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Socio-economic dimensions of climate change adaptation among farmers in Saurashtra region of Gujarat

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Abstract

Climate change is actually posing a serious threat to agriculture, particulary in vulnerable regions of the country like the Saurashtra region of Gujarat. It experiences frequent droughts, cyclones and erratic rainfall and that's why a study was undertaken to determine the socio-economic, psychological, communicational and situational dimensions that affect farmers' adaptations to climatic change in the region. A sample of 240 respondents as selected using multistage random sampling from four districts namely Amreli, Jamnagar, Porbandar and Gir Somnath. Data were collected using a structured interview questionnaire consisting of 14 independent variables. The results reveal that a majority of the respondents were middle aged, with medium levels of farming experience, education, farm size and demonstrated moderate levels of extension participation, mass media exposure, and information seeking behaviour. Furthermore, psychological traits like scientific orientation, risk taking ability and preparedness for adaptation were found to be prevalent among most respondents. It is to be highlighted that nearly 80.00 percent of the farmers followed a highly diversified cropping pattern, which reflects a practical adaptation response to climate change. The study concludes that while farmers exhibit a fair degree of adaptation, mediocrity was prevalent which can be enhanced by strengthening extension systems, weather forecast services and stringent and targeted programmes. The study relied on descriptive analysis highlighting the facts and factors which are crucial to building climate-resilient agricultural communities in the region.

Keywords: Multistage random sampling, climate change adaptation, independent variables, diversified cropping pattern, mediocrity

Introduction

Climate change is real and we have got enough evidence as a testament to this fact. It needs no special capacity to sense the changing patterns of climate in the last few years. Increased frequency of cold and heat waves, floods, droughts *etc.* are a cause of worry among the scientific community. Climate change projections for India for the 2050s suggest an increase in temperature of 2- 4 °C for the country's south and of more than 4°C for its northern region *(*Kumar, 2018*)* [8]**.** The case becomes imperatively special when it comes to food security and agriculture. Agriculture is one of the most vulnerable sectors to climate change as it depends entirely on the climate conditions. Climate change sensitivity depends strongly on the diversity of local landscapes and agricultural systems (Thomas *et al*. 2007) [28]. The one thing that should be noted is that the sensitivity of agriculture is also shaped by how farmers perceive climate change. Their awareness and readiness to climate change will play a crucial role on how can policy regarding climate change mitigation and adaptation be formulated. For this purpose, we need an in-depth understanding of the socio-economic and psychological status of the farmers. It is important to scrutinize these variables because they have an impact on the decision making of the farmers. Farmers go through different stages while they make a decision regarding the adaptation to climate change. The adoption or rejection of an adaptation strategy depends on how the farmers perceive a particular climate problem. So, the understanding of their social setup, psychology, communicational characteristics and financial background becomes very important. This information acts as guiding factor for the scientific community to regulate their efforts specifically towards selected characteristics.

The state of Gujarat has the longest coastline in India making it more vulnerable to marine related disasters, droughts, floods *etc.* Mall *et al.* (2006) [13] had listed Gujarat as one of the most vulnerable states in India w.r.t extreme events taking place as a result of climate change. The study was conducted in Saurashtra region of Gujarat which comprises of 11 districts. In a study by Hiremath and Shiyani (2012) [5], it was reported that the Saurashtra region was having a greater number of years with less than average rainfall as compared to number of years with average rainfall. The farmers in Gujarat grow crops like groundnut, cotton, wheat, mangoes, coconut, pearl millet which have a huge significance in the economy of the state (NABARD,

2024) [12]. Labban *et al.* (2024) [10] have reported that Arabian sea has been witnessing an increase in the number of pre and post monsoon cyclones. This puts Saurashtra region into the vulnerable zone. Recently hit by cyclones like Taukte (2021) and Biparjoy (2023), the situation in Saurashtra seems perilous. There is an urgency for us to make our farmers more aware and adaptive to climate change and understand the complications of the phenomenon. This study was carried out in the Saurashtra region of Gujarat with the objective of studying the dimensions of farmers' profile in Saurashtra region of Gujarat w.r.t. climate change adaptation.

Materials and Methods

This study was conducted in Saurashtra region of Gujarat which comprises of 11 districts of total 33 districts of the state. The region is particularly sensitive to climate change as evident from the intensity and frequency of the cyclones and droughts that hit the region every year. Patel *et al.* (2015) [17] reported that in different stations of Gujarat including Saurashtra region, the maximum yield reduction (-61.00%) was projected in wheat and lowest in pearl millet (<-8.00%). Maize during kharif season was more affected (-47.00%) than the rabi season (-10%). Similarly, pearl millet in summer season was least affected (-8.00%) than kharif season (-14.00%). Thus, Saurashtra region was selected purposively to conduct the study. Then, multistage random sampling technique was employed to select districts, talukas and villages. In multistage random sampling, the sampling frame is divided into hierarchical levels and samples are selected step by step by using random sampling at each step. This method is hierarchical, random and flexible and useful when the population is large and scattered. This has been shown in the figure 1. The figure indicates that Four districts were *viz.* Amreli, Jamnagar, Porbandar and Gir Somnath were randomly selected. Then, two talukas from each district were selected randomly and from each taluka, two villages were selected randomly. The sampling scheme has been elaboratively shown in the table 1.

It can also be seen that from each village, 15 farmers were contacted randomly as respondents of the study, constituting a total sample of 240. The study employed an exploratory and descriptive research design as it aimed at having insights into the socio-economic, psychological and communicational profile of the respondents with respect to their adaptation behaviour to climate change. The selected districts have similar topography, climate, soil type and the kind of crops that are grown. The area has black cotton soils suitable for the cultivation of cotton, groundnut, pigeon pea, Pearl millet *etc.* Black cotton soils are naturally fertile but they get badly tormented by the floods that are caused by heavy rains. These soils require proper drainage facilities for ensured crop production.

Variables and their measurement

A total of 14 variables were selected after consultations with the experts. These were the independent variables that were supposed to show impact on the adaptability of the respondents. These independent variables were classified into four categories *viz.* personal, communicational, psychological and situational variables and have been presented in the form of the following table:

The variables were measured according to the scales mentioned in the table. Using these scales, a structured questionnaire was developed and presented before the respondents during face-to-face interviews. Then the collected data was transferred to Master sheet after coding and tabulation. The frequency, mean and percentages were calculated using MS Excel.

Results and Discussion

The results of the study have been presented in the form of following heads:

Age

The data regarding age of the farmers are depicted in Table 3. It was observed that two third (66.25%) of the respondents belonged to middle age category, followed by 17.50 per cent and 16.25 per cent respondents belonging to old and young age categories, respectively. The observed findings might be the resultant of the fact that in general, the rural communities have middle aged individuals as the head of the families who undertake the major occupation to run the household as old and young aged individuals are generally incapable of holding such a responsibility. The findings of this study are in concordance with those of Panda (2017) [14] and Jha and Gupta (2021) [7].

Education

Education is a means to obtain information and increment knowledge aiming to bring changes in human behaviour with respect to knowledge, skill and attitude. Formal education of farmers might play a pivotal role in influencing the awareness and adaptability levels of farmers. After the consideration of such aspects, the formal education of farmers was studied. The collected information has been presented in Table 4. The data reveal that 41.25 per cent of the farmers had education upto higher level of school education, followed by 24.58 per cent of them having an education upto middle school level. Furthermore, it can be depicted that 16.25 per cent had education upto primary school level, 7.5 per cent were functionally literate and 6.67 per cent were illiterate. Only 3.75 per cent of the farmers had gone to college and attained college level education.

The data show that the farmers had different levels of education. Most of the respondents had higher level of education probably because they were middle aged. Due to lack of proper educational facilities, they could not have pursued college education. The results are in conformity with Dhayal and Mehta (2015) [3] and Masudkar *et al.* (2017) [11].

Farming experience

Farming experience might affect the frame of mind of a farmer as the farmer learns a lot while pursuing farming over the course of time. Any individual learns positive or negative aspects of things through building up an experience which influences the individual's mind. An experience helps in developing skill to deal with contingent problems and the maturity to adjust with adverse situations. The data in the context of farming experience has been presented and in Table 5. The data from the table show that 45.41 per cent of

the respondents had a medium farming experience, whereas, 29.17 and 25.42 per cent of the respondents had more and less level of farming experience, respectively. The majority of the farmers belonged to middle aged group so that is the probable cause of them having a medium farming experience as most of them started farming at the age of around 23-24 years. The results were similar to those of Pawal (2014) [18] and Verma (2017) [32].

Farm size

Farm size is another major factor on which the livelihood of the farmers depends. The adaptability of a farmer to climate change can also be affected by the farm size that the farmer might hold. Farm size is the foremost important asset and a resource that a farmer has and that is why the information on farm size of the farmers was collected which has been tabulated in the form of Table 6.

The data in Table 5.4 depict that two third (66.67%) of the farmers had medium farm size, followed by 19.58 per cent having large farm size and 12.50 per cent having small farm size. Only 1.25 per cent of the respondents belonged to the marginal farm size category. The probable reason for this outcome can be the fact that majority of the rural families live jointly and mostly have joint lands.

Extension Participation

Extension participation is one of the major characteristics which depicts the communication behaviour of the farmer. It assists the farmer to obtain knowledge on the farm business, scientific activities to be undertaken, allied activities and provides ways to solve their problems with the guidance of extension personnel. In the same pretext, data were collected to elicit the pattern of extension participation and its influence on the awareness and adaptability levels of farmers. The collected data have been presented in the form of Table 7. It is discernible from the table that 46.25 per cent of the respondents fell under the medium extension participation category, followed by 35.42 per cent and 18.33 per cent of the respondents having low and high levels of extension participation, respectively.

It can be inferred that not many farmers had high extension participation which be attributed to the fact that in rural communities, farmers tend to believe more on their fellow progressive farmers and opinion leaders rather than an extension agency. So, their contact with extension agency and hence their extension participation is a matter of concern for the scientific community. The results are not in agreement with the findings of Parganiha (2016) [16] and Thorat *et al.* (2016) [29].

Mass media exposure

Mass media exposure helps people in increasing general awareness by providing accurate and timely information which is scientific, technical and relevant. It plays a key role in improving their performance in the occupations and economic activities or whatever they are pursuing. During the survey, the respondent's exposure to different media eg. television, radio, newspaper, magazines, internet etc. was assessed which has been presented in Table 7. It is clear from the table that slightly more than half (55.83%) of the respondents had a medium mass media exposure, followed by 22.50 per cent and 21.67 per cent of them having a low mass media exposure and high mass media exposure, respectively. The results can be a reflection of the increasing usage of mass media in rural areas and people getting aware of different means of media. Internet is also becoming a strong tool which is penetrating in villages faster than ever. This might be the reason mass media is gaining popularity among the rural populace.

Information seeking behaviour

Information seeking behaviour is a psychological construct which makes individuals more and more curious about knowing things that can help them in achieving their goals and develop more understanding of whatever activities they undertake. For farmers, it is important to seek more information on phenomenon like climate change because that is how they will become more aware and adaptive to adverse changes in the climate. Farmers seek information from formal and informal sources and also from mass media. Their pattern of utilization of these sources to seek information from, was assessed and the data are shown in the form of Table 7. From the table, it is evident that majority (82.08%) of the respondents had a medium level of information seeking behaviour, followed by 10.42 per cent and 7.50 per cent of the respondents showing high and less information seeking behaviours, respectively.

This, again can be attributed to the fact that the awareness regarding the sources of information is increasing day by day and people from rural communities want to keep them updated as well. As the repercussions of climate change become evident, the farmers might be seeking more information from their sources to be more aware and looking for ways to cope with it. These results are in concordance with the findings of Pynbianglang (2011) [19] and Raghuvanshi *et al.* (2017) [21].

Access to weather forecast

Access to accurate and timely weather forecast is ultimately linked to the success of the farmers in their farm practices because erratic rainfall patterns and changing seasons are literally disturbing the season cycles throughout the globe. Therefore, an accurate weather forecast and access to it is very important for a farmer to be able to plan a strategy beforehand to cope with adverse climatic scenarios. The data regarding the farmers' access to weather forecast have been tabulated in Table 7. From the table, it is depicted that majority (82.08%) of the farmers had a medium access to weather forecast, followed by 16.25 per cent and 1.67 per cent of the respondents having low and high access to weather forecast, respectively. The interview with farmers revealed that majority of them were using friends/relatives and newspapers as the most credible source of information to obtain weather related information. It was also observed that majority of them was not really applying the preventive measures in case of an adverse forecast, so there is an urgent need to develop more credibility on the part of the sources. The results are in line with the findings of Kunth (2022) [9] but contradicted with the results of Parganiha (2016) [16].

Innovativeness

Innovativeness, as defined in the previous chapters, is the

degree to which an individual is relatively earlier in adopting new ideas in comparison to other members of the social system. It is the orientation of farmers to get associated with changing ideas and adopting them into practice and therefore plays a key role in influencing farmers' awareness and adaptability to climate change. Hence, to know the extent of innovativeness, the information was gathered and data were tabulated in the form of Table 7. From the table, it can be seen that slightly more than half (54.17%) of the respondents belonged to moderately innovativeness category, followed by 37.08 per cent of them belonging to medium innovativeness category. It is also observed that 8.33 per cent and 0.41 per cent of the farmers belonged to less and more innovativeness categories, respectively. It should be noted that no farmer was categorised as a traditional among the study group. The probable reason for such finding can be the increasing awareness about climate change among the rural community and a medium level of extension participation through which the farmers learn about new ideas and techniques, important to be incorporated in agriculture. These results are contrary to those of Jamadar (2012) [6], Panda (2017) [14] and Rohila *et al*. (2018) [22].

Risk Orientation

Risk orientation is the inclination of an individual to take calculated risk while pursuing an activity. When a farmer takes risk in farming, but it backfires to give him the better results, this may create a negative notion in the mind of the farmer. But it can be vice-versa as well. Climate change adaptation involves a lot of risk and therefore, this factor was found imperative for the study. So, the data with respect to risk orientation were collected and framed as shown in the Table 7. From the table, it is discernible that slightly more than half (51.25%) of the farmers had medium level of risk orientation, followed by 32.50 per cent and 16.25 per cent of the respondents having high and low levels of risk orientation, respectively. It is observed that no farmers fell into either of the very low or very high-risk orientation categories. This might be due to the fact that farmers were having good farming experience and were well aware of the risks involved in farming. Therefore, majority of the farmers had a medium and high level of risk orientation. The results were similar to those of Parganiha (2016) [16], Masudkar *et al*. (2017) [11], Panda (2017) [14] and Rathava *et al*. (2023) [20].

Scientific orientation

Scientific orientation has been conceptualised as the extent to which a farmer is inclined to make use of scientific methods in decision making regarding adoption of various new methods and techniques in farming. Scientifically oriented farmers are generally more accepting towards scientific methods and have a favourable attitude towards scientific innovations. Therefore, information was collected to ascertain the scientific orientation of farmers and the results are framed in the form of Table 7. The data in table indicate that exactly half (50.00%) of the respondents had a medium level of scientific orientation, followed by 29.58 per cent and 20.42 per cent of the respondents having high and low levels of scientific orientation, respectively. The results can be attributed to the fact that majority of the farmers had moderate and high level of innovativeness which reflected in their scientifically oriented behaviour. The results are in conformity with the findings of Parganiha (2016) [16] but found contradiction with the results of Raghuvanshi *et al*. (2017) [21].

Preparedness for adaptation

Preparedness for adaptation is the key step to get ready for adverse situations and cope with them. Information with respect to preparedness for adaptation was elicited from the respondents and tabulated in the form of Table 8. The data in table indicate that slightly more than half (51.67%) of the respondents had medium level of preparedness for adaptation, followed by 27.91 per cent and 20.42 per cent respondents having high and low levels of preparedness for adaptation, respectively. These results can be attributed to the fact that more farmers were moderately innovative and scientifically oriented which might have resulted in their medium preparedness for adaptation. These results are in line with the findings of Pynbianglang (2011) [19] but in discordance with the results of Archna (2012) [1].

Perception regarding climate change

The perception of respondents regarding climate change is one factor that shows how do the farmers sense the climate change. The results of the information drawn from the respondents have been tabulated in Table 8. The results are similar to those of Pynbianglang (2011) [19] and Parganiha (2016) [16]. It is discernible from table that majority (76.25%) of the respondents had a medium perception regarding climate change, followed by 22.50 per cent and mere 1.25 per cent of the respondents having low and high perception regarding climate change, respectively. The results showed that the farmers had started to perceive the changes in climate as majority of them had a medium level of perception. This could be attributed to the fact that the respondents had a significant scientific orientation and medium level of mass media exposure.

Cropping pattern

By ascertaining the cropping pattern of the respondents, it can be known how much crop diversification are they adopting. Crop diversification is important for soil health and also beneficial in case of crop failures. The information regarding the cropping pattern of the respondents have been tabulated in Table 8. The results clearly indicate that majority of the respondents (80.83%) adopted highly diversified cropping pattern, followed by 17.91 per cent and 1.25 per cent of the respondents adopting medium diversified and less diversified cropping patterns, respectively. The farmers grew crops like cotton, groundnut, pearl millet, sesamum, green gram, sugarcane and horticultural crops like mangoes, sapota etc. Majority of them had a very diversified cropping pattern which can be attributed to them being medium risk takers which means they diversified their cropping patterns in order to lessen the risk associated with crop failures. These findings are similar to those of Sarkar (2014) [23] and Shenalrao (2017) [24].

Table 1: Selection of sampling area and respondents

Districts	Talukas	Villages	No. of farmers
Amreli	Dhari	Gadhiya	15
		Trambakpur	15
	Khamba	Umariya	15
		Dariyadi	15
Porbandar	Porbandar	Rajpar	15
		Ratnapar	15
	Ranavav	Valotra	15
		Thoyana	15
Jamnagar	Jamjodhpur	Dal Devadiya	15
		Bharadaki	15
	Kalavad	Metiya	15
		Deri	15
Gir Somnath	Talala	Borbav	15
		Surva	15
	Sutrapada	Moradiya	15
		Prashnavada	15

Table 2: Measurement of independent and dependent variables

S. No.	Variables Independent variables	Scales/schedules used for study
	Personal variables	
1.	Age	Chronological age of the respondents
2.	Education	Scale developed by Pandya and Pandya (2008) [15]
3.	Farming experience	Scale developed by Jamadar (2012) [6]
4	Farm size	Scale used by State Department of Agriculture
	Communication variables	
5.	Extension participation	Scale developed by Siddaramaiah and Jalihal (1983) [25]
6.	Mass media exposure	Scale developed by Gajendra (2011) [4]
7.	Information seeking behaviour	Scale developed by Pynbianglang (2011) [19]
8.	Access to weather forecast	Scale developed by Kunth (2022) [9]
	Psychological variables	
9.	Innovativeness	Scale developed by Singh (1977) [26]
10.	Risk orientation	Scale developed by Supe (1969) [27]
11.	Scientific orientation	Scale developed by Gajendra (2011) [4]
12.	Preparedness for adaptation	Scale developed by Vasanthi (2017) [30]
13.	Perception regarding climate change	Scale developed by Dhadwad (2013) [2]
	Situational variable	
14.	Cropping pattern	Scale developed by Vasudeo (2020) [31]

Table 3: Distribution of respondents according to their age n=240

S. No	Age group	Frequency	Percentage
1.	Young age (<35 years)	39	16.25
2.	Middle age (between 35-50 years)	159	66.25
3.	Old age (>50years)	42	17.50
	Total	240	100.00

Table 4: Distribution of respondents according to their education n=240

S. No.	Education level	Frequency	Percentage
1	College/Post graduation	9	3.75
2	Higher education (11th &12th)	99	41.25
3	Middle school (9th & 10th)	59	24.58
4	Primary school (1st to 8th)	39	16.25
5	Functionally literate	18	7.50
6	Illiterate	16	6.67
	Total	240	100.00

Table 5: Distribution of respondents according to their farming experience n=240

S. No.	Farming experience	Frequency	Percentage
1.	Less farming experience (<17 years)	61	25.42
2.	Medium farming experience (between 17-28 years)	109	45.41
3.	More farming experience (>28 years)	70	29.17
	Total	240	100

Table 6: Distribution of respondents according to their farm size

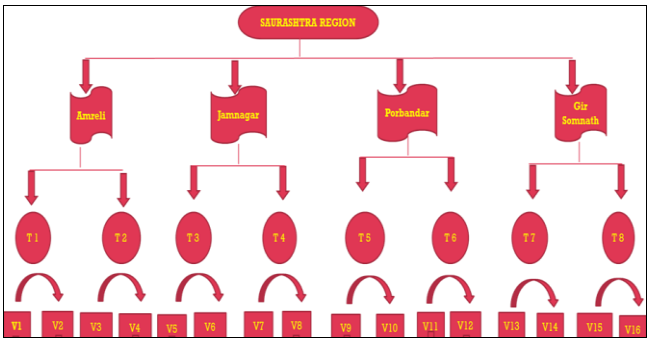
S. No.	Farm size Category	Frequency	Percentage
1.	Marginal size of landholding (upto 1.00 ha)	03	1.25
2.	Small size of landholding (1.01-2.00 ha)	30	12.50
3.	Medium size of landholding (2.01-4.00 ha)	160	66.67
4.	Large size of landholding (above 4.00 ha)	47	19.58
	Total	240	100.00

Table 7: Classification of Respondents by Communicational and Psychological Attributes n=240

S. No.	Extension participation	Frequency	Percentage
1.	Low extension participation (<31.17 score)	85	35.42
2.	Medium extension participation (31.17-43.17)	111	46.25
3.	High extension participation (>43.17)	44	18.33
	Total	240	100.00
	Mean= 37.17 S.D.= 6.00		
S. No.	**Mass media exposure**	**Frequency**	**Percentage**
1.	Low mass media exposure (<13.10 score)	54	22.50
2.	Medium mass media exposure (13.10-19.66)	134	55.83
3.	High mass media exposure (>19.66)	52	21.67
	Total	240	100.00
	Mean= 16.38 S.D.= 3.28		
S. No.	**Information seeking behaviour**	**Frequency**	**Percentage**
1.	Less information seeking behaviour (<36.01 score)	18	7.50
2.	Medium information seeking behaviour (36.01 - 44.07)	197	82.08
3.	High information seeking behaviour (>44.07)	25	10.42
	Total	240	100.00
	Mean= 40.04 S.D.= 4.03		
S. No.	**Risk orientation**	**Frequency**	**Percentage**
1.	Low level of risk orientation	39	16.25
2.	Medium level of risk orientation	123	51.25
3.	High level of risk orientation	78	32.50
	Total	240	100.00
S. No.	**Innovativeness**	**Frequency**	**Percentage**
1.	More innovative farmers	1	0.42
2.	Moderately innovative farmers	130	54.17
3.	Medium innovative farmers	89	37.08
4.	Less innovative farmers	20	8.33
	Total	240	100.00
S. No.	**Scientific orientation**	**Frequency**	**Percentage**
1.	Low scientific orientation (score<8.53)	49	20.42
2.	Medium scientific orientation (between 8.53- 11.97)	120	50.00
3.	High scientific orientation (score>11.97)	71	29.58
	Total	240	100.00
	Mean= 10.25 S.D.= 1.72		
S. No.	**Access to weather forecast**	**Frequency**	**Percentage**
1.	Low access to weather forecast (<3.58 score)	39	16.25
2.	Medium access to weather forecast (3.58-5.10)	197	82.08
3.	High access to weather forecast (>5.10)	04	1.67
	Total	240	100.00

Table 8: Distribution of respondents according to their Climate readiness and situational attributes n=240

S. No.	Preparedness for adaptation	Frequency	Percentage
1.	Low preparedness for adaptation (score<9.67)	49	20.42
2.	Medium preparedness for adaptation (between 9.67-13.93)	124	51.67
3.	High preparedness for adaptation (score>13.93)	67	27.91
	Total	240	100.00
	Mean= 11.80 S.D.= 2.13		
S. No.	**Perception regarding climate change**	**Frequency**	**Percentage**
1.	Low perception regarding climate change (score<46.77)	54	22.50
2.	Medium perception regarding climate change (between 46.77-70.23)	183	76.25
3.	High perception regarding climate change (score>70.23)	03	01.25
	Total	240	100.00
S. No.	**Cropping pattern**	**Frequency**	**Percentage**
1.	Less diversified cropping pattern (upto 3 crops)	3	1.25
2.	Medium diversified cropping pattern (4-6 crops)	43	17.92
3.	High diversified cropping pattern (7 crops and above)	194	80.83
	Total	240	100.00



T= Taluka, V= Village

Fig 1: Multi-stage random sampling followed in the study

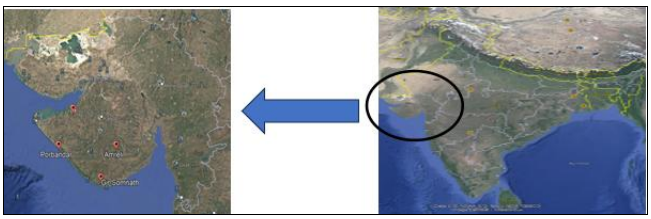


Fig 2: Maps of India and Gujarat highlighting the selected districts

Conclusion

The presented paper focused on the investigation of socio-economic, psychological, communicational and situational dimensions of climate change adaptation among the farmers of Saurashtra region in Gujarat. The findings of the study revealed that a significant population of respondents from the selected areas fell into middle-age category and possessed moderate levels of education, farming experience and farm size. Furthermore, majority exhibited medium levels of extension participation, information seeking behaviour and mass media exposure. Variables like innovativeness, scientific orientation, access to weather forecast and preparedness for adaptation were found be moderately prevalent among the respondents. Moreover, the perception regrading climate change also hovered around a medium threshold. The study highlights the pivotal role that psychological and communicational variables play especially risk orientation, scientific orientation and access to weather forecast on time. A highly diversified cropping pattern was observed to be followed by the respondents which demonstrate an active and intuitive response to climate change. However, it was observed that the representation in 'high' categories across these variables was relatively low which suggests that many farmers still operate below optimal adaptation potential. Therefore, stringent and tailor-made interventions in the form of extension services, credible weather information, adoption of climate resilient technologies and community-based awareness and action are required to improve adaptation among the farmers in the region. The insights from the study provide a valuable reference to policymakers and development agencies targeting to foster climate change adaptation at grassroot level in vulnerable regions like Saurashtra in particular and Gujarat in general.

Limitations of the study: The study mainly relied on descriptive statistics, and future research may incorporate inferential techniques like regression and path anlaysis to validate causal relationships among variables.

References

1. Archna P. A study on farmers' adaptability to climatic variability in castor in Mahaboobnagar District of Andhra Pradesh. M.Sc. (Agri.) Thesis (Unpub.). Acharya N. G. Ranga Agricultural University, Guntur; 2012.
2. Dhadwad MB. Designing and validation of e-learning modules on climate change and its impacts on Indian agriculture. Ph.D. (Agri.) Thesis (Unpub.). Indian Agricultural Research Institute, New Delhi; 2013.
3. Dhayal BL, Mehta BM. Study on knowledge and adoption of green gram production technology by farmers in Chhota Udaipur District of Gujarat. Agriculture Update. 2015;10(4):318-22.
4. Gajendra TH. Perspectives of farmers on effect of climate change on agriculture and livestock. M.Sc. (Agri.) Thesis (Unpub.). University of Agricultural Sciences, Dharwad; 2011.
5. Hiremath DB, Shiyani RL. Evaluating regional vulnerability to climate change: A case of Saurashtra. Indian J Agric Econ. 2012;67(3):335-44.
6. Jamadar R. Farmers' awareness of climate change and their adaptations. M.Sc. (Agri.) Thesis (Unpub.). University of Agricultural Sciences, Dharwad; 2012.
7. Jha CK, Gupta V. Farmers' perception and factors determining the adaptation decisions to cope with climate change: An evidence from rural India. Environ Sustain Indic. 2021;10(1):132-47.
8. Kumar R. Impact of climate change on Indian agriculture [Internet]. 2018 [cited 2018 Jun 19]. https://www.researchgate.net/publication/277147408_Impact_of_climate_change_on_Indian_agriculture
9. Kunth KR. Perceived impacts and strategies to cope-up with climate change on agriculture farming in Saurashtra region of Gujarat state. Ph.D. (Agri.) Thesis (Unpub.). Junagadh Agricultural University, Junagadh; 2022.
10. Labban AH, Hasanean HM, Almahri A, Al-Sakkaf AS, Hussein MAA. Characterizing the tropical cyclones activity over Arabian Sea (1982-2021). Oceans. 2024;5(4):840-56.
11. Masudkar DD, Kamble VB, Anarase MS. Socio-economic status of the farmers in adopted village. J Pharmacogn Phytochem. 2017;6(1):1117-9.
12. National Bank for Agricultural and Rural Development. Gujarat State Focus Paper. NABARD; 2023.
13. Mall RK, Singh R, Gupta A, Srinivasan G, Rathore LS. Impact of climate change on Indian agriculture: A review. Clim Change. 2006;78(2-4):445-78.
14. Panda AA. Awareness and constraints in adoption of Climate Smart Agricultural technologies among rice-pulse growing farmers in Puri District of Odisha. M.Sc. (Agri.) Thesis (Unpub.). University of Agricultural Sciences, Bengaluru; 2017.
15. Pandya CD, Pandya RD. Development and standardization of a scale to measure the socio-economic status of the farmers. Gujarat J Ext Educ. 2008;18&19:7-14.
16. Parganiha O. Farmers' perception about climate change and its impact on agriculture and allied activities in Chhattisgarh plains. Ph.D. (Agri.) Thesis (Unpub.). Indira Gandhi Krishi Vishwavidyalaya, Raipur; 2016.

17. Patel HR, Lunagaria MM, Karande BI, Yadav SB, Shah AV, Sood VK, Pandey V. Climate change and its impact on major crops in Gujarat. J Agrometeorol. 2015;17(2):190-3.
18. Pawal RD, Pisure BL, Jamadar CR. Relationship between socio-economic characteristics of brinjal growers with their adoption gap in production practices. Trends Biosci. 2014;7(19):2903-6.
19. Pynbianglang KH. A study on perception and adaptation of potato growers to climate change in East Khasi Hills of Meghalaya. M.Sc. (Agri.) Thesis (Unpub.). Acharya N. G. Ranga Agricultural University, Guntur; 2011.
20. Rathava S, Patel GR, Mashaliya KV. Farmers' perception about climate change in North Gujarat. Pharma Innov J. 2023;12(11):2095-9.
21. Raghuvanshi R, Ansari MA, Amardeep. A study of farmers' awareness about climate change and adaptation practices in India. Int J Appl Agric Sci. 2017;3(6):154-60.
22. Rohila AK, Shehrawat PS, Malik JS. Awareness, constraints and prospects of Climate Smart Agricultural Practices (CSAP). J Agrometerol. 2018;20(Special issue):167-71.
23. Sarkar S. Assessment of climate change led vulnerability and simulating the adaptive behaviour of farmers in Himalayan and arid ecosystems. Ph.D. (Agri.) Thesis (Unpub.). Indian Agricultural Research Institute, New Delhi; 2014.
24. Shenalrao. Knowledge and attitude of farmers towards crop insurance scheme. M.Sc. (Agri.) Thesis (Unpub.). Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani; 2017.
25. Siddaramaiah BS, Jalihal KA. A scale to measure extension participation of farmers. Indian J Ext Educ. 1983;19(3-4):74-6.
26. Singh K. A study of neo-marginal farmers' situations and socio-economic impact of new agricultural technology. Ph.D. (Agri.) Thesis (Unpub.). Indian Agricultural Research Institute, New Delhi; 1977.
27. Supe SV. Factors related to difference of rationality in decision making among farmers. Ph.D. (Agri.) Thesis (Unpub.). Indian Agricultural Research Institute, New Delhi; 1969.
28. Thomas DSG, Twyman C, Osbahr H, Hewitson B. Adaptation to climate change and variability: farmer responses to intraseasonal precipitation trends in South Africa. Clim Change. 2007;83:301-22.
29. Thorat GN, Vahora SG, Ramjiyani DB. Communication behaviour of tribal dairy women in animal husbandry. Gujarat J Ext Educ. 2016;27(1):59-62.
30. Vasanthi C. Knowledge impact and coping mechanism to climate change by farming community of Chitradurga District. M.Sc. (Agri.) Thesis (Unpub.). University of Agricultural and Horticultural Sciences, Shivamogga; 2017.
31. Vasudeo KS. Awareness on adaptation strategies of Climate Smart Agriculture by farmers. M.Sc. (Agri.) Thesis (Unpub.). Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani; 2020.
32. Verma SK. A study on awareness and adaptation strategies of Climate Smart Agriculture in Sultanpur District of Uttar Pradesh. M.Sc. (Agri.) Thesis (Unpub.). Banaras Hindu University, Varanasi; 2017.