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Farmers knowledge on climate change in turmeric cultivation in Thoubal district of Manipur

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Abstract

Climate change has a huge impact on turmeric since it prefers rich, wet soils in a protected, shady location. At the same time climate change has become major concern for large turmeric growing cultivators in Manipur as its contribution in the production of turmeric is decreasing. The research study was done in order to determine the extent of farmers' knowledge on climate change in turmeric cultivation in Manipur. A research design known as ex-post-facto was used for the study. A total of 111 farmers were chosen purposively from the six villages of Wangjing CD block of Thoubal in Manipur as per information obtained from KVK, Thoubal. The information is collected or gathered through survey using semi-structured interview schedule. Using the appropriate statistical parameters, data was collected, coded, tabulated, analysed and interpreted. It was found that 72.07 per cent of the farmers were having medium level of knowledge followed by high level of knowledge (17.12%) and low level of knowledge (10.81%) on climate change in turmeric cultivation.

Keywords: Climate change, turmeric cultivation, farmers knowledge, majority, Manipur, Thoubal

1. Introduction

Climate change is a change in the statistical distribution of weather patterns that lasts during an extended period of time and also referred to as the long-term changes in temperature and weather patterns. In India, North-Eastern states have experienced more issues as a result of climate change. For example, in 2009, North-Eastern states experienced one of the most severe droughts; in 2012, 2014, and 2017 these states experienced severe floods; in 2018, the majority of these states were affected by large hailstorms and a lack of rainfall; and most recently, in 2019, the monsoon arrived later than usual (Saikia and Hazarika, 2020) [5]. International Panel on Climate Change (IPCC) has projected that by the end of the 21st century, overall rainfall in India will increase by 10-21 percent with more frequent and heavy rainfall days while the mean annual temperature will rise by 3-6 degree centigrade (IPCC, 2012) [1]. It is revealed that the annual rainfall had declined while temperature had been increasing in Manipur and Sikkim (Rymbai, 2016) [4].

Climate change has a huge impact on turmeric since it prefers rich, wet soils in a protected, shady location. The agro-climatic conditions of the region characterised by warm and humid summers with abundant rainfall and cool winters are favourable for turmeric cultivation (SFAC, 2012) [6].

Knowledge on climate change acts as an information and farmers devise ways to adapt to the changing climatic condition. Many areas of the world are already experiencing significant shifts in climate. People don't really pay attention to it, though, unless something severe happens to their surroundings or their daily life. A farmers' knowledge of and experience with the repercussions may differ from that of another's due to varying demographic, social, and economic circumstances. Farmers knowledge on climate change increases the chance of getting a clear-cut idea and influences their future plans. Therefore, there is a critical need for farmers to accept, understand, and adapt to the changing environment. However, in most of the cases, farmers doesn't believe in scientific expertise but believe their personal opinions only.

2. Materials and Methods

The research study was conducted in order to determine the extent of farmers' knowledge on climate change in turmeric cultivation in Thoubal district of Manipur. There are 3 blocks in Thoubal district of Manipur, from which Wangjing CD block is selected. From this block, 6 villages were selected purposively as per information obtained from Krishi Vigyan Kendra (KVK), Thoubal. A total of 111 farmers were also chosen purposively according to the

received information.

A research design known as ex-post-facto design was used for the investigation. The semi-structured interview schedule was prepared with the objectives in mind and presented to the farmers. The extent of the farmers knowledge is studied on a five-point range i.e., strongly known, known, undecided, doesn't know and strongly doesn't know. The scores 5, 4, 3, 2, 1 were assigned respectively.

The total score ranged from "12" to "70," the minimum and maximum obtainable scores. The respondents were divided into groups based on mean and standard deviation. Using the semi-structured schedule information was collected through personal interviews. The statistical tools - mean, standard deviation, frequency and percentage were applied to interpret the information gathered (data).

3. Results and Discussion

The survey studies, farmers knowledge on climate change based on their observation and experience in the past 10 years. It was found that 89.19 per cent of the respondent-farmers were aware of climate change and have, to some extent, knowledge on more than one climatic variable. The rest 10.81 per cent were aware about climate change but have low knowledge on climate change variables.

The table below depicts that 22.82 per cent of the farmers have strong knowledge on climate change, 48.35 per cent of the farmers have considerable knowledge on climate change (know but not completely) followed by 15.62 per cent of farmers whose opinions remain undecided on climate change variables, 5.78 per cent doesn't know about the changes that were going on the climate but have some awareness on

climate followed by 7.43 per cent farmers who were totally unaware of climate changes.

While going into details, table 1 reveals that 100 per cent of the respondent farmers have gained enough knowledge on changes in maximum and minimum temperatures i.e., they are fully aware that temperatures in summer is increasing than previous years and winter temperatures were also increasing due to the change in climate. Similar finding was reported by Shukla *et al.* (2019)^[8]. However, there is a difference in their level of understanding on climate change. Hence, they were grouped as farmers with strong knowledge (39.64%) and farmers with moderate knowledge (60.36%) in accordance with summer temperature or maximum temperature.

The farmers in the study area observed variations in the rainfall pattern where majority of the farmers i.e., 78.38 per cent have observed the decrease in the quantity of rainfall in the recent years, while 8.11 per cent farmers remain undecided about the change in rainfall quantity and the rest of the respondents were not aware of the changes in amount of rainfall. The findings were similar with Rymbai (2016)^[4]. Some farmers were even able to differentiate the duration of rainy days and rainfall quantity. The frequency and percentage of farmers based on their knowledge level is given in table 1.

The farmers have also experienced droughts, floods, changes in timing of rainfall and unexpected rainfall. However, farmers were not much aware of the climatic changes like soil erosion, frost intensity, heat waves i.e., majority of the farmers does not have adequate knowledge on these climatic variables.

Table 1: Distribution of farmers knowledge on climate change at different climatic variables

Sl.no.	Climatic Variables	Strongly know about change in climatic variables		Know something about change in climatic variables		Undecided about change in climatic variables		Doesn't know about change in climatic variables		No Change/Strongly doesn't know about particular climatic variables	
		(F)	(%)	(F)	(%)	(F)	(%)	(F)	(%)	(F)	(%)
1.	Maximum temperature (summer temp)	44	39.64	67	60.36	-	-	-	-	-	-
2.	Minimum temperature (winter temp)	35	31.53	76	68.47	-	-	-	-	-	-
3.	Drought	30	27.03	72	64.86	9	8.11	-	-	-	-
4.	Rainfall quantity	21	18.92	66	59.46	9	8.11	5	4.50	10	9.01
5.	Heat waves in summer	24	21.62	44	39.64	20	18.02	13	11.71	10	9.01
6.	Shorter winters	24	21.62	45	40.54	15	13.51	11	9.90	16	14.41
7.	Floods	21	18.92	47	42.34	43	38.74	-	-	-	-
8.	Soil erosion	22	19.82	45	40.54	20	18.02	7	6.30	18	16.21
9.	Timing of rainfall	32	28.83	60	54.05	19	17.12	-	-	-	-
10.	Unexpected rainfall	18	16.22	51	45.94	19	17.12	13	11.71	10	9.01
11.	Duration of rainy days	18	16.22	42	37.84	25	22.52	13	11.71	13	11.71
12.	Frost intensity	15	13.51	29	26.13	30	27.03	15	13.51	22	19.82
13.	Any other	3	2.70	2	1.80						

F = Frequency, % = Percentage

Table 2: Distribution of farmers according to knowledge level

S. No	Categories	Respondents (n=111)	
		F	%
1	Low (less-than 30)	12	10.81
2	Medium (30-54)	80	72.07
3	High (more-than 54)	19	17.12
	Total	111	100.00

Table 2 depicts the distribution of farmers according to their overall knowledge on climate change. The respondents were divided into three groups i.e., low, medium and high based on their level of knowledge. In the study area it is found that majority of the farmers (72.07%) were having medium level of knowledge on climate change followed by high (17.12%) level of knowledge and low (10.81%) level of knowledge.

The present findings were similar with Shadap (2014) [7], Marshall *et al.* (2014) [2] and Meghwal (2016) [3].

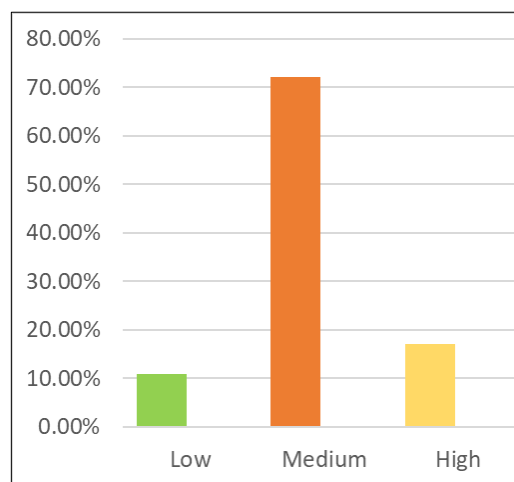


Fig 1: Graphical representation of the farmers knowledge on climate change

4. Conclusion

The study on farmers knowledge on climate change in turmeric cultivation revealed that majority of the farmers had medium level of knowledge on climate change. However, they do not possess adequate knowledge on all the climatic variables. Hence, there is a need to enhance their knowledge on all the climatic variables which may be achieved through awareness and education on aspects of climate change by extension agents and related departments.

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