Original Research Article

Climate Change Awareness and Vulnerability among Farming Communities of Konkan region, Maharashtra, India

Abstract-

This research paper presents an analysis of awareness and vulnerability to climate change among farming communities in a specific study area. The study focuses on understanding the level of awareness among respondents regarding climate change and its associated impacts. Additionally, it looks into the affecting socio economic factors of the level of awareness among farming communities. Furthermore, the study assesses the vulnerability of the farmers to climate change, considering indicators such as exposure to disasters and perceived extent of loss. Based on the analysis of data collected from 245 respondents, it was found that a significant majority of participants demonstrated awareness of changing weather patterns and the warming of the climate. However, a lower level of awareness was observed regarding the significance of addressing climate change as an important issue. In terms of vulnerability, the findings indicated that a considerable number of respondents had experienced various climate-related disasters, including unpredictable rain, floods, cyclones, and outbreaks of disease or pests. The perceived extent of loss varied among respondents, with agriculture and related aspects being most affected. Using a vulnerability categorization method, it was determined that a significant proportion of respondents fell into the low and very low vulnerability categories.

Keywords: Adaptive capacity, Awareness, Climate change, Disaster exposure, Perceived loss, Vulnerability.

Introduction-

Climate change is one of the greatest ecological and social challenge of the twenty first century. It is an important issue globally due to its wide-ranging and profound impacts on the

environment, societies, and economies and demands urgent attention and concerted efforts need to mitigate. (Umwigama, et.al. 2023). It disrupts ecosystems, endangers species, and intensifies extreme weather events, posing risks to biodiversity and human well-being. It also jeopardizes food production, strains economies, and increases the likelihood of conflicts and mass migrations.

Climate change is a worldwide occurrence, yet its effects vary across regions and economies (Maja et.al. 2023) and the role of agriculture is crucial in global economy. Agriculture is at risk due to the current climate variability and projected changes caused by human-induced global warming. When considering crop production models alongside global climate models, it becomes evident that global warming will increase the susceptibility of major crops to temperature stress, ultimately resulting in decreased yields (Jayaraman, 2014). A study conducted by Birthal *et al.* (2014) revealed that rising temperatures would reduce agricultural productivity. However, rainfall, unless excessive, could help counterbalance the detrimental effects of temperature. As a response, irrigation becomes an important strategy to mitigate the harmful consequences of a warmer climate. Predictions indicate that by the end of this century, significant climate change may lead to a 25% reduction in Indian agriculture's productivity. Arid and semi-arid regions are particularly vulnerable to climate change, magnifying its impact. In the absence of adaptation measures, the losses in these regions would be even greater.

Therefore, climate change poses the greatest threat to agriculture in India. Surprisingly, many farmers are not fully aware of climate change. A study conducted by Sarkar and Padaria (2010) in West Bengal reported that only 38% of the farmers had heard of climate change, with a significant number remaining unaware of the phenomenon. Despite experiencing changing climatic conditions in their lives, farmers still lack awareness of the term "climate change." Unless farmers can quickly recognize and adapt to increasing temperatures, climate change is likely to impose substantial costs on the Indian economy. Rapid adaptation may be challenging in a developing country where access to information and capital is limited (Guiteras, 2008).

Many susceptible regions of the earth face significant climatic threats which are vulnerable to climatic change. (Fahad, et.al. 2023). The significance of vulnerability assessment cannot be overstated when it comes to effectively responding to the challenges posed by future climate risks. In

fact, this meticulous assessment process holds the potential to not only address current climate risks but also to elevate the overall management of such risks. By delving into vulnerability assessment, policy-makers and development planners can gain profound insights into the intricate intricacies of an area's susceptibility to climate change. This encompasses a comprehensive understanding of climatic variability and the potential risks that lie ahead in the future. The Indian Council of Agricultural Research (ICAR) takes on the crucial task of conducting vulnerability assessments for Indian agriculture in response to climate change. This comprehensive assessment spans across 573 rural districts of India. The outcome of this assessment reveals that, according to the vulnerability analysis, a staggering 109 out of the 573 rural districts (equivalent to 19% of the total districts) are classified as 'very high-risk' districts. Additionally, a total of 201 districts are deemed as risk districts, as reported by PIB in 2021.

Agriculture in the hilly areas of Maharashtra, particularly the narrow coastal belt along the western margin of the state known as the Konkan region, faces numerous climatic and geographical challenges. This region experiences significant variations in rainfall and temperature and is heavily affected by climatic events such as floods, cyclones, droughts, changing rainfall patterns, extreme temperatures, as well as geographical issues like heavy soil erosion. Consequently, it becomes highly vulnerable to climate change. The Konkan region relies mostly on rainfed agriculture, has minimal irrigation facilities, and consists of small, fragmented land holdings (Shelar *et al.*, 2022a). To adapt to the changing climate, agronomic practices and crop varieties have been modified. However, a deeper understanding of the factors influencing farmers' awareness levels is necessary to develop appropriate policies and programs aimed at promoting successful awareness and implementing effective adaptation strategies to combat climate change. The present research study was undertaken to explore farmers' extent of awareness about climate change, their perception regarding vulnerabilities due to climate change in study area.

Methodology-

The study followed an *ex-post facto* research design, investigating climate change awareness and vulnerability in the Konkan region, specifically focusing on Palghar district selected randomly. This area faces various climatic and geographical challenges due to its fluctuating rainfall and temperature patterns (Shelar *et al.*, 2022a). Many communities here reside in socio-economically marginalized lands, susceptible to erosion and climatic risks such as erratic rainfall, heat waves, and sea water intrusion. To address the multifaceted issues faced by these communities, the study interviewed 245 farmers with at least 15 years of experience. The population for this study comprised individuals involved in farming within the Konkan region. To ensure a representative sample, the proportionate random sampling method was utilized. Utilizing data from the 2011 census, a total of 245 farmers, constituting 10 percent of the farmers from selected households, were selected from four randomly chosen villages in two tehsils of Palghar district.

Operationalizing awareness involved gathering first-hand information from individuals regarding their conscious knowledge about the existence, processes, or activities related to phenomenon or an event. In order to assess the level of awareness among the respondents regarding climate change, a structured schedule consisting of twelve statements across four dimensions was developed. To ensure the content validity of the schedule, a content validity index was utilized, incorporating items with a score above 0.78 into the final version. Furthermore, the scale validity, indicated by a score of 0.76, confirmed the high validity of the scale, surpassing the minimum threshold of 0.74. (Table 1). The respondents' responses were measured on a two-continuum scale, with "agree" and "disagree" options assigned scores of 2 and 1, respectively. Reliability of the scale was tested by using split-half method used by Shelar *et al.*, 2022b. Data 30 respondents from non-sampling area was collected to test the reliability, and correlation value was computed. The correlation value 0.87 shows higher level of reliability of the scale (Table 2). To ascertain internal consistency, Cronbach's Alpha also calculated, yielding a value of 0.80. This result indicates a robust level of internal consistency of the scale.

Based on the output of final data collection, level of awareness indicated by the respondents, were subsequently categorized into different groups using the Cumulative Square Root Frequency method. This method involves analyzing the cumulative square root frequencies of the responses to determine the distribution and patterns within the data, which aids in classifying the respondents into distinct categories based on their levels of awareness.

Vulnerability, as defined by IPCC (2001), relates to the outcome of exposure to climate variations and the ability to adapt. In this study, it pertains to individuals' susceptibility to environmental disasters like floods, earthquakes, heatwaves, etc. To measure vulnerability, a modified version of Parghaniha's (2016) method was used, assessing respondents' experiences with disasters, losses, and coping mechanisms on a two-point scale (0 for "no" and 1 for "yes"). A vulnerability index for each respondent was then calculated using a specific formula.

$$VIi = Oi / S \times 100$$

Where, VIi = Vulnerability index of i^{th} respondent.

Oi = Total score obtained by i^{th} respondent.

S= Total obtainable score

Based on the vulnerability index, the respondents were classified into five distinct categories using Cumulative Square Root Frequency method and the outcomes further elaborated in the results and discussion part.

Results and Discussion-

Profile of the respondents:

Upon analyzing the data concerning the profiles of the respondents within the study area, several noteworthy observations came to light (Table 3). The majority of participants (41.63%) fell into the age group of 33 to 47 years, indicating a relatively middle-aged population. It was also

evident that a significant portion of respondents (31.43%) lacked formal education, highlighting the prevalence of limited educational opportunities in the area. In terms of farming characteristics, a considerable number of farmers (44.90%) possessed marginal-sized land and had accumulated 15 to 27 years of farming experience. This suggests that agriculture plays a prominent role in the livelihoods of the respondents. In fact, farming emerged as the primary occupation for 44.08 percent of the participants, indicating its importance in the local economy. When examining the respondents' annual earnings, a notable proportion (28.16%) reported lower incomes, ranging from 47,000 to 65,000 INR. This sheds light on the economic challenges faced by a significant portion of the farming community. Furthermore, 40.41 percent of farmers followed a fair cropping pattern, indicating a balanced approach to agricultural practices. However, a substantial majority (42.45%) faced issues related to inadequate irrigation facilities, highlighting the need for improved water management strategies in the region. Regarding communication variables, it became apparent that over half of the respondents (54.69%) had limited exposure to mass media, suggesting restricted access to information and resources. Additionally, 59.59 percent of the participants lacked access to weather forecast information, which can hinder their ability to make informed decisions related to farming practices. Examining participation in social institutions, it was observed that 35.51 percent of the respondents displayed a moderate level of involvement, indicating a mixed level of community engagement. However, poor contact with extension institutions was reported by 48.98 percent of the participants, suggesting limited interaction and support from agricultural extension services. Furthermore, a small proportion of respondents (13.88%) migrated from the study area for non-farm work, typically for a duration of 4 to 5 months. This migration pattern indicates additional livelihood challenges and the need for diversified income sources. In terms of psychological aspects, approximately half of the respondents (46.56%) exhibited a moderate level of risk orientation, suggesting a balanced approach to risk-taking in their agricultural practices. Conversely, 44.08 percent displayed a low level of scientific orientation, indicating limited adoption of modern scientific techniques and technologies. On a positive note, the data revealed that a majority of respondents (55.11%) demonstrated a high level of cohesiveness within their community, highlighting the social cohesion and support networks present among the farming population.

The analysis of the respondents' profiles provides valuable insights into the demographic, economic, agricultural, and social characteristics of the study area. These findings shed light on the challenges and opportunities faced by the farming community, emphasizing the need for targeted interventions and comprehensive strategies to address issues such as limited educational opportunities, inadequate irrigation facilities, low incomes, information gaps, and limited adoption of modern farming practices. By understanding these dynamics and tailoring development interventions to the specific needs of the community, it is possible to promote sustainable agriculture, enhance livelihoods, and improve the overall well-being of the farming population in the study area.

Awareness among the farmers about changing climate:

Awareness about climate change is important to study as it facilitates the adaptation among the farming community. Table 4 portrayed the level of awareness among respondents. The findings provide valuable insights into the respondents' awareness of climate change, temperature and weather changes, environmental impacts, and health implications.

The table shows that the statement, "I feel the pattern of weather is generally changing," shows the highest percentage of awareness among respondents, with 89.80% indicating their awareness, while only 10.20% were not aware. This significant level of awareness suggests that the majority of respondents in the survey have noticed shifts and alterations in weather patterns over time, implying a general recognition of changing weather conditions. On the other hand, the statement, "I feel the issue of climate change is very important to deal with," exhibits a lower level of awareness, with only 39.19% of respondents indicating their awareness, while a majority of 60.82% were not aware. This finding reveals that a smaller portion of the respondents recognize the significance of addressing climate change as an important issue. It indicates a need for further education and awareness campaigns to highlight the importance of climate change mitigation and adaptation measures.

Regarding the term "climate change," it was noticed that 55.92% of respondents are aware of the term, while 44.08% are not aware. Although a majority of respondents have heard about the term,

a significant proportion still remains unfamiliar with it. This suggests the need for clear and effective communication to ensure a common understanding of climate change and its implications.

The table further provides insights into the respondents' awareness of temperature and weather changes. The findings indicated a high level of awareness about the warming up of the climate, noted by 88.57% of respondents, and only 11.43% were not aware. This suggests that a significant majority of the respondents recognize the ongoing trend of a warming climate, reflecting a broad understanding of the overall increase in temperature associated with climate change. The second statement, "Weather has become unpredictable," reveals an even higher level of awareness, with 96.74% of respondents being aware and only 3.27% not aware. This finding demonstrates that an overwhelming majority of the respondents have observed and acknowledged the unpredictability in weather patterns, highlighting a widespread recognition of the shifts and fluctuations in weather conditions.

In terms of the duration of seasons, the statement "Duration of seasons is changing" indicates that 81.64% of respondents are aware, while 18.37% are not aware. This observation suggests that a significant portion of the respondents has noticed alterations in the lengths of seasons, further indicating their perception of changing climate patterns. The occurrence of extreme weather conditions is another aspect of climate change. The statement "Occurrence of extreme weather conditions" showed a high awareness level, with 89.39% of respondents being aware and 10.61% not aware. This finding highlights that a considerable majority of the respondents recognize the increased frequency or intensity of extreme weather events, underscoring their understanding of the impacts of climate change. Regarding the risk of crop failure, it was noticed that a significant awareness level, with 93.06% of respondents being aware and only 6.94% not aware. This finding suggests that a vast majority of the respondents are cognizant of the heightened risk of crop failure associated with climate change, reflecting their understanding of the potential impacts on agriculture.

In case of respondents' views on the environmental impacts dimension, Table 4 revealed that 97.14% of respondents demonstrated a high level of awareness about increasing pollution in the atmosphere causing climate change, and only 2.86% were not aware of the same. This indicates that

the majority of respondents recognize the role of increasing pollution in the atmosphere as a significant driver of climate change. It reflects a widespread understanding of the link between pollution and its detrimental impact on the climate. In terms of the occurrence of natural disasters, the statement "Occurrence of natural disasters is increasing" reveals that 77.14% of respondents are aware, while 22.86% are not aware. This finding suggests that a significant majority of respondents have observed the rising frequency or severity of natural disasters, indicating their understanding of the environmental impacts associated with climate change. The statement "Rainfall pattern is changing" shows a high level of awareness, with 92.24% of respondents being aware and only 7.76% not aware. This indicates that a substantial proportion of respondents has noticed shifts and alterations in rainfall patterns, emphasizing their recognition of changing weather and climate conditions.

About the closing dimension, awareness of the health implications of climate change noted in Table 4, it was noticed that the statement "Human and animal health problems are increasing" revealed that 79.60% of respondents are aware, while 20.41% are not aware. This finding suggests that a significant majority of respondents recognize the increasing health problems affecting both humans and animals that are associated with climate change. This awareness reflects an understanding of the broader impacts of climate change beyond environmental changes, emphasizing the need to address and mitigate these health-related challenges.

According to Figure 1, the analysis of overall awareness levels revealed that a significant portion of the respondents (40.82%) demonstrated a medium level of awareness regarding climate change. Additionally, a considerable number of respondents (35.10%) exhibited a high level of awareness, while a smaller proportion (24.08%) had a lower level of awareness concerning climate change. Based on the data presented in both tables, it can be inferred that the majority of the respondents possessed a moderate level of awareness. While many respondents acknowledged the existence of climate change, only a few could articulate a formal definition of the term and recognize the significance of addressing the issue.

These findings highlight the need for targeted awareness campaigns and education programs to enhance understanding and knowledge of climate change among the farming community. By

improving awareness and knowledge, farmers can be better equipped to adapt to changing climate conditions, implement climate-smart agricultural practices, and contribute to climate change mitigation efforts.

Association of profile characteristics with the level of awareness:

In order to determine the relationship between the level of awareness of the respondents about climate change and the profile variables, the Pearson correlation method was utilized. This statistical analysis was conducted using the R software package. The output of this analysis, represented in Figure 2, revealed interesting findings.

Among the sixteen profile variables considered, three variables namely, age, farming experience, and exposure to mass media demonstrated a positive and significant association with the extent of awareness. The significance level was set at 0.01, indicating a high level of confidence in the results. This means that as the age, farming experience, and exposure to mass media increased, the level of awareness about climate change among the respondents also increased. On the other hand, the remaining socio-personal attributes, psychological attributes, and communicational attributes did not exhibit any significant association with the awareness about climate change in the study. This implies that factors such as education level, income, facilities at the farm, psychological outlook, and communication patterns did not have a discernible impact on the respondents' level of awareness regarding climate change.

Vulnerability:

Vulnerability refers to the likelihood of being adversely affected by climate change and the inability to cope with those changes. Assessing vulnerability is an important initial step in planning for climate change adaptation. In this study, vulnerability was assessed using indicators such as exposure to disasters and the perceived extent of loss by the respondents.

The data presented in Table 5 provides insights into the exposure to disaster and extent of loss faced by the respondents over the past decade in the study area. Unpredicted rain emerged as the major disaster, witnessed by 90.20 percent of the respondents. This indicates that a significant proportion of the population has experienced unpredictable rainfall patterns, which can have detrimental effects on agricultural production and livelihoods. Consequently, 45.70 percent of the respondents faced a higher extent of loss in agriculture and related aspects, highlighting the vulnerability of the farming community to the impacts of unpredictable rain. Additionally, 66.53 percent of the respondents experienced outbreaks of disease or pests, resulting in a medium extent of loss for 49.69 percent of them. This indicates the vulnerability of the agricultural systems to disease outbreaks and pest infestations, which can significantly impact crop yields and livestock health. Efforts to strengthen disease and pest management strategies, promote resilient crop varieties, and improve veterinary services can help mitigate these vulnerabilities. Furthermore, 46.53 percent of the respondents were exposed to floods, leading to a medium extent of loss for 49.12 percent. Floods can cause damage to infrastructure, destroy crops, and disrupt livelihoods, particularly in flood-prone areas. Implementing flood management measures, such as early warning systems, flood-resistant infrastructure, and improved drainage systems, can reduce vulnerability and enhance community resilience to flood events.

Wild animal attacks affected 44.49 percent of the respondents, with a majority (59.63%) reporting a low extent of loss. This highlights the interaction between humans and wildlife in the study area and the potential risks associated with it. Balancing wildlife conservation efforts with measures to protect agricultural lands and ensure human safety is crucial in reducing vulnerability to wildlife-related conflicts. Cyclones affected 37.55 percent of the respondents, with most of them (41.30%) experiencing a high extent of damage. Cyclones can result in severe infrastructure damage, loss of lives, and disruption of essential services. Strengthening early warning systems, building cyclone-resistant infrastructure, and implementing effective disaster preparedness and response measures are essential in reducing vulnerability to cyclones. About one-fourth (24.49%) of the respondents revealed vulnerability to earthquakes, with the majority (76.67%) witnessing a low extent

of loss. While earthquakes may not be directly related to climate change, they are natural hazards that can cause significant damage and loss. Enhancing building codes, promoting earthquake-resistant construction practices, and raising awareness about earthquake preparedness can help reduce vulnerability to earthquakes. Finally, Table 5 indicated that a small number of respondents (13.06%) were affected by increased pollution, with a majority (71.88%) reporting a medium extent of loss. Pollution can have adverse effects on human health, ecosystem functioning, and overall well-being. Implementing pollution control measures, promoting sustainable practices, and raising awareness about the impacts of pollution on climate change and human health can help mitigate vulnerability to pollution-related risks.

Table 6 provided information on the types of losses perceived by the respondents as a result of various natural calamities in the study area. Unpredicted rain caused losses for 100 percent of the respondents, indicating the widespread impact on agricultural production. This emphasizes the vulnerability of agriculture to unpredictable rainfall patterns and the need for adaptive measures such as improved water management and resilient farming practices.

Infrastructure damage due to cyclones was experienced by 85.87 percent of the respondents, highlighting the vulnerability of built structures to cyclonic events. This calls for the implementation of resilient infrastructure designs and construction practices to minimize damage and ensure the safety of communities. Outbreaks of diseases or pests resulted in death or injury to livestock for 31.90 percent of the respondents, underscoring the vulnerability of livestock to disease outbreaks. Disease control measures, vaccination programs, and improved animal husbandry practices are crucial in reducing livestock vulnerability and protecting livelihoods. Furthermore, 6.52 percent of the respondents suffered the loss or injury of a family member due to cyclones, indicating the severe impact of cyclonic events on human lives. This highlights the importance of early warning systems, evacuation plans, and community preparedness in minimizing the loss of lives during extreme weather events. Floods led to a loss of water resources for 9.95 percent of the respondents, indicating the vulnerability of water availability and access during flood events. Implementing water resource

management strategies, such as rainwater harvesting and water storage facilities, can help mitigate the vulnerability to water scarcity during flood events. Additionally, 65.63 percent of the respondents experienced health issues due to environmental pollution, indicating the vulnerability of human health to pollution-related risks. Improving air and water quality, promoting clean energy sources, and enhancing public health infrastructure are essential in reducing the vulnerability to pollution-related health impacts.

The extent of vulnerability experienced by the respondents was categorized into five categories using the cumulative square root method, as shown in Figure 3. Almost one-third (31.84%) of the respondents fell into the low vulnerability category (23 to 29% vulnerable), indicating a relatively lower likelihood of being adversely affected by climate change. Furthermore, 26.94 percent of the respondents belonged to the very low vulnerability category (0 to 22% vulnerable), suggesting a higher level of resilience to climate-related impacts. Approximately 20.41 percent experienced a high level of vulnerability (38 to 45% vulnerable), indicating a higher likelihood of being adversely affected by climate change and a greater need for targeted adaptation measures. Meanwhile, 12.65 percent and 8.16 percent fell into the medium vulnerability (30 to 37% vulnerable) and very high vulnerability (46% and above vulnerable) categories, respectively. These findings highlight the specific groups within the population who are more vulnerable to climate change impacts and require tailored interventions to enhance their adaptive capacity.

Overall, a large number of respondents in the study area experienced a low extent of vulnerability. Among the vulnerable respondents, the majority faced unpredicted rainfall as their critical disaster, which primarily affected crop yields in the study area. However, other natural calamities such as cyclones, floods, diseases, pests, and pollution also contributed to the vulnerability of the population. These findings underscore the need for targeted climate change adaptation strategies, including improved disaster preparedness, resilient agriculture practices, infrastructure development, and pollution control measures, to reduce vulnerability and enhance the resilience of the community in the face of climate change.

Conclusion:

In conclusion, this study highlights key aspects of the local farming community. Most respondents were young, had limited education, owned small plots, and relied on agriculture for low incomes. Inadequate irrigation facilities, dependent on monsoons, were evident. Limited exposure to mass media led to reliance on indigenous weather forecasting. Regarding climate change awareness, the study emphasizes the need to raise awareness about its severe impact on agriculture and food security. Age, farming experience, and media exposure correlated significantly with awareness. The vulnerability analysis identified unpredictable rainfall as a major disaster, along with disease/pest outbreaks, floods, wild animal attacks, cyclones, earthquakes, and pollution, resulting in various losses, particularly in crop yields. These findings stress the importance of proactively addressing awareness gaps and vulnerabilities related to climate change. Despite being in a less vulnerable category, preventive measures are crucial. This study lays the groundwork for targeted interventions promoting sustainable agriculture and enhancing farmers' resilience. By increasing awareness and encouraging adaptive measures, it aims to enhance the well-being and food security of the local farming community.

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Table 1: Content Validity of the instrument:

Sl. No.	Item	Item Content Validity Score (i-CVI >0.78)
A	***General Awareness:***	
1	I feel the pattern of weather is generally changing.	0.933333
2	I feel the issue of climate change is very important to deal with.	0.8
3	I heard about the term "climate change."	0.766667
B	***Temperature and Weather Changes:***	
1	Climate is getting warmer.	0.8
2	Weather has become unpredictable.	0.933333
3	Duration of seasons is changing.	0.866667
4	Occurrence of extreme weather conditions.	0.9
5	Risk of crop failure has increased.	0.933333
C	***Environmental Impacts:***	
1	Pollution is increasing in the atmosphere and causing climate change.	0.8
2	Occurrence of natural disasters is increasing.	0.766667
3	Rainfall pattern is changing.	0.8
D	***Health Implications:***	
1	Human and animal health problems are increasing.	0.833333
Scale Content Validity Score (s-CVI)= 0.76		

Table 2: Reliability of the instrument:

Correlations			
		Sum1	Sum2
Sum 1	Pearson Correlation	1	.870**
	Sig. (2-tailed)		.005
	N	8	8
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 3: Profile of the respondents

S. No.	Variables	Results		
		Categories	**Frequency**	**Percentage**
1	Age	Young (up to 47 years)	102	41.63
		Middle (48 to 54 years)	90	36.73
		Old (55 years & above)	53	21.64
2	Education	Illiterate (No education)	77	31.43
		Pre-primary (1 to 4 standards)	69	28.16
		Primary (5 to 7 standards)	55	22.45
		Secondary (8 to 10 standards)	27	11.02
		Higher secondary (11 and 12 standards)	10	4.08
		Graduation and above (13 & above)	07	2.86
3	Farming Experience	Low (15 to 27 years)	98	40.00
		Medium (28 to 35 years)	97	39.59
		High (36 years and above)	50	20.41
4	Annual Income	Very low (up to 42000 INR)	51	20.82
		Low (42001 to 61000 INR)	66	26.94
		Medium (61001 to 70000 INR)	53	21.63
		High (70001 to 90000 INR)	36	14.69
		Very High (90001 INR and above)	39	15.92
5	Occupation	Agricultural labour	11	4.49
		Agriculture	108	44.08
		Agriculture + Horticulture	85	34.70
		Agriculture + Business	20	8.16
		Agriculture + Service	21	8.57
6	Land Holdings	Marginal farmers (up to 1.0 ha)	110	44.90
		Small farmers (1.1 to 2.0 ha)	79	32.24
		Semi-medium farmers (2.1 to 4.0 ha)	48	19.59
		Medium farmers (4.1 to 10 ha)	8	3.27
		Big farmers (more than 10 ha)	0	0.00

7	Irrigation Facility	No irrigation (0 score)	55	22.45
		Poor irrigation (1 to 4 score)	104	42.45
		Average irrigation (4.1 to 5 score)	33	13.47
		Good irrigation (5.1 and above score)	53	21.63
8	Cropping Pattern	Poor (up to 6 score)	84	34.29
		Fair (7 to 11 score)	99	40.41
		Good (12 above score)	62	25.30
9	Mass media exposure	No exposure (0 score)	24	9.80
		Poor exposure (up to 5 score)	134	54.69
		Medium exposure (6 to 7 score)	54	22.04
		Good exposure (8 above score)	33	13.47
10	Weather forecast access	No access (0 score)	146	59.59
		Poor access (1 to 4 score)	76	31.02
		Fair access (5 to 7 score)	14	5.72
		Good access (8 above score)	9	3.67
11	Social participation	No participation (0 score)	83	33.88
		Low participation (1 to 3 score)	62	25.31
		Medium participation (4 to 6 score)	87	35.51
		High participation (7 above score)	13	5.30
12	Extension contact	No contact (0 score)	81	33.06
		Low contact (1 to 4 score)	120	48.98
		Medium contact (5 to 7 score)	22	8.98
		High contact (8 above score)	22	8.98
13	Risk Orientation	Low (up to 18 score)	77	31.43
		Medium (19 to 24 score)	114	46.53
		High (25 & above score)	54	22.04
14	Scientific Orientation	Low (up to 20 score)	108	44.08
		Medium (21 to 25 score)	90	36.73
		High (26 & above score)	47	19.19

15	Community cohesiveness	Low (up to 4 score)	25	10.20
		Medium (5 to 6 score)	85	34.69
		High (7 & above score)	135	55.11
16	Migration	Migrants	34	13.88

Table 4: Awareness of the respondents:

Sl. No.	Item	Response (%)	
		Aware	**Not aware**
A	***General Awareness:***		
1	I feel the pattern of weather is generally changing.	89.80	10.20
2	I feel the issue of climate change is very important to deal with.	39.19	60.82
3	I heard about the term "climate change."	55.92	44.08
B	***Temperature and Weather Changes:***		
1	Climate is getting warmer.	88.57	11.43
2	Weather has become unpredictable.	96.74	3.27
3	Duration of seasons is changing.	81.64	18.37
4	Occurrence of extreme weather conditions.	89.39	10.61
5	Risk of crop failure has increased.	93.06	6.94
C	***Environmental Impacts:***		
1	Pollution is increasing in the atmosphere and causing climate change.	97.14	2.86
2	Occurrence of natural disasters is increasing.	77.14	22.86
3	Rainfall pattern is changing.	92.24	7.76
D	***Health Implications:***		
1	Human and animal health problems are increasing.	79.60	20.41

Table 5: Distribution of the respondents based on their exposure to natural disasters

S.No.	Disaster	No. of respondents exposed (%)	Extent of loss observed		
			High	Medium	Low
1	Unpredicted rain	90.20	45.70 %	39.82 %	14.48 %
2	Flood	46.53	19.30 %	49.12 %	31.58 %
3	Cyclone	37.55	41.30 %	35.87 %	22.83 %
4	Earthquake	24.49	05.00 %	18.33 %	76.67 %
6	Disease/Pest outbreak	66.53	11.04 %	49.69 %	39.26 %
5	Attack of wild animals	44.49	00.00 %	40.37 %	59.63 %
7	Pollution	13.06	18.75 %	71.88 %	09.38 %

Table 6: Distribution of the respondents based on the type of loss faced by them

S.No.	Disasters / Type of loss	Unpredicted rain	Flood	Cyclone	Earthquake	Disease/Pest outbreak	Attack of wild animals	Pollution
1	Loss of yield	100.00	85.96	79.35	1.67	73.62	94.50	43.75
2	Infrastructure damage	10.86	13.16	85.87	18.33	--	9.17	--
3	Death/Injury to livestock	0.90	3.51	4.35	8.33	31.90	11.01	18.75
4	Death/Injury to family member	--	1.75	6.52	--	--	--	--
5	Loss of water resources	--	9.95	2.17	3.33	--	--	--
6	Health problems	--	--	--	--	--	--	65.63

Figure 1: Overall extent of Awareness:

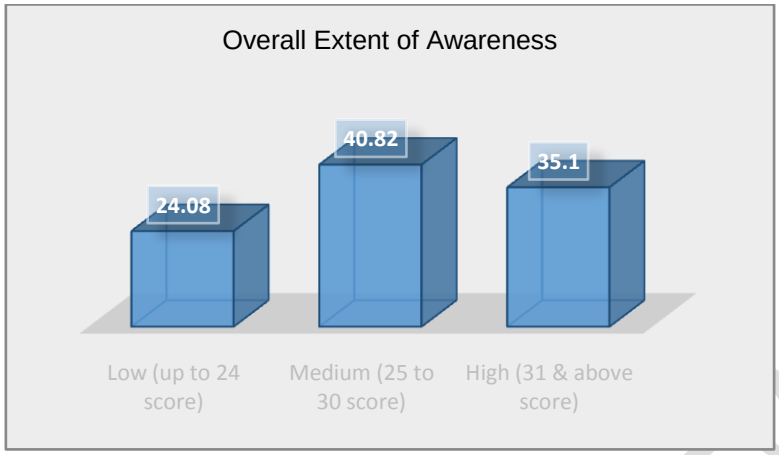

Figure 2. Association of profile characteristics with the level of awareness of the respondents:

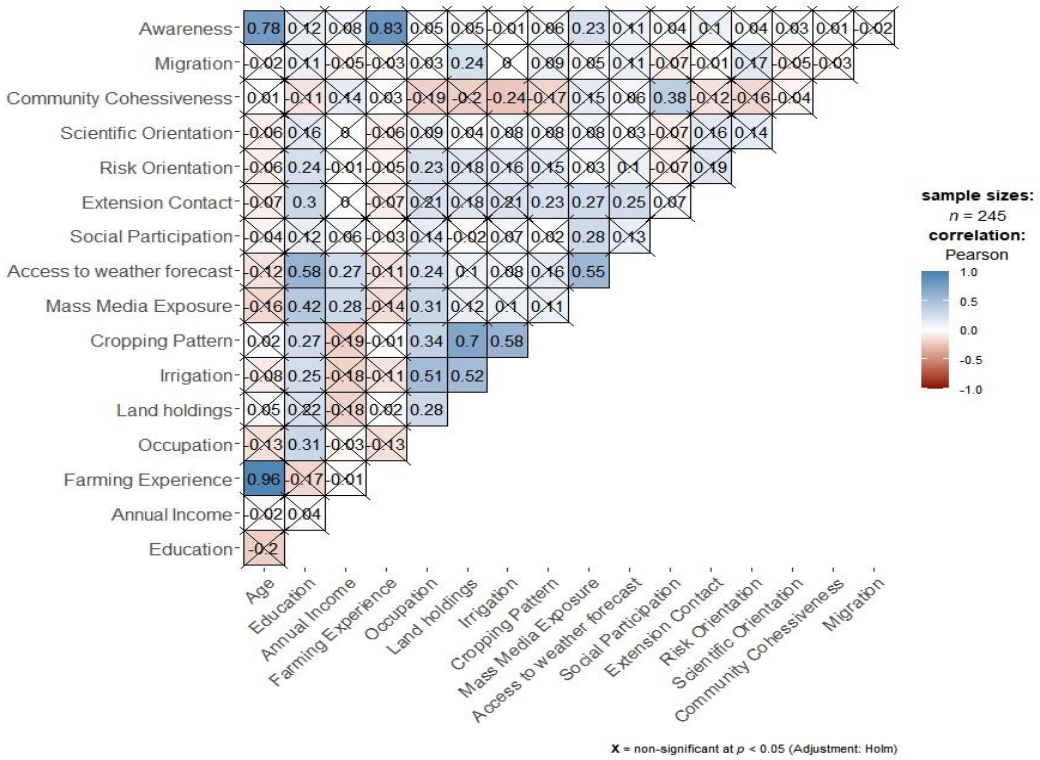

Figure 3: Distribution of the respondents based on their overall extent of vulnerability