Perceptions Regarding Climate Change and its Health Impact: Reflections from a Community-Based Study in India

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Abstract

Background: In the climate change discourse, a body of scholarship focusing on how people perceive climate change and its impact is increasing. However, in the Indian context, such scholarship is limited. Objective: This paper aims to describe the perceptions of people on climate change and its health impacts, which were captured as part of a larger study. Methodology: A cross-sectional study was conducted in randomly selected 983 households in four districts spread across Madhya Pradesh and Jammu and Kashmir. A semi-structured questionnaire was used to collect the data. Results: For 72% of respondents, the perception was not related to climate change per se. Their perceptions were contextual and were based on the anomalies which are observed in the immediate weather conditions. The health impacts of climate change were also not understood at the first place, but with probing 64% of respondents were able to report seasonal diseases. Conclusion: Perceptions of the people regarding climate change are more linked to their own experiences with their local weather conditions rather than the overall concept. This also explains their lack of comprehension about the health impact of climate change, but a sound understanding of seasonal diseases.

Keywords: Climate change, community, perception, weather, and health impacts

INTRODUCTION

In the climate change field, scholarships focusing on the climate change science and assessing its wide range of impacts have developed considerably during the last few decades. Within these scholarships, surveys and studies capturing communities’ views on climate change and its impact have steadily gained prominence.[1-15] However, in the Indian context, such studies are limited,[16,17] with the impacts being discussed largely from a livelihood perspective.[18-22] Literature focusing on the perceived health impact of climate change is further rare, though there are references, largely strategic and macro in nature, which elaborate on the health implications in India.[23-26] With this backdrop, the paper primarily aims to understand how people residing in rural areas of India perceive climate change and its impact on health.

METHODOLOGY

The paper is based on data collected from four districts of India, namely Umaria and Dindori in Madhya Pradesh (Central India) and Jammu and Udhampur in Jammu and Kashmir (Sub-Himalayan region) during 2014–2015 for a larger study which had focused upon climate change and its impact on malaria. These districts were selected from the two sides of a spectrum of variables such as ground altitude, tribal population composition, and Annual Parasitic Index.

In all the selected districts, a list of blocks was prepared. From each block, a Primary Health Centre (PHC) having relatively higher malarial load was selected from each block. However, in case of Jammu and Udhampur, where malaria prevalence is low, not all the blocks were covered. Only those blocks, which had reported malaria cases or have migratory population, were selected. Accordingly, seven PHCs from Dindori, three PHCs from Umaria, four PHCs from Jammu, and three PHCs from Udhampur district were selected. Within these PHCs, a total of 100 villages with high burden of malaria cases were identified with the help of district program officials who were involved

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in the malaria control program. From each selected village, a list of households was prepared and ten households were randomly selected. Ethical approval for the study was obtained from the Institutional Ethics Committee. A semi-structured questionnaire was developed to collect the data through a survey method which was administered to the head or representative of randomly selected 983 households across these four districts. The tool had four sections. The first section captured the demographic and socioeconomic related data of the respondents, their views on climate change, awareness of climate-sensitive diseases, etc. The second section captured respondent’s knowledge about malaria causation, preventive measures, and health-care-seeking behavior. The third and fourth sections captured the details of the malaria cases. The respondents were asked two questions regarding their perceptions of climate change—“whether respondent knew anything about climate change” with options of “yes” and “no.” The respondents who answered affirmatively were then asked to elaborate on their understanding of climate change. Their responses were coded and grouped into different categories for analysis. Similarly, in order to understand the perception of people on how climate change influences human health, respondents were asked three questions. The first question was “whether respondent knew or heard about the climate-influenced diseases with options of “yes” and “no.” Those who answered “yes” were asked to mention the diseases/conditions which they thought were influenced by climate. These respondents were also asked to elaborate on how they come to know about it (i.e., source of information such as newspaper, radio, television, and friends).

**Results**

Around 73% of the respondents were male, while the remaining were female. The mean and median age of the respondents were 41 and 40 years, respectively; with 83% of them married. Around 30% of the respondents did not receive any schooling. The proportion of such respondents was less in Jammu and Kashmir (27.3%) as compared to Madhya Pradesh (32.4%). Among educated respondents, the percentage of respondents having education till senior secondary level (12th class) was more in Jammu and Kashmir (67%) in comparison to Madhya Pradesh (62%). A little more than 50% of respondents reported their primary occupation as farming.

Prompts were made to elaborate the term “climate change” as respondents did not comprehend the literal translation of climate change. It was only after these prompts or hints, the respondents answered positively. Out of the total 983 respondents, 702 (71.4%) said they knew something about climate change. However, among them, 65 (9%) respondents could not elaborate their understanding despite answering positively, while the remaining 637 (91%) shared their perception on climate change. The percentage of respondents saying “yes” was more in Jammu and Kashmir (83.6%) in comparison to Madhya Pradesh (58.7%). While elaborating on their perception of climate change, it was found that the respondents associated climate change primarily to the changes witnessed in their local weather such as changes in temperature, rainfall pattern, and quantity of rainfall. Only a few respondents (2%) associated climate change with diseases [Table 1]. Some of the responses highlighting the perception of people on climate change are presented below in verbatim (accompanied with their translation).

- “‘Aajkal humare yahan kheti sookh jaati hain, garmi adhik ho rahi hain’ (now a days, here, cultivation [crops] fails. There is increase in temperature.)

(a respondent from Umaria District)

- “Barsaat ke mausam mein suraj dikayee de jaata hain, phel to itne baarish hoi thi ki suraj bhi nahi dikhta tha” (Earlier it used to rain so heavily that hardly we could see the sun. Now, even during rainy season, one can see the sun.)

(a respondent from Umaria District)

- “Barsaat mein kami dekhne ko milti hain, garmi jyada ho rahi hain” (witnessing low rainfall, it’s getting hotter)

(a respondent from Dindori District)

- “Is mausam humare yaha thand shuru ho jaati hain, abhi tak baarish ho rahi hain” (by this season, winter used to start; but it is still raining here)

(a respondent from Jammu District)

- “Peechhe baar to kaafi baarish hui, tand der SE aati hain” (last year there was heavy rain, there has been delay in onset of winter season)

(a respondent from Jammu District)

The responses regarding climate change, when segregated state wise, revealed interesting insights on perception. It was found that respondents associating climate change with “heavy rainfall” were more from Jammu and Kashmir (52.3%) as compared to Madhya Pradesh (1.9%). Contrastingly, respondents relating climate change with increase in temperature and less rainfall were largely from Madhya Pradesh [Table 1].

Similarly, many of the respondents initially could not answer to the first question pertaining to the perceived health impact of climate change as respondents could not relate climate with diseases or health. It was only when probing was done that 64% of the respondents (632 in number) mentioned about the climate-influenced diseases. Among the 64% respondents, 66% of the respondents knew about malaria, followed by diarrhea (40.7%), heat stress (30.9%), dengue (9.3%), and malnutrition (6.8%) [Table 2]. With regard to information sources from where respondents came to know about climate-sensitive diseases, about 49% (310) of the respondents mentioned friends, 38% (240) newspaper, 33% (208) television, 26% (164) family members/relatives, 21% (132) radio, and 15% (96) health worker.

**Discussion**

This paper discusses the perception of people, who are residing in the rural areas of Umaria, Dindori, Jammu, and Udhampur...
district, on climate change and its health impact. The findings indicate that respondents, irrespective of geographic regions, did not particularly understand the concept of climate change. Rather, they associated the changes in their local weather conditions of temperature, rainfall quantity, rainfall pattern, etc., to the climate change. The responses relating climate change with heavy rainfall were more in Jammu and Kashmir, which had witnessed massive floods during 2014 (while the data were collected during 2015). Similarly, annual rainfall data, particularly of monsoon months of four consecutive years, starting from 2011 to 2014, for Umaria and Dindori districts found to be supporting people’s perception. The data show a deficit rainfall pattern in both districts, more so in Umaria district in 2012, 2013, and 2014. These findings are in line with those of other studies which have reported that respondents perceived climate change with local variations observed in parameters like rainfall and temperature. Studies conducted in different geographies also reported similar findings wherein extreme events such as floods, droughts, cold, and strong winds were perceived as climate change. These findings are in tune with our study findings wherein respondents from Jammu and Umaria/Dindori associated climate change with heavy rainfall and rainfall deficit, respectively.

With respect to the perceived health impact of climate change, respondents were aware of seasonal diseases. This awareness was more in Jammu and Kashmir as compared to Madhya Pradesh, which could be due to the differential educational attainment of the respondents. However, respondents did not perceive extreme weather events or variations in weather conditions having any relation with diseases. This is similar to findings reported in other studies, conducted in Canada and the USA, wherein respondents did not relate climate change with health effects. However, studies conducted in countries Asia and Africa indicate people being aware of the health impacts of climate change such as injuries, heat risk, stress, illness, food and water insecurity, which is in contrast to our findings.

The perceptual understanding of climate change is largely localized in nature and is related with the variations as well as extreme events observed in weather. It appears that people do not perceive that climate change has a bearing on climate-influenced diseases. Although our study has not captured the local level adaptation measures which people opt to mitigate the impact of weather variations or extreme weather events, existing literature indicates that such perception-based studies have a potential and significant role in climate change adaptation. Such perception-based studies on climate change in India will contribute to the existing literature and will be of help to the implementers implementing climate-adaptive strategies at the ground level. Understanding and incorporating population perspectives into the climate change adaptive strategies and action plans can ensure the resilience of the community toward climate change under an overarching umbrella of appropriate and conducive mitigating measures at all levels, including policy formulation.

**Conclusion**

A careful observation of perceptions of the people on climate change points toward an understanding linked to their experienced local climate variability and extreme weather conditions.

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### Table 1: State-wise distribution of perception on climate change

| Responses                                           | Umaria and Dindori (Madhya Pradesh) (%) | Jammu and Udhampur (Jammu and Kashmir) (%) |
|-----------------------------------------------------|----------------------------------------|-------------------------------------------|
| Total number of respondents                         | 482                                    | 501                                       |
| Number of respondents mentioning any climate-related change | 264                                    | 373                                       |
| Heavy rainfall                                      | 5 (1.9)                                | 195 (52.3)                               |
| Increase in temperature and less rainfall           | 96 (36.4)                              | 0                                         |
| Change in rainfall pattern                          | 13 (4.9)                               | 66 (17.7)                                |
| Increase in temperature                            | 48 (18.2)                              | 31 (8.3)                                 |
| Change in rainfall quantity (decreased)             | 67 (25.4)                              | 1 (0.3)                                  |
| Causes diseases                                     | 5 (1.9)                                | 1 (0.3)                                  |

### Table 2: State-wise distribution of climate-influenced diseases

| Diseases                                           | Umaria and Dindori (Madhya Pradesh) (%) | Jammu and Udhampur (Jammu and Kashmir) (%) | Total |
|----------------------------------------------------|----------------------------------------|-------------------------------------------|-------|
| Number of respondents mentioning any climate influenced diseases | 276                                    | 356                                       | 632   |
| Malaria                                            | 179 (64.9)                             | 239 (67.1)                               | 418 (66.1) |
| Diarrhea                                           | 169 (61.2)                             | 88 (24.7)                                | 257 (40.7) |
| Heat stress                                         | 67 (24.3)                              | 128 (36.0)                               | 195 (30.9) |
| Dengue                                             | 3 (1.1)                                | 56 (15.7)                                | 59 (9.3) |
| Malnutrition                                       | 7 (2.5)                                | 36 (10.1)                                | 43 (6.8) |
| Chikungunya                                        | 1 (0.4)                                | 3 (0.8)                                  | 4 (0.6)  |
conditions vis-à-vis an invisible and unrelatable concept of climate change. This could also explain their lack of comprehension about the health impact of climate change, but a sound understanding of seasonal diseases.

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**Conflicts of interest**

There are no conflicts of interest.

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