# 'We Suffer, They don't Bother': Narratives of Primary Healthcare Vulnerabilities during Floods in Assam, India

S. S. Sumesh<sup>1</sup> and Nitish Gogoi<sup>2</sup>

# Abstract

Public health research across the globe shows increasing inequalities in healthcare, especially among the marginalized sections of society. This paper aims to explore primary healthcare vulnerabilities during floods among socio-spatially marginalized groups in Assam, a state in northeast India. The paper delves into the ideas of 'equity' and 'justice' in primary healthcare policies and their implications during flood-like disasters. Using a 'grounded theoretical approach,' the paper argues that floods severely disrupt primary healthcare services and increase healthcare vulnerabilities among sociospatially marginalized groups, while state support to provide basic healthcare requirements during floods remains totally disrupted. Largely, there is an inadequacy of policy frameworks in addressing the primary healthcare issues of the marginalized communities living in flood-prone areas in Assam. Therefore, based on the findings, we propose 'five building blocks' for the primary healthcare system during disasters like floods: proper implementation of boat clinics, equitable healthcare financing and equity budgeting, inclusive governance systems, collaborations between NGOs and the state health machineries, and gender-sensitive disaster policies with a focus on 'equity' and 'justice'.

# Introduction

Floods are the most common natural disaster occurring worldwide, with their impact expected to grow in the future because of climate change and population shifts (Paterson et al., 2018). The growing body of research significantly shows that socially marginalized and spatially excluded groups are particularly vulnerable to floods (Soetanto et al., 2017; Oulahen et al., 2015; Lowe et al., 2013; Lein, 2009; Walker

<sup>&</sup>lt;sup>1</sup>Asstt. Professor, Dept. of Sociology, Tezpur University, Sonitpur, Assam, Email: sumeshss@gmail.com

<sup>&</sup>lt;sup>2</sup>Asstt. Professor, OKD Institute of Social Change and Development, Guwahati, Assam, Email: nitishgogoi50@gmail.com

& Burningham, 2011; Zahran et al., 2008; Tapsell et al., 2002; Tunstall et al., 2006). Although key drivers of health-related vulnerability to floods have been identified, studies are not convergent on the demographic and societal factors associated with health outcomes that are the product of flood events. Studies are also inconclusive on the effect of flood on health issues and mortality (Rufat et al., 2015, p. 475). Social demographic studies during floods reveal that very young and elderly people are the most vulnerable sections during floods (Lowe, 2013; Ashley & Ashley, 2008). Young and old people tend to suffer from higher psychological distress due to their dependency on other family members (Kar et al., 2004; TT et al., 2012). Similarly, gender status is also closely associated with flood vulnerabilities, where women are disproportionately affected by various harms that occur during floods, which have been worsened by their lack of access to various social and material resources (Walker & Burningham, 2011; Rofi, 2006). During floods, women's mental health illnesses tend to be higher than their male counterparts (Kumar et al., 2007). Women's mental illness during floodlike disasters has also been associated with lower birth weights and diminished social functioning in their children (Hilmert et al., 2016; Simcock et al., 2017).

Research also shows that lower socio-economic households are disproportionately affected by floods. Lower socio-economic status often hinders post-flood recovery and rebuilding processes. Various power interactions, social arrangements, and social connections have also influenced their access to various resources during and after floods. These marginalized groups are frequently disregarded and underserved by state support and other disaster management authorities (Fothergill & Peek, 2004; Kamel, 2012). Other social factors, such as race, ethnicity, and immigration status, have also been closely linked with flood-related harms or other environmental hazards (Cutter, 2003).

In Assam, floods have always been a regular phenomenon. Though different parts of the country are suffering from flooding, the range and magnitude have been high in Assam. Almost every year, three to four waves of floods ravage the flood-prone areas of Assam. Most of the areas under the Brahmaputra Valley have had devastating floods. During the post-independence period, Assam faced major floods in 1954, 1962, 1972, 1977, 1984, 1988, 1998, 2002, 2004, and 2012. The average annual loss due to floods in Assam is to the tune of Rs. 200.00 Crores, and particularly in 1998, the loss suffered was about Rs. 500.00 Crores, and during the year 2004, it was about Rs. 771.00 Crores (Water Resource Department, GoA, 2024). It has been reported that in 2019, around 3,705 villages in 29 revenue circles of 27 districts were affected by floods, and a total of 50 people died (Singh, 2019). Till June 2024, over 1.17 lakh people from around 969 villages in 27 revenue circles in Assam were affected by floods (*The Hindu*, 2024). However, it is the marginalized population that has always suffered from floods, and no significant efforts have been made by the state to control or mitigate flood-related hazards. Instead, floods have been a weapon for the political parties in Assam.

Historically, most of the marginalized people in Assam, such as the Scheduled Caste (SCs),<sup>3</sup> Scheduled Tribes (STs), Char Chapori dwellers,<sup>4</sup> and immigrants, have been living in vulnerable flood-prone areas. They are often referred to as the riverine community in Assam and have been dealing with the devastating incidences of floods in Assam (Borpujari, 2014; Morang, 2017; Sharma, 2021). Therefore, in this paper, we aim to explore primary healthcare vulnerabilities during floods among sociospatially marginalized groups in Assam, India. We also aim to highlight the ideas of 'equity' and 'justice' (Benfer, 2015; Borras, 2020) in primary healthcare policies and their implications during flood-like disasters. To fulfill these objectives, the following research questions have been formulated: (a) What is the status of primary healthcare services during floods among socio-spatially marginalized groups? (b) How do they experience and negotiate primary healthcare accessibility, vulnerability, and health outcomes during floods? (c) How do they view state interventions in reducing primary healthcare issues during floods? And (d) what are the possible ways to address the issues of primary healthcare inequalities and inequities for marginalized sections during floods?

Using a 'grounded theoretical approach,' we explored the existing inequalities and inequities in primary healthcare services during floods and showed the inadequacy of policy frameworks in addressing the primary healthcare issues of the marginalized communities living in flood-prone areas in Assam. We argue that floods cause significant disruptions to primary healthcare services and heighten healthcare vulnerabilities among socio-spatially marginalized groups. Despite this, state support often fails to meet basic healthcare needs during such crises. Based on the findings, we propose 'five building blocks' for the primary healthcare system during disasters like floods, viz., proper implementation of boat clinics, equitable healthcare financing and equity budgeting, inclusive governance systems, collaborations between NGOs and the state health machineries, and gender-sensitive disaster policies with a focus on primary healthcare 'equity' and 'justice'.

Following this introduction, the article is structured as follows: The second section delineates the field settings and methodologies employed in this study. The subsequent three sections present the lived experiences of research participants concerning primary healthcare vulnerabilities during floods. The next section provides narratives from primary healthcare workers regarding the challenges encountered while delivering primary healthcare services during floods. The following section discusses the findings and offers recommendations to enhance primary healthcare services during flood like disasters. The article concludes by arguing for intersectional socio-ecological health disparities research to inform the development of more inclusive primary healthcare policies and practices for marginalized sections of society.

<sup>&</sup>lt;sup>3</sup>STs and SCs are constitutionally designated groups of people in India. They are also known as the Dalit-

broken, scattered, or depressed section. Mahatma Gandhi calls them Harijan-the Man of God.

<sup>&</sup>lt;sup>4</sup>A low-lying flood- and erosion-prone riverbank, primarily inhabited by the Muslim people of Bengali origin in Assam.

# **Field Settings and Research Methods**

The study was conducted from October 2020 to March 2021 in the flood-affected Muttak Kaibarta village, located in the Dibrugarh district of Assam, India. The selection of this village was based on two criteria: first, the Scheduled Caste (SC) background of its residents; and second, it is an isolated riverside geographical location prone to flooding. According to the 2011 Census, Muttak Kaibatra Gaon is a medium-sized village in the Dibrugarh West Circle of Dibrugarh district, Assam, with 176 families residing. The village has a population of 979, with 519 males and 460 females. Of the village population, 95.30% belong to the SC category, while 1.12% belong to the ST category. The sex ratio of the village is lower (886) than the state average (958), whereas the child sex ratio is higher (1033) than the state average (962). The village has a higher literacy rate of 81.91%, with male literacy at 86.93% and female literacy at 76.13% (Census of India, 2011a, b). Although there are no written records about the history of the village, the *Gaon Burha*<sup>5</sup> (the village head) stated that the village was established in 1955.



Figure 1: The Broken Embankment of the River

# Source: Field

The village is situated on the banks of the Burhi Dihing River, covering 133.24 hectares of land (Indian Village Directory, 2024). The Burhi Dihing River is the largest southbank tributary of the Brahmaputra River in the North Eastern Region of India. It originates in the Patkai Hills at an elevation of 2375 meters. After flowing for about 80 kilometres, it meets the plains and runs through the alluvium of Assam Valley for another 300 kilometres before joining the Brahmaputra (Sarma & Sudhir, 1986). As observed during our fieldwork, this river is a lifeline for the villagers despite the flooding issues. Most families depend heavily on the Burhi Dihing River for fishing as their primary

<sup>&</sup>lt;sup>5</sup>Appointed as per the Constitution of India and Panchyati Raaj Act, 1989.

livelihood. Over time, they have also engaged in agriculture on the fertile banks of the river. However, they cannot pursue agricultural activities throughout the year due to annual flooding from June to September, which forces them to live on the river's embankment. Some families rely on daily wage labour to sustain themselves, and only a few villagers have government jobs. Families with better economic conditions are found migrating to Dibrugarh town and other areas to escape the floods.



Figure 2: A Difficult Life!

#### Source:Field

This study employed a 'grounded theoretical approach' (Glaser & Strauss, 1965, 1967, 1968; Charmaz, 2006). Glaser and Strauss (1965, 1967, 1968) argued that this approach helps researchers focus sequentially on the most critical aspects or issues within a specific study field, facilitating the development of grounded concepts or insightful theories. Thus, grounded theoretical research adopts a bottom-up perspective, moving from phenomena and practice to theory and explanation (Flick, 2007), often transcending mere description by constructing new concepts to explicate observed occurrences. Furthermore, it provides researchers with more analytical power from fewer data points (Charmaz & Thornberg, 2021, pp. 307–308). Drawing on grounded research frameworks, we approached 25 village inhabitants for this study, of whom 10

(seven males and three females) agreed to participate. Additionally, to corroborate the narratives collected from the villagers, we interviewed healthcare workers, including the Community Health Officer (CHO), General Nursing and Midwifery (GNM) staff, Accredited Social Health Activists (ASHA), and Auxiliary Nurse Midwives (ANM) working at the Mini Primary Health Centre (MPHC) and sub-centres in the area. In-depth qualitative interviews were conducted to gather the participants' grounded narratives, with each interview lasting approximately 2–3 hours. Non-participant observation was also utilized throughout the fieldwork.

The second author collected, recorded, and transcribed the data, while the first author audited and systematically cross-checked it. To maintain the integrity, sense, and accuracy of the collected data, both authors carefully reviewed all transcripts, followed 'line-by-line' (Charmaz & Thornberg, 2021) coding, and identified meaningful themes to understand the participants' lived experiences of primary healthcare vulnerabilities during floods in Assam. Charmaz and Thornberg (2021, p. 307) suggested that this form of understanding can lead researchers to rethink or relinquish cherished disciplinary concepts that they previously believed would fit their data. Finally, thematic narrative analysis was employed to present the participants' lived experiences of primary healthcare vulnerabilities during floods. All narratives were recorded with the written and verbal consent of the participants. Moreover, this research was conducted according to the convenience of our participants.

# Life in a Boat: Lived Experiences of Disease and Issues of Primary Health Care During Floods

During floods, personal boats are the only available transportation system for the inhabitants of the selected village. The inhabitants of the village travel approximately 12 kilometres to access PHC services, whereas the all-India average distance to government Primary Health Centres (PHCs) centres is 6.6 kilometres. When we asked research participants about health-related issues during floods, Debeshwar Das,<sup>6</sup> a 55-year-old male participant, shared, "You just cannot imagine the situations during floods! We have to suffer from various skin diseases, but due to disruptions in communications, we are not able to access primary healthcare during floods." In another interview, Bikash Das, a 25-year-old young man, shared, "There is always a serious issue with clean water during and after periods of flooding, and we have to rely on river water, which is very harmful for our health." Rupam Das, a 34-year-old participant, noted, "Due to consuming contaminated water, most of the people from our village are suffering from diarrhoea and pneumonia." According to the World Health Organization (WHO), the major risk factor for outbreaks associated with flooding is the contamination of drinking-water facilities. There is also an increased risk of infection with water-borne diseases contracted through direct contact with polluted waters, such as wound infections, dermatitis, conjunctivitis, and ear, nose, and throat infections (WHO, 2005).

<sup>&</sup>lt;sup>6</sup>Names have been changed for ethical reasons.

One of the major issues indicated by our research participants was respiratory infection. Benudhar, a 39-year-old male participant, narrated, "During floods, we all have to suffer from cough and sore throat issues. Headaches are common among the inhabitants of our village, and our children have to suffer from runny noses and breathlessness." Despite these issues, our research participants informed us that there were absolutely no interventions from their PHC, located 12 kilometres away from the village. Even after floods, when they visit their PHC centre, the doctors often tend to refer their health issues as "normal". The common attitude of the doctor, as stated by our research participants, was "It happens; no need to worry."

During interviews, all the participants expressed that they usually depend on noninstitutional treatments such as traditional healthcare practitioners in their locality and religious rituals. After the floods, their primary health centre becomes non-functional. They have to deal with many burdens, and due to disrupted communications and a lack of money, people cannot afford better healthcare services and resort to religious practices. During the post-flood period, they organize community prayers at the river embankment or at religious places such as the *Namghar*.



Figure 3: Water Born Skin Diseases among Research Participants (RP)

Source: Field (Taken on 27-12-2020 with the permission of RP and necessary permission has been taken to publish their pictures)

Interestingly, most of the people in the village are heavily dependent on Deben Gohai, popularly known as 'Deben Doctor,' who lives in the village with his wife and two sons. He completed a radiography course at Assam Medical College (AMC), Dibrugarh, and by profession, he is a farmer while also providing primary healthcare services in his locality. Many of our research participants referred to him when asked about the treatment of their primary healthcare issues. The participants helped us meet him, and we eventually interviewed him. During our conversations, he narrated a grim picture of healthcare vulnerabilities during floods in the village.He observed,

"During floods, most people depend on my services. I have to cover five villages. Actually, people have no other options. It costs Rs. 500–1000 to go to AMC, and it's very far. So, they don't go to AMC. Instead, people come to me for minor treatments. Sometimes I have to deal with serious cases. People don't understand that I am not a doctor. At their request, I have to go and provide my services. I travel everywhere by boat; even at night, people from another village will come by boat to take me to their home and later bring me back. After floods, people suffer from skin problems. People with critical conditions are admitted to Assam Medical College, Dibrugarh. But at night, people have no options except my service......"

Thus, during floods, people in the village suffer from severe healthcare vulnerabilities. Despite these vulnerabilities and the limited healthcare services available during floods, people are forced to endure due to poor socio-economic conditions.

# We Suffer, They Don't Bother: Flood, State and Primary Health Care Inequalities

During our visit to the village, the devastating effects of floods were still visible. Many parts of the riverbank were wrecked due to erosion, and many families were busy reconstructing their damaged houses. A few families were still living on the embankment of the river. Articulating his experiences of inequalities in primary healthcare during floods, Deba Das, a 45-year-old male participant, noted, "I showed my skin issues to the PHC workers during their visit, but they ignored me and were afraid to come closer to me." Similarly, in a different interview, Gunabhiram, a 44-year-old male participant, narrated,

"There are no significant efforts from the state to resolve the issues of floods and PHC; instead, whatever support we receive from the state during a flood emergency is just meagre and not up to the mark."

Toramati, a 55-year-old female participant, sadly narrated, "Twenty years ago, I lost my child during a devastating flood as he suffered from pneumonia." She broke down while narrating the incident. She stated,

"In the last 35 years, I have seen so many ups and downs in this village. Many have died due to cholera, and people are still suffering from many diseases, but we have not been receiving minimal primary healthcare during and after floods from the state. We just suffer, but they don't bother."

It was observed during all the interviews that participants expressed their dissatisfaction with the support received from the state. They also requested their local MLA (Member of Legislative Assembly) to address their issues, but nothing has been resolved, and the MLA has not visited them during or after flood periods. All research participants complained about the post-flood primary healthcare services provided by their PHC. They noted that their PHC offers them very poor medicine which is, according to them, is not effective, as echoed by participant Trishna. Trishna showed us her skin issues and narrated,

"During post-flood, whatever medicine we receive from the government is all very faku dorob (useless medicines)."

She further explained,

"Therefore, even after suffering from skin diseases or other health issues during post floods, we don't visit our PHC. It's meaningless to visit as they always offer us medicines, which are not effective. We don't want faku dorob...."

Significantly, in 2008, the Government of Assam started boat clinic services for the people and communities living on different islands of the Brahmaputra River. As per the National Health Mission (NHM), Assam, fifteen boat clinic units are operational in thirteen districts of the state, including Dhubri, Barpeta, Nalbari, Morigaon, Sonitpur, Lakhimpur, Dhemaji, Dibrugarh, Tinsukia, Jorhat, Goalpara, Bongaigaon, and Kamrup District, with one additional unit each in Dhubri and Barpeta District. Boat clinics provide health services including Reproductive and Child Care, Curative Care, Family Planning Services, Basic Laboratory Services, etc. (NHM, Assam, 2024). However, the people in this village are still deprived of these services. As reported, our research participants were unaware of the boat clinic despite the inclusion of their district, i.e., Dibrugarh, under the boat clinic scheme by the state.

However, they acknowledged the primary healthcare services provided by some NGOs during floods. As reported during interviews, NGOs were the only means to get quality primary healthcare services during floods while the state has failed. Rupama, a 33-year-old research participant noted,

"It is the NGOs who have been taking care of us and providing us with quality healthcare services during and post-flood periods. They

were very helpful for women and children in our village during the floods, as they always brought sanitary napkins and other help."

These findings indicate that the state has been sluggish about the healthcare issues of these populations living in such riverine areas. Interestingly, in a very negligent way, the NHM, Assam stated on their website that there are more than 2000 villages in these riverine areas, and it is not possible for them to cover the entire population and villages due to the lack of health facilities with little or no manpower (NHM, Assam, 2024). Research participants' narratives also reflect the poor attitudes they face and the kind of services they receive during and after floods from state healthcare facilities. This reveals the inadequacy of primary healthcare service delivery in Assam.

# Gender, Floods and Primary Health Care Vulnerabilities

Flooding has been a significant challenge for the women and children of the village. Rupama, who delivered her baby on a boat, narrated her devastating experiences:

"I still remember the pain that I suffered through. It was raining, and we were living on the embankment when suddenly labour pain started. My husband somehow managed to get a boat to take me to the Assam Medical College (AMC), Dibrugarh. But unfortunately, I delivered my baby on the way. After delivery, my child suffered heavily from pneumonia and was admitted for 15 days at AMC, Dibrugarh. We were worried, but with the blessings of God, he is now well."

We observed that while narrating her experiences, she became emotional and was visibly terrified by what she had gone through. She emphasized that her case was not unique; many women and their families had lost their newborn babies due to the lack of immediate post-delivery care hindered by floods. She further noted that due to the lack of post-natal care, newborn babies and children born during the floods often suffer from long-term health issues. Additionally, post-delivery recovery is prolonged as they have to live on the river embankment without proper sanitary systems, including access to clean water. This incident reveals not merely the physical trauma but also the psychological agony the patient suffers.

In a different interview, Trishna Das shared, "We women have to suffer from urinary infections and menstrual issues as we are not able to wash our menstrual rags properly due to privacy and clean water issues." Agreeing with Trishna, Toramati Das expressed, "During the floods, we women have to give up our shyness as there are toilet issues." Rupama also shared, "During floods, most of the time we have to wear damp clothes as there is no place to dry them. Sometimes we wear the same dress for many days."This is, however, a global gendered experience of floods among women. During the 1998 floods in Bangladesh, adolescent girls reported perineal rashes and urinary tract infections because they were not able to wash their menstrual rags properly in private,

often had no place to hang the rags to dry, or had access to clean water. They reported wearing the still-damp clothes, as they did not have a place to dry them (WHO, 2002).

We explored that while women suffer from menstrual issues and other primary healthcare issues, the male respondents we interviewed are exposed to more hazardous conditions. As reported, male research participants and other men of the village are often involved in rescue operations, construction, and repair work during and after floods, which significantly increases their exposure to a higher risk of injuries and waterborne diseases. As Bikash highlighted,

"During and post-floods, I have to take care of everything for our family, and being the only man in the house, it's very difficult for me to manage the effects of the disaster. I have to ignore my health to take care of other family members' health. Sometimes, I also feel very helpless as I can't take care of my family members' health."

Bikash also highlighted the increased responsibilities in the aftermath of floods, such as the economic burden of taking care of other family members' health or rebuilding homes, which, according to him and other research participants, can be both physically and emotionally taxing. The burden of these responsibilities further aggravates their vulnerabilities. Additionally, as reported by male research participants, they mostly work in contaminated water bodies and environments, which is more injurious to their health. Moreover, the focus of relief efforts may sometimes prioritize women and children, including by NGOs, inadvertently neglecting the minimum health needs of men, pushing them into more vulnerable conditions. They also reflected an ignorant attitude toward their health, being 'men'. All these aspects severely harm their primary healthcare during and post floods. Disruptive primary healthcare services and a lack of proper access to healthcare in the aftermath of the flood make their primary healthcare more susceptible.

# Primary Health Care Workers' Narratives on Primary Health Care Services during Floods

During our journey to the MPHC, we observed extensive flood damage to the roads. As reported by the research participants, there are still no adequate transportation facilities to reach the MPHC. While individuals with personal vehicles can access the centre more easily, others face significant difficulties. This raises concerns about the accessibility of primary healthcare services for marginalized populations during floods, which the WHO recognizes as a fundamental human right (WHO, 1946).

Through our interviews with healthcare workers, it became clear that floods severely disrupt primary healthcare services. The state fails to provide the necessary support to healthcare workers during such crises. The GNM (General Nurse Midwife) of the MPHC reported that from June to September, they cannot operate their centre due to heavy floods. She stated,

"During floods, we have to provide healthcare services by boat, and sometimes we are unable to reach the patients due to the rising water levels."

The GNM highlighted the severe health issues women face during floods, especially concerning menstruation. She shared,

"During floods, women's and girls' situations become terrible, especially during menstruation. They suffer from urinary tract infections, and we cannot help. We feel so bad. It's also difficult to reach every village with a poor boat. Still, we always try to support them as much as we can."

The Community Health Officer echoed similar sentiments, stating, "During floods, we can't do our duty properly since we don't have a proper transportation system. We also don't have a boat clinic. We are helpless!" She added that they try to reach the affected populations post-flood and provide better healthcare services. They organize health camps with the help of the Block Primary Health Centre (BPHC) and visit every village to ensure people's health. However, delivering services during the flood remains challenging.

The ANM (Auxiliary Nurse Midwife) also discussed how floods impede their ability to provide services. She mentioned that as healthcare workers, they always try to help those suffering from the flood's impact. However, the severe disruptions in communication and transportation make it nearly impossible to care for everyone's health. The ASHA (Accredited Social Health Activist) worker, who resides in the study village, shared her inability to help her fellow villagers during floods. She can provide pregnancy-related information and accompany pregnant women to health centres if necessary. However, she lamented that due to severe floods and lack of medicines and communication, she cannot assist the pregnant women in her area adequately.

These narratives highlight the challenges primary healthcare workers face during floods. The lack of proper infrastructure and support significantly hampers their ability to deliver essential healthcare services during such emergencies. Their narratives also reflect the inadequacy of health infrastructure of the state to provide necessary and adequate support to healthcare workers. This significantly hinders their ability to fulfil their responsibilities in caring for the health of people affected by floods.

# **Discussion and Policy Recommendations**

Our aim in this paper was to explore primary healthcare vulnerabilities faced by socio-spatially marginalized groups during floods in Assam. The findings of this study demonstrate that residents of socio-spatially marginalized areas are more prone to various forms of risk during floods, which is further exacerbated by poor socio-economic conditions. The personal narratives and dialogues of the research participants

also illustrate how intersections of class, gender, and geography affect primary healthcare during flooding emergencies. Research participants' narratives including the healthcare workers, significantly reflect how the state fails to provide minimum and quality healthcare support during floods. The results largely highlight inadequacies in environmental and socio-ecological policy frameworks for protecting marginalized groups' lives during disasters like floods in Assam. Thus, socio-spatially excluded communities in India have historically received insufficient healthcare support during emergencies (Borooah, 2018; George, 2019; Ghosh, 2014; Sengupta et al., 2020).

Pinto (2021) argues that while philosophical discussions have reignited the discourse on health and justice, their impact on policies, the expansion of choices for marginalized populations, and the reduction of health inequalities appear negligible. Our exploration reveals that despite the critical impact of floods on public health, the state healthcare system often neglects flood related healthcare issues. Villagers' reliance on non-institutional primary healthcare practices reflects the failure of the state to implement inclusive measures in welfare and development policies.

Evidence indicates that robust and comprehensive primary healthcare services during disasters like floods significantly reduce associated morbidities and mortalities (WHO, 2008). Such services can serve as a vital support system for vulnerable and marginalized groups, who typically bear the brunt of disaster consequences (Lamberti-Castronuovo et al., 2022). However, studies have not adequately explored the intersections of primary healthcare initiatives with human rights, social justice, or health equity principles (Redwood-Campbell & Abrahams, 2011). Therefore, focusing on the principles of equity and justice, we propose five building blocks for the primary healthcare system during floods, outlined below.



# Figure 4: Five Building Blocks for Primary Health Care Equity and Justice during Floods

*Proper implementation of the boat clinic:* Although the concept of a boat clinic exists in Assam, there is still inadequacy in its proper implementation. Permanent construction of healthcare infrastructure is not feasible in many flood-affected areas of Assam. Therefore, ensuring the proper maintenance and implementation of boat clinics in such

areas will assist thousands of people living on Brahmaputra Island across Assam in accessing primary healthcare during floods. To achieve this, we recommend that the state increase its funding specifically allocated to this project.

Equitable healthcare financing and equity budgeting: The concepts of health inequality and inequity often overlap, with scholars sometimes using these terms interchangeably. "Health equity" refers to the ability of all individuals to attain their full health potential without being disadvantaged by socially determined circumstances such as race, ethnicity, religion, gender, age, social class, socio-economic status, or other factors (NCCDH, 2013, p. 2). In contrast, "health inequalities" denote disparities in health outcomes among different population groups that are considered unjust and unavoidable, often defined by social, economic, demographic, or geographic factors. Moreover, health injustices arise from inequitable healthcare financing, as evidenced by declining investments in India's public healthcare system (Berman & Ahuja, 2008). Peripheral states like Assam face funding challenges that hinder effective healthcare policy implementation. Hence, we propose equitable healthcare financing to foster an inclusive healthcare system, especially keeping disaster situations like flood which is a perennial problem in the state. Additionally, we advocate for "equity budgeting," which involves preparing and analysing budgets from an equitable standpoint to assess the equitable impacts of budgetary decisions, particularly on marginalized populations in every region (Gogoi & Sumesh, 2022).

*Inclusive governance system:* We propose the adoption of "inclusive governance" to address socio-ecological health issues affecting marginalized groups. Such a governance framework would reinstate primary healthcare as a public good accessible to marginalized populations. It would also facilitate the implementation of equity budgeting across all levels of primary healthcare policy formulation, implementation, and evaluation.

*Collaborations between NGOs and the State healthcare machineries:* Research in India has shown that community-based interventions by NGOs significantly enhance healthcare delivery in remote areas (Shukla et al., 2011). During floods in Assam, NGOs like the 'Satya Shakti Foundation' and 'Helpage India' have played crucial roles in providing quality primary healthcare services. Therefore, we propose that the Government of Assam integrate NGOs into policy framework and evaluations, allowing them to monitor the performance of primary healthcare services during disasters such as floods. This could involve allocating specific funds to NGOs to address primary healthcare issues among flood-affected populations in the state.

*Gender-sensitive disaster policies:* National and international disaster management bodies often neglect women's representation, leading to insufficient consideration of their needs and interests in disaster management policies (Schwoebel & Menon, 2004). Our study highlighted how both women and men's issues were overlooked by the state and primary healthcare services during floods in Assam. Although gender-sensitive disaster policies have been proposed, Assam has yet to implement such schemes despite

its recurrent flood vulnerabilities. Therefore, we propose the formulation of gendersensitive disaster mitigation plans and policies. This could involve organizing training programs for both female and male representatives to ensure their active participation and representation in disaster planning processes. Thus, by recognizing and addressing the unique primary healthcare vulnerabilities of both men and women during and postfloods, state can develop more effective and inclusive disaster response strategies. This gender sensitive framework not only support the well-being of both genders (including other gender specific to societies) but also strengthens the overall resilience of flood affected communities.

# **Conclusion: A Way Forward**

This study illustrates how floods disrupt primary healthcare services and exacerbate healthcare vulnerabilities among marginalized populations. It highlights that during floods, people suffer from a range of healthcare issues, from minor to severe, compounded by inadequate healthcare infrastructure and poor economic conditions, forcing them to normalize both floods and diseases in their daily lives. They often resort to local traditional healers or religious rituals for treatment. Women's healthcare issues, such as urinary infections due to inadequate sanitation, become particularly vulnerable during floods. For instance, Rupama's experience of delivering her baby on a boat underscores the extreme challenges faced by pregnant women in accessing timely healthcare during floods. In such contexts, the state and its healthcare services often fail to reach these vulnerable populations.

Therefore, we argue that the state is yet to prioritize improvements in minimum healthcare services during floods or to address the spatial vulnerabilities of marginalized communities, such as those observed in the village we studied. Instead, the state has significantly failed to implement equitable healthcare policies to address the issues of marginalized people living in flood-prone areas in Assam.Based on these findings, we also argue for intersectional socio-ecological health disparities research efforts aimed at reducing spatial biases in healthcare and developing more inclusive public healthcare policies. Intersectionality acknowledges the importance of addressing individual, institutional, and structural levels of power within specific socio-historical contexts to advance health equity and social justice (López & Gadsden, 2016, p. 1). In summary, socio-ecological health inequalities pose significant challenges amidst rapid environmental changes, necessitating comprehensive future planning for equitable healthcare delivery among marginalized groups.

# **Ethical Considerations**

The institutional ethical review for this study was done by the institution "Tezpur University" under its research ethical committee namely "Tezpur University Ethical Committee (TUEC)" with the approval number "DoRD/TUEC/10-14/2018/2(d)." The data underlying this article cannot be shared with anyone outside of the research team in order to protect the privacy of the individuals who participated in the study and consent requirements.

# Acknowledgement

We extend our gratitude to the anonymous reviewers for their insightful comments on the earlier draft of this article, which significantly improved our arguments.

# **Declaration of Conflicting Interests**

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

# Funding

This study was supported by Indian Council of Medical Research under the project titled, 'Inequality and Inclusion in Primary Healthcare System in India: Comparative Analysis of Kerala and Assam', with the registration number 2015-3586/32/2016/ ICMRICSSR-SBR, at the Department of Sociology, Tezpur University, Assam, India.

# References

Ashley, S.T., & Ashley, W.S. (2008). Flood fatalities in the United States. *Journal of Applied Meteorology and Climatology*, 47 (3), 805–818. <u>https://doi.org/10.1175/2007JAMC1611.1</u>

Benfer, E. A. (2015). Health justice: A framework (and call to action) for the elimination of health inequity and social injustice. *American University Law Review*, 65 (2), 275-351. <u>https://digitalcommons.wcl.american.edu/aulr/vol65/iss2/1</u>

Berman, P., & Ahuja, R. (2008). Government health spending in India. *Economic and Political Weekly*,43(26-27), 209-216. <u>https://www.epw.in/system/files/pdf/2008\_43/26-27/</u> Government\_Health\_Spending\_in\_India.pdf

Borooah, V. K. (2018). Caste, religion, and health outcomes in India, 2004–14. *Economic and Political Weekly*, *53*(10), 65-73. <u>https://www.epw.in/journal/2018/10/special-articles/caste-religion-and-health-outcomes-india-2004-14.html</u>

Borpujari, P. (2014). Hit by climate change, Assam River communities bury their pride, move into houses on stilts. *The Scroll*, October 13, 2014. <u>https://scroll.in/article/682650/hit-by-climate-change-assam-river-communities-bury-their-pride-move-into-houses-on-stilts</u>

Borras, A.M. (2020). Toward an intersectional approach to health justice. *International Journal of Health Services*, 51(2), 206–225. <u>https://doi.org/10.1177%2F0020731420981857</u>

Census of India. (2011a). Motak Kaibatra Gaon Population - Dibrugarh, Assam.Retrieved fromhttps://www.census2011.co.in/data/village/291191-motak-kaibatra-gaon-assam.html

Census of India. (2011b). Individual PCA and Special Tables on SC and ST of Assam. <u>https://</u>censusindia.gov.in/tables\_published/scst/scst\_main.html

Charmaz, K. (2006). Constructing grounded theory: A practical guide through qualitative analysis. Thousand Oaks, CA: Sage.

Charmaz, K., & Thornberg, R. (2021). The pursuit of quality in grounded theory. *Qualitative Research in Psychology*, 18(3), 305-327. <u>https://doi.org/10.1080/14780887.2020.1780357</u>

Cutter, S. L., Boruff, B. J., & Shirley, W. L. (2003). Social vulnerability to environmental hazards. *Social Science Quarterly*, *84* (1), 242–261. <u>https://onlinelibrary.wiley.com/doi/epdf/10.1111/1540-6237.8402002</u>

Flick, U. (2007). Designing qualitative research. SAGE.

Fothergill, A., & Peek, L. A. (2004). Poverty and disasters in the United States: A review of recent sociological findings. *Natural Hazards*, 32, 89–110. <u>https://doi.org/10.1023/</u> B:NHAZ.0000026792.76181.d9

George, S. (2019). Reconciliations of caste and medical power in rural public health services. *Economic & Political Weekly*, 54(40), 43–50. <u>https://www.epw.in/journal/2019/40/special-articles/reconciliations-caste-and-medical-power-rural.html</u>

Ghosh, S. (2014). Equity in the utilisation of healthcare services in India: Evidence from national sample survey. *International Journal of Health Policy Management*, 2(1), 29–38. <u>https://doi.org/10.15171/ijhpm2014.06</u>

Glaser, B. G., & Strauss, A. L. (1965). Awareness of dying. Chicago: Aldine.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. New York, NY: Aldine de Gruyter.

Glaser, B. G., & Strauss, A. L. (1968). Time for dying. Chicago: Aldine.

Gogoi, N., & Sumesh, S. S. (2022). The political economy of public health inequalities and inequities in India: Complexities, challenges, and strategies for inclusive public healthcare policy. *International Journal of Health Services*, *52*(2), 225–235. <u>https://pubmed.ncbi.nlm.nih.gov/35084231/</u>

Hilmert, C. J., Kvasnicka-Gates, L., Teoh, A. N., Bresin, K., & Fiebiger, S. (2016). Major flood related strains and pregnancy outcomes. *Health Psychology*, *35*(11), 1189–1196. <u>https://doi.org/10.1037/hea0000386</u>

Indian Village Directory. (2024). Motak Kaibatra Gaon: Village Overview. <u>https://villageinfo.</u> in/assam/dibrugarh/dibrugarh-west/motak-kaibatra-gaon.html

Kamel, N. (2012). Social marginalization, federal assistance and repopulation patterns in the New Orleans Metropolitan area following hurricane Katrina. *Urban Studies*, *49* (14), 3211–3231. https://doi.org/10.1177%2F0042098011433490

Kar, N., Jagdisha, S., Murali, N., & Mehrotra, S. (2004). Mental health consequences of the trauma of super-cyclone 1999 in Orissa. *Indian Journal of Psychiatry*, 46(3), 228-37. <u>https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2951648/</u>

Kumar, M. S., Murhekar, M.V., Hutin, Y., Subramanian, T., Ramachandran, V., & Gupte M.D. (2007). Prevalence of posttraumatic stress disorder in a coastal fishing village in Tamil Nadu, India, after the December 2004 tsunami. *American Journal of Public Health*, *97*(1), 99-101. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1716229/pdf/0970099.pdf

Kutty, R.V., & Sarma, P.S. (2012). Risk factors of post-traumatic stress disorder in tsunami survivors of Kanyakumari district, Tamil Nadu, India. *Indian Journal of Psychiatry*, *54*, 48-53. https://doi.org/10.4103/0019-5545.94645

Lamberti-Castronuovo, A., Valente, M., Aleni, C., Hubloue, I., Ragazzoni, L., & Barone-Adesi, F. (2022). Using ambulatory care sensitive conditions to assess primary healthcare performance

during disasters: A systematic review. International Journal of Environmental Research and Public Health, 19(15), 1–8. <u>https://doi.org/10.3390/ijerph19159193</u>

Lein, H. (2009). The poorest and most vulnerable? on hazards, livelihoods and labeling of riverine communities in Bangladesh. *Singapore Journal of Tropical Geography*, *30*(1), 98–113. https://doi.org/10.1111/j.1467-9493.2008.00357.x

López, N., & Gadsden, V. L. (2016). Health inequities, social determinants, and intersectionality. Discussion paper, National Academy of Medicine. <u>https://nam.edu/wp-content/uploads/2016/12/Health-Inequities-Social-Determinants-and-Intersectionality.pdf</u>

Lowe, D., Ebi, K. L., & Forsberg, B. (2013). Factors increasing vulnerability to health effects before, during and after floods. *International Journal of Environmental Research and Public Health*, *10*(12), 7015–7067. https://doi.org/10.3390/ijerph10127015

Morang, H.C. (2017). A study on livelihood diversification among the tribals living in riverine areas of Assam. Guwahati: Directorate of Assam Institute of Research for Tribals and Scheduled Castes, Jawaharnagar, Khanapara. <u>https://repository.tribal.gov.in/bitstream/123456789/74223/1/</u> <u>AIRT\_2017\_0009\_report.pdf</u>

NCCDH. (2013). Let's talk: Health equity. Antigonish, NS: National Collaborating Centre for Determinants of Health, St. Francis Xavier University. <u>https://nccdh.ca/images/uploads/Lets\_Talk\_Health\_Equity\_English.pdf</u>

NHM, Assam. (2024). Boat clinic. Government of Assam, Health and Family Welfare, National Health Mission. <u>https://nhm.assam.gov.in/schemes/boat-clinic</u>

Oulahen, G., Mortsch, L., Tang, K., & Harford, D. (2015). Unequal vulnerability to flood hazards: "Ground truthing" a social vulnerability index of five municipalities in Metro Vancouver, Canada. *Annals of the Association of American Geographers*, *105*(3), 473-495, <u>https://doi.org/10.1080/0</u> <u>0045608.2015.1012634</u>

Paterson, D. L., Wright, H., & Harris, P.N.A. (2018). Health risks of flood disasters. *Clinical Infectious Diseases*, 67(9), 1450–1454. <u>https://doi.org/10.1093/cid/ciy227</u>

Pinto, E. P. (2021). *Health justice in India: Citizenship, power and healthcare jurisprudence*. Springer. 2021.

Redwood-Campbell, L., & Abrahams, J. (2011). Primary healthcare and disasters-the current state of the literature: What we know, gaps and next steps. *Prehospital and Disaster Medicine*,26(3), 184-91. https://pubmed.ncbi.nlm.nih.gov/22107769/

Samuel, R. (2015). Social vulnerability to floods: Review of case studies and implications for measurement. *International Journal of Disaster Risk Reduction*, 14(4), 470–486. <u>https://doi.org/10.1016/j.ijdrr.2015.09.013</u>

Sarma, J. N., & Basumallick, S. (1986). Channel form and process of the Burhi Dihing River, India. *Geografiska Annaler: Series A, Physical Geography*, 68(4), 373 – 381. <u>https://www.tandfonline.com/doi/abs/10.1080/04353676.1986.11880187</u>

Schwoebel, M.H., & Menon, G. (2004). Mainstreaming gender in disaster management support project: a report for the women in development task order new and expanded opportunities for vulnerable groups in India. Centre for Development and Population Activities (CEDPA) and Chemonics International Inc. <u>https://environxchange.com/images/article/177/main%20</u> dis%20mngt.pdf

Sengupta, A., Sahoo, M., Khan, A., Shaikh, R., & Khan, R. (2020). Maternal health status in tribal India: a 5-year intervention program and its outcome. *Indian Journal of Community Medicine*, *45*(2), 189–193. <u>https://doi.org/10.4103/ijcm.IJCM\_158\_19</u>

Sharma, A. (2021). The Mishing and the Miyah have learnt to live with the Brahmaputra. Can Assam?' *The Wire*, September 13. <u>https://science.thewire.in/environment/mishing-miyah-adapt-brahmaputra-floods-assam-resilient-communities/</u>

Shukla, A., Scott, K., & Kakde, D. (2011). Community monitoring of rural health services in Maharashtra. *Economic and Political Weekly*, *30*(30), 78-85. <u>https://www.epw.in/system/files/pdf/2011\_46/30/Community\_Monitoring\_of\_Rural\_Health\_Services\_in\_Maharashtra.pdf</u>

Simcock, G., Elgbeili, G., Laplante, D. P., Kildea, S., Cobham, V., Stapleton, H., Austin, M.-P., Brunet, A., & King, S. (2017). The effects of prenatal maternal stress on early temperament: The 2011 Queensland flood study. *Journal of Developmental and Behavioral Pediatrics: JDBP*,38(5), 310–321. https://doi.org/10.1097/DBP.000000000000444

Singh, B. (2019). Assam floods: Death toll reaches 50. *The Economic Times*, July 19. <u>https://economictimes.indiatimes.com/news/politics-and-nation/assam-floods-death-toll-reaches-50/articleshow/70297192.cms?from=mdr</u>

Soetanto, R., Mullins, A., & Achour, N. (2017). The perceptions of social responsibility for community resilience to flooding: The impact of past experience, age, gender and ethnicity. *Natural Hazards*, *86*, 1105–1126. <u>https://doi.org/10.1007/s11069-016-2732-z</u>

Tapsell, S.M., Penning-Rowsell, E.C., Tunstall, S.M., & Wilson, T.L. (2002). Vulnerability to flooding: Health and social dimensions. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 360 (1796), 1511–1525. <u>https://pubmed.ncbi.nlm.nih.gov/12804263/</u>

*The Hindu.* (2024). Assam floods: Situation remains grim, over 1.17 lakh people affected. *The Hindu,* June 23, 2024. <u>https://www.thehindu.com/news/national/assam/assam-floods-situation-remains-grim-over-117-lakh-people-affected/article68323426.ece</u>

Tunstall, S., Tapsell, S., Green, C., Floyd, P., & George, C. (2006). The health effects of flooding: Social research results from England and Wales. *Journal of Water and Health*, 4(3), 365–380. https://doi.org/10.2166/wh.2006.031

Walker, G., & Burningham, K. (2011). Flood risk, vulnerability and environmental justice: Evidence and evaluation of inequality in a UK context. *Critical Social Policy*, *31*(2), 216–240. https://doi.org/10.1177%2F0261018310396149

Water Resources Department, GoA (2024). Flood and Erosion Problems. Government of Assam. Retrieved from-<u>https://waterresources.assam.gov.in/portlets/flood-erosion-problems</u>

WHO.(1946). Constitution of the World Health Organization. World Health Organization,<u>https://apps.who.int/gb/bd/PDF/bd47/EN/constitution-en.pdf</u>

WHO. (2002). Gender and health in disasters. World Health Organization, Department of Gender and Women's Health 20, Avenue Appia Geneva, Switzerland. <u>https://www.who.int/gender/other\_health/genderdisasters.pdf</u>

WHO. (2005). Flooding and communicable diseases fact sheet risk assessment and preventive measures. World Health Organization Communicable Disease Working Group on Emergencies, HQ. https://www.who.int/hac/techguidance/ems/FloodingandCommunicableDiseasesfactsheet.pdf

WHO. (2008). The world health report 2008: Primary healthcare now more than ever. Geneva, Switzerland: World Health Organization. <u>https://www.paho.org/hq/dmdocuments/2010/PHC\_The\_World\_Health\_Report-2008.pdf</u>

WHO. (2017). Flooding: Managing health risks in the who European region. World Health Organization Regional Office for Europe. <u>https://apps.who.int/iris/handle/10665/329518</u>

Zahran, S., Brody, S.D., Peacock, W.G., & Vedlitz, H. A. (2008). Grover, social vulnerability and the natural and built environment: A model of flood casualties in Texas. *Disasters32* (4), 537–560. <u>https://pubmed.ncbi.nlm.nih.gov/18435768/</u>