

**An Examination of Cultural and Political Relationships with Flood Management in  
Bangladesh**

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Today, the world's climate is rapidly changing. Although climate change happens naturally over the course of centuries and millennia, today's situation indicates anthropogenic activity in the form of greenhouse gas emissions as the most likely driver of recent climate change and global warming (Denchak, 2017). Annual global greenhouse gas emissions have risen significantly from 1900, from under 1,000 million metric tons in 1900 to nearly 10,000 million metric tons of CO<sub>2</sub> emissions in 2014, rising by at least 78% in just 1970 to 2011 alone. Levels of non-CO<sub>2</sub> greenhouse gas emissions (e.g., methane, nitrous oxide) have also risen significantly since 1900 (EPA, 2006).

Global warming comes with many consequences, affecting the environment and livelihoods of peoples all around the world. Heat waves, droughts, and floods are associated with this aspect of climate change. Also associated with global warming are rising sea levels and extreme weather, including heavier rainfall and more powerful hurricanes (MacMillan & Turrentine, 2021). Since 1880, "global mean sea level has risen about 8-9 inches ... with about a third of that coming in just the last two and a half decades" (Lindsey, 2021, para. 1). These rapidly rising sea levels constitute a threat to those living in coastal areas.

In particular, the country of Bangladesh is vulnerable to flooding caused by increasing frequency and intensity of storms and rising sea levels. Due to the country's geographic location, topography, and low resources to handle extreme weather events, Bangladesh experiences flooding that causes massive damage to the nation's economy and life for citizens. Annually, at least 30% of the nation's land experiences flooding, up to 70% with extreme flooding events

(Mirza, 2002). In recent history, year of 2017 contained two flooding events causing economic losses estimated to be about \$1.83 billion USD, one flood occurring from March to April and the other in August (Haque et al., 2019). In 1970 and 1991, cyclones hit the nation, resulting in 300,000 and 138,000 deaths, respectively (Agrawala et al., 2003). The economic damage and loss of lives greatly shape the culture of the country.

Flooding events are deeply ingrained in the politics, identity, and culture of Bangladesh. Strong flood events and poor disaster management can be tied to Bangladesh's cultural history and identity as some of the main causes of its separation from Pakistan. According to Cook (2010), the poor response to the cyclone in 1970 was an example of incompetency of Islamabad's disaster management, followed up by the famines in 1974 because of those poor control strategies. This famine also shifted the main objective of flood management in the country towards boosting its agricultural sector and development to reduce food insecurity. According to Elahi (2017), by 1974, Bangladesh was a food deficit country which depended on import of agricultural goods. Due to Bangladesh's international trade relations with Cuba, the United States withheld food aid to the country. The combination of flooding disaster and political disaster created the conditions for the devastating famine, likely being the main reason for Bangladesh to shift its focus towards agriculture as a flood damage mitigation strategy.

The citizens of Bangladesh, namely the rural citizens, need some form of assistance to sustain their livelihoods. National response by the government of Bangladesh addressing these issues have taken a long time to formulate and may have trouble being implemented at a local level, where individuals have already adapted their own flood management strategies. Some of these strategies include domestic migration of male villages in summer months, netting short-term relief but likely long-term consequences to livelihood. Current plans, including annual

farming subsidies, may also be unsustainable for the government to provide in the long-term (Hossain, 2021). Non-governmental organizations (NGOs) also provide humanitarian aid to the citizens, however, there are rising concerns about the true purpose of NGOs and whether their true goal is to develop the citizens of Bangladesh or to develop their own organization. Even still, awareness of the existence of these governmental and NGO programs or how to benefit from them remains low. To tackle this problem of decentralized flood management, it is important to analyze current strategies at the local, governmental, and NGO level and provide alternative options or next steps that can be implemented with the existing ingrained strategies already developed by the rural residents of Bangladesh.

### **Citizens and Autonomous Adaptations**

As mentioned previously, lack of disaster management was a key factor in the separation between Pakistan and Bangladesh (formerly West Pakistan and East Pakistan, respectively). In 1971, the country of Bangladesh was formed. However, since then, flooding and damage associated with it were (and are) an ever-present problem that has not been sufficiently addressed through national policies. On a smaller, more local level, discussion and action surrounding flood management strategies have relatively recently become more and more critical. Up until the first half of the 20<sup>th</sup> century, flood management was based on local governance and culture instead of national as the colonial strategy at the time was to be more hands off from planning (Cook, 2010). Flood management was also not as imperative as it is now since the population was significantly lower and high-risk flooding areas did not have to be occupied by locals. As the population in the country grew later in the century, more and more homesteads were developed in flood prone areas. With this, household-level (autonomous) adaption measures for flood management and cost mitigation arise. In the short term, to protect their family and livelihood,

rural citizens of Bangladesh resort to their own localized versions of autonomous adaptations, solving some of their problems but sometimes creating new ones in the process.

In a rural village in Gaibandha, Bangladesh, there exists a community where a committee of women protect their village from flooding by taking preemptive measures. In an interview with Oxfam Canada (2013), the head of the community group, Sahena, gives her experience in monitoring and recovering from flooding. In this region, there are at least 10 disaster committees, with Sahena being the elected leader of hers. She monitors flooding by listening to the radio about news of the river and potential flooding heading their way. In 2007, receiving reports that waters were rising in India, she led the committee to prepare for the ensuing flood. Actions to prepare include creating clay ovens on high ground prepared with kindling and raising the ground level of their village. However, even Sahena knows that this may not last, as flooding has quickly become more and more unpredictable. This is an example of a local autonomous adaptation to act preemptively to incoming flooding, and although it has been working for Sahena and her village, it may soon not be enough.

In a case study of a village in the Satkhira District, Fenton et al. (2017) observed the current autonomous adaption measures of villagers. In the case study, they aimed to see whether a planned adaption strategy would be more beneficial long-term rather than the short-term, reactive incremental adaptations by the villagers. In recent decades, the negative financial impact due to flooding in the area has drastically risen. Nearly all the villagers who used to plant cash crops in the summer, own livestock, and pay off mortgages on their properties (signs of prosperity in the area) have had to fully change their way of living due to increased flood severity. During the summer months, flooding was so intense that the villagers were unable to cultivate cash crops. Unable to make profit from the summer months, the villagers had to revert

to selling their rice cultivated in the winter, mainly used for their sustenance. This caused food insecurity, leading to cultural shift of domestic migration of male villagers in summer months to barely scrape a portion of their former income. This domestic migration as observed by Fenton et al. can be seen as a negative transformative adaptation strategy because in the long-term, household income still declines as villagers migrate to hotspots where there are already lower agricultural wages.

In an interview with *The Economist* (2015), villagers share their adaptations to saltwater flooding using aquaculture. After Cyclone Aila, villages are unable to grow and cultivate rice, as the land has become flooded with salt water. To adapt to this, villagers had to turn to what they can harvest in saltwater conditions: fish, shrimp, and crabs. Converting land use from agriculture to aquaculture is not always beneficial, though. In the previously mentioned case study by Fenton et al., they observed that the poorer villagers usually resorted to renting their land out to wealthier people, as they had the capital to start aquaculture while they did not. This drastically lowered the income those poorer villagers received compared to what they used to earn.

Autonomous adaptation has its fair share of successes and failures. In the above cases, it solves the immediate problem of income loss and food insecurity. However, in the long term, they can be unsustainable and become much more costly. For farmers, extreme flooding events cause an irreparable loss for the marginal subsistence farmers, leading to a vicious cycle of constant downsizing of land ownership (Younus & Harvey, 2014). Should success be found in some communities, somewhat like in Sahena's case, these adaptations should be studied, improved upon, and included in national planning. Rather than solely having autonomous adaptations, planned adaptations with the help of national government policies and benevolent NGOs could result in longer term successes for rural residents of Bangladesh.

## **Bangladesh Government Policies and Action**

In the previously mentioned case study by Fenton et al. (2017), the Satkhira district has seen the intensity of flooding events increase dramatically in the 10 years before the study was conducted. According to the study, the main cause of flooding seems to be an engineering project completed in the 1960s, the Coastal Embankment Project. Although the project's goal was to reduce harm to the local agriculture economy by protecting crops from saline water, decades later it ended up “[restricting] tidal flow and prevented sedimentation on surrounding floodplains, leading to sedimentation in rivers and reducing drainage capacity” (Fenton et al., 2017, p. 2391), causing the local Kobodak River to overflow more often. These types of government projects around Bangladesh end up short-sighted, creating a debt of more complex problems to solve in the future which, in some places, is now.

In more recent years, the national government of Bangladesh has been working on implementing national strategies to mitigate harm caused by flooding events. Some policies include NAPA and BCCSAP. While the government has started the implementation of these strategies, there are many barriers to acknowledge and address. The most glaring barrier to success is the lack of education and awareness among Bangladesh's citizens on the existence of new national strategies, how to benefit, and educating the citizens on the impacts of climate change. While some claim government strategies such as annual agricultural subsidies will help farmers become more self-sufficient, critics such as Atiq Rahman, executive director for an NGO working on sustainable development, claim these strategies are unsustainable to fund in the long run. More on this claim was not included in the article. Alternatives being trialed by the government include climate disaster insurance. Rahman asserts that diverting part of the subsidies funds into insurance would be a more efficient way to help farmers (Hossain, 2021).

Even with the existence of these kinds of programs, awareness among villagers remains direly lacking.

Failed government projects need to be addressed and updated within the context of local communities as they exist today, as seen in the case of the Satkhira district. Although it is unclear if the villagers have requested assistance from the Bangladesh government, the cause of flooding there today is directly linked to a government project and should alert the government to provide recourse.

### **Role of Non-Governmental Organizations**

After the cyclone of 1970 and the following political upheaval, non-governmental organizations quickly took hold in Bangladesh, providing much needed humanitarian aid to the nation. Since then, the rate of NGOs in Bangladesh has risen dramatically, with 26,000 NGOs registered with the NGO Affairs Bureau in 2008 (ADB, 2008). The largest NGO in Bangladesh, Bangladesh Rural Advancement Committee (BRAC), was formed in 1972, and persists today as an international NGO. Impacts that NGOs have in Bangladesh include, but are not limited to, providing water desalination plants to rural communities (The Economist, 2015), rescue, shelter, medical services, microfinance loans, and increasing population literacy. While the impact of NGOs in general in the public eye is seen as beneficial, there lies some questioning as to whether some NGOs are sufficiently fulfilling their humanitarian missions as claimed.

One might assume that the end goal of an NGO is to provide resources to a community in need by creating sustainable conditions for the exchange of knowledge, goods, and services. Once this network is created, the idea is that the management would then pass on to the local government and governing agencies, at least as claimed by Davis (2006). However, with the persistence of NGOs in Bangladesh and after reading a statement about BRAC feeling the need



to continue to expand operations, Davis raises questions concerning the premise of NGOs feeling the “need to do more and more”. Davis asks of NGOs: “Why do NGOs ‘need to do more and more’? Is their main concern their organizational sustainability or the sustainable development of the community?” (2006, p. 2). In other words, are NGOs more interested in helping the local community become self-sufficient or are they looking for reasons to expand their organization’s influence?

In a conspiratorial take, it is believed that so many NGOs exist in Bangladesh due to widespread corruption in the guise of humanitarian relief or the belief that Bangladesh is a failed state. This is not to say that all NGOs partake in this but raises a concern about how these organizations may be operated. When Bangladesh was newly formed, international donor funds were ubiquitous. The availability of these funds gave rise to many organizations seeking to obtain a share. Combined with the fact that the elites in the nation saw the newly formed country as a failed state, it is believed that they deliberately allowed the country to remain underdeveloped to continue receiving international aid and cheap labor (Davis, 2006). In an article published on New Age, Md Zakir Hossain, the state minister for primary and mass education, claims that NGOs who have been requesting larger budgets have been misappropriating funds that were to be used for the goal of financial literacy (Kamol, 2019). This is one of many examples of NGOs subverting the goal of furthering the community for self-gain.

More specifically concerning flood management, Davis claims the large NGOs tend to avoid acting against flood management policies that would benefit rural communities to gain favor with the technocratic elite that manages government policy actions. He also asserts that there is a challenge to ensure that Development NGOs and policies relating to them are realized

for actual sustainable development of poor and marginalized communities rather than a political theatre where everyone believes that to be the case when it often is not.

The concern here does not lie with all NGOs in Bangladesh. There are many examples of NGOs that fulfill their mission statement and act with pure intentions to further the development of the nation. However, under the guise of acting charitably, many NGOs are taking advantage of large paychecks and redirecting that money towards building their own organization rather than wholly fulfilling their mission they promised. Moving forward, policies and actions that scrutinize NGOs would allow for more efficient redirection of resources.

### **Towards Sustainable Flood Management Strategies**

To create sustainable flood management practices in Bangladesh, it is important to recognize the cultural driving factors that lead rural residents to uptake autonomous adaptations, the lack of government action, and the conflicting goals of NGOs. Action taken towards flood management in Bangladesh has slightly improved in recent years but can be vastly improved upon. Lack of government assistance and ingrained cultural practices by rural villagers hereby pose a problem: possibility of a lack of adoption of new strategies. Rural citizens have been managing on their own for a while now without the government's help; what better does the government know about the villager's land than the villager? Do villagers owe trust to a government that has failed to take rapid action? How do villagers ensure that they will not be left to fend for themselves after an organization makes a quick stop in their area for a project just so the organization can make a quick buck? To tackle these problems, new flood management strategies should be implemented with the principles of sustainable community-responsive adaptation.

### **Implementing Principles of Sustainable Community-Responsive Adaptation**

Research done by Mulligan et al. (2017) on Kibera, Kenya and flood management strategies implemented in that area prompted the authors to propose a set of principles of sustainable community-responsive adaptation that present guidance on how to approach other areas in a similar context (e.g., Bangladesh). The principles proposed by Mulligan et al. are listed as follows:

**Table 1.** Principles of Community-Responsive Adaptation

Grouping Measure	Principle
People	1. Vulnerable people are best placed to understand the specific challenges they face in the areas they live; therefore, they must be involved in identifying solutions
People	2. As first responders and agents of change in the settlement, women should play a central role in initiatives to improve preparedness and response, as well as in growing resilience in the longer term
People	3. Flood impacts extend beyond river and drainage flood zones to affect public health and wellbeing of all residents
People	4. Integrated adaptation solutions that consider flood protection water, sanitation, public space, and income-generating activities can transform the physical, social, and economic resilience of communities
Place	5. Effective action for climate change adaptation needs to be specific to the context at a local (sub-catchment) scale as climate risks vary significantly from one area to the next

**Table 1** (continued)

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Grouping Measure	Principle
Place	6. Improving physical flood protection and drainage in both areas adjacent to the river and to minor drainage ways within the settlement is a critical solution for reducing the direct and indirect risks of flooding
Place	7. Hard (structural) adaptation solution needs to be complemented by soft (non-structural) solutions to achieve cost-effectiveness and sustainability (e.g., ongoing revenues and maintenance arrangements)
Place	8. Landscape-driven approaches to physical flood protection and drainage can be cost-efficient, can restore ecological functions and can be flexible to climate change
Place	9. By improving the physical and environmental quality of the spaces, conflict and tensions are reduced and communities are inspired to collaborate and take pride in maintaining their surroundings
Place	10. Public space can be a focal point through which many of these structural and non-structural solutions merge to address the confluence of flooding, poor drainage, solid waste dumping and lack of sanitation in slums adjacent to rivers
Scale	11. Micro-scale improvements of physical and social resilience not only reduce climate risk in and of themselves but can also secure and amplify the effects of larger infrastructural interventions (i.e., by plugging into formal government infrastructure)

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**Table 1** (continued)

Grouping Measure	Principle
Scale	12. Reliable information on flood exposure and settlement patterns is required to enable the planning for integrated adaptation solutions at micro-scale and settlement scale

*Note.* Adapted from *Community-responsive adaptation to flooding in Kibera, Kenya* by Mulligan et. al

Many, if not all, of these principles can be used as recommendation to the Bangladesh government in concert with NGOs to create effective, sustainable strategies to implement in rural communities impacted by flooding.

### **Engineering Solutions within Social and Cultural Contexts**

Principles 1-10 of community-responsive adaptation relate to the people and environment surrounding flooding-affected rural areas. While undertaking engineering projects in under-served areas, it is important to be aware of inadvertently extending social injustices and power conflicts. In an article about engineering, globalization, and social justice, Nieuwma and Riley (2010) describe cases of social justice considerations in engineering developments in Nicaragua and Sri Lanka.

In the case of the Nicaraguan projects, the visiting engineering students and local engineering students both resorted to focusing on the delivery of a product as the main goal. This was counter to the original goal of understanding “the product development process and developing robust product concepts connected closely with community needs” (Nieuwma & Riley, 2010, p. 38). In this case, the local expert on community engagement was unavailable for

the project, resulting in assumptions being made about the local community without any input. In other cases, these kinds of assumptions can arise from language and cultural barriers. It is important to be aware of these barriers and work to overcome them. If they are ignored, good intentions can be spoiled by miscommunication, resulting in a product failing to meet the larger context of local economics and politics and unable to be implemented in the local area.

The second example of social injustices in engineering for development concerns the work of a Sri Lankan NGO, Energy Forum. The original goal of the project was to implement a renewable, decentralized electricity generation solution to Sri Lanka's population that lives outside the reach of the national electricity grid. Energy Forum realized potential for future areas of growth for the project to establish itself as a major player in the energy sector. Even though they consulted with the community and engaged with them thoroughly, Energy Forum believed themselves to be the owners of the project, while the community did not see it that way. When designing engineering projects, direction of the project should be discussed with all the stakeholders to prevent imbalances in project ownership.

### **Recommended Steps to Amend and Create Flood Management Strategies in Bangladesh**

To prevent extending social injustices, engineering development projects need to be aware of the local community's needs every step of the way, as they should be recognized as a stakeholder in the project. Some examples of recommended steps for the Bangladesh government and NGOs in context to the information provided above are as follows:

With principle 2, an existing example can be seen with Sahena in the Oxfam Canada interview. As an autonomous adaptation, she and other citizens have created committees consisting of women to react to and mitigate flood damage. She has faced adversity in taking on

her role, as in Bangladesh, women are generally subject to the will of their husbands or other male family members. Her husband originally did not want her in this leading role, but slowly realized the positive impact she had been contributing towards and is now content. National strategies should include awareness campaigns on educating against misogyny, the important role of women in their communities, and taking initiative on creating local flood management committees. It was not mentioned whether the committee membership is paid or voluntary, but financial incentives could also be considered to run these committees.

Principles 1, 3, 4, 5, 7, and 10 relate to adequate engagement with the local community and the engineering organization. The community members recognize problems areas that are priorities for requiring solutions and should be included in discussions for project development. It would be recommended to conduct extensive surveying of each affected sub-catchment alongside locals before initiating project construction. Community engagement should also not just be limited to the duration of the project. Instead of leaving the community to fend for itself afterward, the project developers need to establish a form of consistent communication to address concerns for the foreseeable future.

Lastly, the remaining principles are steps to be taken before taking the proposed project to the prospective flooding-affected community. These principles reinforce the concept of developing for sustainable, long-term products and how they benefit the local and wider community. Extensive data collection and modeling of prospective sites should be done with the goal of sustainable impact.

To successfully apply the above principles, it is important to wring out organization issues first. Scrutinization of NGOs need to become more prominent to ensure that first and foremost, they are fully providing the service they claim to provide. Another issue to be

addressed is lack of awareness or hesitancy from rural villagers. Awareness campaigns through community-based NGOs, such as ones consisting of volunteers, can lead to more trust and openness to communicate. Many rural villagers are illiterate, so physically visiting locations should take priority as internet communication would fail to reach the intended audience.

## **Conclusion**

Rising greenhouse gas emissions cause the global climate to rapidly change, leaving behind several developing nations around the world. To combat extreme flooding events in Bangladesh caused by rising sea-levels and more frequent and intense storms, action needs to be taken, and quickly. While on a local level, rural villagers sometimes successfully undergo autonomous adaptations. However, not many of these can be sustainable in the long term. Government action has been lagging, leaving much room for improvement. Non-governmental organizations are providing relief, but not as effectively as they could be.

By following the principles of sustainable community-responsive adaptation as outlined by Mulligan et al., it is possible to develop centralized practices and policies that may be applied contextually to rural villages through the assistance of government agencies and NGOs to help mitigate flood damage. These practices, along with socially conscious management of engineering projects, aim to protect rural villagers in Bangladesh both from damages associated with flooding and from exploitation by local elites and corporations. Although this paper is unable to solve all the multi-faceted problems of the complex organizational entanglement of government, politics, and cultural experiences of Bangladesh and its citizens, it sheds light on the current situation of millions of people and provides possible avenues to explore to ensure the betterment of their livelihoods.



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