Impact of NICRA Project Interventions on Knowledge and Awareness Level of Farmers on Climate Resilient Agro-Technologies

S. Sultana[1*], P. Das[2], I. Barman[2] and S. Barman[3]

[1]APART, Krishi Vigyan Kendra, Barpeta, India
[2]Department of Extension Education BN college of Agriculture,
Assam Agricultural University, Biswanath Chariali, India
[3]Department of Extension Education, Assam Agricultural University, Jorhat-13, India

*Corresponding author

A B S T R A C T

The present study was conducted in Lakhimpur district of Assam to measure the level of knowledge and awareness of farmers on climate resilient agro-technologies. A total of 160 farmers, 80 NICRA (National Innovations on climate resilient agriculture) participant farmers and 80 non-participant farmers were selected randomly from the 8 purposively selected villages. The findings of the study revealed that majority of the participant farmers (56.25%) had medium level of knowledge while for nonparticipant farmers (83.75%) had low level knowledge on climate resilient agro-technologies. The t- value 3.47 indicates significant difference of knowledge level between two group of famers which may be due to intervention of INCRA project. It was seen that all the participant farmers (100%) were aware about all the fourteen climate resilient agro-technologies considered in the study, while differential level of awareness was observed among the non-participant farmers. The percentage of non-participant farmers varied from 31.25 per cent to 93.75 percent as regards to their level of awareness regarding the climate resilient agro-technologies under consideration. The existing extension efforts made under the project need to be strengthened and streamlined to enhance the knowledge and awareness level of participant farmers on climate resilient agro-technologies.

Introduction

Climate change is become the burning issue throughout the world. The adverse effect of climate change is mostly affected to poor people. The impact of climate change on agriculture and food security is now a major concern for UNO and considered as one of the important goal of millennium development goal. There is now evident that the increase of global temperature and changes of rainfall rate is observed during 20th century throughout the world. According to the World Bank Report (2015) without urgent action, climate impacts could push an additional 100 million people into poverty by 2030. Climate change poses a threat to food access for both rural and urban populations by

reducing agricultural production and incomes, increasing risks and disrupting markets. Poor producers, the landless and marginalized ethnic groups are particularly vulnerable (Olsson, *et al.,* 2014). There is a significant importance of climate resilient innovations in the present day, most commonly in the agricultural sector. So, it is necessary to introduce climate resilient agro-technologies so that the farmers can adapt to the changing climate vulnerability. Realising the situation in Assam different climate resilient agro technologies were introduced under NICRA project in some selected districts vulnerable to climate change.

The technological interventions in terms climate resilient agriculture technology have been provided to farmers by the All India Coordinated Research Project on Dry land Agriculture under NICRA project in Lakhimpur districts. Awareness and proper knowledge about climate resilient agriculture technology are very important for the farmers to cope up with adverse effect of climate change or variability. The present study was conducted in Lakhimpur district of Assam to assess the impact of NICRA project in terms of level of knowledge and awareness of the farmers on climate resilient agro-technologies.

Materials and Methods

The present study was undertaken in Lakhimpur district of Assam to measure the level of knowledge and awareness of farmers on climate resilient agro-technologies introduced under the NICRA Project. A total of 160 farmers, 80 NICRA participant farmers and 80 non-participant farmers were selected randomly from the 8 purposively selected villages. A knowledge test was used to assess the knowledge level for the purpose. A total of 26 items was administered to both the group of sample farmers.

The knowledge level of a respondent on climate resilient agro-technology was indicated by the total score received by him on the test. The answers for the questions in the knowledge test were in dichotomous categories. In computing the knowledge scores of the respondents, correct answer to a question was given one score and for incorrect answer was given zero score. The total score on the test had a theoretical range of 0 to 26. The intrinsic validity of the test was estimated by taking the square root of the reliability coefficient (Guilford, 1954). The reliability of the test was estimated with the help of split-half method (odd-even design) by applying the following formula (Rulon,1939).

$$r_{tt} = 1 - \frac{S_d^2}{S_t^2}$$

Where, r_{tt} stands for reliability coefficient of the total test scores, d is the difference between two half scores, S_d is the standard deviation of those differences and S_t is the standard deviation of total test scores. Based on the mean ($\overline{X}$) and standard deviations (S.D.) of the obtained scores, respondents were classified into three categories as shown below:

Categories	Score range
Low	Below 22
Medium	22-24
High	Above 24

To measure the level of awareness fourteen climate resilient agro-tehnologies were considered and the farmers were categorised as Aware/unaware against each climate resilient agro-technology. After that the frequency and percentage of each category was calculated. Frequency, mean, SD, CV and t- test were the statistical tools used for analysis and interpretation of data.

Results and Discussion

Knowledge on climate resilient agro-technologies of participant and non-participant farmers

It is evident from Table 1 that majority of the participant farmers (56.25%) had medium level of knowledge on climate resilient agro-technologies, followed by 20.00 per cent respondents with high level of knowledge. Only 15.00 per cent of the participant farmers were found with low level of knowledge .The co-efficient of variation (8.01%) indicated that the participant farmer respondents were highly homogeneous with respect to their level of knowledge on climate resilient agro-technologies. Regarding the level of knowledge on climate resilient agro-technologies of the non-participant farmers, majority of them (83.75%) had low level of knowledge, followed by 16.25 per cent with medium level of knowledge. None of the non-participant farmers were found with high level of knowledge on climate resilient agro-technologies. The co-efficient of variation (40.93%) indicated that the non-participant farmer respondents were relatively heterogeneous with respect to their level of knowledge on climate resilient agro-technologies. The mean knowledge level score of participant farmers (23.08) was much higher than that of the non-participant farmers (12.85).The difference between the mean level of knowledge on climate resilient agro-technologies of participant and non-participant farmers were 10.23. The significance of the difference between two sample means was tested by employing t-test. The't' value was found to be significant at 0.01 level and it indicates that the project interventions had significant impact on the participant farmer's level of knowledge on climate resilient agro-technologies introduced under the project.

Awareness of participant and non-participant farmers about climate resilient agro-technologies

The findings presented in Table 2 revealed that all the participant farmers (100%) were aware about all the fourteen climate resilient agro-technologies considered in the study, while differential level of awareness was observed among the non-participant farmers regarding the climate resilient agro-technologies considered in the study.

Table.1 Distribution of respondents according to their level of knowledge on climate resilient agro-technology n=160

Category of farmers	Level of knowledge			Mean	SD	CV	t value
	Low	**Medium**	**High**				
Participant	15 (18.75)	45 (56.25)	20 (25.00)	23.08	1.85	**8.01**	**3.47***
Non participant	67 (83.75)	13(16.25)	0(0.00)	12.85	5.26	**40.93**	

Figure in parenthesis indicate percentage   * significant at 0.01 level

Table.2 Distribution of respondents according to level of awareness on climate resilient agro-technology n=160

Climate resilient agro-technology	Number of Participant farmers		Number of Non-participant farmers	
	Aware	Not aware	Aware	Not aware
1. Growing short duration *sali* rice cultivar for dry spell management	80 (100.00)	0 (0.00)	80 (100.00)	0 (0.00)
2. Growing medium duration *sali* rice cultivar for dry spell management	80 (100.00)	0 (0.00)	80 (100.00)	0 (0.00)
3. Growing alternate crops for dry spell management	80 (100.00)	0 (0.00)	55 (68.75)	25 (31.25)
4. Crop diversification for dry spell management	80 (100.00)	0 (0.00)	65 (81.75)	15 (18.75)
5. Growing hybrid maize cultivar in the driest period of the year	80 (100.00)	0 (0.00)	80 (100.00)	0 (0.00)
6. Rain water harvesting in farm ponds and use of harvested rain for irrigation of *rabi* crops	80 (100.00)	0 (0.00)	80 (100.00)	0 (0.00)
7. Rain water harvesting in farm ponds and use of harvested rain water for raising seedling of *sali* rice	80 (100.00)	0 (0.00)	80 (100.00)	0 (0.00)
8. Use of organic manure (vermi-compost/compost)	80 (100.00)	0 (0.00)	80 (100.00)	0 (0.00)
9. Diversification of Farming system	80 (100.00)	0 (0.00)	55 (68.75)	25 (31.25)
10. Application of NPK for drought management in *sali* rice	80 (100.00)	0 (0.00)	25 (31.25)	55 (68.75)
11. Animal feed management through growing of fodder crops	80 (100.00)	0 (0.00)	75 (93.75)	5 (6.25)
12. Protected cultivation of high value crops	80 (100.00)	0 (0.00)	60 (75.00)	20 (25.00)
13. Double cropping	80 (100)	0 (0.00)	65 (81.25)	15 (18.75)
14. *In-situ* rain water harvesting for moisture conservation (mulching)	80 (100.00)	0 (0.00)	80 (100.00)	0 (0.00)

Figures within parentheses indicate percentage

All of the non-participant farmers (100.00%) were found to be aware of the climate resilient agro-technologies, viz., growing short duration *sali* rice cultivar for dry spell management, growing medium duration *sali* rice cultivar for dry spell management, growing hybrid maize cultivar in the driest period of the year, rain water harvesting in farm ponds and use of harvested rain for irrigation of *rabi* crops, use of organic manure (vermi-compost/compost) and *in-situ* rain water harvesting for moisture conservation (mulching). The percentage of non-participant farmers varied from 31.25 per cent to 93.75 percent as regards to their level of awareness regarding the other climate resilient agro-technologies under consideration.

Findings on knowledge level of participant farmers on climate resilient agro-technologies revealed that majority of the participant farmers had medium level of knowledge. This implies that existing extension educational efforts made under the project need to be strengthened and streamlined to enhance the knowledge and awareness level of participant farmers on climate resilient agro-technologies.

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