice. Upland rice is grown in unfavourable rainfed soil and weather conditions. To achieve the target of increased rice production due to growing population, there is a need to raise the productivity, a major portion of which has to be achieved from this ecosystem as the yield level in irrigated ecosystem have been exploited to the maximum level. The warm and humid climatic condition being conducive for many pests, form a major constraint for increasing rice production in this ecosystem. Therefore, it is essential to evolve suitable location specific integrated crop management strategy that is environment friendly, economically viable and socially acceptable. In this context, farmers' participatory on-farm trials on ICM in rainfed upland rice ecosystem of Koderma district of Jharkhand were conducted to increase the farmers' access to ICM technology and to test the suitability/ viability of the technology on farmers' fields. Therefore, a study was conducted with the objective to access the impact of on-farm trials on the knowledge level of participating farmers about the ICM technology and to document the benefits of on-farm trials as perceived by the farmers.

METHODOLOGY

The study was conducted in Chandwara block of Koderma district of Jharkhand. In the present study knowledge was conceptualized as the sum total of farmers' knowldge about different components of integrated crop management practices. Out of total adopted farmers for on-farm trials, a target number of 50 respondents were randomly selected for this study from five villages' viz., Urwan, Badki Ghamri, Jogidih, Madangundi and Chandwara of Chandwara block in district Koderma.

Participatory Rural Appraisal was performed with the selected farmers to measure the knowledge level of farmers in three major areas viz., a) improved crop management practices, b) improved pest management practices and c) improved weed and rodent management practices. Fifty questions were framed including open-ended and close-ended questions. A score'1' was awarded for each correct answer and '0' for wrong answers. Thus, the minimum and maximum score that an individual could obtain was '0' and '50', respectively. The pre-knowledge level of the respondents was tested by using the PRA tools prior to implementation of farmers' participatory

on-farm trial. The information collected during the pre-knowledge test provided the basic idea about the existing knowledge level of the farmers.

After completion of the farmers' participatory on-farm trials, again the knowledge level of the respondent farmers was evaluated through farmers participatory PRAs. However, along with this, some other information relating to their sources of information about the ICM technology and benefits of farmers participatory on-farm trials were gathered and analyzed accordingly.

RESULTS AND DISCUSSION

A perusal of Table 1 indicates that Subject Matter Specialists from Krishi Vigyan Kendra, Koderma were the major source of information relating to ICM practices as reported by all the respondents followed by pesticide dealers and traders (76%), personal experiences (70%), neighbouring farmers (68%) and village level agricultural workers (64%), respectively. A percentage of the respondents (40%) got the information from mass media and only 36 % respondents from Agricultural Extension Officer.

Table 1. Distribution of the respondents according to their sources of information relating to integrated crop management techniques (N=50)

Information Sources	Frequency	%*	Rank
Agricultural Extension Officer	18	36.00	VII
Experts from KVK	50	100.00	I
Mass Media	20	40.00	VI
Neighbouring Farmers	34	68.00	IV
Personal Experiences	35	70.00	III
Pesticides Dealers and Traders	38	76.00	II
Village Agricultural Workers	32	64.00	V

* The added percentage is more than 100 since multiple responses were allowed

It is obvious that the SMS from KVK Koderma were the major sources of information among the farmers because the farmers' participatory on-farm trials on ICM technologies were directly carried out by the KVK. The farmers used to exchange their views, ideas and experiences more informally and frequently with the KVK. Conducting farmers' participatory on-farm trials in farmers' fields proved to be very effective for creating awareness and acceptance of improved rainfed rice production practices among farmers and ultimately getting relative advantages/benefits by adopting the improved practices.

A critical examination of Table 2 indicates that insect pest management was perceived as the top most benefit of on-farm trials on ICM technology by all the respondents. This may be because of the knowledge that was provided for identification of the insect pest and natural enemies and introduction of newer methods of management during the on-farm trials. Besides, disease management, weed and rodent management and improved crop management practices were other important benefits of on-farm trials which were perceived by 94%, 86% and 78% respondents, respectively. A few other benefits including increased yield (72%), reduced cost of cultivation (64%), sharing technology with fellow farmers (60%) and labour saving techniques (56%) were also perceived by the respondents.

Table 2. Benefits of On-farm trial as perceived by the farmers (N=50)

Benefits perceived in areas	Frequency	%*	Rank
Disease Management	47	94.00	II
Exposure visit to nearby Rice Research Station	20	40.00	X
Helping other Farmers in Practicing the Technology	25	50.00	IX
Improved Crop Management Practices	39	78.00	IV
Increased Yield	36	72.00	V
Insect Pest Management	50	100.00	I
Labour Saving Techniques	28	56.00	VIII
Opportunity to attend Farmers' Day related to Rice Technology	18	36.00	XI
Reduced Cost of Cultivation	32	64.00	VI
Sharing of Technology with Fellow Farmers	30	60.00	VII
Weed and Rodent Management	43	86.00	III

* The added percentage is more than 100 since multiple responses were allowed

The knowledge levels of the respondents about ICM technologies were studied before and after exposure to farmers' participatory on-farm trials to study the impact of these trials. The data presented in Table 3 depicts that there was a remarkable change (59%) in overall knowledge level of the farmers about ICM practices. In crop management, the mean knowledge level increased from 28% (pre-exposure) to 90% (post- exposure) indicating the highest change of 62%. Similarly, in pest management practices and weed and rodent management, the pre-exposure mean knowledge level increased from 20% (pre-exposure) to 80% (post- exposure) and from 20% (pre-exposure) to 75% (post-exposure) showing a change of 60% and 55%, respectively. These findings are in conformity with the earlier work of Ray (1976), Bhat (1980), Manjunath (1980), Singh and Prasad (1986), Narayanaswamy and Eshwarappa (2000), Verma (2000) and Dani et al. (2007).

Table 3. Distribution of respondents according to their mean knowledge level before and after exposure to participatory on-farm trials

Areas	Range of scores	Pre-exposure mean knowledge	Post-exposure mean knowledge	Change in mean knowledge
Crop Management scores	0-25	7.0(28.00)	22.5(90.00)	15.5(62.00)
Pest Management	0-15	3.0(20.00)	12.0(80.00)	9.0(60.00)
Weed and Rodent Management	0-10	2.0(20.00)	7.5(75.00)	5.5(55.00)
Overall Knowledge Levels	0-50	12.0(22.66)	42.0(81.66)	30.0(59.00)

Figures in the parentheses indicate percentage

Table 4. Distribution of respondents according to their increase in knowledge level in pest management

Areas	Frequency	Percentage	Rank
Identification of Insect pests, Diseases and Natural enemies	44	88	I
Monitoring of Insect Pests, Diseases and Natural enemies	42	84	II
Introduction of Seed treatment	40	80	III
Introduction of Dolomite application in soil	37	74	IV
Use of Pesticides	35	70	IV

* The added percentage is more than 100 since multiple responses were allowed

The increase in knowledge level of participants was also studied with regards to five major areas of pest management. The results presented in Table 4 clearly indicated that the maximum number of respondents (88%) expressed gain in knowledge in identification of insect pests, diseases and their natural enemies.. Similarly, 84% of the respondents expressed an increase in knowledge level in the area monitoring of insect pests, diseases and natural enemies followed by introduction of seed treatment (80%), introduction of dolomite application in soil (74%) and use of insecticides (70%), respectively.

CONCLUSION

There was a significant change in knowledge level of the farmers about ICM technologies after exposure to farmers' participatory on-farm trials. This change can be attributed to different reasons like frequent contacts with KVK, exposure to improved crop management practices and field day related to rainfed rice production technology. Hence, the planners, administrators and researchers must give focal importance to train the grass root extension workers and progressive farmers on the concept of farmers' participatory on-farm trials on farmers' field. Conducting farmers' participatory on-farm trials on farmers' fields can prove to be a very effective extension approach for creating awareness and acceptance of improved production technologies for sustaining rice production.

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