



Farmers' Perception on Climate Change- A Study of Solan District in Himachal Pradesh

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Abstract: The study conducted on a random sample of 120 respondents selected from three development blocks of Solan district (H.P.) revealed that a majority of the respondents had unfavorable perception on climate change. Only about 15 percent were found to have favorable perception on climate change. After cross-examining the data block wise, more than 85 percent of the respondents of Dharmpur block and Solan block were found to have unfavorable perception on climate change. There was a significant difference in the respondents perception of Dharmpur block and Kandhaghat block. Similarly the respondents from Solan block and Kandhaghat block differed significantly in their perception on climate change. However, no significant difference in the perception was observed between the respondents of Solan block and Dharmpur block. Hence, the study implies that sincere efforts should be made by the government to plan and implement adaptation strategies among the farming community with the involvement of people.

Index terms: Perception, Climate Change, Sincere Efforts, Adaptation Strategies, Farming Community.

I. INTRODUCTION:-

Climate change refers to changes in the global weather conditions for a longer period of time caused either by natural processes or by human activity (Chakraborty *et al.* 2000). The changes in climatic factors like temperature, rainfall etc. adversely affect agricultural productivity through physiological changes in crops. According to a report of Inter- Governmental Panel on Climate Change (2007) natural climatic variability compounded with climate change adversely affect millions of livelihood around the world. The rural communities in the developing countries are expected to be affected more due to their extensive dependence on climate sensitive livelihood options and limited capacity to adapt as per the existing changes (Kumar and Pathak, 2020). The erratic nature of weather conditions and lack of accurate predictability were also observed to pose serious problems for the adaptation processes by the rural people (Garg, 2015).

Climate changes are being most seriously felt in the Himalayan region as it belongs to the most vulnerable ecosystem; and most of the populations depends on agriculture for its livelihood (Gonzalez, 2021). Various research studies have shown that most of the farmers are ignorant about the effects of climate change, the risk and uncertainties involved to mitigate the effects of climate change (Vannclay, 2004). Keeping this review, the present study entitled “**Farmers’ Perception on Climate Change – A study in Solan District of Himachal Pradesh**” was undertaken with the following specific objectives:-

- I. To study the socio- economic profile of respondents.**
- II. To determine the respondents’ perception on climate change.**
- III. To examine the respondents’ block- wise perception on climate change.**

II. METHODOLOGY:-

The study was conducted in Solan district of Himachal Pradesh. Out of total five development blocks in Solan district, three blocks namely **Kandhaghat, Dharmpur and Solan** were randomly selected. From each selected block, two villages were randomly selected and from each selected village, 20 respondents were selected randomly, thus, making the total sample size as 120 respondents.

Measurement of variables:-

Dependent variable

Farmers’ Perception: - Perception refers to the process of receiving information about and making sense of the world around us. It involves deciding which information is to be noticed, how to categorize this information and how to interpret it within the framework of our existing knowledge. In other words, perception includes all those processes by which an individual receives information about the environment through seeing, hearing, feeling, tasting, and smelling. The study of these perceptual processes shows that their functioning is affected by three classes of variables i.e. **The objects or events being perceived, the environment in which perception occurs, and the individual doing the perceiving.**

For the purpose of the present study, perception has been operationalised as the **farmers’ awareness and their opinion on the climate change** based on their previous knowledge/predisposition. It was measured by utilizing the **scale developed by Raghuvanshi (2018)** with suitable modification. The respondents’ response was obtained on a 5-point continuum scale i.e. **Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree with respective scoring** of 5,4,3,2 and 1 for positive statements. The scoring was reversed in case of negative statements. The frequency of respondents under each column of 5-point continuum scale was multiplied with its respective score in order to compute the total score of respondents on each statements/ Item. In this way, the total score of each respondents on all of these 13 items was obtained. On the basis of the Mean score and Standard deviation, the respondents were classified into the following three categories:

Table 1 Categories of farmers' perception on climate change

Favorable	($> \bar{X} + SD$)
Neutral	($\bar{X} \pm SD$)
Unfavorable	($< \bar{X} - SD$)

The data were collected with the help of well- structured and pre-tested interview schedule by personally interviewing the respondents. The data were tabulated, analysed and interpreted by applying the suitable statistical test like Mean, Standard deviation and F- Test.

III. RESULTS AND DISCUSSION:-

The main findings of the study have been discussed as under the following heads and sub-heads:

Respondents' demographic profile:-

The Socio-economic characteristics of the respondents are displayed in Table 1

Table 2 Respondents' profile (n=120)

S.NO.	Socio-personal traits	Frequency	Percentage
(i)	Age (years)		
	Young (35-45)	34	28.33
	Middle (45-55)	53	44.17
	Old (55-65)	33	27.50
(ii)	Gender		
	Male	62	51.67
	Female	58	48.33
(iii)	Educational qualification		
	Illiterate	11	09.15
	Primary	32	26.66
	Middle/Matric	56	46.66
	High School/ Higher Secondary	11	09.16
	Graduates	10	08.37
(iv)	Type of family		
	Nuclear	112	93.33
	Joint	08	06.67
(v)	Occupation		

	Agriculture	103	85.84
	Government job	13	10.83
	Own business	04	03.33

It is clear from the data that a significant majority of the respondents had nuclear family system (93.33%) with main occupation as agriculture (85.84%). More than 50 percent of the respondents were male (51.67%), matric/high secondary passed (56%) and belong to Young to Middle aged categories (72.50%). Hence, it can be concluded that a majority of the respondents were Male, Matric to High Secondary passed, had Nuclear family system and their main occupation was agriculture.

Respondents' Perception on Climate Change:-

The perception of respondents farmers about climate change i.e. what do they think about climate change and its effect on agriculture was obtained on 5-point continuum scale viz; Strongly agree, Agree, Undecided, Disagree, Strongly disagree with respective score of 5,4,3,2,1 for positive statements and for negative statements the scoring was reversed. The data are presented in Table 3.

Table 3 Farmers' Perception on Climate Change

S.N O.	Statements	Response					Total score	Mean score
		SA	A	U D	DA	SDA		
(i)	Agriculture sector has become more vulnerable due to climate change.	103 (85.83%)	17 (14.16%)	-	-	-	583	4.85
(ii)	Climate change is not a serious problem these days.	-	-	-	-	120 (100%)	600	5.00
(iii)	Temperature is increasing every year due to climate change.	13 (10.83%)	107 (89.16%)	-	-	-	493	4.10
(iv)	Human intervention/ activities has no role in climate change.	-	-	-	102 (85 %)	18 (15.00%)	498	4.15
(v)	The frequency and extent of dry spells has adversely affected agriculture production.	04 (3.33%)	116 (96.66%)	-	-	-	484	4.03
(vi)	Climate change has caused uncertainty of rainfall.	08 (6.66%)	112 (93.33%)	-	-	-	488	4.06
(vii)	There is no effect of climate change on production of crops.	-	-	-	113 (94.16%)	-	487	4.05

(viii)	There is no change in cropping pattern due to climate change.	-	-	-	109 (90.83)		491	4.09
(ix)	There is no effect of climate change on water table.	-	-	-	110 (91.6%)		490	4.08
(x)	Climate change is one of the prominent factors for causing deforestation.	08 (6.66%)	112 (93.33%)	-	-		488	4.06
(xi)	Forest fire is the outcome of climate change.	12 (10.00)	108 (90.00%)	-	-		492	4.10
(xii)	Climate change has adversely affected the livelihood of farmers.	-	120 (100%)	-	-		480	4.00
(xiii)	Farmers remain in dilemma/confusion among various agricultural operations due to climate change.	-	116 (96.66%)	-	04 (3.33%)		472	3.93
Overall Mean Perception on Climate Change = 4.19								

It is clear from the data all the respondents were Agreed on the Statements like ‘Agriculture sector has become more vulnerable due to climate change,’ ‘Temperature is increasing every year due to climate change’ ‘The frequency and extent of dry spells has affected agriculture production’ ‘Climate change is one of the prominent factors for causing deforestation’ and ‘Climate change has adversely affected the livelihood of farmers’. In other words, all the respondents were affirmative in their response that Due to climate change, temperature is increasing every year, Agriculture has become more sensitive/vulnerable, ‘Climate change was found to be one of the prominent factor for causing deforestation and consequently has resulted in more dry spells which had adversely affected the livelihood of farmers. It was also observed from the data that a significant majority of the respondents (83 to 94%) were undecided that the Human Intervention has no role in climate change. There is no effect of climate change on water table and on production of crops. In other words, then perception was Neither Favorable nor Unfavorable on these statements/aspects. However, all the respondents were found to be Strongly disagree on the statements that climate change is not a serious problem these days i.e. they had considered it serious problem. The overall mean perception score of 4.19 clearly indicated that the perception of all the respondents on the above statements was affirmative i.e. towards the Positive side.

These findings were found to be in agreement with those of Maddison (2006) who reported that a majority of the respondents perceived that temperature had drastically increased and the precipitation was found to be declined in Eleven African Countries and Bhushal (2010) who observed that 50 percent of the respondents perceived that temperature was rising, a rainfall pattern was unpredictable, seasons were changing and the incident of drought were increasing.

Khan and Arya (2016) also reported that farmers were adversely affected by climate change through irregular and uneven rainfall, rising temperature and dry winters with less snowfall. Similar finding were also reported by Kimani and Bhardwaj (2015) that the mid- hills of Himachal Pradesh had become warmer and drier due to less rainfall. The researcher further observed that agriculture was adversely affected due to climate change which is becoming a matter of serious concern.

Respondents' Overall Perception on Climate Change:-

On the basis on Mean score and Standard Deviation, the respondents were classified in to three categories mentioned in Table 3

Table 4 Overall Perception on Climate Change

S. NO.	Perception	Frequency	Percentage
1	Favorable (>53.86 score)	17	14.16
2	Neutral (51.5-53.86 score)	09	7.51
3	Unfavorable (<51.5 score)	94	78.33

It is evident from the Table that more than three fourth of the respondents (78%) had unfavorable Perception on climate change. In other words, they were Agreed that because of climate change the chances of forest fire had increased, it has caused uncertainty of rainfall, adversely affected production of crop, water table and livelihood of farmers. However, those who had favorable perception on climate change were found to be about (15%).

These finding were in consonance with those of Ansari *et al.* (2018) who observed that many farmers had negative perception about climate change may be due to inadequate knowledge of adaptation, mitigation and resilience strategies. The authors further found rise in temperature, decrease in the ground water table, erratic and sporadic rainfall and increase in the duration of heat stress due to high temperature.

Respondents' Block- Wise Perception on Climate Change:-

The respondent's perception on climate change (Block-Wise) was also examined i.e. they differed in their perception or not, the data are presented in Tables 5 to 7.

Table 5 Respondents' Perception on Climate Change (Dharmpur Block n=40)

Perception	Frequency	Percentage
Favorable (>53.03 score)	03	7.50
Neutral (51.77-53.03 score)	01	2.50
Unfavorable (<51.77 score)	36	90.00

Table 6 Respondents' Perception on Climate Change (Kandhaghat Block n=40)

Perception	Frequency	Percentage
Favorable (>54.83 score)	08	20.00
Neutral (51.37-54.83 score)	09	22.50
Unfavorable (<51.37 score)	23	57.50

Table 7 Respondents' Perception on Climate Change (Solan Block n=40)

Perception	Frequency	Percentage
Favorable (>53.29 score)	04	10.00
Neutral (51.81-53.29 score)	01	2.50
Unfavorable (<51.81 score)	35	87.50

It has been clearly observed from the data that a majority of the respondent selected from all the three development Blocks i.e. Dharmpur, Kandhaghat and Solan had **Unfavorable Perception** on climate change. The percentage of those who had Unfavorable Perception on climate change was found to be the Highest in Dharmpur block (90%) followed by Solan (87.50%) and Kandhaghat Block (57.50%).

Comparative Difference in the perception of respondents:-

Whether there existed any significant difference in the perception of respondents of all the selected three Blocks, the data have been presented in Table 8 to 10. It has been observed from the data in Tables 8 to 10 that there was a significant difference in the respondents' perception of Kandhaghat Block and Dharmampur Block. The calculated F value of 7.52 was found more than the Tabulated value of F i.e. 1.84

Table 8 Respondents' Perception Dharmampur VS Kandhaghat

Name of the Block	Variance	F value
Dharmampur	0.40	7.52*
Kandhaghat	3.01	
F tab = 1.84		

Table 9 Respondents' Perception Solan VS Kandhaghat

Name of the Block	Variance	F value
Solan	0.56	5.37*
Kandhaghat	3.01	
F tab = 1.84		

Table 10 Comparison of Respondents' Perception Solan VS Dharmampur

Name of the block	Variance	F value
Solan	0.56	1.40
Dharmampur	0.40	
F tab = 1.84		

Similarly, a significant difference in the respondents' perception of Solan Block and Kandhaghat Block was also observed. The calculated value of F is clearly indicative. However there was no significant difference in the respondents' perception of Solan block and Dharmampur Block as the calculated value of F was found to be less than the Tabulated value of F.

IV. CONCLUSIONS

The study concluded that the majority of the respondents had unfavorable perception towards climate change. Similar trend was observed in block wise where a majority of them had unfavorable perception on climate change. The respondents from Dharmpur and Kandhaghat blocks; and the respondents of Solan and Kandhaghat block differed significantly in their perception on climate change. Hence, sincere efforts should be made by the government to plan and implement adaptation strategies among the farming community with the involvement of people.

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