**Perceptions of Climate Resilient Technologies among Maize Farmers in Haveri District, Karnataka, India**

# Abstract

**Aims:** The study aims to evaluate maize growers' perceptions of climate-resilient technologies and investigate their socio-demographic profiles in Haveri District, Karnataka, India. **Background**: Climate change is a global phenomenon that affects the productivity of crops. Maize is a highly produced crop after rice and wheat, also the most vulnerable towards climate change. Hence, there is a need to develop various climate-resilient technologies in order to minimize the yield loss. **Methodology**: The present study was conducted in Haveri and Ranebennur taluks of Haveri district in the year 2023. to know the perception of climate resilient technologies by maize growers. The data was collected by personal interview method from 120 farmers, including 30 small and 30 big farmers from each taluk, and the data was analysed by using the suitable statistical tools. **Findings**: The findings revealed that nearly half (47.50 %) of the maize growers had average perception, followed by better (31.67 %) and poor perception on climate resilient technologies. The chi-square value of 16.26 indicated that the perception level on climate resilient technologies was significant at 1 per cent. Farming experience had a positive and significant association with the perception level of the maize growers towards climate-resilient technologies. As experience serves as the foundation for understanding about a technology, which in turn affects how an individual perceives it, and also influences their adoption behaviour. **Conclusion**: The study found that a significant percentage of farmers (51.67% small and 43.33% big) have only average knowledge of climate-resilient technologies, highlighting the need for awareness campaigns, demonstrations, and training to improve adoption and sustainable production.

**Keywords**: Perception, Climate resilient technologies, Maize growers, Profile characteristics

# Introduction

Agriculture is the backbone of the economic system of most countries. In addition to food and raw materials, agriculture also provides employment opportunities to a large population. Climate change directly affects agricultural production as this sector is inherently sensitive to climatic conditions, and it is one of the most vulnerable sectors to the impact of global climate change (Kang & Banga, 2013). Agricultural production has always been closely linked with variations in weather. Climate aberration, variability, and climate change is estimated to have a vital impact on agriculture, including changes in temperature, carbon dioxide, glacial run-off, precipitation, and interaction of these elements. The overall effect of climate change on agriculture depends on the various measures adopted to balance these effects (Praveen & Sharma, 2019). Climate change is an important issue for the 21st century, requiring renewed attention by all stakeholders to address its adverse impact on agricultural productivity, the environment, and its effect on food security (Sri et al., 2024; Fischer et al., 2001).

Resilience management practices are more visible in many areas to enhance 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 of agriculture to climate change is gaining importance (MURTHY, 2019). Effective crop management practices, such as conservation tillage in combination with residue retention/incorporation, can help counteract the adverse effects of a changing climate. Rotation in cropping patterns is a season-long but effective strategy to improve crop resilience to stress (Benitez-Alfonso et al., 2023).

Resilience is the capacity of a system and its constituent parts to foresee, absorb, accommodate, or recover from the effects of a hazard 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 practises, better water management, implementing new farm practises like resource conservation techniques, improving pest management, crop insurance, and enhancing farmers' innate technical knowledge are some possible adoption strategies (Rivero et al., 2022). The technologies evolved by the scientific community, as well as by common people, can be adopted to cope with extreme climate events. It can reduce the risks associated with climate change and strengthen the backbone sector of the economy.

Keeping the above facts in view, an attempt was made to analyse the perception of climate resilient technologies by maize growers in Haveri district of Karnataka.

# Objectives

1. To asses the perception of maize growers on climate resilient technologies.
2. To study the profile characteristics of maize growers.

# Methodology

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

# Results and Discussion

The first objective of the study was to asses the perception level of maize growers on climate resilient technologies. In the present study, perception was conceptualized as the interpretation of maize growers about climate resilient technologies, those technologies that enhance agriculture production and productivity through effective utilization of resources that improve the sustainability of maize cultivation through adoption of improved production and risk management technologies under a changing climate. For measuring the perception of maize growers schedule developed by Manjunath (2016) with suitable modifications was used.

# Table 1: Statement-wise Perception of overall maize growers towards climate resilient technologies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sl.**  **No.** | **Technologies** | **Overall**  **(n = 120)** | | |
| **A** | **UD** | **DA** |
| **No.**  **(%)** | **No.**  **(%)** | **No.**  **(%)** |
| 1 | Summer ploughing increases water content in soil and  prevent the attack of pests | 64  (53.33) | 35  (29.17) | 21  (17.50) |
| 2 | Application of pre and post emergent herbicides  improves the yield | 46  (38.33) | 44  (36.67) | 30  (25.00) |
| 3 | Ridge and furrow method of sowing is beneficiary  during early season drought | 40  (33.33) | 47  (39.17) | 33  (27.50) |
| 4 | Increasing organic matter in soil enhances water  holding capacity | 62  (51.67) | 43  (35.83) | 15  (12.50) |
| 5 | Recommended seed rate (22-27 kg/ha) helps in  producing higher yield | 34  (28.33) | 63  (52.50) | 23  (19.17) |
| 6 | Following recommended spacing(60x20 cm) helps in  maintaining optimum plant population and nutritional uptake | 37  (30.83) | 48  (40.00) | 35  (29.17) |
| 7 | Application of recommended dose of fertilizers (N:P:K -  150:65:65 kg/ha) helps in getting higher yield | 38  (31.67) | 42  (35.00) | 40  (33.33) |
| 8 | Irrigation in alternate rows helps in reducing water  loss | 52  (43.33) | 54  (45.00) | 14  (11.67) |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 9 | Application of irrigation water in Morning/Evening  session helps to prevent evaporation loses | 36  (30.00) | 64  (53.33) | 20  (16.67) |
| 10 | Adaptation of micro irrigation improves water use  efficiency during water scarcity | 70  (58.33) | 45  (37.50) | 05  (04.17) |
| 11 | Growing of drought tolerant hybrids helps to maintain  yield level | 51  (42.50) | 57  (47.50) | 12  (10.00) |
| 12 | Growing of disease and pest-resistant hybrids prevents  loss | 53  (44.17) | 52  (43.33) | 15  (12.50) |
| 13 | Thinning and weeding during prolonged dry spell  reduces competition for moisture and nutrients | 48  (40.00) | 51  (42.50) | 21  (17.50) |
| 14 | Spraying anti-transpirant (kaoline 6%) helps to reduce  transpiration during prolonged dry spell | 08  (06.67) | 46  (38.33) | 66  (55.00) |
| 15 | Intercropping with pulse crops (redgram) promotes  climate resilience through high resource efficiency | 48  (40.00) | 54  (45.00) | 18  (15.00) |
| 16 | Constructing proper drainage and dead furrows helps to  drain out excess water from the field | 56  (46.67) | 39  (32.50) | 25  (20.83) |
| 17 | Top dressing with N and K during high rainfall/flood  condition for effective nutrient management | 66  (55.00) | 44  (36.67) | 10  (8.33) |
| 18 | Staking in maize during high rainfall conditions keeps  cobs off the ground to maintain its marketable yield | 05  (04.17) | 44  (36.67) | 71  (59.16) |
| 19 | Mulching and farm pond construction help for soil-  water conservation | 46  (38.34) | 49  (40.83) | 25  (20.83) |
| 20 | Providing life-saving irrigation during the critical stage  reduces yield loss | 110  (91.67) | 10  (8.33) | 00  (00.00) |
| 21 | Proper drying and fumigation of stored grains help to  reduce moisture and prevent the attack of pests. | 64  (53.33) | 45  (37.50) | 11  (9.17) |
| 22 | Deep ploughing breaks subsurface hardpan and  conserves moisture | 62  (51.67) | 45  (37.50) | 13  (10.83) |
| 23 | Wind breaks protect crops from heat waves and  conserves moisture | 28  (23.33) | 63  (52.50) | 29  (24.17) |
| 24 | Managing the attack of pests by IPM reduces the yield  loss | 63  (52.50) | 51  (42.50) | 06  (05.00) |
| 25 | Controlling the disease incidence reduces yield loss | 63  (52.50) | 47  (39.17) | 10  (8.33) |

A- Agree, UD- Undecided, DA- Disagree,

Table 1 depicts the statement wise Perception of maize growers towards climate resilient technologies Both small and big farmers agreed on certain climate resilient technologies like providing life saving irrigation during critical stage reduces yield loss (91.67 %), adaptation of micro irrigation improves water use efficiency during water scarcity (58.33 %), top dressing with N and K during high rainfall/flood condition for effective nutrient management (55.00 %). This is

due to the fact that farmers know the importance of providing irrigation during the critical stage and nutrients for effective growth.

The respondents were undecided about certain climate resilient technologies like application of irrigation water in morning/evening session helps to prevent evaporation loses (53.33 %), following recommended seed rate which helps in producing higher yield and planting wind breakers to protect crops from heat waves and conserves moisture (52.50 %), growing of drought tolerant hybrids to maintain yield level (47.50 %). As farmers perceived that these technologies are adopted based on the need and availability of the resources.

The maize growers disagreed on certain climate resilient technologies like Staking in maize during high rainfall conditions to keep cobs off the ground to maintain its marketable yield (59.17 %), spraying anti-transpirant to reduce transpiration during prolonged dry spells (55.00 %). Application of the recommended dose of fertilizers helps in getting a higher yield (33.33 %). The reason might be the lack of knowledge on certain technologies like spraying anti-transpirant and the cost incurred to adopt.

# Table 2: Overall perception of maize growers towards climate resilient technologies

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Category** | | **Small farmers**  **(n1=60)** | | **Big farmers**  **(n2=60)** | | **Overall**  **(n =120)** | |
| **No.** | **%** | **No.** | **%** | **No.** | **%** |
| **Poor perception**  **(<52.98)** | **Mean (55.63) SD (5.30)** | 04 | 06.66 | 21 | 35.00 | 25 | 20.83 |
| **Average perception**  **(52.99-58.28)** | 31 | 51.67 | 26 | 43.33 | 57 | 47.50 |
| **Better perception**  **(>58.28)** | 25 | 41.67 | 13 | 21.67 | 38 | 31.67 |
| **Chi-square value** | | **16.26\*\*** | | | | | |

\*\* Significance at 0.01 level

It is evident from Table 2 that among small farmers growing maize, slightly more than two fourth (51.67 %) of them had an average perception on climate resilient technologies, followed by better (41.67 %) and poor (06.66 %) perception.

In the big farmers category, more than two-fifths (43.33 %) of them had average perception, followed by poor (35.00 %) and better (21.67 %) perception on climate resilient technologies.

The overall perception of maize growers on climate resilient technologies was identified that nearly half (47.50 %) of the respondents had an average perception, followed by better (31.67 %) and poor (20.83 %). With the chi-square value 16.26, it indicated that the perception level on climate resilient technologies was significant at 1 per cent.

The probable reason for average- better perception among maize growers is due to their improved knowledge and awareness about various climate resilient technologies and the farmers had medium extension contact where extension personnel act as a best information source for farmers in adopting the technologies to cope up with the adverse effects of climate change on maize crop.

# Table 3: Comparative analysis on the perception of maize growers on climate resilient technologies

**(n= 120)**

|  |  |  |
| --- | --- | --- |
| **Category** | **Mean rank** | **Mann-Whitney U test**  **(Z value)** |
| Small farmers | 76.71 | 5.11\* |
| Big farmers | 44.29 |

\*significance at 0.05 level

Comparison between small and big farmers growing maize with respect to their perception on climate resilient technologies is depicted by using- Mann-Whitney U test, and the results are shown in Table 3.

As it is evident that the big farmers had obtained a relatively lesser mean score of 44.29, while the small farmers had a mean score of 76.71. Further, the Z-value (5.11) showed the significant difference between the perception level of small and big farmers growing maize at a 5 per cent level of significance.

The reason for the better perception of small farmers might be small land holdings and a limited source of income. In order to protect their crop from the effects of climate change, they try all possible ways to acquire the knowledge or information from the experts, agricultural professionals, extension workers, and even from progressive farmers on various mitigation strategies towards climate change. As agriculture is the only source of income for many small farmers, they are prone to protect their crop by adopting new and simple technologies to improve their yield, thereby improving their income and standard of living.

# Table 4: Association between profile characteristics of maize growers (small and big farmers) and their perception of climate resilient technologies.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sl. No** | **Variable** | **Chi-square value** | | | |
| **Small farmers (n1 =60)** | **C value** | **Big farmers (n2 =60)** | **C value** |
| 1 | Age | 4.82NS | 0.273 | 6.54NS | 0.314 |
| 2 | Education | 20.21\*\* | 0.502 | 21.13\*\* | 0.510 |
| 3 | Annual income | 18.86\*\* | 0.489 | 20.57\*\* | 0.505 |
| 4 | Farming experience | 24.25\*\* | 0.537 | 24.01\*\* | 0.535 |
| 5 | Credit orientation | 2.58NS | 0.203 | 2.72NS | 0.208 |
| 6 | Economic motivation | 2.96NS | 0.217 | 3.11NS | 0.222 |
| 7 | Irrigation potential | 9.98\* | 0.378 | 10.70\* | 0.389 |
| 8 | Extension contact | 11.59\* | 0.402 | 12.54\* | 0.416 |
| 9 | Extension participation | 11.41\* | 0.400 | 10.51\* | 0.386 |
| 10 | Mass media participation | 21.11\*\* | 0.510 | 23.52\*\* | 0.531 |
| 11 | Innovative proneness | 6.82NS | 0.319 | 5.36NS | 0.286 |
| 12 | Scientific orientation | 13.83\*\* | 0.433 | 10.67\* | 0.389 |
| 13 | Knowledge about climate  resilient technologies | 13.91\*\* | 0.434 | 12.28\* | 0.412 |
| 14 | Decision-making ability | 13.48\*\* | 0.428 | 12.59\* | 0.416 |

\*\*significance at 0.01 level \*significance at 0.05 level NS- Non-significant

In case of small farmers, the characteristics like education, annual income, farming experience, mass media participation, decision-making ability, scientific orientation and

knowledge about climate resilient technologies had a positive and significant association with perception level at a one per cent level of significance. Whereas irrigation potential, extension contact, and extension participation had a positive and significant association with perception level at a five percent level of significance. However, age, innovative proneness, credit orientation, and economic motivation had a non-significant association with perception level.

In case of big farmers, the characteristics like education, annual income, farming experience, mass media participation, and decision-making ability had a positive and significant association with perception level at a one per cent level of significance. Whereas irrigation potential, extension contact, extension participation, scientific orientation, and knowledge about climate resilient technologies had positive and significant associations with perception level at a five per cent level of significance. However, age, innovative proneness, credit orientation, and economic motivation had a non-significant association with perception level.

Farming experience had a positive and significant association with the perception level of the maize growers towards climate-resilient technologies. As experience serves as the foundation for understanding about a technology, which in turn affects how an individual perceives it, and also influences their adoption behaviour.

Education had a positive and significant association with the perception level of growers towards climate-resilient technologies. The probable reason might be that an individual's knowledge of a technique or practice may have an impact on his style of thinking and how he perceives the world around him.

Mass media exposure of the maize growers had a positive and significant association with their perception level. The possible reason might be that mass media provides ample information on various aspects of climate resilient technologies; the greater the exposure of the maize growers towards mass media greater will be their capacity to obtain more information about technologies and their usage.

Annual income had a positive and significant association with perception level, this is due to the fact that annual income has an important role in securing education and information from outside sources and improving their knowledge level.

Knowledge about climate resilient technologies had a positive and significant association with the perception level. This is because an increased understanding of these

climate resilient technologies contribute to a more informed and positive perception among maize growers.

Scientific orientation had a positive and significant association with perception level. The possible reason might be that farmers who have a more scientific approach to their farming practices are likely to have a better perception on new technologies based on evidence and research. They may value the potential benefits of climate-resilient technologies due to their understanding of scientific principles.

Extension contact had a positive and significant association towards perception on climate resilient technologies. This is because when farmers frequently interact with extension experts, they gather more knowledge about different technologies, which, in turn, enhances their understanding and viewpoint regarding these technologies.

Extension participation had a positive and significant association with the perception level. Participating in extension activities, such as training sessions, group meetings, demonstrations, exhibitions, and study tours, has a positive and significant impact on the perception level.

Irrigation potential had a positive and significant association with the perception level, as the irrigation potential creates a conducive environment for farmers to explore and adopt climate-resilient technologies due to improved water availability, reduced risk, diversified crop choices, increased productivity, and better access to resources.

Decision making ability had positive and significant association with the perception on climate resilient technologies this is due to the reason that the farmers with better decision-making abilities are more likely to understand, appreciate, and adopt climate- resilient technologies due to their informed choices, risk assessment skills, resource allocation strategies, long-term perspectives, problem-solving capabilities, access to information, and increased confidence.

# Table 5: Association between profile characteristics of overall maize growers and their perception on climate resilient technologies.

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl.**  **No.** | **Variable** | **Chi square value** | |
| **Overall**  **(n =120)** | **C value** |
| 1 | Age | 9.34NS | 0.269 |
| 2 | Education | 20.61\*\* | 0.383 |
| 3 | Annual income | 21.53\*\* | 0.390 |
| 4 | Farming experience | 28.80\*\* | 0.440 |
| 5 | Credit orientation | 3.98NS | 0.179 |
| 6 | Economic motivation | 4.37NS | 0.187 |
| 7 | Irrigation potential | 11.33\* | 0.294 |
| 8 | Extension contact | 12.66\* | 0.309 |
| 9 | Extension participation | 13.67\*\* | 0.320 |
| 10 | Mass media participation | 26.71\*\* | 0.427 |
| 11 | Innovative proneness | 9.07NS | 0.265 |
| 12 | Scientific orientation | 13.03\* | 0.313 |
| 13 | Knowledge about climate resilience  technologies | 12.91\* | 0.312 |
| 14 | Decision-making ability | 14.43\*\* | 0.328 |

\*\*significance at 0.01 level \*significance at 0.05 level NS- Non-significant

Table 5 indicates that the characteristics like education (20.61\*\* ), farming experience (28.80\*\*), annual income (21.53\*\*), mass media participation (26.71\*\*), extension participation (13.67\*\*) and decision making ability (14.43\*\*) had positive and significant association with perception level on climate resilient technologies at one per cent level of significance. Whereas irrigation potential (11.33\*), extension contact (12.66\*), scientific orientation (13.03\*), and knowledge about climate resilient technologies (12.91\*) had positive and significant association with perception level at a five per cent level of significance. However, age (9.34NS), innovative

proneness (9.07NS), credit orientation (3.98NS) and economic motivation (4.37NS ) had non- significant association with perception level. The results are in line with the findings of the study conducted by Sai Tejashree (2022).

Education had a positive and significant association with perception level, as maize growers with higher levels of education tend to have a more positive perception of climate-resilient technologies. This could be because higher education might enable them to better understand the benefits and importance of these technologies.

Farming experience had a positive and significant association with perception level, as growers with more farming experience have a more positive perception of climate-resilient technologies. This makes sense as experienced farmers are likely to have witnessed changing weather patterns and their impact on crops, making them more receptive to technologies that can mitigate these effects.

Annual income had a positive and significant association with perception level, as maize growers with higher annual incomes are more likely to perceive climate resilient technologies positively. This is because they might have more resources to invest in these technologies and understand their potential impact on their crop yield and income.

Mass media participation had a positive and significant association with the perception level. Those who engage with mass media (TV, radio, internet) are more likely to have a positive perception of climate-resilient technologies.

Decision-making ability had a positive and significant association with the perception level. Maize growers with better decision-making abilities are more likely to have a positive perception of climate-resilient technologies.

Irrigation potential had a positive and significant association with perception level. Areas with better irrigation potential are likely to experience more pronounced impacts of climate change. The farmers in these areas might recognize the need for adapting to changing water availability.

Extension contact had a positive and significant association with the perception level. The probable reason could be that farmers who have regular interactions with agricultural extension services are exposed to new ideas and information.

Extension participation had a positive and significant association with the perception level. This is due to the reason that farmers who actively engage in extension programs and workshops are more likely to be informed about innovative farming practices, including climate-resilient technologies.

Scientific orientation had a positive and significant association with perception on climate resilient technologies this is due to as the farmers who possess a greater inclination towards scientific approaches tend to exhibit improved perceptions regarding climate resilient technologies.

Knowledge about climate resilient technologies had a positive and significant association with perception level, because the farmers who are well-informed about these technologies are more likely to perceive them positively. Knowledgeable farmers can better understand the advantages and relevance of such technologies for their specific farming contexts.

# Table 6: Profile characteristics of Maize growers

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sl N**  **o.** | **Characteri stics** | **Category** | **Small farmers**  **n1=60** | | **Big farmers (n2 =60)** | | **Overall (n =120)** | |
| **No.** | **%** | **No.** | **%** | **No.** | **%** |
| 1 | Age | Young (<35 years) | 07 | 11.67 | 10 | 16.67 | 17 | 14.17 |
| Middle  (35-55 years) | 41 | 68.33 | 38 | 63.33 | 79 | 65.83 |
| Old (>55 years) | 12 | 20.00 | 12 | 20.00 | 24 | 20.00 |
| 2 | Education | Illiterate | 11 | 18.34 | 09 | 15.00 | 20 |  |
| Primary education | 15 | 25.00 | 10 | 16.67 | 25 | 20.84 |
| High school  education | 23 | 38.33 | 26 | 43.33 | 49 | 40.83 |
| College level | 06 | 10.00 | 10 | 16.67 | 16 | 13.33 |
| Degree level | 05 | 8.33 | 05 | 8.33 | 10 | 8.33 |
| 3 | Annual  income | Low (<1,24,571.8) | 33 | 55.00 | 04 | 6.67 | 37 | 30.84 |
| Medium (1,24,572- | 25 | 41.67 | 30 | 50.00 | 55 | 45.83 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | 209211.5) |  |  |  |  |  |  |
| High (>209211.5) | 02 | 3.33 | 26 | 43.33 | 28 | 23.33 |
| 4 | Farming experience | Low (<18.13) | 16 | 26.67 | 23 | 38.33 | 39 | 32.50 |
| Medium (18.14-  30.36) | 20 | 33.33 | 12 | 20.00 | 32 | 26.67 |
| High (>30.36) | 24 | 40.00 | 25 | 41.67 | 49 | 40.83 |
| 5 | Credit orientation | Low (<2.16) | 09 | 15.00 | 39 | 65.00 | 48 | 40.00 |
| Medium (2.17-3.26) | 33 | 55.00 | 18 | 30.00 | 51 | 42.50 |
| High (>3.26) | 18 | 30.00 | 03 | 5.00 | 21 | 17.50 |
| 6 | Economic motivation | Low (<19.29) | 15 | 25.00 | 13 | 21.67 | 28 | 23.33 |
| Medium (19.30-  21.66) | 27 | 45.00 | 18 | 30.00 | 45 | 37.50 |
| High (>21.66) | 18 | 30.00 | 29 | 48.33 | 47 | 39.17 |
| 7 | Irrigation potential | Low (<16.04) | 14 | 23.34 | 25 | 41.67 | 39 | 32.50 |
| Medium  (16.05-29.83) | 29 | 48.33 | 22 | 36.67 | 51 | 42.50 |
| High (>29.83) | 17 | 28.33 | 13 | 21.66 | 30 | 25.00 |
| 8 | Mass media participation | Low (<3.65) | 20 | 33.33 | 17 | 28.33 | 37 | 30.84 |
| Medium (3.66-5.24) | 28 | 46.67 | 24 | 40.00 | 52 | 43.33 |
| High (>5.24) | 12 | 20.00 | 19 | 31.67 | 31 | 25.83 |
| 9 | Extension contact | Low (<5.27) | 18 | 30.00 | 15 | 25.00 | 33 | 27.50 |
| Medium (5.28-6.83) | 23 | 38.33 | 26 | 43.33 | 49 | 40.83 |
| High (>6.83) | 19 | 31.67 | 19 | 31.67 | 38 | 31.67 |
| 10 | Extension participation | Low (<4.24) | 29 | 48.33 | 31 | 51.67 | 60 | 50.00 |
| Medium (4.25-  5.49) | 16 | 26.67 | 16 | 26.67 | 32 | 26.67 |
| High (>5.49) | 15 | 25.00 | 13 | 21.66 | 28 | 23.33 |
| 11 | Innovative proneness | Low (<12.56) | 21 | 35.00 | 19 | 31.67 | 40 | 33.33 |
| Medium (12.57-  16.16) | 22 | 36.66 | 24 | 40.00 | 47 | 39.17 |
| High (>16.16) | 17 | 28.34 | 17 | 28.33 | 33 | 27.50 |
| 12 | Knowledge | Low (<14.45) | 14 | 23.33 | 17 | 28.34 | 31 | 25.83 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | about climate resilient technologies | Medium (14.46-  16.55) | 25 | 41.67 | 23 | 38.33 | 48 | 40.00 |
| High (>16.55) | 21 | 35.00 | 20 | 33.33 | 41 | 34.17 |
| 13 | Scientific orientation | Low (<14.76) | 14 | 23.34 | 17 | 28.34 | 31 | 25.84 |
| Medium (14.77-  18.13) | 25 | 41.66 | 24 | 40.00 | 49 | 40.83 |
| High (>18.13) | 21 | 35.00 | 19 | 31.66 | 40 | 33.33 |
| 14 | Decision making ability | Low (<13.45) | 18 | 30.00 | 16 | 26.67 | 34 | 28.33 |
| Medium (13.46-  19.06) | 22 | 36.67 | 28 | 46.66 | 50 | 41.67 |
| High (>19.06) | 20 | 33.33 | 16 | 26.67 | 36 | 30.00 |

With respect to profile of the small farmers growing maize, it was found that more than half (68.33 %) were middle aged, nearly two fifth (38.33 %) of them completed high school education, more than half (55.00 %) belonged to low annual income, two fifth (40.00 %) of them had high farming experience, more than half (55.00 %) belonged to medium credit orientation, nearly half (45.00 %) of them had medium economic motivation, two forth (48.33 %) had medium irrigation potential, significant percent (46.67 %) had medium mass media participation, more than one third (38.33 %) had medium extension contact, nearly two forth (48.33 %) belonged to low extension participation, more than one third (36.67 %) had medium innovative proneness, more than two fifth (41.67 %) had medium knowledge about climate resilient technologies and scientific orientation each and significant percent (36.67 %) belonged to medium decision making category.

With respect to profile of the big farmers growing maize, it was found that nearly two third (63.33 %) were middle aged, more than two fifth (43.33 %) of them completed high school education, half (50.00 %) of them belonged to medium annual income, more than two fifth (41.67 %) of them had high farming experience, nearly two third (65.00 %) belonged to low credit orientation, nearly half (48.33 %) of them had high economic motivation, more than two fifth (41.67 %) had low irrigation potential, two fifth (40.00 %) had medium mass media participation, more than two fifth (43.33 %) had medium extension contact, slightly more than half (51.67 %) belonged to low extension participation, two fifth (40.00 %) had medium innovative proneness, more than one third (38.33 %) had medium knowledge about climate

resilient technologies, two-fifths (40.00 %) had medium scientific orientation, and a significant percentage (46.66 %) belonged to the medium decision-making category.

With respect to profile of overall maize growers, it was found that nearly two third (65.83 %) were middle aged, slightly more than two fifth (40.84 %) of them completed high school education, nearly half (45.84 %) of them belonged to medium annual income, significant percent (40.84 %) had high farming experience, more than two fifth (42.50 %) belonged to medium credit orientation, more than one third (39.17 %) of them had high economic motivation, more than two fifth (42.50 %) belonged to medium irrigation potential, significant percent (43.33 %) had medium mass media participation, slightly more than two fifth (40.83 %) of them had medium extension contact, half (50.00 %) of them belonged to low extension participation, nearly two fifth (39.17 %) had medium innovative proneness, two fifth (40.00 %) had medium knowledge about climate resilient technologies, slightly more than two fifth (40.83

%) of them had medium scientific orientation, and a considerable percentage (41.67 %) belonged to the medium decision-making category. The results of the study are in line with the studies conducted by Sharadh (2016), Manjunath (2018), and Murthy (2019).

# Conclusion

The study was conducted to asses the perception of maize growers on climate resilient technologies. It revealed that, significant percentage of the respondents, both small (51.67 %) and big (43.33 %) farmers, have an average perception of climate resilient technologies in maize cultivation therefore it is a matter of concern that still large portion of farmers don’t have better perception on these technologies especially big farmers. Hence, there is an immediate necessary to awaken the farming community towards climate resilient technologies by conducting appropriate extension activities like demonstrations, training, awareness campaigns, study tours, or field trips to successful farmers, etc, which helps to adapt to a changing climate and increase production on a sustainable basis.

# References

MANJUNATH, H. LAXMAN, 2016, Farmers’ Perception about Climate Change and their Adaptation in South Gujarat. *M. Sc. (Agri.) Thesis* (Unpub.), Navsari Agricultural University, Navsari.

MANJUNATH, K. V., 2018, Adoption of climate resilient technologies by paddy growers.

*M.Sc. (Agri.) Thesis* (Unpub.), Univ. Agric. Sci., Bengaluru, Karnataka.

MURTHY, M. A., 2019, Climate Resilience Management level among Farmers in Agriculture in Eastern Dry Zone of Karnataka. *Ph.D (Agri.) Thesis* (Unpub.), Univ. Agric. Sci., Bengaluru, Karnataka.

SAI TEJASHREE, G., 2022, Cognitive and adoption behaviour of horticulture crop growers towards precision farming technologies in eastern dry zone of Karnataka. *M.Sc. (Agri.) Thesis* (Unpub.), Univ. Agric. Sci., Bangalore.

SANTOSH NAGAPPA NINGOJI, THIMME GOWDA, M. N., MUDALAGIRIYAPPA, SHIVARAMU, H. S., VASANTHI, B. G. AND

MAHABALESHWAR HEGDE, 2021, Comparative Performance of Dryland Cropping Systems under Reduced Runoff Farming in Alfisols of Karnataka, *Mysore J. Agric. Sci.,* **55** (3) : 199 - 208.

SHARAD JOSHI, 2016, Farmers’ perception about climate change and strategies to cope-up with climate change in Uttar Pradesh. *M. Sc. (Agri.) Thesis* (Unpub.), Govind Ballabh Pant University of Agriculture & Technology, Pantnagar, Uttarakhand.

SRINIVASA REDDY, D. V., SAVITHA, M. S., RAMESH, P. R., BHANDI, N. H., RAJU

G. TEGGGELLI, VISHWANATH AND RAVI, S., 2023, Climate Resilient

Technology to Adapt to Climate Change for Sustainable Livelihood and Production, *Mysore J. Agric. Sci.,* **57** (2) : 294-300.

Sri, C. R., Suhasini, K., Ashok, K., & Raj, B. M. U. (2024). Climate Resilient Technologies, Adaptation, Mitigation and their Influence on Farm Income in Telangana State of India. International Journal of Environment and Climate Change, 14(2), 894–901. <https://doi.org/10.9734/ijecc/2024/v14i24003>

Fischer, G., Shah, M., van Velthuizen, H., & Nachtergaele, F. O. (2001). Global agro-ecological assessment for agriculture in the 21st century. International Institute for Applied Systems Analysis. Laxenburg, Austria. Available link : <https://pure.iiasa.ac.at/id/eprint/6667/1/RR-02-002.pdf>

Kang, M. S., & Banga, S. S. (2013). Global agriculture and climate change. Journal of Crop Improvement, 27(6), 667-692

Praveen, B., & Sharma, P. (2019). A review of literature on climate change and its impacts on agriculture productivity. Journal of Public Affairs, 19(4), e1960.

Benitez-Alfonso, Y., Soanes, B. K., Zimba, S., Sinanaj, B., German, L., Sharma, V., ... & Foyer, C. H. (2023). Enhancing climate change resilience in agricultural crops. Current Biology, 33(23), R1246-R1261.

Rivero, R. M., Mittler, R., Blumwald, E., & Zandalinas, S. I. (2022). Developing climate‐resilient crops: improving plant tolerance to stress combination. The Plant Journal, 109(2), 373-389.