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Constraints experienced by maize growers in adoption of climate resilient technologies in Haveri district of Karnataka

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Abstract

Climate change and food security are today's two main agrarian challenges. Adaptation of climate resilience is no doubt the greatest strategy to deal with these problems. The National Innovations in Climate Resilient Agriculture (NICRA) ICRA programme aims to make the country's most vulnerable areas climate resilient. Numerous climate-resilient technologies have been exhibited nationwide since the project's launch. Even though many programmes working on climate resilient technologies farmers are lacking behind in adopting them. In order to study the constraints faced by the farmers in adopting CRT a study was conducted in Haveri and Ranebennur taluks of Haveri district in the year 2023. The data was collected by personal interview method from 120 farmers including of 30 small and 30 big farmers from each taluk, and the data was analysed by using the suitable statistical tools. The study revealed that Majority of the farmers expressed that uneven and untimely rainfall and non availability of labours as major constraint with mean score 2.63 and 2.25 respectively, and suggested that crop insurance at farmers level and crop diversification need to be promoted.

Keywords: Constraints, Climate resilient technologies, Maize growers.

Introduction

India's agriculture industry is being impacted by climate change (Vijayabhinandana *et al*., 2022) [9]. Significant crop losses, food price volatility, and insecurity of livelihood are caused by climate change and extreme risks such floods and severe droughts (Ghanghas *et al*., 2015; Meena *et al*., 2022) [2, 4]. Many impacts of climate change on agriculture include altered cropping patterns, increased pest and disease incidence, and decreased agricultural productivity (Ashoka *et al*., 2022) [1]. Due to rising temperatures, widespread glacier melting, changes in the frequency of catastrophic events, and other factors, climate change has also gained international attention and urgency (Pabba *et al*., 2022) [6].

Resilience management practices are more visible in many areas to enhancing agricultural productivity and it is critical for ensuring food and nutritional security for poor of the poorest. Therefore, it is of utmost importance to promote the resilience agriculture to climate change is gaining importance.

Resilience management techniques are more widely used to increase agricultural output, and they are essential for ensuring the food and nutritional security of the world's poorest people. Promoting agriculture's ability to adapt to climate change is so crucial and becoming more important. Resilience is the capacity of a system and its constituent parts to foresee, absorb, accommodate, or recover from the effects of a hazards event in a timely and effective manner, including by ensuring, preserving, restoring, or improving its fundamental structure and functions. When the external environment improves, it describes a system's capacity to quickly return to normal condition after shock. Planned adoption is essential to increase the agricultural production under adverse climatic conditions that tend to support adoption for climate resilient technologies because they increase resilience and reduce yield variability under variable climate and extreme events. Crop diversification, creating cultivars resistant to floods, droughts, and salinity stress, changing crop management practices, better water management, implementing new farm practices like resource conservation techniques, improving pest management, crop insurance, and enhancing farmers' innate technical knowledge are some possible adoption strategies. The technologies evolved by scientific community as well as common people can be adopted to cope with extreme climate events. It can reduce the risks associated with climate change and strengthen backbone sector of economy.

Even though many climate resilient technologies are developed there are problems which are faced by the farmers during adoption like cost, availability of the timely resources, site specific technologies, etc., which influences

them either not to adopt certain technology or partially adopt. Thus the present study was aimed to identifies the constraints faced by the maize growers of Haveri district in adopting CRT.

Objectives

1. To understand the constraints experienced by the maize growers in adopting CRT.
2. To know the suggestions provided by Maize growers for greater adoption of CRT.

Methodology

The study was conducted in the Haveri district of Karnataka. Based on the highest area under maize crop, Haveri and Ranebennur taluks were selected. The sample was collected randomly, three villages from each taluk was selected and from each villages 10 small farmers and 10 big farmers was selected. Thus, the total sample for the study was 120. The data was collected through personal interview method by using structured schedule and was analysed using suitable statistical tools.

Results and Discussion

The first objective of the study was to understand the constraints experienced by the maize growers in adopting CRT. Farmers are currently dealing with several issues related to their farming, including climate aberrations, high input costs, poor market prices for their produce, etc. Their current circumstances prevent them from making any improvements to their farming as a result of these aberrations. In light of this context, attempts have been made to pinpoint the challenges farmers face while adopting climate resilient technologies.

Table 1: Constraints faced by the small farmers growing maize in adoption of climate resilient technologies

Sl. No.	Items	Small farmers (n_1=60)	
		Mean score	Rank
1	Uneven and untimely rainfall	2.66	I
2	Non availability of labour to adopt climate resilient hnologies	2.50	II
3	Mono cropping	2.20	III
4	High cost of inputs	2.20	III
5	Small size land holding	2.12	IV
6	Non availability of critical inputs	1.90	V
7	Untimely release and improper scheduling of water he canals	1.80	VI
8	Limited extension activities about Climate Resilient icultural technologies	1.70	VII
9	Lack of sufficient knowledge and guidance about the mate resilient technologies	1.52	VIII
10	Power shortage	1.47	IX

Majority of small farmers growing maize reported uneven and untimely rainfall (Rank I) with mean score 2.66 as major constraint as it is a national issue where farmers suffer from irregular rainfall due to climate change followed by non availability of labours to adopt climate resilient technologies (Rank II) with mean score 2.50 as many of the agricultural practices require labour and there is shortage of labours as they are migrating to different occupation followed by mono cropping (Rank III) and high cost of inputs (Rank III) with mean score 2.20 as maize being the major crop in the area farmers are cultivating the maize crop continuously without crop diversification which leads to loss of soil fertility and also affect their income source if the crop fails as there are no other means of income and due to limited production and high demand for the inputs farmers are charged more for inputs, followed by small size land holding (Rank IV) with mean score 2.12 might be because of fragmentations of land with the nuclear family system becoming more and increase in the population which is not economical to invest in new innovations when the per capita availability of land is limited. Non availability of critical inputs (Rank V) with mean score 1.90 as farmers face problem in getting critical inputs like seeds, fertilizers, traps, pesticides etc during the peak period of season, followed by untimely release and improper scheduling of water in the canals (Rank VI) with mean score 1.80 based on the availability of water the scheduling will be done not on the requirement of the farmers which creates problem for majority of maize growers, limited extension activities about climate resilient agricultural technologies (Rank VII) with mean score 1.70 due to lack of demonstrations, training programmes by extension workers in the villages, followed by lack of sufficient knowledge and guidance about the climate resilient technologies (Rank VIII) with mean score 1.52 may be majority of farmers are less educated and unaware about various climate related technologies followed by power shortage (Rank IX) with mean score 1.47 due to remote areas and lack of proper connections.

Table 2: Constraints faced by big farmers growing maize in adoption of climate resilient technologies

Sl. No.	Items	Big farmers (n_2 =60)	
		Mean score	Rank
1	Uneven and untimely rainfall	2.53	I
2	Non availability of labour to adopt climate resilient hnologies	1.97	IV
3	Mono cropping	2.12	III
4	High cost of inputs	1.28	IX
5	Small size land holding	1.00	X
6	Non availability of critical inputs	2.35	II
7	Untimely release and improper scheduling of water he canals	1.75	VII
8	Limited extension activities about Climate Resilient icultural technologies	1.88	V
9	Lack of sufficient knowledge and guidance about the mate resilient technologies	1.82	VI
10	Power shortage	1.42	VIII

Majority of big farmers growing maize reported uneven and untimely rainfall (Rank I) with mean score 2.53 as it is problem faced by whole nation and the district has received excess rain from last year's i.e., more than 1000mm, followed by non availability of critical inputs (Rank II) with mean score 2.35 as there were many private agencies providing critical inputs but the timely availability with quality was lacking, mono cropping (Rank III) with mean score 2.10 as farmers try to avoid the problem of mechanization and harvesting majority of big farmers grow mono cropping continuously leading to soil degradation, followed by non availability of labours to adopt climate resilient technologies (Rank IV) with mean score 1.97 as there was shortage of labours in villages maize growers had to bring labour from other neighbouring villages and bare their expenses followed by limited extension activities about climate resilient agricultural technologies (Rank V) with mean score
1.88 due to lack of demonstrations, training programmes by extension workers in the villages, followed by lack of sufficient knowledge and guidance about the climate resilient technologies (Rank VI) with mean score 1.82 may be majority of farmers are less educated and unaware about various climate related technologies, followed by untimely release and improper scheduling of water in the canals (Rank VII) with mean score 1.75 followed by power shortage (Rank VIII) with mean score 1.40 may be due to improper line connections to all villages followed by high cost of inputs (Rank IX) with mean score 1.28 due to high demand for quality inputs followed by small size land holding (Rank X) with mean score 1.00 might be due to fragmentation of land from generation to generation.

Table 3: Constraints faced by the oveall maize growers in adoption of climate resilient technologies

Sl. No.	Items	Overall (n =120)	
		Mean score	Rank
1	Uneven and untimely rainfall	2.63	I
2	Non availability of labour to adopt climate resilient hnologies	2.25	II
3	Mono cropping	2.15	III
4	High cost of inputs	1.74	VII
5	Small size land holding	1.57	IX
6	Non availability of critical inputs	2.14	IV
7	Untimely release and improper scheduling of water in canals	1.81	VI
8	Limited extension activities about Climate Resilient cultural technologies	1.83	V
9	Lack of sufficient knowledge and guidance about the mate resilient technologies	1.69	VIII
10	Power shortage	1.46	X

In overall condition maize growers reported the major constraints faced by them while adopting the various climate resilient technologies were uneven and untimely rainfall (Rank I) with mean score 2.63, followed by non availability of labour to adopt climate resilient technologies (Rank II), mono cropping with mean score 2.25, (Rank III) with mean score 2.15, non availability of critical inputs (Rank IV) with mean score 2.14, limited extension activities about Climate Resilient agricultural technologies (Rank V) with mean score 1.83, untimely release and improper scheduling of water in the canals (Rank VI) with mean score 1.81, high cost of inputs (Rank VII) with mean score 1.74, lack of sufficient knowledge and guidance about the climate resilient technologies (Rank VIII) with mean score 1.69, small size land holding (Rank IX) with mean score 1.57 and power shortage (Rank X) with mean score 1.46. The results are in line with the findings of the study conducted by Murthy (2019) [5].

Table 4: Suggestions by small farmers growing maize for greater adoption of climate resilient technologies

Sl.	Suggestions	Small farmers (n_1=60)	
		Mean score	Rank
1	Crop insurance at the farmers/ micro level	1.77	I
2	Crop diversification	1.77	I
3	Creating awareness to the farmers on scientific water nagement	1.70	II
4	Increasing subsidies on micro irrigation structures	1.68	III
5	Involvement of local farmers in decision making in asing water to the canals	1.65	IV
6	Ensuring timely availability of inputs	1.60	V
7	Creating awareness to the maize growers on ironmental/ climate change.	1.53	VI
8	Conducting more demonstrations and training grammes on Climate Resilient Technologies in maize	1.43	VII
9	Conducting study tours to the successful demonstration ts of farmers practising climate resilient technologies	1.40	VIII
10	Uninterrupted power supply	1.10	IX

The second objective to know the suggestions offered by the respondents in adoption of climate resilient technologies for greater adoption in maize cultivation are depicted in the Table 4.

Majority of small farmers growing maize had expressed suggestions like crop insurance at farmers/ micro level and crop diversification (Rank I) with mean score 1.77 followed by creating awareness to the farmers on scientific water management (Rank II) with mean score 1.70, increasing subsidies on micro irrigation structures (Rank III) with mean score 1.68, involvement of local farmers in decision making in releasing water to the canals (Rank IV) with mean score 1.65, ensuring timely availability of inputs (Rank V) with mean score 1.60, creating awareness to the maize growers on environmental/ climate change (Rank VI) with mean score 1.53, conducting more demonstrations and

training programmes on Climate Resilient Technologies in maize (Rank VII) with mean score 1.43, conducting study tours to the successful demonstration plots of farmers practising climate resilient technologies (Rank VIII) with mean score 1.40 and uninterrupted power supply (Rank IX) with mean score 1.10.

Among the small farmers the pressing need of the hour is providing insurance for the crops lost during change in climate and practicing crop diversification to avoid mono cropping and improving the fertility of soil, creating awareness and educating the farmers on scientific and judicious use of water and also to provide subsidies to adopt micro irrigation so farmers can effectively use water resources. Involvement of local farmers in decision making in releasing water to the canals because irrigation department officials are releasing the water at irregular intervals which is limiting factor to the farmers to take up the climate resilient technologies, and extension agents should ensure the timely availability of quality inputs. As majority of the maize growers had low extension participation they need to be educated about the environmental changes and conducting various study tours and demonstration to cope up with the loss due to climate change. They also suggested that focus should be given for providing uninterrupted power so farmers can carry out their agricultural practices peacefully.

Table 5: Suggestions by big farmers growing maize for greater adoption of climate resilient technologies

Sl. No	Suggestions	Big farmers (n_2 =60)	
		Mean score	Rank
1	Crop insurance at the farmers/ micro level	1.67	III
2	Crop diversification	1.67	III
3	Creating awareness to the farmers on scientific water engagement	1.65	IV
4	Increasing subsidies on micro irrigation structures	1.70	II
5	Involvement of local farmers in decision making in releasing to the canals	1.50	V
6	Ensuring timely availability of inputs	1.72	I
7	Creating awareness to the maize growers on environmental/ mate change.	1.65	IV
8	Conducting more demonstrations and training programmes Climate Resilient Technologies in maize	1.46	VI
9	Conducting study tours to the successful demonstration plots armers practicing climate resilient technologies	1.45	VII
10	Uninterrupted power supply	1.27	VIII

Majority of big farmers growing maize had expressed suggestions like ensuring timely availability of inputs (Rank I) with mean score 1.71, followed by increasing subsidies on micro irrigation structures (Rank II) with mean score 1.70, crop diversification and crop insurance at farmers/ micro level (Rank III) with mean score 1.67, Creating awareness to the farmers on scientific water management and creating awareness to the maize growers on environmental/ climate change (Rank IV) with mean score 1.65, involving local farmers in decision making in releasing water to the canals (Rank V) with mean score 1.50, conducting more demonstrations and training programmes on climate resilient technologies in maize (Rank VI) with mean score 1.46, conducting study tours to the successful demonstration plots of farmers practising climate resilient technologies (Rank VII) with mean score 1.45 and uninterrupted power supply (Rank VIII) with mean score 1.27.

Among the big farmers there is more need of critical inputs at the right time and right price and ensuring more subsidy on the water saving micro irrigation equipments like drip, sprinkler, etc and also majority of the farmers are cultivating only maize crop continuously which is a most exhaustive crop hence there is also need to educate farmers on crop diversification and encouraging them to grow different crops. They also suggest there is need for crop insurance to reduce the loss and involve local farmers while making decisions related to the timing and quantity of release of water to the canals. Creating awareness on water management and climate change through training programmes, demonstrations and study tours for efficient resource management is very important. Government should provide uninterrupted power to reduce the problems faced while running motors during irrigation.

Table 6: Suggestions by overall maize growers for greater adoption of climate resilient technologies

Sl. No	Suggestions	Overall (n =120)	
		Mean score	Rank
1	Crop insurance at the farmers/ micro level	1.72	I
2	Crop diversification	1.72	I
3	Creating awareness to the farmers on scientific water nagement	1.68	III
4	Increasing subsidies on micro irrigation structures	1.69	II
5	Involvement of local farmers in decision making in releasing er to the canals	1.68	III
6	Ensuring timely availability of inputs	1.55	V
7	Creating awareness to the maize growers on environmental/ mate change.	1.59	IV
8	Conducting more demonstrations and training programmes Climate Resilient Technologies in maize	1.45	VI
9	Conducting study tours to the successful demonstration plots armers practising climate resilient technologies	1.43	VII
10	Uninterrupted power supply	1.18	VIII

From table 6 it was identified that under overall condition majority of the farmers expressed their suggestions like crop insurance at farmers/ micro level and crop diversification (Rank I) with mean score 1.72 followed by increasing subsidies on micro irrigation structures (Rank II) with mean score 1.69, creating awareness to the farmers on scientific water management and involvement of local farmers in decision making in releasing water to the canals (Rank III)

with mean score 1.68, creating awareness to the maize growers on environmental/ climate change (Rank IV) with mean score 1.59, ensuring timely availability of inputs (Rank V) with mean score 1.55, conducting more demonstrations and training programmes on Climate Resilient Technologies in maize (Rank VI) with mean score 1.45, conducting study tours to the successful demonstration plots of farmers practising climate resilient technologies (Rank VII) with mean score 1.43 and uninterrupted power supply (Rank VIII) with mean score 1.18. The results are in line with the findings of the study conducted by Manjunath (2018) [3].

Conclusion

The study was conducted to understand the constraints experienced by the maize growers in adopting Climate Resilient Technologies. The major constraints perceived by the maize growers are uneven and untimely rainfall, non availability of labour to adopt climate resilient technologies and mono cropping since, there is more labour problem extension officials should promote less labour intensive climate resilient technologies like seed cum fertilizer drill, micro irrigations, mobile app for soil testing, growing drought and pest resistant varieties etc. Majority of farmers grow maize alone which is highly exhaustive crop hence there is also need to educate farmers on crop diversification and encouraging them to grow different crops like soyabean, redgram, bean etc. Farmers should be educated about the importance and method of using various climate resilient technologies by ding appropriate extension strategies like method demonstrations, training, study tours/ trips to successfully adopted fields/farmers, etc.

Authors contribution

Latha R. Hosangadi: Conceptualization, data collection and analysis.
C. M. Savitha: Data correction, supervision, editing.
Y. N. Shivalingaiah: Analysis and curation of data.
Manjunath Gowda: correction and refinement of the analysis.
T. L. Mohan Kumar: Selection of tests and procedure for data analysis

References

1. Ashoka N, Harshavardhan M, Hongal S, Meti S, Raju R, Patil GI, *et al*. Farmers' acuity on climate change in the central dry zone of Karnataka. Indian J Ext Educ. 2022;58(3):136-41.
2. Ghanghas BS, Shehrawat PS, Nain MS. Knowledge of extension professionals regarding impact of climate change in agriculture. Indian J Ext Educ. 2015;51(3&4):125-9.
3. Manjunath KV. Adoption of climate resilient technologies by paddy growers [MSc thesis]. Bengaluru: Univ. Agric. Sci.; 2018. Unpublished.
4. Meena DC, Dubey RK, Pal R, Dubey SK, Bishnoi R. Assessment of farmer's attitude and social vulnerability to climate change in the semi-arid region. Indian J Ext Educ. 2022;58(3):46-50.
5. Murthy MA. Climate Resilience Management level among Farmers in Agriculture in Eastern Dry Zone of Karnataka [PhD thesis]. Bengaluru: Univ. Agric. Sci.; 2019. Unpublished.
6. Pabba AS, Naik VR, Rani VS, Naik BB. Adoption of climate resilient agricultural technologies by farmers in Nalgonda district of Telangana State. Indian J Ext Educ. 2022;58(2):30-4.
7. Pooja KB, Umesh, Pavithra KN. Climate change adaptation strategies by paddy growing farmers: A case study in Tungabhadra Command area of Karnataka, India. Mysore J Agric Sci. 2022;56(1):252-60.
8. Srinivasa Reddy DV, Savitha MS, Ramesh PR, Bhandi NH, Raju G, Tegggelli V, *et al*. Climate Resilient Technology to Adapt to Climate Change for Sustainable Livelihood and Production. Mysore J Agric Sci. 2023;57(2):294-300.
9. Vijayabhinandana B, Asha R, Kumar BSNSG. Adaptation methods practiced by farmers in response to perceived climate change in Andhra Pradesh. Indian J Ext Educ. 2022;58(2):81-5.