Case report

Using participatory approaches in climate and health education: A case report from rural India

Ritu Parchure a,*, Anuj Ghanekar b, Vinay Kulkarnia

a Prayas Health Group, Pune, India
b Independent Researcher, India

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ABSTRACT

Introduction: Climate change has been called a 'Planetary Health Emergency'. Climate-induced health impacts are universal, but their expressions may be localized depending upon local determinants, necessitating the need for contextually grounded health adaptation actions. Community engagement is central to multisectoral climate and health actions. Communities need to be informed, educated, involved, and empowered to identify unique pathways through which climate change impacts health locally. The use of participatory approaches is recommended over top-down ones.

Case presentation: The present case study describes the experience of using a participatory approach to involve local rural communities in India, generating evidence towards climate health policies and implementation. A total of 30 participatory dialogues were carried out, interacting with approximately 374 individuals in 9 village communities from Bhor Block of Pune district in western India.

Discussion: Three lessons emerged from qualitative data analysis — a) Tailoring participatory approaches is important. Approaches like pictorial stories, causal loop diagrams, listing and ranking, timeline, and action-oriented dialogues were customized for climate and health discourse and action; b) The participatory approaches offer ample opportunities and advantages such as their appealing value, ability to unfold contextual vulnerability, and actionable insights for adaptation. c) The barriers a social system poses to the participatory approach cannot be overlooked.

Conclusion: Participatory approaches can build peoples’ abilities for critical analysis of situations and problem-solving about climate change and can enhance local community engagement. More research is needed in this area to facilitate education about climate change and health.

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1. Introduction

Climate change is the largest threat to human health and has been called a ‘Planetary health emergency’ [1,2]. Its range covers direct impacts such as injuries and deaths due to extreme weather events like floods or heatwaves to indirect effects like alteration in patterns of certain infectious diseases, water-borne diseases, malnutrition, or mental health effects [3]. An additional 250,000 deaths per year could be attributed to climate change by 2030 [4].

Climate-induced health impacts vary significantly across different regions, shaped by diverse geographical features, socio-economic contexts, and pre-existing vulnerabilities [5]. Consequently, health adaptation actions must be contextually grounded, operating at various scales, for example, in India, from sub-national to district and even micro-level village contexts. An array of solutions, such as developing real-time early warning and surveillance systems, understanding vulnerabilities, formulating health system innovations, and evidence-based actions, are widely discussed and are being implemented [6]. A key consideration to achieve better adaptability is strengthening primary healthcare and increasing multisectoral collaboration, specifically aiming at local contexts [7].

Local community engagement is central to the goal of such multisectoral climate and health actions, regardless of country. Communities need to be informed, educated, involved, and empowered to identify unique pathways through which climate change impacts health locally. This will also add to the general local knowledge repository, which is often inadequate. However, traditional top-down communication models—where communities merely receive global information—have a limited role and do not take into account the nuances of different communities. Instead of just being passive recipients, communities need to be engaged as active stakeholders. A participatory approach has been recommended instead of a “one-
way” transfer of technical and complex information [8,9]. Participa-
tory approaches can unravel the lived experiences and local realities
of affected communities [10,11]. To the best of our knowledge, proj-
ects using participatory approaches for climate-health linkages have
not been widely performed, especially in LMICs such as India, and
there is a need to demonstrate these approaches.

In light of this need, the present case study describes the experi-
ence of using a participatory approach to climate change and health
education in a rural area and associated communities in India. Such
efforts contribute towards the UN Sustainable Development Goal 3-d
- "strengthening preparedness, resilience and response capacities to
health emergencies."

2. Case presentation

2.1. The setting

From the Bhor block (1,86,116 population) in the Pune district of
Maharashtra state, 9 village communities (covering 9000 population)
were shortlisted belonging to the catchment area of a selected Gov-
ernment health facility. As indicated in Fig. 1, Pune district is located
in the western region of Maharashtra state. The Bhor block is situated
to the southwest within Pune district.

The selected village systems were considered with other relevant
sub-systems like health facilities. These agrarian village communities
had close contact with nearby urban centers. Every village had a ded-
icated elected representative, a community health worker (CHW),
and a village health committee. The actions described were con-
ducted from August 2022 to March 2023.

2.2. The approach

An established civil society organization, working on the climate
change and health domain, started an initiative to explore the possi-
bilities of integrating a climate change lens in the health system. The
initiative was supported by local private funding; the goal of the ini-
tiative was to assess how climate change was affecting villagers
health-wise and help them adapt to and reduce the consequences of
climate change. The participatory dialogue sessions were conducted
by a climate change and health educator along with two community
facilitators and a note taker. (One of the authors fulfilled the role of
the educator) The dialogues were categorized based on the phase in
which they were introduced, such as preparatory dialogues aiming
for rapport establishment, follow-up meetings, and action-oriented
dialogues. The dialogues ranged from 45 min to 1.5 h. The follow-up
meetings (ranging between 2 and 5) were held at an interval of
approximately a month. The participatory activities used during the
dialogues were planned reiteratively in a “snowball” manner where
one action or consultation with local stakeholders helped brainstorm
further activities.

All steps undertaken as a part of the health communication efforts
were documented and analyzed manually by deriving themes and
subthemes. A “naturalistic” understanding of the issue was per-
formed. Ethics approval was not needed for this intervention in the
field as it was an educational and awareness effort. This paper is
based on a post-hoc analysis of the intervention to help identify suc-
cessful participatory approaches to educating and involving a rural
community regarding the climate-health nexus. Data presented were
anonymized and derived from the field notes taken by the assigned
note-taker. The field notes were analyzed by a researcher who was
not involved as an educator, using reflexive iteration [12]. Analysis
themes were validated by taking the “third-person” views of col-
leagues who were not involved in the work.

The methods described in Table 1 were used to involve and edu-
cate local communities about climate and health actions. The meth-
ods were based upon the body of existing tools, such as Participatory
Rural Appraisal tools by Robert Chambers [13]. However, the specific
tools used in the field were creatively constructed by the educators
themselves.

Images showing examples of field use of participatory aids can be
found in Fig. 2.

2.3. Results

A total of 30 participatory dialogues were conducted in the ver-
nacular language Marathi, with a total of 374 individuals

Fig. 1. Pune district, State of Maharashtra, India.
Process Purpose

Pictorial story (Chitra Katha) Fig 2(a) People discussed a handmade set of pictures exhibited by the facilitator. This weaved locally relevant possibilities of climate-health stories with the help of a probe asked by the facilitator. People listened to a local case vignette of a Water-borne disease outbreak and established climate-health linkages using a visual representation of a causal loop diagram, represented by easily understandable symbols. Participants also mapped local action requirements through system loops such as early reporting of the disease outbreak by Community Health Workers, public and private health care providers to the health system and proactive water safety monitoring at the village level. To offer a visual pathway for people to reflect on their lives. This is also important for people who cannot read.

Causal loop diagrams Fig 2(b) To stimulate analytical discussions on local cause-and-effect interconnections

Timelines Fig 2(c)(d) People compared the local situation three decades back (as a standard reference time duration for climate change) and changes perceived over time till now. They constructed the temporal dimension of climate change and health and the socio-economic context from a historical perspective. To identify patterns, trends, and shifts over time and contextualize today’s scenario

Listing and ranking People made a comprehensive list of their life issues, creating a village profile in which they also located the concerns specific to climate and health. Priorities were assigned based on their perceived importance or relevance. To help identify the perceived importance of climate and health concerns

Action-oriented dialogues These were aimed to move beyond discussions and generate concrete actions. To focus on practical solutions, implementation, and positive change.

Table 1

<table>
<thead>
<tr>
<th>Tool</th>
<th>Process</th>
<th>Purpose</th>
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<tr>
<td>Pictorial story</td>
<td>People discussed a handmade set of pictures exhibited by the facilitator.</td>
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<tr>
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<td>Listing and ranking</td>
<td>reference time duration for climate change) and changes perceived over</td>
<td>today’s scenario</td>
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<td>Action-oriented</td>
<td>People made a comprehensive list of their life issues, creating a vector</td>
<td>To help identify the perceived importance of climate and health concerns</td>
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<td>dialogues</td>
<td>(Water-Borne Diseases) outbreak and established climate-health linkages</td>
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<td></td>
<td>using a visual representation of a causal loop diagram, represented by</td>
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<td></td>
<td>easily understandable symbols.</td>
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<td>Workers, public and private health care providers to the health system and</td>
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<td>proactive water safety monitoring at the village level.</td>
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participating. Participants included adult men and women residing in the intervention villages who were 30–60 years old. Most of the participants resided in puccha households (permanent or well-built structures), and had access to electricity and LPG (Liquefied Petroleum Gas) connections. While some households possessed ceiling fans, owning an air conditioner was rare. Some of them had limited reading abilities. Their spoken language was ‘Marathi’. The participants were found to lack a modern science-based knowledge of climate change. Many of the participatory dialogues were well received by the participants. During these sessions, they shared their experiences and observations related to climate-health connections. Some of these are described in the next section, as we discuss the key takeaways.

3. Discussion

The following three key lessons from the case can be discussed.

3.1. Tailoring participatory approaches for climate and health discourse and action is a prerequisite

Regardless of particular methods, participatory methods must be tailored to the locale they are used in [14]. For climate health discussions, participatory approaches were customized to align with the intended objectives. The use of tailored participatory approaches like narrative communication has been endorsed in literature [15].

3.2. Participants need to be provided with multiple ways to access their experiences regarding climate change

Appeal value of approaches - The use of appealing approaches, especially pictorial ones, facilitated active engagement. Illiterate participants could readily grasp information through visual tools. The tools were “Conversation starters,” where simplified climate change content served as a discussion entry point. The pictorial tools provided a framework of potential climate-health pathways of local relevance.

Unveiling Contextual Vulnerability - The tools facilitated a nuanced understanding of climate-associated health vulnerabilities, delving into their intricate causes across various life domains (such as livelihood and lifestyle). This understanding emerged from the lived realities of individuals. Real-life cases surfaced through meaningful discussions. Engaging in dialogue sometimes sparked debates and conflicts. These exchanges, however, further allowed villagers to establish vital connections between climate change, health, and social determinants. The examples below describe these interactions.

Example 1 - Bhor Taluk is not known for extreme heat. However, record temperatures have been set in recent times. Discussions in one of the villages revealed sudden deaths among elderly with comorbidities after farming work on a hot sunny day during the summer. Family members explained how multiple factors enmeshed with climate change and its health implications –

“In March 2022, Sumatibaai (name changed) followed her daily routine and went to accomplish her agricultural work. The afternoon heat was at its peak. After a day-long work in the field, 59-year-old Sumatibaai felt dizzy and fell. She was a diabetes and hypertension patient. Her daughter-in-law gathered people. They made Sumatibaai drink water and took her home. In the evening she again started feeling restless. The private hospital was 8 km away. Sumatibaai was admitted there, but after an hour, she expired. We don’t know whether working in extreme heat has caused this incident, but we need to take extra care of our elders during summers henceforth, that is for sure…”

These stories improved participants’ understanding of climate change and relatability to science. It created alarm and interest in knowing the potential attribution of extreme heat-related illnesses and adaptive actions. The integration of experience of health risks in communication strategies has been advocated for improving adaptation practices [16].

Example 2 - The climate connection of Vector-Borne Diseases was hard to imagine and understand in the absence of local past evidence on correlations and uncertainty about the future. However, the participatory approach provided space for mutual learning. One of the dialogues between participants suggests how people made sense of this intricate pathway by referring to their observations in non-health domains.

“Our schedule of pesticide use has changed nowadays. Earlier those were not used in winter. Last year, farmers sprayed it during winter, too. The monsoon pattern has changed, so we have no option. The
humidity was high last winter. If the behavior of pests changes, so will vectors. We adapt our practices to prevent crop damage. We should think similarly for Dengue and Malaria too.

Learning about climate change through relatable contexts bridged the gap between abstract concepts and everyday realities.

Determining solutions- The tools offered windows to initiate discussions on climate-focused micro-scale health adaptations. For example, some measures suggested for heat adaptation were: early warning dissemination using the Local village council loudspeaker, Gram Suraksha Yantrana (Village safety mechanism), WhatsApp groups, and protection from extreme heat by providing head caps to farm laborers. The process demystified complexity by grounding the concept of health adaptation in a given context. Stakeholder mapping was an integral part of the dialogues which also identified the need for local capacity-building.

3.3. The barriers a social system poses while using a participatory approach cannot be overlooked

The community’s ability to mitigate climate-induced health impacts is directly correlated with its inherent social structure. Even seemingly mundane health behaviors, which are often shaped by social and psychological factors, can impact both climate and health outcomes. However, the existing social context presents several obstacles to maintaining this process.

Initial resistance exhibited by people- In many villages, people were found prioritizing other domains of life (like livelihood and lifestyle) over health-related discussions. Additionally, people had preconceived expectations from any health-related meetings (eg. immediate benefits such as free medicines/consultations etc.). This adversely impacted their openness and interest in joining the discussions on health adaptation at the individual or collective level.

Fig. 2. The glimpses of participatory tools (a) Pictorial story of the impact of extreme rainfall (b) Causal loop diagram for diarrhoea outbreak (c) The timeline generated chart decided by villagers to display at the village council office (d) People make lists and rank their priorities using paper chits.
Intersectionality barriers within the village — In these dialogues, participation based on gender, age, and social group was disproportionate. Certain subgroups that are known to have higher vulnerability to climate-induced health impacts (such as migrants) had lower representation. However, the intervention was constrained by limited resources and a short timeframe, limiting its reach to a diverse set of people within villages.

Need for integration in existing community processes — For scalable and sustainable actions, climate-health education needs to be integrated into existing community processes, using participatory approaches. The pragmatic limitations of short-term exploratory intervention identified the avenues for such integrations. However, there is a need to continue the participatory community processes sustainably over a longer period.

4. Conclusion

Climate change will continue to have far-reaching impacts on all aspects of our existence. Climate-health education and engagement are important but must be customized to fit the specific local contexts. This case report delineates a model for climate-adaptive health system actions at a hyper-local level in rural India through a participatory approach. The approach is in alignment with the 73rd Constitutional Amendment Act passed by the Indian Parliament in 1992, which focuses on decentralizing decision-making from the central governments to the local villages. Such approaches have the potential to build abilities for critical analysis of situations, enhancing collective efficacy and cross-sector collaborative learning [17–19]. These abilities are crucial, especially in the context of climate change and health, to adapt to dynamically changing vulnerabilities and uncertainties of health impacts.

The exploratory intervention provides a thematic framework at an ideational level which can be further replicated in other countries, especially LMIC ones, after adequate contextualization. An in-depth inquiry into the application and efficacy of these tools in diverse settings is needed.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

CRediT authorship contribution statement

Ritu Parchure: Writing – review & editing. Writing – original draft. Methodology, Formal analysis, Conceptualization. Anuj Ghanekar: Writing – review & editing. Writing – original draft, Formal analysis. Vinay Kulkarni: Writing – review & editing. Conceptualization.

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Supplementary materials

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