

Perception of Chickpea Growers towards Climate Change in Bemetara District of Chhattisgarh

ABSTRACT

Climate change is the global phenomenon of climate transformation characterized by the changes in the usual climate of the planet regarding temperature, rainfall and wind) that are especially caused by human activities. Various detrimental effects have been recorded due to changes in weather patterns. The research explores the perception of chickpea growers towards climate change in Bemetara District of C.G. The study reveals that majority of chickpea growers exhibit a medium level of perception. The findings highlight the need for targeted interventions to improve respondents' perception and equipping them with necessary tools to manage the risk posed by climate variability.

Keywords : Chickpea Growers, Climate change, Perception

INTRODUCTION

Climate is the long-term pattern of weather in a particular area. "It also defined as the average weather for a particular region and time period, usually taken over 30 years". It's really an average weather pattern for a particular region (National Geographic Survey). Climate change can be attributed directly or indirectly to human activity that alters the composition of the global atmosphere

and which is in addition to natural climate variability observed over comparable time period. (UNFCCC, United Nations Framework Convention on Climate Change).

Today, climate change has been recognized globally as the most pressing critical issue affecting the mankind survival in the 21st century.

Pulses in India have long been considered as the poor man's only source of protein as they are a low cost substitute

for vegetables in periods of high prices of vegetables. India is the largest producer and consumer of pulses in the world.

Globally, chickpea (*Cicer arietinum*) is the second most important legume crop after dry beans. India ranks first in the world, contributing 68 per cent of the global chickpea production. It is the most important pulse crop of India. In India (2021), as per the latest statistics, chickpea is grown in an area of 99.96 lakh hac with a production of 119.11 lakh ton and productivity 1192 kg/ha. (Directorate of Pulses Development, Bhopal) In Chhattisgarh (2021) area, production and productivity of chickpea are 3.02 lakh ha, 2.68 lakh ton and 887 kg/ha respectively. (Chhattisgarh Agriculture Statistics. Directorate of Agricultural, Raipur). The Bemetara district of Chhattisgarh is one of the most important chickpeas growing areas, and the increasing area under chickpea crop in the Bemetara district has changed the farmer's socio-economic status. The area under chickpea crop in the district is 67936 ha while the production is 59335 MT. (DAA office report 2021-22)

Various detrimental effects have been recorded due to alteration in temperatures, like minimum and maximum temperature by 0.86 and 2.46°C along with decrease in rainfall by 268mm in a study on impact of climate change on productivity and

adoption strategy for pulses. (Dubey et al. 2011)

Therefore the present study was undertaken with the following specific objective:-

- 1 To assess the perception of chickpea growers towards climate change.

METHODOLOGY

The present study was conducted in Bemetara district of C.G which was purposively selected for the study out of the 33 districts of Chhattisgarh. The district has been known for the highest chickpea production but over last few years the region has experienced a decline in chickpea production. The two blocks, i.e., Saja and Bemetara, was selected purposively because of highest production of chickpea among the whole of the 4 blocks. Six villages were randomly selected from each block. A list of Chickpea growers was prepared from selected villages with the help of RAEOs and from each selected villages and 10 Chickpea growers were selected randomly to make sample size of 120.

Perception of chickpea growers about climate change was the centre point in the study. Perception is the

process by which an individual receives an information or stimuli from the environment and transform it into psychological awareness. To ascertain level of perception regarding climatic events or changes, respondents were asked about 26 selected events/changes occurred in each on environment and agriculture. The responses are to be recorded on five points. The scoring for positive statement was 5,4,3,2 and 1 and for negative statements 1,2,3,4 and 5 for strongly agree, agree, undecided,

disagree and strongly disagree.

RESULT

1. Perception of chickpea growers towards climate change

Table 1, shows that the majority of respondents (70.00%) had a medium level of perception towards climate change, followed by (16.67%) had high level of perception and (13.33%) had low level of perception towards climate change.

Table 1: Distribution of respondents based on their perception towards climate change

S. No.	Category	Frequency	Percentage
1.	Low (Up to 99)	16	13.33
2.	Medium (100 -106)	84	70.00
3.	High (Above the 106)	20	16.67
Total		120	100.00
Mean = 103.34		S.D. = 3.2185	

From the result it is concluded that majority of the respondents possessed medium level of perception towards climate change.

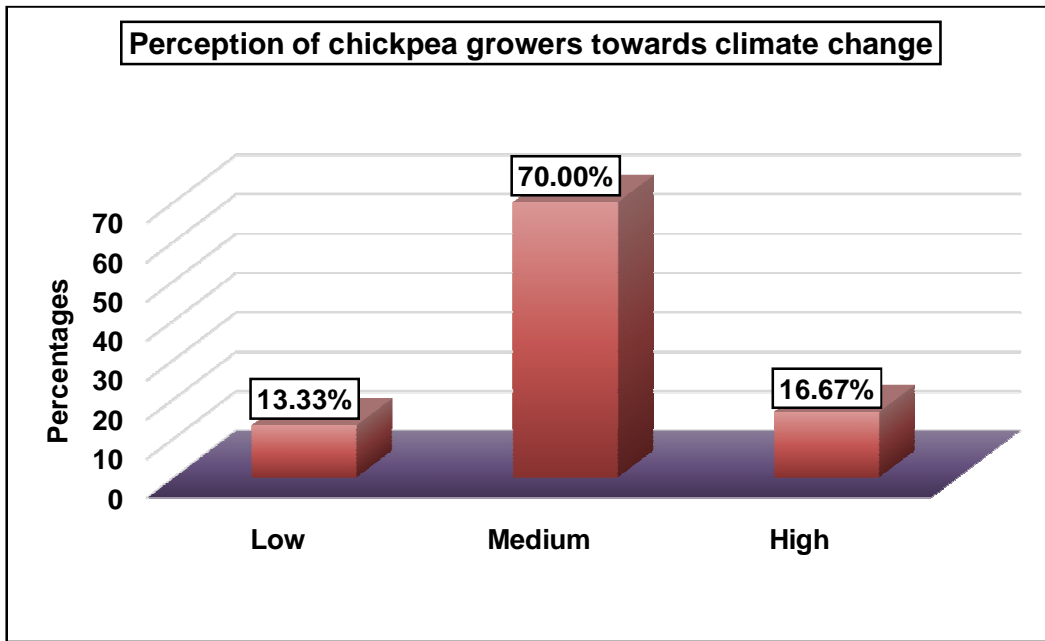


Fig 1: Distribution of respondents based on their perception towards climate change

Table 2, shows that the majority of the chickpea growers 97.50 per cent strongly agreed with the statement that high temperatures affect the chickpea crop. While, 02.50 per cent agreed with this statement.

The majority of the chickpea growers 90.00 per cent agreed about the statement that weather variation makes chickpea cultivation more difficult. However, 09.17 per cent and 00.83 per cent strongly agreed and undecided, respectively, with this statement

The majority of the chickpea growers 56.67 per cent strongly agreed with the statement that chickpea sowing is done later due to the delay in

the arrival of the monsoon in Kharif. While 43.33 per cent agreed with this statement.

About 49.17 per cent of chickpea growers were undecided about the statement that chickpea varieties are not adaptive to changing climatic conditions. However, 33.33 per cent agreed, but 09.17 per cent and 08.33 per cent strongly disagreed and disagreed, respectively, with this statement.

The majority of the chickpea growers 68.33 per cent strongly agreed with the statement that the number of irrigations change in chickpea crop due to high rainfall variation. while, 31.67 per cent agreed with this statement.

Table .2: Distribution of respondents based on their perception of chickpea growers towards climate change

S. No.	Statements	SA		A		UD		DA		SDA	
		F	%	F	%	F	%	F	%	F	%
1	High temperatures affect the chickpea crop.	117	97.50	03	02.50	00	00.00	00	00.00	00	00.00
2	Weather variation makes chickpea cultivation more difficult.	11	09.17	108	90.00	01	00.83	00	00.00	00	00.00
3	Chickpea sowing is done later due to the delay in the arrival of the monsoon in Kharif.	68	56.67	52	43.33	00	00.00	00	00.00	00	00.00
4	Chickpea varieties are not adaptive to changing climatic conditions.	00	00.00	40	33.33	59	49.17	10	08.33	11	09.17
5	The number of irrigations change in chickpea crop due to high rainfall variation.	82	68.33	38	31.67	00	00.00	00	00.00	00	00.00
6	Rainfall fluctuation is commonly occurring more these days.	92	76.67	28	23.33	00	00.00	00	00.00	00	00.00
7	Traditional varieties of chickpea crop are getting extinct.	00	00.00	14	11.66	106	88.34	00	00.00	00	00.00
8	Chickpea crop growth affected due to fluctuation in temperature during winter.	10	08.33	02	01.67	108	90.00	00	00.00	00	00.00
9	Low temperature causes flowers abortion and delays pod set in chickpea crop.	103	85.83	17	14.17	00	00.00	00	00.00	00	00.00
10	Chickpea cropping techniques are changing due to climate change.	00	00.00	100	83.33	20	16.67	00	00.00	00	00.00
11	Water requirement increase in chickpea crop due to climate change.	62	51.67	58	48.33	00	00.00	00	00.00	00	00.00
12	Heavy fog affecting chickpea cultivation practices.	39	32.50	81	67.50	00	00.00	00	00.00	00	00.00
13	Chickpea maturity is affected due to more rainfall variation.	20	16.67	100	83.33	00	00.00	00	00.00	00	00.00
14	Decrease area of chickpea crop due to climate variation.	72	60.00	48	40.00	00	00.00	00	00.00	00	00.00
15	Cropping patterns are changing due to climate change.	73	60.83	47	39.17	00	00.00	00	00.00	00	00.00
16	Duration of summer season is prolonged.	103	85.83	17	14.17	00	00.00	00	00.00	00	00.00
17	Climate change causes more losses in the chickpea crop.	39	32.50	57	47.50	24	20.00	00	00.00	00	00.00
18	Pest attacks are more due to climate change in the chickpea crop.	74	61.67	46	38.33	00	00.00	00	00.00	00	00.00
19	More occurrence of diseases due to climate change in the chickpea crop.	61	50.84	59	49.16	00	00.00	00	00.00	00	00.00

20	The productivity of chickpea crops has changed due to extreme weather events.	92	76.67	28	23.33	00	00.00	00	00.00	00	00.00
21	The cost of cultivation increased due to more expenditure on pesticide, herbicide and fungicide.	17	14.17	103	85.83	00	00.00	00	00.00	00	00.00
22	The price of fertilizers and pesticides more increase due to climate variation.	00	00.00	48	40.00	72	60.00	00	00.00	00	00.00
23	Wages increase in chickpea cultivation according to weather changes.	22	18.33	88	73.33	10	08.34	00	00.00	00	00.00
24	Temperature change has little effect on chickpea production.	15	12.50	33	27.50	00	00.00	59	49.17	13	10.83
25	Quality of chickpea crop reduce due to extreme changes in climate.	00	00.00	120	100.00	00	00.00	00	00.00	00	00.00
26	The method of irrigation changes due to changes in rainfall patterns.	00	00.00	16	13.33	05	04.17	99	82.50	00	00.00

(SA - Strongly agree, A – Agree, UD – Undecided, DA – Disagree, SDA - Strongly disagree)

(F = Frequency, % = Percentage)

The majority of the chickpea growers 88.34 per cent undecided with the statement that traditional varieties of chickpea crop are getting extinct. While 11.66 per cent agreed with this statement.

The majority of the chickpea growers 90.00 per cent undecided about the statement that chickpea crop growth affected due to fluctuation in temperature during winter. However, 08.33 per cent and 01.67 per cent strongly agreed and agreed, respectively, with this statement.

The majority of the chickpea growers 85.83 per cent strongly agreed with the statement that low temperature causes flowers abortion and delays pod set in chickpea crop. while, 14.17 per cent agreed with this statement.

The majority of the chickpea growers 83.83 per cent agreed with the statement that chickpea cropping techniques are changing due to climate change. while, 16.67 per cent undecided with this statement.

The majority of the chickpea growers 51.67 per cent strongly agreed with the statement that water requirement increase in chickpea crop due to climate change. while 48.33 per cent agreed with this statement.

The majority of the chickpea growers 67.50 per cent agreed with the statement heavy fog affecting chickpea cultivation practices. while 32.50 per cent strongly agreed with this statement.

The majority of the chickpea growers 83.33 per cent agreed with the statement that chickpea maturity is affected due to more rainfall variation. while 16.67 per cent strongly agreed with this statement.

The majority of the chickpea growers 60.00 per cent strongly agreed with the statement that decrease area of chickpea crop decrease due to climate variation. while 40.00 per cent agreed with this statement.

The majority of the chickpea growers 60.83 per cent strongly agreed with the statement that cropping patterns are changing due to climate change. while 39.17 per cent agreed with this statement.

The majority of the chickpea growers 85.83 per cent strongly agreed with the statement that duration of summer season is prolonged. while 14.17 per cent agreed with this statement.

About 47.50 per cent of chickpea growers were agreed about the statement that climate change causes more losses in the chickpea crop. However, 32.50 per cent and 20.00 per cent strongly agreed and undecided, respectively, with this statement.

The majority of the chickpea growers 61.67 per cent strongly agreed with the statement that pest attacks are more due to climate change in the chickpea crop. while, 38.33 per cent agreed with this statement.

The majority of the chickpea growers 50.84 per cent strongly agreed with the statement that more occurrence of diseases due to climate change in the chickpea crop. while 49.16 per cent agreed with this statement.

The majority of the chickpea growers 76.67 per cent strongly agreed with the statement that the productivity of chickpea crops has changed due to extreme weather events. while 23.33 per cent agreed with this statement.

The majority of the chickpea growers 85.83 per cent agreed with the statement that the cost of cultivation increased due to more expenditure on pesticide, herbicide and fungicide. while 14.17 per cent strongly agreed with this statement.

The majority of the chickpea growers 60.00 per cent undecided with the statement that the price of fertilizers and pesticides more increase due to climate

variation. While 40.00 per cent agreed with this statement.

The majority of the chickpea growers 73.33 per cent agreed about the statement that wages increase in chickpea cultivation according to weather changes. However, 18.33 per cent and 08.34 per cent strongly agreed and undecided, respectively, with this statement.

About 49.17 per cent of chickpea growers were disagreed about the statement that temperature change has little effect on chickpea production. However, 27.50 per cent, 12.50 per cent and 10.83 per cent agreed and strongly agreed and strongly disagreed, respectively, with this statement.

The total numbers of the chickpea growers 100.00 per cent agreed with the statement that quality of crop produce reduces due to extreme changes in climate.

The majority of the chickpea growers 82.50 per cent disagreed about the statement that the method of irrigation changes due to changes in rainfall patterns. However, 13.33 per cent and 04.17 per cent agreed and undecided, respectively, with this statement.

CONCLUSION

It is concluded that the majority of respondents had a medium level of perception towards climate change. This suggests a critical need for targeted educational programs and support system to improve their understanding of climate change and building resilience against the challenges posed by climate change.

REFERENCES

- Anonymous b. 2022. Chhattisgarh agriculture statistics, Directorate of Agriculture, Raipur, C.G., Government. 64p.
- Anonymous c. 2022. Annual Report (2021-2022). Directorate of Pulses Development, Bhopal. 40p.
- Ansari M A, S Joshi and Raghuvanshi R. 2018. Understanding farmers perceptions about climate change: a study in a North Indian State. *Adv Agr Environ Sci.* 1(2): 85–89.
- Barman and Lotha. 2016. Farmers' Perception on Climate Variability and Their Coping Strategies -An Assessment in Assam, India. *Indian Res. J. Ext. Edu.* 16 (3).
- Chadachal R I. 2017. A study on perceived impacts of climate change and coping mechanisms by rice farmers in Raichur district of Karnataka State. M.Sc. (Ag.) Thesis. Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad.
- Chandrashekhkar K P. 2019. Farmers' perception about climate change in Marathwada district of Maharashtra State. M.Sc. (Ag.) Thesis. Vasanttrao Naik Marathwada Krushi Vidhyapeeth, Parbhani.
- Dhaka B L, K Chayal, and M K Poonia. 2010. Analysis of farmers perception and adaptation strategies to climate change. *Libyan Agriculture Research Center Journal International* 1(6) pp: 388-390.
- Dubey S K, Sah U and Singh S K. 2011. Impact of climate change on pulse productivity and adaptation strategies as practiced by the pulse growers of Bundelkhand region of Uttar Pradesh. *Journal of Food Legumes* 24(3): 230-234.
- IPCC. 2001. Climate change 2001: Synthesis report. Available at https://www.ipcc.ch/site/assets/uploads/2018/05/SYR_TAR_full_report.pdf
- IPCC. 2007. Climate change 2007: Synthesis report. Cambridge University Press, Cambridge, UK. Available at: <http://www.Ipcc.Ch/>
- IPCC. 2011. Climate change 2011: Synthesis report.
- Jamvati. 2017. Farmers perception towards climate change on productivity of chickpea in Tikamgarh district of Madhya Pradesh. M.Sc. (Ag.) Thesis. JNKVV, Jabalpur.
- Joshi S. 2016. Farmers' perception about climate change and strategies to cope up with climate change in Uttar Pradesh. M.Sc. (Ag.) Thesis (Unpublished). G. B. Pant University of Agriculture and Techonology, Pantnagar.
- Maddison D. 2007. The Perception of an Adaptation to Climate Change in Africa. Policy Research Working Paper. The World Bank, Development Research Group, Sustainable Rural and Urban Development Team, Pretoria, South Africa.
- Uttam B M. 2019. Farmers Perception about Climate Change in Marathwada Region. M.Sc.(Ag.) thesis. Vasanttrao Naik Marathwada Krishi Vidyapeeth, Parbhani.

Yadav S K. 2021. Farmers' Perception about
Climate Change in Udaipur
District of Rajasthan. M.Sc. (Ag.)

thesis. Maharana Pratap
University of Agriculture and
Technology, Udaipur, Rajasthan.

UNDER PEER REVIEW