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Extent of awareness of farmers regarding climate resilient technologies in Rewa block of Rewa district (M.P.)

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Abstract
The present study was undertaken in Rewa block of Rewa district. Through random sampling, one hundred twenty farmers from Rewa block were selected purposively because Krishi Vigyan Kendra and College of Agriculture, Rewa are situated in this block. Farmers' access to Climate Resilient Technologies is comparatively easy than the farmers of others blocks of Rewa district. The result showed that 52.50 percent farmers exhibited medium level of awareness and 45.83 percent exhibited medium level of adaptation regarding Climate Resilient Technologies.

Keywords: Climate resilient technologies, Krishi Vigyan Kendra, awareness, adaptation, climate change

Introduction
Climate change is comparatively a new threat which is being faced by the world community in the recent years. Scientists and environmentalists have assessed that a change in the temperature by 1 ^{0}C may pose threat to about 30 percent of flora and fauna. Looking to the extent, farming community is most likely to affect as Indian agriculture is predominantly dependent on monsoon. In recent year distribution in amount of rainfall in the monsoon has also been observed. The impacts of changing climate on agricultural have been severely felt in India. In recent years it has been projected that under the scenario of a 2.5 ºC to 4.9 ºC temperature rise in India. Rice yield will drop by 32%-40% and wheat yield by 41-52%. This would cause GDP to fall by 1.8%-3.4% (GOI, 2011). There has been growing interest regarding human perception and value system toward climate change.

To enhance the resilience of Indian agricultural (including crops, livestock and fisheries) to climatic variability and climate change through strategic research on awareness and adaptation, National Initiative on Climate Resilient Agricultural (NICRA) Program was launched in 2010-11 by ICAR, New Delhi. The farmer's adaptation strategy to a large extent depends upon their perception and attitude they hold regarding climate change. Adaptation to climate change involves changes in agricultural management practices in response to change in climate condition (Shyam, 2015) [3].

Awareness on the climate change impacts is gaining more importance so in developing countries like India as variability in monsoonal rainfall as well as frequency of extreme weather events is on rise. Thus there is a necessity to educate the farmers on this important weather variable and unless they are educated thoroughly on the quantum and distribution of rainfall, contingent crop planning at the farm level by the farmer himself remains a mirage (Rao *et al*. 2011) [2].

A study was conducted with the following specific objectives
1. To know the socio-personal, economical, communication and psychological characteristics of the respondents.
2. To study the extent of awareness of farmers regarding Climate Resilient Technologies.

Methodology
The present study was conducted in Rewa district of Madhya Pradesh in 2018-19. CRIDA-ICAR worked out in the year 2013 that Rewa district comes under highly vulnerable district to climate change. Therefore it is right time to know the extent of awareness in this district. Hence, Rewa district was selected purposively for the study.

Out of 9 blocks Rewa block was selected purposively as Krishi Vigyan Kendra and College of Agriculture, Rewa situated in this block. Ten villages were selected randomly for the present study with the help of KVK scientist and other officials. The farmers were selected from each village through proportionate random sampling method to get a sample of 120 respondents.

Results

Table 1: Socio-personal, economical, communication and psychological characteristics of the respondents

S. No.	Variables	Categories	Frequency	Percentage
1.	Age	Young	25	20.83
		Middle age	61	50.83
		Old	34	28.33
2.	Education	Illiterate	13	10.83
		Up to primary level	22	18.33
		Up to middle level	26	21.66
		High school & above	59	49.16
3.	Land holding	Marginal	20	16.66
		Small	31	25.83
		Medium	40	33.33
		Large	29	24.16
4.	Farming experience	Low	36	30.00
		Medium	52	43.33
		High	32	26.66
5.	Farm resources	Low	33	27.50
		Medium	67	55.83
		High	20	16.66
6.	Social participation	Low	28	23.33
		Medium	80	66.66
		High	12	10.00
7.	Local personal channels	Low	39	32.50
		Medium	56	46.66
		High	25	20.83
8.	Local cosmopolitan channels	Low	30	25.00
		Medium	58	48.33
		High	32	26.66
9.	Mass media contact	Low	28	23.33
		Medium	53	44.16
		High	39	32.50
10.	Innovative proneness	Low	27	22.50
		Medium	55	45.83
		High	38	31.66
11.	Risk orientation	Low	21	17.50
		Medium	29	24.16
		High	70	58.33
12.	Scientific orientation	Low	27	22.50
		Medium	58	48.33
		High	35	29.16
13.	Knowledge regarding climate change	Low	35	29.16
		Medium	59	49.16
		High	26	21.66
14.	Change proneness	Low	32	26.66
		Medium	62	51.66
		High	26	21.66

Data presented in Table 1 shows that majority belonged to middle age group (50.83%) and educated up to high school & above (49.16%), one third (33.33%) respondents had medium size of land holding and 43.33 per cent had medium farming experience. More than half of the respondents (55.83%) had medium farm resources. About 66.66 per cent respondents had medium social participation and had medium local personal channels (46.66 per cent) with medium cosmopolitan channels (48.33 per cent). A sizable group of the respondents (44.16%) had medium mass media contact and had medium innovative proneness (45.83 per cent). More than half of the respondents high (58.33%) risk orientation to climate resilient technologies and near to half of the respondents (48.33%) had medium scientific orientation to climate resilient technology, while about fifty percent respondents (49.16 per cent) had medium knowledge regarding climate change and had medium change proneness (51.66 per cent).

Table 2: Extent of awareness of farmers regarding Climate Resilient Technologies

S. No.	Technologies	Awareness			Total score	Mean score	Index	Rank
		High	Medium	Low				
A.	**Natural resource management technology**							
1.	Moisture conservation	62	42	16	286	2.28	79.44	I
2.	Water harvesting and recycling for supplemental irrigation	35	55	30	245	2.04	68.05	II
3.	Water saving irrigation method	28	50	42	226	1.88	62.77	IV
4.	Conservation tillage	32	58	30	242	2.01	67.22	III
5.	Artificial ground water recharge	20	40	60	200	1.66	55.55	V
	Average Mean: 1.97							
B.	**Crop management technology**							
1.	Drought / temperature tolerant varieties	35	58	27	248	2.06	68.88	III
2.	Advancement of planting dates of rabi crop in areas with terminal heat stress	55	47	18	277	2.30	76.94	I
3.	Water saving paddy cultivation methods (SRI, direct seeding)	42	58	20	262	2.18	72.77	II
4.	Frost management in horticulture through fumigation	28	60	32	236	1.96	65.55	V
5	Community nurseries for delayed monsoon	28	48	44	224	1.86	62.22	VI
6	Custom hiring centers for timely planting	36	50	34	242	2.01	67.22	IV
	Average Mean: 2.06							
C.	**Livestock and fisheries technology**							
1.	Demonstration of fodder production	28	45	47	221	1.84	61.38	III
2.	Preventive vaccination	38	62	20	258	2.15	71.66	I
3.	Management of fish pond during water scarcity and excess water	11	35	74	177	1.47	49.16	IV
4.	Breed up – gradation and nutrient supplement management	30	50	40	230	1.91	63.88	II
	Average Mean: 1.84							
D.	**Institutional intervention**							
1.	Establishment of seed bank	36	53	31	245	2.04	68.05	I
2.	Establishment of fodder bank	22	32	66	196	1.63	54.44	III
3.	Creation of agriculture commodity groups	32	50	38	234	1.95	65.00	II
4.	Collective marketing	14	31	75	179	1.49	49.72	V
5	Climate literacy program	20	30	70	190	1.58	52.77	IV

Average Mean: 1.73
Overall average mean 1.9

Natural resource management technology
Mean awareness score in natural resource management technology was highest in Moisture conservation (mean score 2.28, rank I) followed by water harvesting and recycling for supplemental irrigation (mean score 2.04, rank II), conservation tillage (mean score 2.01, rank III), water saving irrigation method (mean score 1.88, rank IV) and artificial ground water recharge (mean score 1.66, rank V) respectively.

Crop management technology
It was observed that the mean awareness score in crop management technology was found highest in advancement of planting dates of rabi crop in areas with terminal heat (mean score 2.30, rank I) followed by water saving paddy cultivation methods (SRI, direct seeding) (mean score 2.18, rank II), drought / temperature tolerant varieties (mean score 1.05, rank III), custom hiring centers for timely planting (mean score 2.01, rank IV), frost management in horticulture through fumigation (mean score 1.96, rank V) and community nurseries for delayed monsoon (mean score 1.86, rank VI) respectively.

Livestock and fisheries technology
It was observed that the mean awareness score in livestock and fisheries technology was found highest in preventive vaccination (mean score 2.15, rank I) followed by breed up gradation and nutrient supplement management (mean score 1.91, rank II), demonstration of fodder production (mean score 1.84, rank III), management of fish pond during water scarcity and excess water (mean score 1.47, rank IV) respectively.

Institutional intervention
It was observed that the mean awareness score in Institutional intervention was maximum in establishment of seed bank (mean score 2.04, rank I), creation of agriculture commodity groups (mean score 1.95, rank II), establishment of fodder bank (mean score 1.63, rank III), climate literacy program (mean score 1.58, rank IV), and collective marketing (mean score 1.49, rank V) respectively.
Among all the climate resilient technologies mean awareness score of crop management technology was highest (2.06) followed by natural resource management technology (1.97), livestock and fisheries technology (1.84) Institutional intervention (1.73) respectively. It was also found that overall average mean awareness score of all technology was 1.9.

Table 3: Awareness of respondents regarding Climate Resilient Technologies

S. No.	Climate Resilient Technologies	Awareness Index	Rank
1.	Natural resource management technology	66.60	II
2.	Crop management technology	68.93	I
3.	Livestock and fisheries technology	61.52	III
4.	Institutional intervention	58.08	IV

Awareness of respondents regarding Climate Resilient Technologies
The awareness index of different climate resilient technologies among the farmers shows awareness of the farmers to climate resilient practices to cope up with climate change. It is evident that the crop management technology occupied I rank having the highest (68.93) awareness index followed by natural resource management technology (66.60

awareness index), livestock and fisheries technology (61.52 awareness index) and institutional intervention (58.08 awareness index). The finding of Sarkar and Padaria (2015) [4] supports this result.

Table 4: Distribution of the respondents according to their overall awareness of Climate Resilient Technologies.

S. No.	Extent of awareness	No. of respondents	Percentage
1	Low	27	22.50
2	Medium	63	52.50
3	High	30	25.00
	Total	120	100

Overall awareness of the respondents towards Climate Resilient Technologies.

The perusal of the data presented in Table 4 showed that out of total, a higher percentage of the respondents exhibited medium level of awareness regarding climate resilient technologies (52.50 percent) followed by high level of awareness regarding climate resilient technologies (25.00 percent) and only 22.50 percent respondents showed low awareness regarding climate resilient technologies.

Table 5: Summary of association between profile of the respondents and awareness regarding Climate Resilient Technologies.

S. No.	Characteristics	χ^2	D.f	C	Degree of association
1.	Age	6.26*	4 d.f	0.11	Negligible
2.	Education	19.44	6 d.f	0.38	Fair
3.	Landholding	15.27	6 d.f	0.34	Fair
4.	Farming experience	13.22	4 d.f	0.32	Fair
5.	Farm resources	13.65	4 d.f	0.32	Fair
6.	Social participation	4.71*	4 d.f	0.10	Negligible
7.	Local personal channels	11.59	4 d.f	0.31	Fair
8.	Local cosmopolitan channels	10.79	4 d.f	0.11	Fair
9.	Mass media contact	10.34	4 d.f	0.29	Fair
10.	Innovative proneness	11.49	4 d.f	0.31	Fair
11.	Risk orientation	27.74	4 d.f	0.42	Fair
12	Scientific orientation	11.58	4 d.f	.0.31	Fair
13	Knowledge regarding climate change	25.19	4 d.f	0.40	Fair
14	Change proneness	18.33	4 d.f	0.38	Fair

*Non Significant at 0.05 level of significance

Association between profile of the respondents and awareness regarding Climate Resilient Technologies

The 'χ^2' and 'C' value indicating the association between profile of the respondents with their awareness regarding climate resilient technologies. The characteristics namely, education, size of land holding, farming experience, farm resources, local personal channels, local cosmopolite channels, mass media contact, innovative proneness, risk orientation, scientific orientation, Knowledge regarding climate change, change proneness had significant relationship with their awareness and had fair degree of association. The result also depict that age and social participation establish non-significant relation and negligible degree of association with awareness regarding Climate Resilient Technologies.

Conclusion

Efforts regarding climate resilient technology needs extension intensification to generate more and effective awareness. Most of the results indicate that farmers are dwelling in a situation of indecisiveness which can effectively be transformed into positive side through a chain of demonstration and trainings. Simultaneously, involvement of local youth and rural children into climate literacy programmes can bring desirable level of awareness to mitigate climate change. Formal as well as informal education is essential to increase response to climate change and help them in practicing sustainable farming.

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