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Perception of Punjab Paddy Growers towards Climate Change

Harsimranjit Singh Brar[1], Anil Sharma[1], Jagjeet Singh Gill[2*] and Surabhi Sharma[2]

ABSTRACT

The study was conducted in five agro climatic zones of Punjab. One district from each zone, three blocks from each district and further one village from each block was selected randomly. Ten farmers having experience of minimum fifteen years of paddy cultivation, from fifteen villages of five zones were selected. Data was collected by using the interview schedule. More than three fourth (78.38 %) of the respondents agreed with the statement that climate change lead to more outbreak of diseases whereas 21.62 per cent of the respondents had neutral response. The quality of crop was affected due to climate change was perceived by 73.65 per cent of the respondents and very few (4.73%) had neutral response towards this statement. Statements namely paddy production is affected, affecting date of transplantation of the crop, selection of varieties to be sown, delaying crop maturity, leading to new weeds infestation, more outbreak of diseases, crop quality affected, net income from the crop were having mean score 2.72, 2.32, 2.34, 2.33, 2.10, 2.78, 2.69 and 2.70 respectively and were found to be significant with the perception of the farmers regarding climate change.

Keywords: Paddy Growers, Climate Change, Perception, Punjab State, Farmers Response.

INTRODUCTION

Climate change is one of the greatest challenges being faced by global community in 21st century. Air temperature near the earth surface rose by 0.74° C from 1906 to 2005 and it is estimated to increase as much as 6.4° C on average during the 21st century (Anonymous 2007a). Climate change refers to any change in climate overtime, either due to natural variability or as a result of human activity. The changes occur due to variation in different climatic parameters such as cloud cover, precipitation, temperature and increase in green house gases (GHG's) emission through human activities. It is a change in the mean and variability of its properties that persist for an extended period, typically decades or longer (Anonymous 2007b).

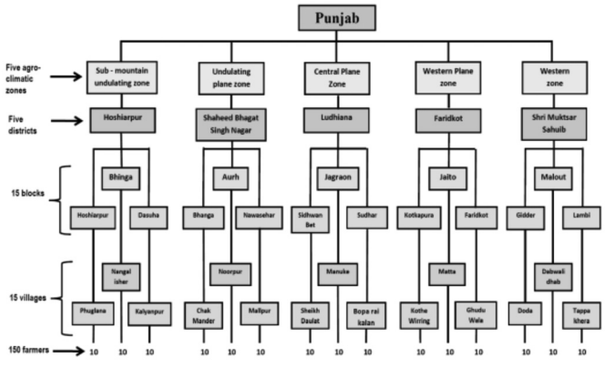
Developing countries have been more vulnerable to climate change than developed countries because of the predominance of agriculture in their economies and scarcity of capital for adaptation measures (Fischer *et al* 2005). Similarly, FAO (2005) has predicted that in developing countries, 11 per cent of arable land would be affected by climate change, including a reduction of cereal production in up to 65 countries constituting about 16 per cent of agricultural gross domestic product (GDP). The increase in temperature has both negative and positive impacts on agriculture as Intergovernmental Panel on Climate Change (IPCC 2007) has projected that the potential food production to increase with increase in local average temperature over a range of 1 to 3° C, but above this it is projected to decrease (Kumar 2014). Agriculture and food security are among the major casualties of climate change in India. The pace and extent of warming across India is wide spread and undisputed. Impact of climate change is serious such as erratic monsoon, changes in agricultural zones, spread of tropical diseases, sea level rise, change in availability of freshwater, floods, droughts, heat waves, storms, hurricanes, rainfall intensity etc. India is likely to bear the highest agricultural productivity losses in the world due to climate change pattern observed and scenarios projected. Climate change projections made up to 2100 for India indicate an overall increase in temperature by 2-4° C with no substantial change in precipitation quantity (Kumar, 2010). Climatic patterns change also causes spatial distribution of agro-ecological zones, habitats, distribution patterns of plant diseases and pests which have significant impacts on agriculture and food production (Easterling *et al,* 2007). Thus it is very

[1]Centre for Communication and International Linkages, PAU, Ludhiana, [2]University Institute of Agricultural Sciences, Chandigarh University, Mohali, [*]Corresponding author e-mail:jagjeetsinghgill@gmail.com

important to know the perception of the farmers regarding climate change.

METHODOLOGY

The study was conducted in Punjab. On the basis of five agro-climatic zones, one district from each zone, three blocks from each district and further one village from each block was selected randomly. From each village, ten farmers having experience of fifteen year in paddy cultivation were selected randomly. Thus, a total of 150 farmers were selected but two farmers didn't believe that climate change is happening so the sample consisted of 148 farmers. The data was collected through personal interview method through structured interview schedule. Statistical tools like frequency and percentage and z-test were used to interpret the data in meaningful way.



RESULTS AND DISCUSSION

Data set in Table 1 reveals that majority (91.21%) of the farmers thought more usage of chemicals in agriculture, 60.13 per cent perceived over exploitation of natural resources and 45.27 per cent thought paddy production as main reason for climate change. Whereas 22.29 per cent thought that lack of appropriate machinery was also a reason for climate change**.** Same study was conducted by Lutz *et al (*1994), Shultz *et al (*1997) & Wahid *et al* (2007).

A perusal of Table 2 reveals that more than three fourth (78.38 %) of the respondents agreed with the statement that climate change lead to more outbreak of diseases whereas 21.62 per cent of the respondents had neutral response. The quality of crop is effected due to climate change because of climate change was perceived by 73.65 per cent of the respondents and very few (4.73%) had neutral response towards this statement. The whole effect of climate change is on the net income of the farmer, 72.97 per cent agreed and near about one fourth of the respondents had neutral response towards the statement that climate change affects the net income. The respondents in agreement with the statement that climate change effects the paddy production were found to be 70.27 per cent whereas there was no respondent that disagreed the statement. Slightly less than sixty five per cent i.e. 64.19 per cent agreed and only few (6.08%) disagreed with the statement that climate change effects the number of irrigations. More than sixty i.e. 62.84 per

Table 1: Distribution of respondents according to their perceived cause, effect and reasons for climate change

n=148

S. No.	Causes	f*	%
1	Naturally happening	116	78.37
2	God responsible	40	27.02
3	Human beings in general	119	80.40
4	Evil	0	00.00
5	Developed countries	17	11.48
6	Industry	91	61.48
7	Government/politician's	74	50.00
8	Un-judicious usage of natural resources	58	39.19
	Effects		
1	Temperature is higher than before	122	82.43
2	More floods than before	9	06.08
3	More droughts than before	35	23.64
4	Air is more polluted than before	67	45.27
5	Sunshine hours are fluctuating	53	35.81
6	Rainfall pattern is shifting	103	69.59
	Reasons		
1	More usage of chemicals in agriculture	135	91.21
2	Over exploitation of natural resources	89	60.13
3	Appropriate machinery is lacking	33	22.29
4	Livestock	0	0.00
5	Paddy production	67	45.27

* Multiple response

Table 2: Distribution of respondents according to perception towards effect of climate change on paddy production

n=148

S. No.	Statements	Agree		Neutral		Disagree	
		f	%	F	%	f	%
1	Paddy production is affected	104	70.27	44	29.73	0	00.00
2	Affecting date of transplantation of the crop	72	48.65	51	34.46	25	16.89
3	Selection of varieties to be sown	76	51.35	61	41.22	11	07.43
4	Delaying crop maturity	83	56.08	59	39.86	6	04.06
5	Affecting number of irrigation	95	64.19	44	29.73	9	06.08
6	Changing the fertilizer application in the crop	87	58.78	41	27.70	20	13.52
7	Leading to new weeds infestation	46	31.08	71	47.97	31	20.95
8	More outbreak of insect pests	93	62.84	46	31.08	9	6.08
9	More outbreak of diseases	116	78.38	32	21.62	0	00.00
10	Crop quality affected	109	73.65	32	21.62	7	4.73
11	Net income from the crop	108	72.97	36	24.32	4	2.71

cent agreed and 31.08 per cent had neutral response to the statement that there is more outbreak of insect pest due to climate change. The statement that climate change lead to change in the time period of fertilizer application was agreed by 58.78 per cent of the respondents and disagreed by 13.52 per cent of the respondents.

More than half (56.08%) of the respondents agreed and 39.86 per cent of the respondents had neutral response towards the statement that climate change lead to delay in crop maturity. Slightly more than half (51.35%) agreed with the statement that climate change effect in the selection of varieties to be sown and only 7.43 per cent disagreed with this statement. More than fourty five i.e. 48.65 per cent agreed and 16.89 per cent disagreed with the statement that climate change affect the date of transplantation of the crop. Less than one (31.08%) agreed and 20.95 per cent disagreed with the statement that climate change lead to new infestation of weeds. Same study was conducted by Reilly and Schimmelpfenning (1999), Benedicta *et al* (2010) & Dhanya and Ramachandran (2015).

Table 3: Degree of perception towards effect of climate change on paddy production

n=148

S. No.	Statements	Mean	SD	Z value
1	Paddy production is affected	2.72	0.452	5.583*
2	Affecting date of transplantation of the crop	2.32	0.747	3.154*
3	Selection of varieties to be sown	2.34	0.687	2.948*
4	Delaying crop maturity	2.33	0.704	3.114*
5	Affecting number of irrigation	2.58	0.606	1.436(NS)
6	Changing the fertilizer application in the crop	2.45	0.722	0.972(NS)
7	Leading to new weeds infestation	2.10	0.717	6.985*
8	More outbreak of insect pests	2.57	0.608	1.160(NS)
9	More outbreak of diseases	2.78	0.413	8.118*
10	Crop quality affected	2.69	0.558	3.936*
11	Net income from the crop	2.70	0.515	4.587*

NS=Non-Significant, *Significant at 0.01 level, **Significant at 0.05 level of significance

The data in Table 3 depict that the mean score of the three items i.e. affecting number of irrigation, changing the fertilizer application in the crop, more outbreak of insect pests were 2.58, 2.45 and 2.57 and found to be non significant with respect to climate change on paddy production and whereas all other statements namely paddy production is affected, affecting date of transplantation of the crop, selection of varieties to be sown, delaying crop maturity, leading to new weeds infestation, more outbreak of diseases, crop quality affected, net income from the crop were having mean score 2.72, 2.32, 2.34, 2.33, 2.10, 2.78, 2.69 and 2.70 respectively and were found to be significant with the perception of the farmers regarding climate change.

CONCLUSION

The result showed that majority of the farmers believed that climate was changing. The farmers believed that their activities affected the climate variability. So, the need of modern day agriculture is to find climate smart solutions to mitigate these problems.

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