Perception of Farmers towards level of awareness on Climate Change in Kishanganj district of Bihar

ABSTRACT

Climate change is viewed as the main problem to agriculture development in India. High dependence on agriculture and allied sectors make Indian state Bihar vulnerable to climate change. Farmers' perceptions of climate change, their preferences for adaptation strategies must be understood in order to improve policy for addressing the issues that climate brings to farmers. Therefore, the main aim of the present study was to understand farmer's perception to awareness to the climate change and their perception towards coping mechanism for changing climate. A total 240 respondents were selected using purposive sampling in the % villages of Kishanganj district during March to May 2023. Descriptive research design was used in the study. Data was collected through face to face interview method using semi structured interview schedule and analyzed using suitable statistical tool and technique. It was found that majority of farmers had medium level of socio-economic characteristics. From the study result it was found that farmers were aware about the climate change. Farmers agreed that Peak time of seasons has changed, there is change in onset of monsoon. Farmers exhibited resilient to changing climate through various local adaptation practices such as Switch to timely weather forecasting information, Climate resilient practices, etc. The findings will help to refine and enrich the knowledge among the stakeholders to provide an effective framework for decisions and policy making.

Key Words: Awareness, climate change, farmers, perception, resilient

INTRODUCTION

The impacts of climate change on agriculture and agricultural livelihoods have been identified as one of the primary barriers to sustainable development. Various consequences of climate change on agriculture including decreased crop output, altered water availability, soil erosion, an increase in pests and diseases, and—most significantly—affecting the socioeconomic stability of farming communities [1]. Changes in the climate have an influence on agriculture around the world, but nations like India are more vulnerable because of their big populations that depend on agriculture and their heavy use of natural resources. Despite the fact that India has achieved "self-sufficiency" in the production of food grains [2]. In

addition, it brought with it a number of socioeconomic and environmental problems, including increased pests and diseases, water logging, ground and surface water contamination, and loss of soil fertility [3]. India is one of the nations that is considered to be most vulnerable to climate change [4]. A large rise in temperature, frequent heat waves, droughts, extremely high precipitation events, and powerful cyclonic activity were all recently documented by researchers [5,6,7]. Since Bihar is state dependent on agriculture, agriculture is essential for total growth of the state's economy. About 81% of the population in Bihar, which is significantly more than the national average, is employed in agriculture and related businesses. The phonology, physiology, and productivity of the majority of agricultural crops have been disrupted in India as well as in Bihar over the past few decades due to climate change, which has taken the form of severe drought, unpredictable rainfall, high temperatures, etc. [8].

As the climate and agricultural production system change, food security will be impacted, and farmers will be the first to feel the severe repercussions [9]. Crop failure has negative effects on the economy, including inflation and farmer misery. India is quite concerned about climate change and the difficulties may bring because 85% of farmers there have inadequate financial resilience [10]. In this situation, farmers are the top implementers of adaptation measures to lessen the effects of climate change on the production system. Long regarded as a prerequisite for taking adaptation measures, perception of climate changes [11]. Farmers who understand climate change and its negative effects are more likely to support policy measures to address it [12].

To reduce the risk of climate change, perception, awareness, and adaptation are necessary. [13] in her research in four villages in Maharashtra and Andhra Pradesh, found that knowing farmers' perceptions is crucial for creating adaptation strategies to deal with the growing effects of climatic unpredictability and shocks. In a study conducted in Namibia, [14] discovered that Farmers were aware of the situation with regard to climate change, and they had seen major fluctuations in the amount of rainfall and temperature that had an adverse effect on their farms and crops.

Despite possessing fertile soil, adequate rainfall, and groundwater availability, Bihar is vulnerable to a number of natural and man-made calamities that reduce the productivity of the agriculture sector, including floods, droughts, hailstorms, cyclones, and earthquakes. North Bihar makes up to 74% of the region's total area and experiences floods more frequently than south Bihar does. To enhance policy for addressing the problems that climate presents to farmers, it is important to understand how farmers view climate change, what adaption techniques they prefer, and what barriers to adaptation they face [15]. Farmers had been watching the consequences of climate change on their own, it was discovered after completing a proper exercise with them. The aim of the current study is to investigate the socioeconomic position and climate change knowledge of farmers. This study aims to: (1) examine respondents' socioeconomic circumstances; and (2) ascertain farmers' perceptions of the effects of climate change.

MATERIAL AND METHODS

The study is based on primary data obtained from a household survey in the Kishanganj district of Bihar using a semi-structured interview schedule during March to May 2023. The data for the study is purposively selected from Kishanganj district as this district is severely affected by flood. Multi-stage sampling design was used for the study. Three stage sampling frame was formulated to select the sampling unit. In first stage, Kishanganj district was selected based on the vulnerability index to climate change. In second stage, five villages namely Chagaliya, Kashipur, Kashipur Belwa, Lohadanga and Motihara Taluka from Kishanganj block were selected. Qualitative methods were applied to study farmer's perception about flood and climatic variability, occurrence of flood. In each villages, 48 farmers were selected thus the total number of farmers were 240. Collected data were scored, tabulated, computed and analyzed using appropriate statistical tools and technique to provide necessary interpretations.

RESULT AND DISCISSION

Socio-economic status of respondents

Table 1 displays the socioeconomic position of farmers, and it is evident that 44.1% of respondents had a medium level of socioeconomic status followed by 29.5% had high level of socio-economic status and rest 26.2% respondents had low level of socio-economic status respectively. Findings of the study were similar to findings of Varadan and Kumar [16].

Table 1: Distribution of respondent based on socio-economic status

S. No.	Category	Frequency	Percentage
1	Low	63	26.2
2	Medium	106	44.1
3	High	71	29.5
	Total	240	100

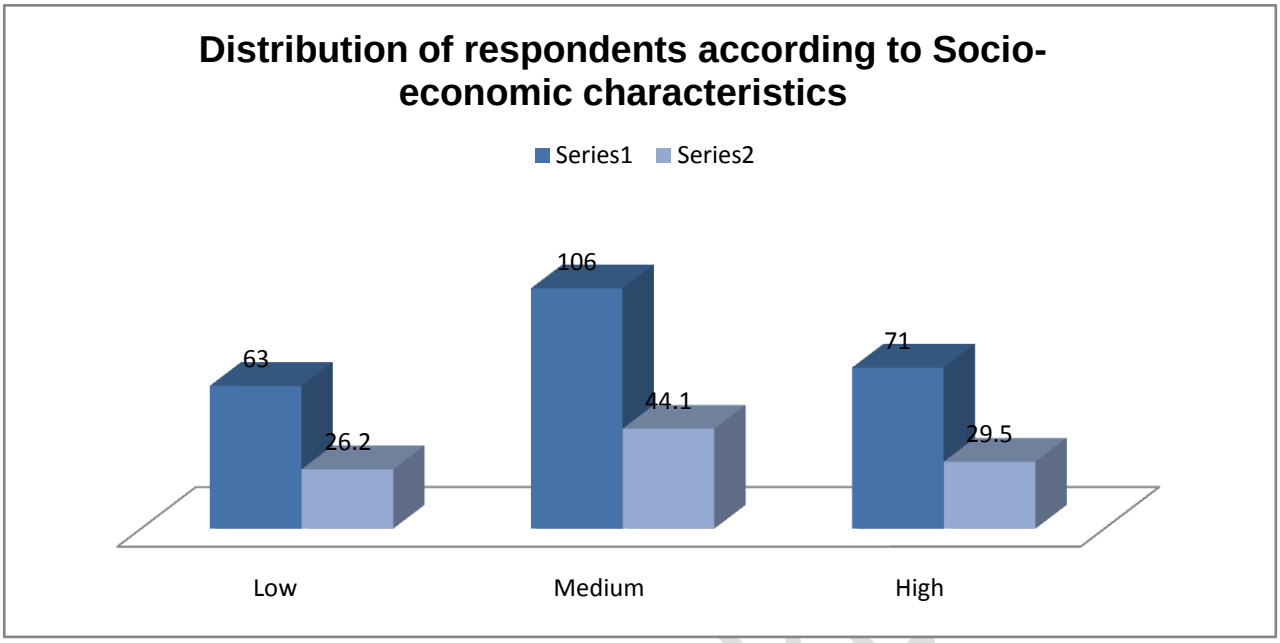

Fig1: Distribution of respondents according to socio-economic characteristics

Farmer's perception about awareness to climate change

Table 2 shows the respondents awareness on climate change. From the data it was found that 94% farmers perceived that peak timing of the summer, rainy and winter season has been changed in few years. The findings show similarity with the findings of Hein, Y et al. [17] that peak time of seasons and their duration has been changed. 92 % farmers agreed that timing of monsoon onset has been change. The similar result was found by Pandey et al. [18]. 88% farmers were aware that there was uncertain distribution of rainfall and 87% farmers perceived that there was increase in temperature in summer season. Dhanya and Ramachandran [19], Shashidahra and Reddy [20] also reported the similar findings. 85% farmers reported high occurrence of heat waves during summer season and 83% farmers reported change in rainfall pattern in rainy season. Findings of the study were in line with the findings of Nizam [21], Singh [22]. 82% farmers reported that temperature was increasing in summer season. Similar findings were reported by Dhanya and Ramachandran [23], Dupdal et al. [24].

Table 2: Distribution of respondent based on their perception about climate change

Statements	Agree (%)	Disagree (%)
Change in onset of monsoon	92	8
Occurrence of heat waves	85	15
Increasing temperature in summer season	82	18
Increase in number of hot days in summer	87	13
Peak time of seasons has changed	94	6

Change in rainfall termination	83	17
Recurrence of dry spells	79	21
Uncertain rainfall distribution	88	12

Farmer's perception about copping strategies to climate change

Farmers' main adaptation strategies in response to climate change have been recognized as adopting climate resilient methods and converting to reliable weather forecasts. There are a lot of climate resilient practices which can be adopted by the farmers and farmers found it one of the main coping strategies against climate change.

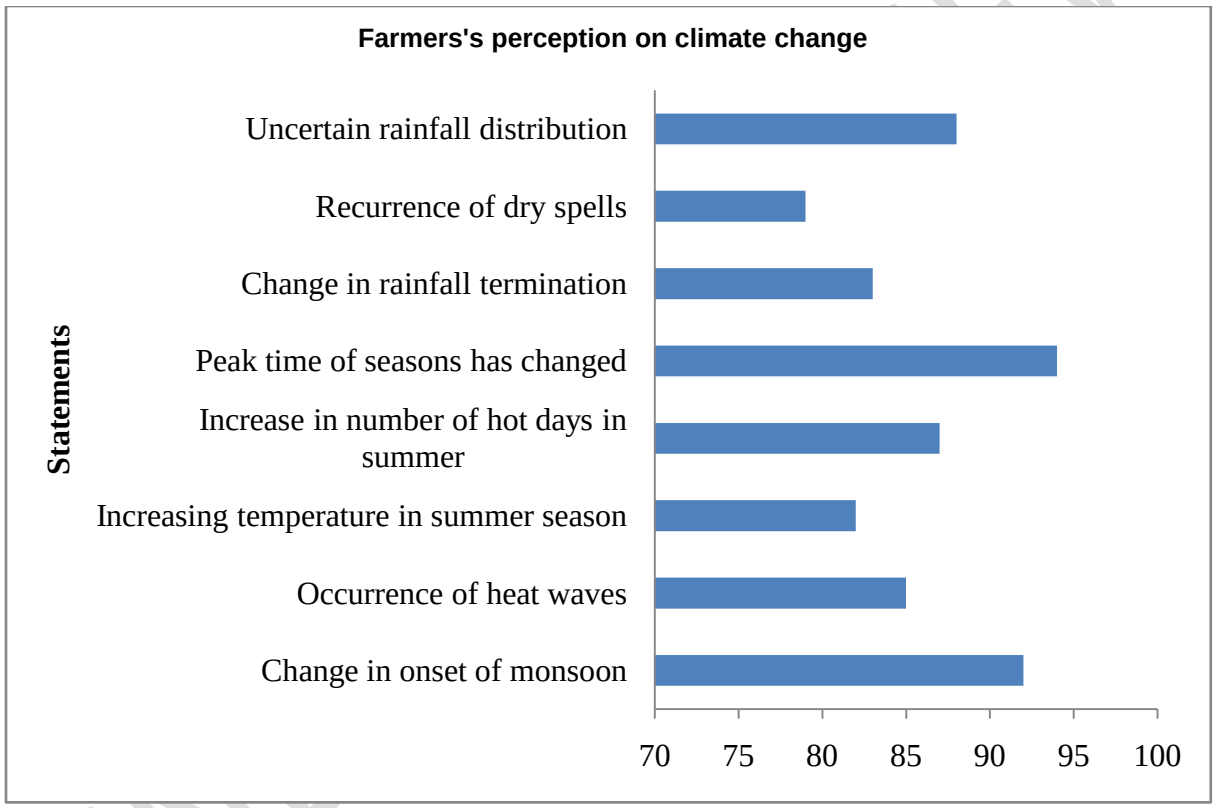

Fig2: Distribution of respondent based on their perception about climate change

If farmers get timely weather update they can choose appropriate and suitable climate smart practices to cope up with climate change. Governments programs were found as the third main strategies to cope up with climate change problems. There are many capacity development and awareness programs provided by Krishi Vigyan Kendra at district level where farmers can benefited with technological information to reduce the risk of climate change. Crop diversifications with short duration crops such as pearl millets, cowpea was found as an important coping mechanism. As the study area is affected by flood, farmers agreed that using of flood tolerant and short duration varieties could be beneficial to cope up with climate

change. Result of mean Garret ranking further revealed that change in cropping method and sowing time according to climate change will be beneficial for farmers. Application of modern agricultural technologies was found another coping mechanism for climate change. Findings of the study was in line with findings of Dupdal et al. [25], Raghuvanshi and Ansari [26].

Table 3: Distribution of respondent according their coping strategies to climate change

Statements	Mean Garret Score	Rank
Switch to timely weather forecasting information	92.5	II
Climate resilient practices	95.1	I
Crop diversification	87.9	IV
Use of flood and drought tolerant varieties	85.2	V
Change in cropping methods and time	79.1	VII
Short duration and early maturing varieties	83.7	VI
Application of modern technologies	76.5	VIII
Governments programs	88.9	III

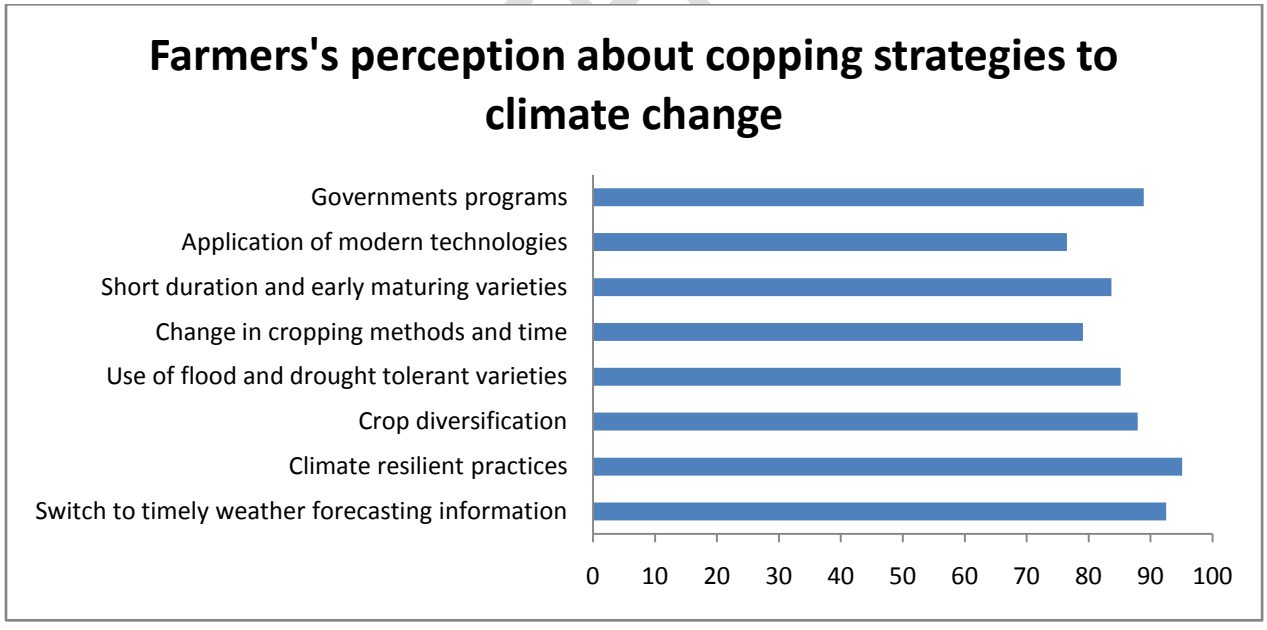

Fig3: Distribution of respondent according their coping strategies to climate change

CONCLUSION

The current study demonstrates the significance of understanding farmers' perceptions of climate change in creating adaptation strategies to combat the escalating effects of climate change and its variability. Studies have shown that majority of farmers had medium level of socio-economic characteristics. From the study result it was found that farmers were aware about the climate change. Farmers agreed that Peak time of seasons has changed, there is change in onset of monsoon, uncertain rainfall distribution, recurrence of dry spells etc. are some of the main problems of climate change. However, farmers demonstrated adaptability to the changing climate through a variety of local strategies, including switching to timely weather forecasting information, Climate resilient practices, Use of flood and drought tolerant varieties, Change in cropping methods and time, Application of modern technologies. Based on these findings, it would be crucial for politicians and agricultural scientists to address climate change and identify the elements that have a detrimental impact on agricultural productivity, production efficiency, and farm profitability.

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