“Critical questions are missing”: Perspectives of environmental justice activists of Bangladesh on justice and technology

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ABSTRACT

Recent years have seen increasing interest in aligning interactive technology design and research with social justice values and practices, including those pertaining to environmental justice. These efforts can result in both innovative sociotechnical approaches to amplify environmental justice movements and resist injustices that may come about with the deployment of emerging technologies. Given the global nature of environmental injustice and the interconnectedness of their root causes and efforts to address them, it is important to understand the experiences and perspectives of activists from climate change-vulnerable Low and Middle-income Countries (LMICs). In this paper, we present findings from an interview study with five environmental justice activists in Bangladesh who share their motivations for activism, their views on the roots of injustice, the power dynamics in environmental justice activism, and their use of digital technologies for organizing, raising awareness, and coalition building. Our findings show the importance of genuine motivation and power analysis in this complex ecosystem and the potential of interactive technologies to support EJ activism.

CCS CONCEPTS

• Human-centered computing~Human computer interaction (HCI)~Empirical studies in HCI

KEYWORDS

Environmental Justice; Bangladesh; Social Media; Activism

Reference Format:

Hasan Mahmud Prottoy, Lydia Stamato, and Foad Hamidi. 2023. “Critical questions are missing”: Perspectives of environmental justice activists of Bangladesh on justice and technology. In *LIMITS ’23: Workshop on Computing within Limits, June 14-15, 2023.*
https://doi.org/10.21428/bf6fb269.d81e72c1

1 Introduction

Environmental and climate injustices have become increasingly pressing issues in recent years, with devastating impacts on vulnerable communities around the world [52,53,55]. Low and middle-income countries (LIMIC) are particularly vulnerable to environmental degradation and climate change due to the legacy of colonialization, ongoing exploitative practices, lack of control over resources, and of political influence on the world stage [54]. As a result, they often find themselves excluded from decision-making processes that affect their interests and concerns [54]. Addressing these issues requires urgent action and a commitment to social and environmental justice. Digital technologies are an integral part of the current world system and can contribute both to advancing climate and environmental disasters and mitigating or averting them. In recent years, the broader HCI community has shown increasing interest in aligning the design, understanding, and reimagining of interactive technology with the values of social and environmental justice.

Advocating for environmental justice (EJ) is generally defined as the efforts toward eradicating the unequal distribution of environmental resources and unfair exposure to environmental pollution, hazards, and destruction to communities [1]. In this study, we aim to understand the perspectives of a subset of environmental justice activists in Bangladesh, a particularly vulnerable country to the impact of climate change [2]. Specifically, we seek to explore their motivations for engaging in activism and their opinions on the potential benefits and limitations of using interactive technologies to organize and engage with their communities. Our motivation for working in this context has been that given Bangladesh’s ongoing experiences of climate and environmental adversity and injustice, its comparatively weak position in world power and influence, its colonial past, and local complexities, activists currently working in this context, may provide us with an understudied and valuable perspective on the subject matter that may inform EJ efforts both in other LMICs and beyond. We are also motivated by the need for more research on justice and equity in relation to computing research on environmental applications.

In this paper, we present findings from an interview study conducted with five participants from Bangladesh who have years of experience working on environmental and climate justice issues. In the next section, we provide the background and contextualization of this study in the broad HCI and LIMITS literature. Next, we describe our methods and present our findings, discussion, and conclusion. Overall, our findings show that while EJ activists are highly motivated to take action, they are critical of the overall EJ ecosystem in Bangladesh due to the conflicting interests of different actors and the unbalanced power relation between them. We also found that EJ advocates use different digital technological tools in intentional, effective, and strategic ways for organizing, coalition building, and coordinating between different stakeholders. We argue that the perspective on the complex and conflicting interests between different actors involved in EJ in Bangladesh offers a new understanding for the LIMITS community on the challenges and limitations in working, engaging, and building systems in LMICs.

2 Background and Related Work

2.1 Sustainable HCI

Since Eli Blevis's initial arguments that sustainability can and should be the focus of interaction design in his landmark paper "Sustainable interaction design" at CHI 2007 [13], sustainable HCI (SHCI) is continuously seeing efforts to define its vision thus far [3,13,14,15,28,29,30,31]. Mankoff et al., at their special interest group at the same CHI conference, acknowledged that HCI faced an unanswered challenge in creating interactive systems that have a sustainable impact [14]. Shortly after, Paul Dourish argued that the dominant approaches to environmental research in HCI were inherently self-limiting and overlooked important areas for potential action [15].

There have been efforts to shift SHCI's focus to making significant changes in our current way of life rather than making incremental changes in individual actions. Knowles et al. [3] suggested orienting around climate change, developing a new model for the digital economy, building and supporting a mass movement, fighting injustice and inequality, fostering values-based debate, and bracing for impact. This gradual evolution in the vision of SHCI emphasizes the need to address environmental justice and climate change more and more. So far, various works have showcased SHCI's efforts to incorporate these implications (e.g., [16-25]).

Other recent systematic reviews use frameworks from sustainable development areas like Sustainable Development Goals (SDG) and Triple Bottom Line (TBL) for reviewing SHCI literature [32,33]. Hansson et al., for example, used the United Nations' Sustainable Development Goals (SDGs) to identify high-level goals that SHCI researchers have worked toward since the inception of SHCI [32]. They came to the thinking that the SDG' and the SDG targets can be used generatively, for example, as a checklist, to come up with areas and problems where SHCI research could but has not yet contributed to any larger extent [32]. Scuri et al used the framework of Triple Bottom Line (TBL) consisting of three dimensions: environment, economy, and society, to classify SHCI works [33]. They identified that there is a gap in addressing the economic angle in SHCI literature if we take TBL as a framework [33].

Our work contributes to SCHI by interrogating sustainable practices and development discourses through the lens of environmental justice.

2.2 From Sustainability to Limits: Critical Postcolonial Computing and Design Justice

Postcolonial computing and design justice literatures inform us about how environmental justice is rooted in local and global power structures, wealth distribution, and historical processes like colonization. As the conversation about SCHI began to gain traction, Irani et al. [5] introduced postcolonial computing, which asks technology designers (in particular, those from WEIRD (Western, educated, industrialized, rich, and democratic) contexts [34]) to consider more carefully cultural differences affecting technology design and use and to remain vigilant against resurfacing colonial dynamics. Irani advances this notion by interrogating the logic of entrepreneurship, innovation, and design as practiced in a postcolonial context characterized by economic and political inequality, highlighting the harm uncritical technology design can perpetuate [35]. Costanza-Chock [4] and the Design Justice Network introduce design justice to operationalize what science, technology, and society scholars have identified as the political motivations and consequences of design (e.g., [36]). Design justice is enacted by explicitly articulating the distribution of benefits and harms of a design decision and (to accomplish this) taking a participatory and intersectional feminist lens to the design space. Costanza-Chock details the applicability of Patricia Hill Collins' matrix of domination [37] to design and demonstrates its generativity across several cases situated primarily in North America.

More broadly, scholars have highlighted grassroots movements and community efforts that played a significant role in resisting climate and environmental injustice. While some of this work situates itself within SHCI, other work questions the notion of sustainability, emphasizing alternative perspectives and approaches. For example, the annual LIMITS workshop [26,38] is described by Pargman and Raghavan [38] as representative of a multidisciplinary paradigm shift that changes the context within which researchers "pose questions in and across their sub-fields." With collapse informatics, Tomlinson et al. [39] bring together the fields SHCI, information and communication technologies for development (ICT4D), and crisis informatics to create a new design space in an imagined future where "sustainability doesn't work out" [40] and specialized knowledge and skills are needed to support life on earth under conditions of "rapid, significant loss of an established level of sociopolitical complexity" ([41], quoted in [39]). This perspective (see also, [42]) critically engages and reflects the entanglement of research, technology, and colonialism, which cannot be ignored in an investigation into global environmental justice [43]. As a way forward, Ghoshal et al. developed a praxis for technology design and use within grassroots activist communities organizing for justice [12]. The present study seeks to contribute to this work by exploring perspectives at the

intersection of climate and environmental justice and technology design from the Global South in dialogue with Costanza-Chock's formulation of design justice and Irani et al.'s postcolonial computing.

2.3 EJ Activism in Bangladesh

With respect to the current impacts of climate change, Bangladesh is one of the most vulnerable countries that faces and is currently experiencing multiple and complex challenges. The financial and material toll of global climate and environmental inequity was recently recognized at the United Nations Climate Change Conference COP27, where for the first time an agreement regarding "loss and damage" funding for vulnerable counties was made [47,48].

This issue is perpetuated given that Bangladesh is among Low- and Middle-Income Countries (LMICs) [50], with a GDP per capita of $2,458 USD [49]. As current knowledge points to the long-term impacts of industrialization and consumption in WEIRD contexts as major causes of climate change [51], the challenges in Bangladesh become global environmental justice issues. Therefore, environmental justice activism in Bangladesh has to deal with both global and local factors where multiple actors, including international donor and development organizations, local and international NGOs (Non-governmental Organization), local government, civil society organizations and community members and leaders, are involved [44,45]. Each of these actors comes with their own interests and agendas, which in many cases are in conflict with each other [44,45].

The complexity of this context offers exciting opportunities for the LIMITS community to engage deeply with questions of navigating power dynamics where an affected community has to struggle with issues of limited agency and say against the powerful actors who are claiming to work for their betterment. Our work builds on similar efforts in the LIMITS and the broader HCI community that tackle similar social and environmental justice issues. For example, Zaber et al. who studied hashtag activism for raising awareness about riverbank erosion in Bangladesh [46]. Using evidence from the use of social media hashtags used by people impacted by river erosion, the authors argued that social media could bridge information gaps and promote awareness and intervention in marginalized communities [46]. In the current paper, we explore the knowledge gap about the possibilities and limits of using interactive technologies and digital media to further EJ efforts from local activists' perspectives. While our research is firmly situated in Bangladesh, our findings can be transferrable to many other LMIC contexts with similar geopolitical characteristics.

3 Methods

The overarching goal of this project is to understand the perspectives of a subset of environmental justice activists in Bangladesh to understand their motivations for activism, and their use and views on the possibilities and limitations of interactive technology use for organizing and community engagement. As the subject matter is related to the power structures of the current world system and there are opportunities for using critical theories (e.g., [8]) in our analysis, we paid particular attention to critical perspectives and adopted a critical lens, questioning broader existing power dynamics and paying attention to ways our findings point to make positive change [11].

3.1 Participants

We interviewed five adult participants with experience working on environmental justice issues in Bangladesh. The participants were recruited using a combination of convenience and snowball sampling, where the first author contacted people in his friends' network who had social justice and environmental justice interests and connected him to their contacts in the community with relevant experience and expertise. In preparation for the study, the first author browsed social networks, websites, and online media related to social justice and environmental justice efforts in Bangladesh to find potential participants and identify relevant stakeholder groups, including local and international NGOs and development organizations who work in this field, researchers and academics, artists, journalists, young leaders involved in climate and environmental actions, and grassroots legal and policy advocates. While the current participants do not represent all these stakeholder groups, they are from several groups that are underrepresented in research in this area, including young leaders, grassroots policy organizers, and journalists. Our small participant number reflects our selection criteria of working with experts currently active in Bangladesh.

Following, we will provide detailed descriptions of each participant, including their demographic information. All participants are from Bangladesh.

P1 (27 years old, male) works with internally displaced populations and climate migrants in Bangladesh. He has previous experience collaborating with international organizations, such as BRAC and WaterAid, on projects related to policy advocacy for environmental issues and digitalization. P1 is currently pursuing graduate education at a university in the UK.

P2 (35 years old, female) is a community architect who leads a team of designers and architects working on addressing housing-related issues in low-income settlements in Dhaka, Bangladesh. A large portion of the communities P2 works with are forced migrants displaced by environmental disasters.

P3 (25 years old, male) is a young community leader, involved in climate action and ensuring environmental sustainability. He founded a youth-led organization that supports widespread climate change awareness, and adaptation-based projects in twelve LMICs, including Bangladesh.

P4 (26 years old, male) is a young community leader of a group of activists who are raising awareness about environmental justice. P4 is originally from the coastal region of Bangladesh, and was personally impacted by the adverse effects of climate change. He has collaborated with different development organizations, sectors within the government of Bangladesh, and local stakeholders.

P5 (45 years old, male) is a documentary photographer who is conducting a long-term documentary photography project on the impact of climate change in Bangladesh over the past nineteen years.

3.2 Data Collection and Analysis

We conducted semi-structured remote interviews and asked questions pertaining to participants' motivations for pursuing environmental justice causes in Bangladesh, their perspectives on the causes and current characteristics of activism in Bangladesh, and their perspectives on the role of digital technologies in activism in this context. We chose semi-structured interviews for their flexibility, enabling follow-up questions, clarification, and adjusting questions to better fit a participant's role or level of experience. All study participants confirmed having access to robust Internet connectivity and experience with web conferencing tools to enable remote interview participation. All the interviews were conducted in English using web conferencing tools available to participants, including Zoom, Webex, and Google Meet, and were audio recorded after receiving the participant's permission. The interviews lasted from 70 to 100 minutes. Our study was reviewed and approved by our university's Institutional Review Board (IRB) prior to data collection.

All interview data were transcribed before analysis. We used an inductive thematic analysis [9,10] approach to construct themes from patterns identified in the data. We engaged with the six phases of thematic analysis, including familiarizing ourselves with the data, generating codes, generating initial themes, reviewing themes, defining and naming the themes, and writing them up for the current paper. The first author led the analysis and the second and third authors helped review and refine themes.

4 Findings

4.1 Motivations for Engaging in Climate and Environmental Justice Action

Participants talked about their motivations for engaging in climate and environmental justice activism. Their motivations are grounded in personal experiences of witnessing the impact of climate change, the realization of deep-rooted injustice, and social responsibility to use their professional abilities to create a real impact for vulnerable communities.

4.1.1 Personal experiences with climate change. Experiencing or seeing the devastating effects of climate change firsthand is a powerful motivator for our participants to take action and advocate for climate and environmental justice. For some participants (P1, P2, P5), a main motivator was learning firsthand about the difficult experiences of community members as a result of climate change. P1 discovered the impact of climate change personally while he started doing an ethnographic study with the internally displaced population of Bangladesh as part of his dissertation. P2 also went through a similar journey while she engaged with a community in Dhaka who migrated from coastal regions of Bangladesh as they lost their livelihood due to adverse climate conditions. P5 started his career as a documentary photographer, and his first assignment was to assist a senior photographer from National Geographic in a project documenting global warming in Bangladesh. He had to go to various parts of the country to find out and document the real-life impact of climate change on people's lives. From that point, he started his own long-term project to document the impact of climate change in Bangladesh which is continuing for nineteen years.

P4 described how climate change is not just a distant concept for him but a daily reality due to firsthand experience. He still vividly remembers the nightmare of Super Cyclone Sidr that hit his village in 2007, which marked the beginning of a series of catastrophic cyclones and floods that continue to ravage his community. As a cyclone survivor, he personally witnessed the devastating impact of climate change on his family, his community, and the environment. The trauma and anxiety caused by these experiences have motivated him to raise his voice and take action in the fight for climate justice. He described his motivation as follows:

> I first witnessed the cyclone in Super Cyclone Sidr in 2007 when I was a seventh-grade student, and I was in my village ... So, that night was truly a nightmare for me...And the next morning, I found my community totally devastated. And other communities you know in Barguna, Shatkhira, Shamnagar [neighboring districts]. It turned to death valley, right? So, after that super cyclone Sidr, we faced numerous cyclones ... [It] is not general or normal [to have so many cyclones] ...we faced Aila, Mohsin, Nargis, Amphan, Ruani, Bulbul, Yash [cyclone names] - so a series of numerous cyclones there and we are still facing flooding as well as salinity.

In the above quote, P4 is stating that the intensity and negative impact of cyclones in their region have increased in recent years, which motivated them to learn more about climate change and its impacts. P4 then shared how this experience was traumatic for them:

> So, I faced climate change in my in day-to-day life. And I want to call me as a cyclone survivor. And still, I can remember this kind of trauma. So, it [creates] climate anxiety [for] me ... And now I am staying in Dhaka, when a cyclone forms, I feel more mentally stressed [because] my family are in that village, so I don't know [if] they will survive or not. ... My father died last year, but my mother and my brother [are still] in the village. So, I am feeling more tension and more stress for them. So, it's the one kind of mental stress and this trauma, this anxiety motivated me to raise climate justice.

The above quote by P4 shows that for climate activists from Bangladesh, climate-related disasters are not just an abstract concept or a problem for future generations to solve. They perceive it as an immediate threat to their lives and communities which works as an important motivating factor to initiate the action and the work they do.

4.1.2 Social responsibility to address injustice. Another source of motivation for our participants to join environmental justice activism comes from their belief in their social responsibility to

address injustice. For example, P1 stated how when he was pursuing his bachelor's in civil engineering, he had to choose a thesis subject, and he became interested in environmental engineering as a subfield because of its connection to questions of justice and injustice. P5 described how the stories he collected from the people in the field made him realize the multidimensional aspect of injustice on the affected people, especially displaced from one area to another. He described how climate-driven migration could lead to a trail of difficulties. For example, when a family has to relocate multiple times, every time their assets get significantly lower, that affects the education of the kids, causes child marriages, brings violence against women in many ways, and falls into the trap of debts. He noted that the human cost of these situations is often neglected or overlooked, which motivated him to bring out the narrative of the affected people and families through photographs.

In another case, P4 was already a children's rights activist but became involved in environmental justice when he witnessed the impact of climate change on a remote island community. This realization of the injustice faced by vulnerable communities who are least responsible for the crisis worked as a driving force for him to advocate for climate justice and hold governments and businesses accountable.

> When I started work for protecting child rights and advocating for child-focused budget, I went to a remote island. Its name is Rangabali, at the … subdistrict of the coastal district, Potuakhali. I found a community with eight people. But they did not have a single cyclone shelter. One cyclone shelter was built there, but it was announced as abandoned. So, they are in the middle of the Bay of Bengal, and they faced all kinds of climatic impacts, but they did not have a safe cyclone center to them.

He went on to describe how they became aware of the dangerous impact of climate change on children in the community and its intersections with children's rights issues:

> And the children of that village … after class five grade, they have to … visit another village. ... And they have to ride the boat. And this boat, and the river-way are very risky to them. So, most of the girls are deprived or drop out from their education and are forced into child marriage. ... Boys have to join in catching fish with their fathers, and they have to be child laborers also. And some boys can continue but till eighth grade only…It's due to remoteness, due to climatic impact as well as the families are taking child marriage as a coping mechanism when they are facing natural disasters.

He further described how the experience made him realize that issues of children's rights and climate change are intermingled and need to be tackled together:

> So, when I started to talk against, I started action against child marriage, I found [that its] root cause is natural disaster fueled by the climate crisis. So, if we want to take true action, we have to [take into account] natural disasters and climate change, also.

Finally, he described how the connection between these different injustices amplified his motivation to pursue environmental justice:

> This community … are not using the air conditioner. They are not using refrigerators so they can consume meat. So, their carbon footprint or their contribution to global warming is very minimal. But they are facing, and they are bearing the highest price of the brand of the climate crisis. So, it is unjust. … Then, I committed that I have to fight for them to ensure justice because they are not responsible for this crisis. So then I mobilized young people and established Youthnet for climate justice and … [I started] this movement to hold accountable the governments and businesses and ensure climate justice for those vulnerable communities.

These personal experiences and realizations shared by the participants highlight the connection between their sense of social responsibility and environmental justice activism. Participants often recognized that the most vulnerable communities are often the least responsible for the crisis and yet bear high prices. This realization has compelled them to fight for environmental justice, hold governments and businesses accountable, and mobilize young people in their fight for a more sustainable and just world.

4.1.3 Bringing professional knowledge and experience to do something 'really' impactful. The use of professional skills and knowledge in a meaningful and impactful way is another motivating factor behind participants' involvement in "climate-responsive" (as described by P2) activities. P2, who is an architect by training, shared that their personal quest for purpose and fulfillment led them to realize the potential impact of their skills as an architect. The participant and her colleagues established the Platform for Community Action and Architecture (POCAA), using their skills to design and build homes for low-income communities that were resistant to natural hazards. In this way, they described that they were able to utilize their expertise in a way that directly benefited a larger segment of society beyond the "10%" typically served by their profession. In her words,

> [My motivation] comes from a personal quest. … Since we are architects, you know, we [usually] work for maybe 10% of our society. … And then I start to feel like this scale is not that useful. I didn't feel this scale was adding any purpose to life. When I was in university, and then I was studying in Dhaka I got a chance to volunteer in one of the villages near Dinajpur, which is a city in the northern part of Bangladesh. And there again, we were doing a design workshop and then building like ten houses, and the title was 'How to use locally adaptable material?', but use it in a very stronger way so that all the natural hazards that will not hamper these houses. So, of course, for the villagers or for the low-income communities, no engineer or architect is going there to make the houses strong for the people who lose their house every year during the flood. So how to make that strong? That was a turning point in my life when I understood that my skills can also be useful more than putting it into a, you know, philosophical place for 10% of society. Then I can use it for actually 90% of the

> people and not be so theoretical, philosophical, and just hands-on work and things like that. This is my personal journey and then all my colleagues, they also have similar kinds of personal journeys. And when we finished our university, we started our professional [of community architects working for equitable housing] network.

As P2 mentioned, this kind of personal journey is common among activists in the field of environmental justice in Bangladesh, as they seek to use their unique skills and knowledge to address issues of social injustice. P3 was an undergraduate student in Environmental Science when he started his organization to create a platform for students in a similar background to raise awareness about climate justice. They wanted to use their academic knowledge in practical action. P5, who is trained as a journalist, similarly drew on his professional skills:

> Journalists cannot change the society; it is not their job either. What we can do is, bring evidence and narratives from the people. Real change can be brought by politicians and policymakers. Our work is to bring the evidence to them, in the public sphere.

For our participants, the sense of purpose that comes with using their skills to address the real needs of vulnerable communities in need can be a transformative experience.

4.2 Critical Views on EJ Activism

Despite their strong motivations to engage in environmental justice work, participants are also critical of some aspects of the current climate action ecosystem in Bangladesh. They note that the development sector in Bangladesh, which is comprised of many NGOs, has played a significant role in achieving the country's economic progress but that there is a need for critical evaluation of past work to improve future efforts. In their opinion, working in this area has become attractive to some profit-driven parties partly due to the involvement and interest of big development organizations, international NGOs, and donors who push the agenda in a top-to-bottom manner. This raises questions about the actual impact of these efforts on the life of affected people. Furthermore, participants shared that NGOs are often influenced by the agendas of donors who fund them, making some of their work "tokenistic" (i.e., making symbolic efforts without sincere commitment). We discuss these findings below.

4.2.1 Critical views on the role of development organizations, NGOs, and donors. P1 noted that climate change has become "a big thing now" in Bangladesh, and many NGOs are working in the climate justice field. However, he was critical of some of this work, stating that it is often controlled or manipulated by the donors who fund it. He expanded that their decision to work on climate change has been influenced by various factors, such as the current ecosystem, donors, and the industry. In light of these issues, P1 questioned the extent to which motivations for pursuing climate justice issues are authentic, and how much they are motivated by funding and support pressures:

> [Many of the environmental justice-oriented NGOs] are influenced by the donors where the funds come from. Like, for example, [anonymized foreign donation organization] has a mandate of climate action and, you know, it works top to bottom. So, when they decide that, you need to work with climate change, you will have to work with climate, and you cannot leave it. Like, for example, … you cannot say that my decision [to be a funded scholar working on climate change] is completely my decision. It has been influenced by many of the factors like … the ecosystem, like the donors, the, or the jobs or the industry, other things.

Given these factors, P1 expressed doubts about the "real" impact of environmental justice efforts that are directed and motivated by foreign funding and influenced by many mixed motivations:

> So, you know, what [environmental justice] is like becoming, a big thing, but I'm not sure whether it's a real big thing, because I saw many people who work with climate activism … but I, I'm not sure that how this impact has been being measured, or … how influential is this.

P2 discussed the increased awareness of environmental issues and environmental justice in Bangladesh, with decision-makers and grassroots people becoming more aware. However, similar to P1, she also mentioned that the use of the term "climate" has become a buzzword, with development organizations climate-washing their proposals and narrative.

> [Increased awareness is] because the development sector, which we have, which is comprised of a lot of NGOs, they are working in different sectors- for livelihood, for health, for education, and they are bringing in the element of climate justice in their activities. I think right now, all the projects that are happening in Bangladesh, I just hear climate, climate, climate, and this is good in a way that people are aware. But this is also, right now, got a little bit confusing because now it has become a little bit like a buzzword as well that you can use it. In some cases, the development organizations or development industry do whatever they were doing before, but then they are like 'climate washing' their narrative.

P2 also noted that NGOs have been instrumental in achieving Bangladesh's economic growth, and while they have done good work, there is a need to be critical of previous work and restructure it to make it better. In another instance, with respect to structural factors, P2 commented that the current political situation in Bangladesh has shaped all government agencies and NGOs working with the government, creating an imbalanced and homogenous sector:

> The NGOs who have to work with the government closely, and [they] have to take permission from the government for every small activity they do, like they are going from [visit different parts of a region]… So since the political power has not changed for a pretty long time now, all the narrations have become one, which is very, very imbalanced, I would say. So, the versatility or

> diversity of those things [are negatively impacted]. So right now, versatile questions, diversified questions, critical questions are missing.

She further described how reliance on and getting used to existing ways of doing things has resulted in a lack of versatile, diverse, and critical questions in the development sector:

> I think in Bangladesh, the development sector, which means a lot of NGOs, are doing a lot of services for people, and that has helped Bangladesh to where it is now economically. [This has resulted in Bangladesh's status move] from the least developing country to a middle-income country because of achieving many things in terms of income generation and health and education; Mostly [the development] field and NGOs has been the key to achieve this in Bangladesh. And since they …have been doing it with different global supports, they have adopted their way in that. This is how it works for them. They talk in a certain way. They write or communicate in a certain way, and that brings the funding, and then they work. For a very long time, NGO has done very good work. And I feel like now it's really the time to be critical about the previous work. You always have to look back and evaluate your work. And then, if you need to restructure, you do that. So right now, that's the critical moment. I feel like the development sector in Bangladesh has to do to make it better. Otherwise, we will lose the path.

Finally, P5 described, how at the beginning of his career, he worked as a consultant photographer for NGOs and donor organizations, primarily to finance his own project. Doing this work, he noticed certain constraints and requirements put on his work to emphasize specific narratives and stories that serve the organization's image, rather than getting to the truth of a matter. These pressures made him choose to work more independently and to choose to work with small local NGOs, not larger donor agencies. In his words,

> As a journalist of a third world country, I haven't taken global assistance, purposefully. Because if I take that assistance, it comes with a kind of embargo- 'you can't do this and that!' It also brings a kind of self-embargo too. So, I tried to be independent to some extent. I haven't included any big actors.

This lack of support for the independence and self-determination of local agencies, experts, and communities in addressing environmental justice issues was a central criticism of current efforts in Bangladesh.

4.2.2 Environmental justice work as tokenism. Tokenism can be defined as the practice of making symbolic efforts toward inclusion without a genuine commitment to equity [27]. Participants shared several mentions of tokenism in environmental justice efforts by development organizations and NGOs.

For example, P3 expressed concerns about the misuse of youth-led organizations by larger development organizations that "*tokenize*" young people, using them to create an appearance of youth engagement without investing in their development or addressing their needs. As P3 noted:

> Sometimes they just want to use the local people or the local youth for their own benefit...they try to engage the young people from local community...but I really believe that while they have to work with the local people, they also need to develop their own capacity as well.

P1 echoed these concerns, describing the tendency towards tokenism in many works and activism efforts. P1 observed,

> …sometimes I feel it might be offensive, but yeah, I find often this kind of works, and activism is like tokenistic. They are just doing it because they have to do it.

P2 raised a related issue, highlighting the lack of genuine listening to and understanding of community needs in some NGOs. According to P2, some organizations would repeatedly ask communities what they need but then write the answers in their own words, reflecting their own agendas rather than the community's concerns. As P2 observed,

> ... always they ask, but they always do not hear back. They usually hear back what they want to hear.

Taken together, these quotes highlight the damaging effects of tokenism in how it replaces genuine community engagement and efforts towards impactful capacity-building actions for underrepresented groups. They reveal a need for development organizations to move beyond tokenistic efforts towards inclusion and instead prioritize authentic partnership and listening to local communities.

Overall, these instances highlight the complex nature of environmental justice activism in Bangladesh and the various factors that influence it. While the participants agreed that there has been increased awareness and action in addressing environmental issues, they urged the importance of being critical of the work being done and to address the influence of donors and the development sector on the narrative surrounding climate change. According to the participants, the 'tokenizing' nature of big organizations and lack of diversity of thoughts due to the current political situation in Bangladesh needs to be addressed to ensure effective, dynamic, and equitable climate action in Bangladesh.

4.3 Using Technology for Activism and Organizing

Our participants shared how the rise of social media platforms has provided EJ practitioners with new and powerful tools for collaborating, coordinating, and managing within their teams, connecting with communities, organizing movements, and networking with donors and development organizations. These platforms offer opportunities for international collaboration and enable activists to reach out to different stakeholders in novel ways.

4.3.1 Social media and online meeting platforms for communication and collaboration within organizations and with community members. Participants shared their experiences using various social media platforms and technology tools to support their work for environmental and climate justice. They discussed using various social media platforms to create hubs for special

interest groups, share information, and stay connected with other activists. For example, P4 mentioned using Facebook and its Messenger application, which allows asynchronous communication among multiple users, to create groups and coordinate with different units:

> We are much active on the Facebook. We put all the young people in a Facebook group, and we segregated them in different units. Like we created a group which is only for Barisal [a region in Bangladesh]. All young people who are interested from Barisal and supporting us in Barisal are there. … And we selected our coordinators from different units, they also included a central coordination group.

He expanded on how these virtual groups allow them to communicate and make decisions in real-time without needing a physical office:

> It is all in [Facebook] Messenger. It's our office. A Messenger group is our office. We have a central unit in Messenger, we have a facilitator group in Messenger. All kind of communication and all kind of decision making are occurring in the messenger groups. So we no need more physical office. And it's a very connected platform. And we can solve all concerns in the real time. Like someone gets some climate information from their community, from Rajshahi [a local district], he or she could share right now and we can learn right now and can react.

In this quote, P4 describes how an existing social media platform makes it possible to communicate, coordinate, and share information across multiple sites. Similarly, P2 shared their experience of using instant messaging tools like Messenger, Imo, and Viber to monitor construction work during a strict lockdown due to the COVID-19 pandemic:

> During the COVID time, it's mostly the communication tools. All the messengers, Facebook Messenger or Imo, Viber -These are the messenger tools we were using… We were constructing houses in Gabtoli [a region in Dhaka], and then we were in a very strict lockdown for two, three months and we were very concerned about how are we going to monitor those works or do anything in the community. We couldn't go there for three months and then we were exchanging images. The house owner or the builder of the house, they would take [an] image and send it to us. Like, "this is the progress of the house by now." And then if we had any suggestion, we would draw and then send them the image. This is how we actually done all the work of our construction management team just through [Facebook] Messenger communication. It happened a little bit different than what we would have expected, but then we were very happy that this is a newly learned tool that people were used to using for the work.

She also mentioned their use of Facebook groups and synchronous meeting tools like Google Meet and Zoom to stay connected with their team and project beneficiaries. She also noted that the community members were using these tools to remain connected with each other. In her words,

> Other than the [Facebook] Messenger, now we are using of Facebook groups so that they are also connected- not only with us, but with themselves as well without visiting each other in the houses. And then now we are using a lot of meeting tools like Google Meet and Zoom.

Overall, participants had positive views of virtual communication and coordination tools and especially acknowledged their usefulness during the COVID-19 pandemic when meeting in person was restricted.

4.3.2 Using different platforms for different stakeholders. The participants described how they intentionally use different platforms for addressing different groups of stakeholders and community members. They described how they need to maintain and coordinate communication with multiple groups in the different local, national, and international NGOs and development organizations, governmental bodies, and academics to accomplish their activism. P3 mentioned that Facebook is "very much popular" among Bangladeshi people, which is a strong motivation for using it to connect to local people. But he also emphasized the importance of Twitter as a platform to show solidarity with people from other countries.

> If we also need to show solidarity, solidarity with people from other countries, then Twitter is the best platform. While we do some tweets and even some [official] representatives from the developed countries….they also show solidarity with us. They also get the information [on] what's going on in Bangladesh.

In this quote, P3 describes how in some cases, Twitter can provide a direct communication channel to international groups or even official representatives, which in addition to contributing to solidarity, can lead to visibility and increased awareness of environmental justice issues in the international context. He further highlighted that using the LinkedIn social platform helps them to connect and spread news with professionals from the development sector.

> For professionalism or for networking and building a network with professional people … LinkedIn is the best platform. When we share our activity on our LinkedIn page, then it becomes more easier to spread the news with [people] in the development field.

P2 mentioned that the community they were working with were already used to Imo because of its popularity in migrant workers of Bangladesh. This familiarity helped the participatory design team to identify and communicate tools that the community was comfortable using:

> ...people were already using Imo before COVID in Bangladesh, because a lot of people work outside of Bangladesh and every family has that kind of member. So people are already communicating with that person using this tool. So it was easy for people to adopt

> something similar to that [similar messaging applications].

P4 also talked about using and maintaining a presence on different social media platforms to communicate with different NGOs, donors, and other activists, including Zoom, WhatsApp, Telegram, and Slack. He further added that for "sensitive discussions," they prefer more secure platforms as they consider common popular platforms not safe or secure:

> So sometimes we are using … WhatsApp. But WhatsApp currently is not, you know, safe or secure for us. So, for some critical discussion or, in fact, sensitive discussion, we also use, you know, Signal and Telegram [two encrypted communication platforms]. We have to maintain lots of social media and messaging platforms here to communicate.

As P4 describes, in addition to who is part of the communication, the choice of platforms also depends on the type of content they are dealing with. Our findings show that activists have sophisticated and nuanced practices when using digital communication and coordination technologies and use a variety of tools to achieve a variety of goals.

4.3.3 Using social media for organizing movement and pursuing international collaboration. In addition to communication and coordination, participants described more specific aims that they pursued with social media in relation to environmental justice. For example, P4 described a scenario where they used "Twitter as a weapon" to raise awareness and put pressure on investors to divest from a coal-based power plant in Bangladesh:

> We found that Japan is investing in a coal-based power plant. Especially, the Matarbari 2 coal-based powerplant at Cox's Bazar [a district in Bangladesh] … we started a digital strike (at Twitter) amid COVID 19 lockdowns. And we have tagged the Japanese prime ministers and different agencies like JICA [Japan International Cooperation Agency] that they can't fund or invest in fossil fuels [in Bangladesh], especially on coal.

He described how their campaign continued afterward and transformed into an offline in-person protest. Following the online strike, they organized an in-person protest using the popular Japanese cartoon character Pikachu which went viral on social media, leading to a joint campaign with a Japanese environmental justice organization, Fridays for Future Japan, and finally led to the suspension of the funding for the coal power plant. This incident shows how environmental justice activities used social media to facilitate international collaboration between activists from different countries to help bring changes about change.

While perspectives were generally positive about the role of digital technologies, and especially social media, in pursuing social justice issues, participants also had concerns about its limitations. For example, P1 talked about the role of social media in activism against gender-based violence against women in Bangladesh. He first described how social media could help women connect with the community and share experiences and resources:

> When [women who have experienced gender-based violence] talk about this openly in [social media] platforms, it helps them to connect with other victims. They have some groups, private groups, which allow them to … share their struggles and discuss what could be achieved in this battle. So I think, yes, [social media] do help them to connect and collaborate.

But he also recognized the importance of taking actions offline together with online activities to bring about "real impact":

> But I would say if something real needs to be in place, [the activism] would be physical, it would be offline. So it might start from those platforms [i.e., social media], but it would [lead to] … some processions or some meeting or face-to-face get together to do things which have real impact. … I have seen some activism that started on Facebook and also died on Facebook! It didn't bring any real justice.

From the above quotes, we can see that participants appreciated the strengths of using social media for activism but also recognized the importance of offline activities to bring about impactful changes.

4.4 Root Causes of Injustice

Climate injustice results from multiple factors and is a complex and multifaceted issue. Participants emphasized the importance of understanding and addressing the root causes of this crisis, as key environmental justice goals. For example, P4 commented that carbon emissions are merely a symptom of the larger systemic issues:

> The root cause is capitalism. Root cause is colonialism. Root cause is domination. Carbon emission is not the root cause. Carbon emission is the symptom.

P2 emphasized the impact that perceptions of superiority or inferiority between nations or regions can have on climate injustice. In P2's view, the internalization of the belief that some nations or regions are better than others can contribute to the perpetuation of climate injustice. P2 stated:

> The belief some other regions of the world or some other nation of the world is better than us. So we have to be that [like those who are perceived to be superior]. This is a very common perception of our own selves here.

P2 described that this perception can lead to a sense of resignation and acceptance of environmental degradation, reinforcing a cycle of harm and inequality in the context of a country like Bangladesh.

Similarly, P1 highlighted the broader political and historical context of climate change, emphasizing that issues of inequality and power imbalances cannot be separated from the crisis at hand. In P1's words:

> The main key things that are behind this climate thing is not separated from the overall politics. So yeah, and Bangladesh is not a separate actor from this

> network...They have their historical marginalization of like colonialism and like lower economic assets and resources. Historically, [Bangladesh and other LMICs] have been on the back seat, and now when we are talking about climate, they are also in the back.

Finally, P2 advocated for paying more attention to the voice of people who are directly impacted:

> Some challenges are beyond … whether or not we have access … to digital communication. … the narration of climate responsibility is so different from what is actually happening on the ground. And then that narration already influences how global resources will be mobilized…People are not skeptical about [climate change anymore]. You can use the word climate change. You can use it for good or for bad … but now we face this [narrative] derived from, bluntly to say, the West and to have it imposed here like that. You should do [what the West dictates] and that's how you will get these resources … it would have been so much easier if people would really listen [to] the group who are the main sufferers.

These statements connect current experiences of environmental injustice to regional and global histories of colonialization and domination that can lead to an internalized sense of inferiority that can lead to inaction or resignation, issues that need to be confronted and addressed at the root for sustainable and lasting progress can be made.

5 Discussion

Our findings show that the participating EJ activists in Bangladesh are often motivated by first-hand personal experiences to initiate, join, or pursue social justice causes. Our participants expressed strong motivations grounded in personal experience with the impact of climate change, the realization of deep-rooted injustice, and social responsibility to create a real impact by engaging in EJ in Bangladesh. This reveals the importance of genuine motivations leading to authentic engagement in approaching problems related to environmental and climate injustice.

Importantly, participants are aware of how their perspectives and priorities may differ from others in the complex ecosystem of organizations and communities, that are involved in and impacted by environmental justice issues. Their views, including those critical of EJ efforts in Bangladesh and beyond, inform their use of interactive systems, including social media platforms and informal communication tools, such as group messengers (e.g., Facebook Messenger), chat tools, and others. They use these platforms in intentional and effective ways to further their causes, including those beyond their immediate geographical location. Participants had to coordinate with several stakeholders, including the local community, national and international NGOs, development organizations, and state actors. They adopted sophisticated strategies, like using encrypted and private platforms for discussing sensitive topics and choosing different platforms for addressing different stakeholders to increase the impact of their communications. Awareness about this ecosystem consisting of complex dynamics between different stakeholders and conflicting interests in LIMICs can inform computing researchers and designers to further the current vision of sustainable HCI and LIMITS community. Interestingly, while participants acknowledged that digital tools provided substantial support in terms of communication, especially during the COVID-19 pandemic lockdowns, they attached great importance to offline actions to complement online organizing.

Our study revealed the concerns of the participating EJ practitioners about the role of big actors in influencing the narrative and directing toward taking certain actions that fit their agenda, which they found "tokenistic" and imposed from top-down. Participants advocated for genuine listening to the affected communities to address this issue.

Previous LIMITS literature [46] highlighted the importance of social media for bridging information gaps and promoting awareness and intervention in marginalized communities. Our findings extend this work by showing how EJ activists use existing social networks and communication technologies to organize national and international efforts. Additionally, our findings show how activists use interactive technologies to navigate between different stakeholders and highlight their nuanced awareness of how the global context impacts local ones. Interestingly, our participants did not use any local technologies and relied on appropriating existing ones for their purposes. Thus, there is an opportunity to explore future designs that would better serve the needs of participants.

As the participants expressed critical views on the top-down and tokenistic nature of many EJ efforts, their strategic ways of using interactive technologies can be considered as attempts to subvert the top-down nature of the current system. Furthermore, participants emphasized the need for a critical approach to address the root causes of environmental injustice, such as global capitalism and colonialism, which necessitates a fundamental change in our way of life. This aligns with the current visions of sustainable HCI and LIMITS [3,26] that encourage us to strive for systemic change.

6 Conclusion

There is increasing interest in the technology research and practice communities to understand and support the efforts of social justice movements to change the world for the better. There is a need for more work focused on the perspectives and practices of environmental justice (EJ) activists from regions directly impacted by the adverse effects of climate change. We conducted interviews with five EJ activists from Bangladesh and asked about their motivations, experiences, and interactive technology use. Our findings showed the importance of social media and online meeting platforms for generating and maintaining interest and momentum between and among activists, organizations, communities, and other stakeholders. However, they also revealed tensions between activists' goals, technology design, and global influences such as development initiatives and funding. Our findings can inform the work of technology researchers and designers who want to build on the experiences, needs, and desires of some of the most impacted and vulnerable stakeholders of environmental and climate change crises.

ACKNOWLEDGMENTS

We would like to thank our participants for sharing their valuable perspectives with us. We also thank LIMITS reviewers for their valuable feedback for improving the paper.

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