

Farmers' Perception and Attitude toward Climate Change in Coastal Ecosystem of West Bengal

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ABSTRACT

Coastal area of India is more prone to the devastating impact of climate change. The present study was conducted in Sunderbans coastal ecosystem of West Bengal which is famous for mangrove forest and aquatic resources but this area is now under the adverse impact of climate change. Total six villages were identified from the two blocks of South 24 Pargana district of West Bengal for the present study. The main body of the research was carried out using a structured survey instrument. It was observed that nearly 38 per cent of the respondents had heard about climate change. Majority of farmers perceived that climate change is real and it is already underway. People of the Sunderbans area had mixed type of attitude toward climate change. They showed positive attitude towards government and scientists' role in solving climate change related problem and majority of them were worried about indiscriminate destruction of plant and animal species of the Sunderbans area. Attitude of the people also reflected their helplessness orientation toward climate change.

Keywords : Perception; Attitude; Climate Change; Coastal Ecosystem;

Climate change has been recognized globally as an ever increasing threat to our planet that is becoming impossible to ignore. The major underlying causes of climate change are the wasteful use of fossil fuels, destruction of forests, industrialisation and even poverty and population growth mainly in the developing countries. The danger is real that our climate and environment systems will be altered irreversibly if the present misguided policy continues in such areas as economy, energy, agriculture, population and environment. The most obvious manifestation of climate change is the rising of average worldwide temperature, popularly termed as global warming. Beside, most of the countries are facing the problems of melting of glaciers, rising of sea-level, changes in precipitation patterns, increase in plant diseases and a number of potential challenges for public health.

Climatic conditions influence all aspects of our life and shape the physical, chemical, biological and socio-economic environment. Human activities are influenced to a significant extent by weather and climatic conditions and reversibly human value and cultural system also have great impact on environmental system. The

economic and social implications of global climate change are the subject of intense national and international study in present day scenario. There are a number of researches on physical and biological aspects of climate change. But in recent years there has been growing interest regarding human perception and value system toward climate change and there is an endeavor to understand the climatic change from socio-economic perspective to prepare a roadmap for capacity building of people and to help the policy maker in formulating future policy based on human perception and attitude. This is due to the fact that the farmers' adaptation strategy to a large extent depends upon their perception and attitude they hold regarding climate change. If farmers held a negative attitude toward climate change or perceive that changes in climate are part of a normal climatic cycle, they may fail to adequately adapt. In addition, local knowledge concepts formed with farmers' social, economic and environmental construct could also lead to conflict with scientific knowledge (Vanclay, 2004). With this background, the present study has been undertaken to analyze the farmers' perception and attitude toward climate change in Sunderbans region of West Bengal.

METHODOLOGY

The study was conducted in the coastal ecosystems of West Bengal as fourth assessment report of IPCC mentioned that coastal belts are more prone to devastating impact of climate change (IPCC, 2007) and short term data analysis showed that Indian Sunderbans which is famous for mangrove forest in India may lose 15 % of land area by 2020 due to sea level rise (Roy, 2007). The study utilized descriptive survey research design. One district representative of coastal ecosystems was purposively selected for the study. From the selected district, two blocks and from each block three villages were selected purposively considering the potential impact of climate change in the area. Thus, total six villages were identified for the study. Sample of respondents were drawn randomly from selected six villages. Twenty respondents were selected randomly from each village whose livelihood depends on agriculture and allied activities. In all, 120 farmers were interviewed from six villages of two purposively selected blocks seeing the potential impact of climate change.

Individual's perception about climate change was measured by using the modified scale of Leiserowitz (2006). The scale is of six statements and the responses for each statement was rated over a five-point continuum which ranged from strongly agree (5) to strongly disagree (1) for positive items and reverse for negative items. Attitude towards environment and climate change was measured by modified scale of DEFRA (2007). The scale consists of 16 items of which 8 items are positive and the rest 8 are negative. The scoring pattern was 5 to 1 for positive statements and 1 to 5 for negative statements. The respondents were personally

interviewed by the researcher with the help of a well structured interview schedule. Data were analyzed using appropriate statistical technique.

RESULTS AND DISCUSSION

Perception about climate change : Perception is the way of processing raw data which a person receives through his sensory organ from the environment into meaningful patterns. Human perception depends not only on individual personality but also on community, environment and interaction among these components. Study of climate change in the light of human perception is essential because the success of any climate and environmental policy is contingent upon the consensus between these two components. So, before taking any initiative to adapt to climate change at first we have to assess the peoples' perception about climate change. For example, Sarkar *et. al.* (2010) measured the risk perception of people about climate change and reported that 70 per cent people perceived increase in crop diseases followed by reduction in agricultural production (46.7%), increase in salinity (40%), increase in insect and pest attacks (20%) etc. Sarkar *et. al.* (2010) also developed a vulnerability index by taking into account peoples' perception about climate change as one component and tried to see how peoples' perception affects their vulnerability level toward climate change. The scale of Leiserowitz was modified to measure the perception of people about climate change for the present study. The major findings of study regarding perception are presented in Table 1.

The item that the climate change is a real and already going on has been strongly endorsed by about

Table 1. Distribution of respondents according to their perception about climate change (N=120)

S. No.	Statement	SA (%)	A (%)	UD (%)	D (%)	SD (%)	Mean Score
1.	Climate change is real and occurring and already affecting day to day living.	23.3	40		33.3	3.3	3.47
2.	Scientists agreed that climate change is a serious problem and action should be taken to combat climate change.	13.3	50	0	0	36.7	3.40
3.	It is the most urgent and serious problem of present decade affecting farmers' livelihood.	13.3	43.3	0	10	33.3	2.93
4.	It is merely a deception by some section of scientific community and policy maker.	33.3	26.7	6.7	20.8	12.5	2.40
5.	It is a gradual and incremental problem.	0	6.7	36.7	43.3	13.30	2.37
6.	It is not at all a problem but just blown out by the environmentalists and civil society.	31.7	20.8	0	35.8	11.7	2.43

23 per cent and was agreed affirmatively by 40 per cent of the respondents. The statement obtained a mean score of 3.4 out of 5. More than 63 per cent of them had favourable disposition with the fact that the scientists agreed that climate change is a serious problem and action should be taken to combat climate change. While 56 per cent agreed that climate change was a very urgent and serious problem, 60 per cent believed that it was merely a deception and for about half of them it was not at all a problem but just blown out by the environmentalists and civil society. The findings revealed that largely people realized the imminence of the phenomenon and problems of climate change. However, educational campaign needs to be launched for increasing awareness among people in order to promote proactive adaptive interventions.

The mean score on item 'climate change is real and it is already underway' was fairly high (3.47) and mean score of item 'Scientists agreed that climate change is a serious problem and action should be taken to combat climate change' was also high. Whether it is a very urgent and serious problem was affirmatively endorsed by over 56 per cent of the respondents. The mean score in rest of the items, which had negative connotation, was very low indicating that respondents did not endorse them affirmatively. Thus it can be deduced that in general the respondents perceived the occurrence of climate change.

Attitude towards environment and climate change: Attitudes are individuals' predisposition to behave consistently either positively or negatively towards an object or person. Attitudes are learned and enduring that means they are acquired as a result of socialisation and are not subject to easy change. It becomes essential to study climate change in respect to people's attitude as attitude involves both belief and emotional component of human personality. So, attitude is a good predictor of human behaviour. Attitudes have three components- cognitive component, affective component and action tendency. If all the three components fall in line and the environmental factor is also in line with the underlying attitude then decision can be quickly arrived at as little or no post decisional dissonance is likely to occur. On the other hand if the underlying components are working at cross purpose and the environmental factors happen to be antagonistic to the existing attitude then decision making becomes a difficult task and the dissonance is

likely to occur during the decision making and even after the decision has taken. Based on this attitude-behaviour relationship people may develop positive or negative attitude toward climate change. For successful implementation of any climate change mitigation programme therefore it is essential to know people's attitude toward climate change. For example, *Evans et. al. (2008)* tried to measure rural people's attitude toward climate change and found that only 32 per cent farmers agreed that climate change is happening and 26 per cent believed that it was human induced. Farmers' attitudes that climate change was not a priority risk were revealed in their responsiveness to adaptation and mitigation. In response to changes in their local climate 48 per cent farmers initiated a high level of change in their management practices, 31 per cent tried alternative enterprises and just 20 per cent had implemented new more suitable enterprises. There were 42 per cent who had not implemented any enterprise change at all. Similarly, *Sujit et. al. (2010)* measured farmers' attitude toward climate change in Sunderbans Coastal ecosystem of West Bengal, India. Major findings regarding farmers' attitude toward climate change are presented here in the Table 2.

For the item 'I am worried about the indiscriminate destruction of indigenous plants and animals of Sunderbans'; the mean score was 3.97, which indicated favourable attitude among the respondents towards the protection of local ecosystem. However, a majority showed unfavourable attitude towards taking initiatives for checking ecological degradation in Sunderbans. Ninety per cent of the respondents expressed agreement with the statement that it was the responsibility of the Government to maintain and preserve the ecological balance in the Sunderbans, while about only one-third (37 per cent) showed agreement with the statement that the community had a larger role than Government in taking initiatives for reducing ecological degradation in Sunderbans. However, their agreement with the statement that fisherfolks in Sunderbans area should deploy sustainable practices for better environment with a mean score of 3.4, gives some ray of hope among the people to mend their ways for ecological redressal. Agreement by nearly 73 per cent of the respondents with the statement that 'personally I can not do anything to stop loss of the biodiversity of Sunderbans', reflected the helplessness orientation among people of the area.

Table 2. Distribution of respondents according to their attitude towards climate change and adaptation behaviour (N=120)

S. No.	Statement	SA (%)	A (%)	UD (%)	D (%)	SD (%)	Mean
1.	I am worried about the indiscriminate destruction of indigenous plants and animals of Sunderbans.	30	53.3	0	16.7	0	3.97
2.	Human beings are able to find solution to make a adaptation to the problem of climate change.	16.7	36.7	6.7	40	0	3.3
3.	The Scientists will solve problems of climate change.	23.3	36.7	16.7	20	3.3	3.57
4.	The local knowledge system of the area holds potential in finding solutions to problems related to climate change (increase in sea level, coastal flood, cyclones, salinity etc.) and making sustainable a adaptation for livelihood and survival.	0	26.7	0	73.3	0	2.53
5.	Climate change is a natural process and nature has its own coping ability.	0.8	45	6.7	30.8	16.7	3.18
6.	It is the angry of god for the avarice and ill ways of humans towards the nature.	0	49.2	0	18.3	32.5	3.34
7.	The negative impacts of climate change are too far in the future to really worry me.	9.6	44	0	20	0.8	2.83
8.	To me, short term business survival is more important and	9.6	65.6	0	20	0.8	2.34
9.	I do not have the luxury of spending a lot of time on a long term global issue like climate change						
10.	It is more laborious to do things that are environment friendly.	17.6	58.4	0	20	0	2.33
11.	It is very difficult for me to change my habits and behavior to be more environment friendly.	8	62.4	0	25.6	0	2.45
12.	I don't believe my behaviour, everyday lifestyle and farming activities are responsible for climate change.	9.6	69.2	0	20.2	0	2.31
13.	We can afford to loose some of the biodiversity of Sunder bans. to meet the livelihood demands of the people of the area	6.7	61.7	0	31.7	0	2.56
14.	Personally I can not do anything to stop loss of the biodiversity of Sunder bans.	6.7	73.3	0	20	0	3.67
15.	It is the responsibility of the Government to maintain and preserve the ecological balance in the Sunderbans.	40	50	0	10	0	4.2
16.	The community can play a larger role than Government in taking initiatives for reducing ecological degradation in sunderbans.	6.7	30	0	63.3	0	2.8
17.	Fisherfolks in Sunderbans should deploy sustainable practices for better environment.	0	66.7	6.7	26.7	0	3.4

Nearly half of the respondents felt that 'climate change was the wrath of the God', while about 60 per cent of them endorsed that scientist would find out the solution.

The findings revealed that predisposition of the respondents are mixed. Because of belief system and personality orientation they showed attitude of dependency on external source for management of problem. Attitude for self-initiated a doption behaviour could not be deduced from the result. Hence, it is imperative to provide motivational, attitudinal and infrastructural support to the people in order to develop

their capabilities for village-centric adaptive mechanism and measures.

CONCLUSION

The present study disproved the hypothesis that climate change is merely a hoax as most of the sample population has perceived some changes in relation to different climatic phenomenon over the last few years. The study showed mixed result about human perception and attitude of the farmers toward the climate change. Though some people perceived that climate change is a

real and it is already undergoing but many of them did not perceive the problem of climate change as a real threat. Similarly the attitude of the farmers proved that they were incapable individually to solve the problem of climate change which demands a call for community action. Their positive attitude toward the item that it is the responsibility of government to maintain ecological balance proved their dependence on government and public policy for solution of this serious problem. But hardly any policy can be effective until it is supported by the human perception and attitude and cultural

system. The present attitude discrepancy on several attitude items may be attributed to the lack of scientific knowledge about the cause and effect relationship of climate change. So, at first we have to build a positive attitude among the farmers about climate change by proper educational and extension system. Both mass media and individual extension system can be used to give them right information about climate change and its importance in their livelihood.

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