J Krishi Vigyan 2018, 7(1) : 124-128 DOI : 10.5958/2349-4433.2018.00115.0

Extent of Adoption of Climate Resilient Technologies in Adopted Villages of Chatra District in Jharkhand

D Oraon, R K Singh, V K Pandey, V P Rai, U K Singh and Z Alam

Krishi Vigyan Kendra, Chatra-825 401
Birsa Agricultural University, Ranchi (Jharkhand)

ABSTRACT

Adoption index of climate resilient technologies was studied in Mardanpur and Gari villages where NICRA project was on operation by KVK, Chatra. It was observed that majority of the climate resilient technology demonstrating farmers of both village were under the medium adopter categories followed by high and low. A correlation analysis showed that six independent variables *i.e.,* family size, farm size, herd size, family income, access of natural resources and access to market., were found to influence extent of adoption significantly. Regression analysis between independent variables and extent of adoption inferred that access to natural resource and innovativeness were found to be significant ($P<0.01$). The rest of the variable were found to be non significant. Result advised that agencies concerned with transfer of technologies should give more emphasis on demonstrations, exhibitions, field days, crop days, *kisan mela*, exposure visit, field schools etc. on climate resilient technologies and ensure more participation and interaction of farmers. Similarly, more number of training programmes on climate resilient technologies need to be organized.

Key Words: Adoption, Climate, Farmers, Resilient technology, Village.

INTRODUCTION

Enhancing the resilience of Indian agriculture to cope with climate variability and climate change is imperative to the livelihood security of small and marginal farmers in the country. Promoting appropriate adaptation strategies will enable farmers to cope with various climate risks, promote efficient use of natural resources to bring sustainability to farm production and stability. The aim is to build the resilience of the farming community to face extreme weather events such as droughts, floods, cyclones, unseasonal rains, heat and cold wave. Demonstration of appropriate practices and technologies with a climate focus evolved by the State Agricultural universities is taken up in farmer participatory mode under National Initiative on Climate Resilient Agriculture (NICRA) adopted villages.

The overall focus of technology demonstrations under NICRA is to enhance resilience of farms and the farming community to climate risks so as to ensure sustainability over a period of time. Farmers need to intelligently adapt to the changing climate in order to sustain crop yields and farm income. Traditionally, technology transfer in agriculture has aimed at enhancing farm productivity. Current threat due to climate variability will only exacerbate this vulnerability, particularly for small and marginal farmers owing to their lack of risk bearing ability. Increased frequent droughts as well as high intensity rainfall are affecting agriculture production. Farmers are increasingly witnessing drought and flood like situations during the same season. While increased drought frequency is a real cause of concern, high intensity rainfall can also be turned into opportunities, provided the community

Corresponding Author's Email : ranjaykumarsingh_06@rediffmail.com

is enabled to harvest the runoff and use it efficiently. Similarly, delay in onset of monsoon and its early cessation are limiting production and productivity of rainfed areas threatening food security of poor households. However, there is not much that can be done in short term to reverse the trend in climate variability, certainly there is much to do in terms of enhancing the capacity of the farming community to adapt to variable climatic patterns.

Jharkhand is a state with very diverse agricultural production systems, exposure to a long coast- line, continuous harnessing of the river waters for irrigation, varied agro climatic situations as well as existence of different types of soils. Natural vegetation, precipitation patterns and more than anything, hard working and innovative farmers offer unlimited possibilities for adoption of climate resilient technologies. There are excellent untapped potential for export of fruits such as Aonla, Jackfruits, Guava, spices like chilies, food grains like rice, pulses and vegetable crops such as tomato, brinjal and medicinal and aromatic plants. The farmers need support by way of researched information on climate resilient technologies and dedicated extension workers and NGOs can help the farmers of Jharkhand. Hence, an effort was made to study the extent of adoption of climate resilient technologies and to analyze the relationship between the extent of adoption and profile characteristics of the demonstrating farmers.

MATERIALS AND METHODS

An exploratory research design was followed and the study was undertaken in two purposively selected villages of Arra panchyat in Chatra block namely Mardanpur and Gari of Chatra District where 11 climate resilient agriculture technologies were demonstrated at farmers' field. These were introduction of drought tolerant rice varieties Anjali, Vandana, Abhishek, Sahbhagi, introduction of low water requirement crops like Ragi, Niger, Sweet potato and sesame, advancing sowing date of mustard and wheat during first fortnight of October, spraying of insecticide and pesticide for control of disease and pest in crops and vegetables, inter cropping of maize and pigeon pea (1:1 ratio), inter cropping of maize + black gram in 1:1 ratio, sub-sequential community paddy nursery raising, establishing custom hiring centre for timely operation, aerobic and direct seeded rice cultivation in upland, decomposition of plant leaf, rice and wheat stubble in field and green manuring in medium and low land. A total number of 80 respondents *i.e.,* 40 farmers from each selected village were selected as a respondents of the study.

To study the extent of adoption by the farmers, a semi structured interview schedule was developed. The instrument consisted of climate resilient crop production practices under different management situation on a two point continuum i.e. adopted or not adopted. Based on the responses of the farmers frequencies and percentages were calculated to study the extent of adoption of climate resilient technologies practices. To study the adoption quotient, the scores for all the recommended practices by each farmer were added and then the adoption quotient for each individual was worked out. The adoption quotient was used to find out the overall adoption of the climate resilient technologies by the farmers in each of selected villages. Based on the adoption quotient values, the farmers were grouped as low, medium and high categories by using class interval method.

RESULTS AND DISCUSSION

Extent of Adoption of Climate Resilient Technologies

The data (Table 1) show that majority of climate resilient demonstrating farmers of Mardanpur and Gari villages were under the medium adoption category *i.e.* (57% & 65%) followed by high (28% & 18%) and low (15% & 17%) adopter categories. The trend might be due to the fact that, majority of them were under middle to young age, possessed high school level education, good access to natural resources, source of information and market, involvement of scientist of KVK and

ATMA functionaries in promoting and educating and motivating them to adopt the climate resilient technologies. Further, it was also observed that lack of knowledge on complex practices, cost involved and insufficient time were the major reasons which compelled them to belong to medium level of adoption. The finding were the consonance with that Rakshit *et al* (2016) Junial *et al* (1991) and Savitha(2010).

Table 1. Distribution Of Climate Resilient Technologies Demonstrating Farmers According to their Adoption of Climate Resilient Technologies.

Sr. No	Category	Mardanpur (N=40)		Gari (N=40)		Total (N=80)	
		f	%	f	%	f	%
1	Low	6	15	7	17	13	16
2	Medium	23	57	26	65	49	61
3	High	11	28	7	18	18	23

Correlation analysis between independent variable and extend of adoption

The data (Table 2) show that six independent variables selected for the study were found to be influencing the extent of adoption significantly. Situational variables namely, access to natural resource and access to market were correlated significantly and positively at 0.001 percent level of probability whereas, in case of personal variables, family size was found to be correlated positively at 0.05 percent probability and socio economic variables namely, farm sixe, herd size and annual family income where found to be correlated significantly and positively at 0.01 percent level of probability.

Table 2. Correlation between independent variables of demonstrated farmers and extent of adoption of climate resilient technologies.

Sr. No	Independent variable	'r' values
1	Age	0.0441 NS
2	Education	0.1968 NS
3	Farming experience	0.0249 NS
4	Family size	0.3158**
Socio-economic variables		
5	Farm size	0.2601***
6	Sources of information	0,00.118 NS
7	Herd size	0.4010***
8	Farming system	0.2086 NS
9	Family income	0.2820***
Situational variables		
10	Cropping intensity	0.0603 NS
11	Access to natural resources	0.5305*
12	Access to market	0.4516*
Psychological variables		
13	Scientific orientation	0.0084 NS
14	Innovativeness	0.0134 NS
15	Risk orientation	0.0574 NS
16	Fatalisom	0.1068 NS

* Significant at 0.001 level of probability, ** Significant at 0.05 level of probability

*** Significant at 0.1 level of probability

A positive and significant relationship was observed between extend of adoption and personal variables. It was found from the literature that climate resilient technologies demand more labour at appropriate time. The farmers with medium to big family size would not find it difficult to participate in the family farm activities and participate in preparation of various crops production practice like land preparation, weed margent, insect pest management and harvesting and processing on time etc might be the reason for such results.

In socio-economic variables, farm size, herd size and annual family income were correlated positive, farm size, herd size and annual family income were found to be the most contributing factors for adopting climate resilient technologies. This showed the possibility of adopting climate resilient technologies, if the farmers possess big farm size, large herd size and with high annual income might have showed interest to try out new ventures on experimental basis and can afford to take possible risk if any in the initial period. The findings were in

Table 3. Regression analysis between independent variables of demonstrated farmers and extent of adoption of climate resilient technologies.

Sr. No	Independent variable	Partial regression coefficient	Standard error	t-value
Personal variables				
1	Age	0.1677	0.11461	1.3343
2	Education	0.6208	0.5438	1.1163
3	Farming experience	-0.0730	0.1334	0.6914
4	Family size	0.0644	0.6707	0.0922
Socio-economic variables				
5	Farm size	-0.0611	0.1688	0.3014
6	Sources of information	-0,0172	0.1405	0.1302
7	Herd size	0.6262	0.3581	1.6148
8	Farming system	8.1678	0.7965	1.2428
9	Family income	0.0226	0.0301	0.5613
Situational variables				
10	Cropping intensity	0.0108	0.0264	0.4177
11	Access to natural resources	1.617	0.5787	3.4432*
12	Access to market	0.6434	0.4814	1.1158
Psychological variables				
13	Scientific orientation	-0.0542	0.4602	0.1465
14	Innovativeness	-0.5600	0.2565	2.2233*
15	Risk orientation	0.2430	0.4720	0.4847
16	Fatalism	-0.1222	0.5020	0.2628

$R^2 = 0.6324$; F=3.065 *Significant at 1 percent level of probability;
NS = Non significant.

consonance with that of Chouhan *et al* (2013).

Regression analysis between independent variables and extent of adoption

The results inferred that access to natural resources and innovativeness were found to be significant at 1 per cent level of probability. The rest of the variables were found to be non-significant (Table 3). From the significant value of R^2, it can be concluded that, only 2 variables contributed up to 53.24 per cent of variation on the extent of adoption of climate resilient technologies and the remaining 46.76 per cent variation was due to extraneous variables. An over view of table on regression analysis indicated that, all the sixteen independent variables included under personal, socio-economic, situational and psychological characteristic explained about 53.24 per cent of variation in the extent of adoption of climate resilient technologies

The situational variable access to natural resources and psychological variable innovativeness were significant in predicting the extent of adoption of climate resilient technologies. It was clear from the above results that, farmers who had more access to natural resources and high innovativeness tends to adopt climate resilient technologies

Past studies and experiences indicated that, an innovative farmer always reaped windfall profits from new technologies. An innovation in farming has the potential to exploit new markets and thereby

an innovator can command the market and get remunerative prices for the produce. It was clear that the farmers who are more innovative will try to gather the information from all the media sources available to them once they find a new method/ idea in the agriculture. They will try to utilize the knowledge of that particular practice/idea to decide the pros and cons of it before actually implementing it in their fields. These farmers always try to follow new practices and methods of cultivation and will be more informative than the other farmers with respect to climate resilient technologies hence it was found significant in predicting the extent of adoption of climate resilient technologies

CONCLUSION

It was concluded that agencies concerned with transfer of technology should given more emphasis on demonstrations, exhibitions, field days, crop days, *kisan melas*, visit to research stations, field schools, campaigns etc to ensure more participation and interaction of farmers. They should also organize more number of training programmes and ensure the timely supply of crop inputs for faster adoption of climate resilient technologies.

REFERENCES

Rakshit S, Padria R N and Bomdyo padhya S (2016). Farmers adoption strategies cropping behavior and barriers to effective adoption to current climate risks A Study on Sundarban region. *Indian J Ext Edu* **53** (3&4) : 17-20.

Chouhan S, Singh S R K, Panda A K and Gautam U S (2013). Adoption dynamics of improved sugarcane cultivation in Madhya Pradesh. *Indian Res J Ext Edu* **13** (2) :26-27.

Kafle B (2010). Determinants of adoption of improved maize varieties in developing countries. *Indian Res J Appl Basic Sci* **1**:1-7.

Received on 20/2/2018 *Accepted on 30/6/2018*