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CONSTRAINTS FACED BY FARMERS IN ADOPTION OF CLIMATE RESILIENT TECHNOLOGIES

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KEYWORDS

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ABSTRACT

National Innovations on Climate Resilient Agriculture (NICRA) project was launched by ICAR in 2011 to develop climate-resilient agriculture technologies through strategic research. It demonstrates and reinforced to accept better practices and wide-ranging technologies for mitigating climate risk to make farming as a profitable business. The current study was carried out in the Anantapur district of Andhra Pradesh, India. The sample consists of 60 farmers as beneficiaries from NICRA villages and 60 farmers as nonbeneficiaries from non-NICRA villages were selected randomly. The ex-post facto research design was used in the study. The constraints faced by the farmers for adoption of climate resilient technologies were lack of sufficient rainfall, lack of owned resources, lack of short duration and drought tolerant crop varieties, lack of knowledge about climate resilient practices, and inadequate financial support. The key suggestions given to the respondents for implementation of climate resilient technologies are the provision of technical guidance and information should be delivered on regular basis, training programs should be conducted about climate resilient practices, financial assistance should be rendered for water and soil conservation and need based technology demonstrations should be given.

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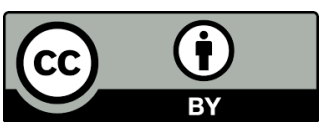

1 Introduction

Climate change is one of the important aspects of concern for our country to ensure food and nutrition security to the increasing population. The impacts of climate change are worldwide, but developing countries like India are extremely vulnerable as the large proportion of the population depends on agriculture. As per the latest report, the global average temperature rise is 0.99^0 C since the pre-industrial time of 1850 (Schmidt et al., 2019). The year 2016 ranks as the warmest year, 16 of the 17 warmest years in the 136 year record all have occurred since 2001. The predicted upsurge in temperature will be in the range of 0.5–1.2°C by 2020, 0.88–3.16°C by 2050, and 1.56–5.44°C by the year 2080 (IPCC 2007). Previous studies in India revealed that there are significant adverse impacts of climate change, predicted to be a decline in the yields by 4.5 to 9.0%, based on the magnitude and distribution of warming. The agriculture sector is contributing about 17.4% of India's GDP, and 4.5 - 9.0% negative impact on production implies a cost of climate change to be roughly up to 1.5% of GDP per year. Therefore, the Government of India has accorded extra priority on research and development to deal with climate change in general and agriculture. The Prime Ministers National Action Plan over climate change has recognized agriculture as one of the 8 national missions, to encounter the challenges of sustaining domestic food production in the face of changing climate and to produce information on adaptation and mitigation in agriculture. During the XI Five year plan, ICAR started a network project 'National Initiative on Climate Resilient Agriculture' in February 2011, and in XII five-year plan, it is referred as 'National Innovations in Climate Resilient Agriculture' (NICRA).

The project targets to increase the resilience of agriculture to climate change and climate vulnerability through strategic research and technology demonstration, sponsored grants, and capacity building. The technology demonstration component and capacity building component of the NICRA project have paved the way to climate resilience in the project villages. But the extent of adoption and diffusion of climate resilient technologies in these areas is low which has led to low resilience to climate change. Countering the importance and facts in view, the present research was carried out with the objective, to explicate the constraints faced by the farmers in the adoption of climate resilient technologies and suggestions to overcome the constraints.

2 Materials and Methods

The present research was conducted in the Anantapur district of Andhra Pradesh during the year 2018 - 2019. This district was purposively selected because the NICRA has been implemented in this district since its inception. Chamaluru, Chakrayapeta, and Peravalli villages were selected purposively for the study, as NICRA was implemented in these selected villages of the Anantapur district. Aakuledu, Podaralla, and Siddaramapuram villages were selected under non- NICRA villages, where the program was not implemented. From each selected village, 20 respondents were selected by simple random sampling technique. The sample comprising of 60 farmers as beneficiaries from NICRA villages and 60 farmers as nonbeneficiaries from non-NICRA villages are selected randomly. Thus, making a total sample size of 120 respondents in the study. The ex-post facto research design was used in the study. The data was collected through the personal interview method.

3 Results and Discussion

3.1 Constraints

Constraints given by the respondents were operationally defined as constraints faced by the respondents for the adoption of climate resilient technologies. The respondents were inquired to express the constraints faced by them for the adoption of climate resilient technologies and the problems as stated by them were noted. Percentages and frequencies were calculated and ranking was given in the order of magnitude.

The results presented in table 1 revealed the constraints faced by the beneficiary and non-beneficiary farmers for the adoption of climate resilient technologies. The major constraints were given as lack of sufficient rainfall with a mean score of 2.66 followed by lack of owned resources (2.49), lack of short duration and drought tolerant crop varieties (2.48), lack of knowledge about climate resilient practices (2.40), inadequate financial support (2.30), resistance to change the conventional practices (2.23), poor availability of critical inputs (2.17), high labor cost (2.04), getting benefits from climate resilient technologies are not quick (2.01), lack of awareness on climate change (1.91), lack of support from the line departments (1.85) and established structures for livestock (1.75) respectively.

It is inferred that major constraints from beneficiaries are lack of sufficient rainfall, lack of owned resources, and lack of short duration and drought tolerant crop varieties. From the results of the study, it can be concluded that major constraints from non-beneficiaries are lack of sufficient rainfall, lack of knowledge on climate resilient technologies, and lack of short duration and drought tolerant crop varieties. Results of the current study are in agreement with the findings of Jasna (2015), Archana (2017), and Dupdal & Patil (2019) those who reported similar constraints in their study.

Table 1 Constraints faced by the beneficiary and non-beneficiary farmers for adoption of climate resilient technologies

S.N.	Constraints	Beneficiaries (n1=60)			Non-beneficiaries (n2=60)			Total (N=120)		
		Score	Mean Score	Rank	Score	Mean Score	Rank	Score	Mean Score	Rank
1	Lack of awareness on climate change	121	2.01	IX	109	1.81	XI	230	1.91	X
2	Lack of knowledge on climate resilient technologies	134	2.23	VI	154	2.56	II	288	2.4	IV
3	High labour cost	127	2.11	VII	118	1.96	IX	245	2.04	VIII
4	Lack of short duration and drought tolerant crop varieties	151	2.51	III	147	2.45	III	298	2.48	III
5	Poor availability of critical inputs	129	2.15	VIII	132	2.20	VI	261	2.17	VII
6	Lack of support from line departments	110	1.83	XI	112	1.86	X	222	1.85	XI
7	Lack of sufficient rainfall	162	2.7	I	158	2.63	I	320	2.66	I
8	Lack of owned resources	157	2.61	II	142	2.36	IV	299	2.49	II
9	Getting benefits from climate resilient technologies are not quick.	117	1.95	XI	125	2.08	VII	242	2.01	IX
10	Inadequate financial support	140	2.33	V	137	2.28	V	277	2.30	V
11	Lack of established structures for livestock	106	1.76	XII	105	1.75	XII	211	1.75	XII
12	Resistance to change the conventional practices	147	2.45	IV	121	2.01	VII	268	2.23	VI

Table 2 Suggestions given by beneficiary and non-beneficiary farmers for adoption of climate resilient technologies

S. N.	Suggestions	Beneficiaries (n1=60)			Non-beneficiaries (n2=60)			Total (N=120)		
		No.	%	Rank	No.	%	Rank	No.	%	Rank
1	Awareness programs should be conducted on different climate resilient technologies under the NICRA project	41	68.33	VIII	50	83.33	III	91	75.83	VI
2	Provision of technical information and guidance should be given regularly	56	93.33	I	53	88.33	II	109	90.83	I
3	Financial assistance should be made for soil and water conservation	54	90.00	II	47	78.33	V	101	84.16	III
4	Financial assistance should be made for livestock development viz community grassland, fodder bank, and cattle shed development etc.	45	75.00	VII	41	68.33	VIII	86	71.66	VIII
5	Training programs should be conducted on climate resilient practices	51	85.00	III	55	91.67	I	106	88.33	II
6	Critical inputs should be made available on time	47	78.33	V	45	75.00	VI	92	76.67	V
7	Technology demonstrations should be delivered on need based problems.	49	81.67	IV	49	81.67	IV	98	81.67	IV
8	Follow up activities	46	76.67	VI	42	70.00	VII	88	73.33	VII

3.2 Suggestions

Suggestions of the respondents were operationally defined as the solutions given by them for the improvement in the adoption of climate resilient technologies effectively. Respondents were invited to give their suggestions to improve their adoption of climate resilient technologies, measures to overcome the existing problems faced by them in continuation of adoption. Percentages and frequencies were calculated and ranking was given in the order of magnitude.

Results presented in table 2 stated the suggestions given by beneficiary and non-beneficiary farmers for the adoption of climate resilient technologies. The majority of the respondents (90.83%) suggested that provision of technical guidance and information should be given on regular basis, followed by the training programs should conduct on climate resilient practices (88.33%), financial assistance should be made for water and soil conservation (84.16%), technology demonstrations should also be given on need based problems (81.67%), critical inputs should be made available on time (76.67%), awareness programs should be conducted on

different climate resilient technologies under NICRA project (75.83%), follow up activities (73.33%) and financial assistance should be made for livestock development viz community grassland, fodder bank, and cattle shed development (71.67%), respectively.

It is inferred that major suggestions from beneficiaries are the provision of technical guidance and information should be given on regular basis, financial assistance should be made for water and soil conservation and training programs should be conducted on climate resilient practices. It is concluded that major suggestions from non-beneficiaries are training programs should be conducted on climate resilient technologies, provision of technical information and guidance should be given on a regular basis and awareness programs should be conducted on various climate resilient practices under the NICRA project. The present findings are in line with the research work of Charitha (2017).

Conclusion

NICRA project develops and supports the adoption of diverse improved practices and technologies for mitigating climate change to provoke agriculture as a good business. The present study accentuated the constraints confronted by the respondents in adopting the climate resilient technologies and suggestions to overcome these constraints. The major constraints are lack of sufficient rainfall, lack of owned resources, and lack of short duration and drought tolerant crop varieties. Most of the farmers suggested that provision of technical guidance and information should be given on regular basis, training programs should be conducted on climate resilient technologies and financial assistance should be made for soil and water conservation.

Conflict of Interest

The authors declare that they have no conflict of interest.

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