

# Governance Perspective for Climate Change Adaptation: Conceptualizing Policy-Community Interface in Bangladesh

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## Article

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## Abstract

Climate change adaptation is currently an important community concern in the developing countries like Bangladesh. The conceptualization of adaptation in the government system matters to develop its canon in promoting activities such as employment generation important for local communities. The lesser the gap between government policy and the local community's needs for adaptation results in more effective outcomes to ensure policy success and to promote sustainable community livelihood or vice versa. This interface between policy and community is important for climate change adaptation which is explored in this paper along with the findings of the research project, DELtas, vulnerability and climate change: Migration and Adaptation (DECCMA) conducted during 2014–2018 in Bangladesh, Ghana, India, and the United Kingdom. The data from Bangladesh was collected from 1,384 survey respondents, 19 Focus Group Discussions (FGDs), 3 workshops, and 43 Key Informant Interviews (KIs). The findings of the paper argue that the adaptation activities mainly focus on the perspective of the Reactive Approach of Limited Action (RALA) rather than the Proactive Approach To Adaptation (PATA). RALA perspective has been characterized by the two major factors: piecemeal and top-down approach in adaptation perspective which fails to recognize the community conceptualization of climate change, policy perspectives in coping with local concerns, and governance approaches for effective adaptation. The government needs to focus on the PATA in policy, programs, and projects with the governance approach from the bottom-up or, in other words, from the local perspective. Community participation in decision-making processes is characteristic of the bottom-up governance model. One good example of bottom-up or community participatory decision-making is Indigenous governance systems in Canada. Local community participation, consultation, and representation are essential parts of PATA in adaptation policy formulating and execution.

## Introduction

Climate change is a reality and coastal people in the developing countries like Bangladesh are the frontline victims of sea level rise and related climatic abnormalities (Findlay 2021b). An important point here is to differentiate between mitigation and adaptation. Jotzo (2007) suggests criteria is needed to consider this difference in climate policy making and implementation process at local and international level. While the mitigation of greenhouse gas emission gets the most important policy preference to combat climatic change (Winkler 2005) it effects on the marginalized people in the developing countries do not get proper attention (Findlay 2020a). Bangladesh needs to rely on this adaptation practice to save lives and livelihoods of the poor and marginalized people. Bangladesh contributes to less than 0.36 percent of total emissions globally (Ministry of Foreign Affairs 2018). However, the country ranked seventh as the most affected country in 1999–2018 according to the 2020 Global Climate Risk Index (Eckstein et al. 2020). Major factors such as the geographic location, low elevation, population density, lack of proper infrastructure, weak institution, and dependency on natural resources make the coastal people less resilient in coping with the climatic change. In Bangladesh the total geographic area is 15,7566 square kilometers, and the total population is about 160 million with an average density of about 1,015 per square kilometers (although the density in major cities like Dhaka is higher, about 34,000 per square kilometers) (Alam et al 2018: xi). Local people depend on natural resources to sustain themselves. Traditionally people depended on wild fish, etc. given the riverine system that originates in the Himalaya Mountains and passes through Ganges-Brahmaputra basin. The rich fertile land of the basin makes the riverine system successful for agriculture (Hossen 2017). However, climate changes cause major disruption to the ecosystem that local communities are dependent upon (Hossen 2021). The result is local communities are further marginalized due to lower incomes from lower yields from agricultural products (Salehyan 2008).

An estimated projection shows that 97 percent of coastal areas of Bangladesh and over 35 million people are vulnerable to the multiple climatic events including floods, droughts, cyclones, river bank erosion, and increased salinity (Shamsuddoha and Chowdhury 2013). For example, the extreme flood in 1998 affected 67 percent of the total area in Bangladesh and lasted for 65 days and caused 1,100 deaths, rendered 30 million people homeless, and damaged 500,000 homes and 700,000 hectares of cultivated land (Aich and Rashid 2018). The total post-harvest loss of rice was about 20 percent and vegetables was 30 percent of the total production that results in about US\$ 4 billion losses (Karim and Islam 2018). The International Monetary Fund (IMF) forecasts (2019) over one-third of total population displacement in Bangladesh will be due to climate change effects such as flooding, droughts, and coastal erosion (Daily Star 2019).

The government in Bangladesh has made significant efforts on reducing climate change impacts and promoting adaptation specific policies and programs such as the 2009 Bangladesh Climate Change and Action Plan (BCCSAP 2009) and the 2005 National Adaptation Plan of Action (NAPA). The major question is whether these policies are able to accommodate the needs of local people to overcome the climatic impacts to ensure that adaptation policies are implemented. Similarly, accommodating for gaps in government policy to support the needs of local communities is a concern. This point will be addressed in this paper based on the Reactive Approach of Limited Action (RALA) and Proactive Approach to Adaptation (PATA) policies. The RALA is described as government policy that focuses on government activities in a top-down or hierarchical and paternalistic governance approach implemented after a climatic event such as a flood or a cyclone. With this RALA, adaptation scope for the marginalized people is very limited due to the gap between local people's understanding and the government's top-down efforts as Findlay (2020a) stated: "climate change impacts vary regionally, intersect with all aspects of human society – including culture, politics and livelihoods – and are often felt first by the most vulnerable communities." This paper argues that the RALA approach is not effective for climate change in the poor communities in the coastal areas of Bangladesh. In this context, the government needs to focus on the PATA that is characteristic of a bottom-up policy approach important to represent local community voices in the climatic policy making and implementation process. Based on Ayers's (2011) argument, the PATA approach can be described as locally embedded understanding of adaptation.

In support of the PATA adaptation approach this paper considers the inclusion of Indigeneity as an ethical approach to governance. Indigeneity that is an Indigenous philosophy is based community ethics that are deeply embedded in human's relationship with the land specific to a place (Armstrong, 2010). In this way, local knowledge holders are important in passing down ecological land practices that could contribute to mitigating climate change. Peter Knudtson and David Suzuki (1992: 8) explain the connection between humans and the ecology as a "deeply rooted sense of place and relationship with the entirety of the natural world". From an Indigenous perspective, relationships are vital and all encompassing of the individual, family, community, nation and the natural world (Armstrong, 2000; Brandt-Castellano, 2008). Fritjof Capra and Pier Luigi Luisi (2019: 308) further elaborate on the importance of community

relationships as it pertains to knowledge where communities: “produce a shared system of beliefs, explanations, and values – a common extent of meaning – that is continually sustained by further communications” that complements community decision-making. Governance systems with community networks have strong communication and dialogue indicative of Indigenous kinship relationships (Findlay 2021a). Local governance as a starting point for decision-making is essential in multi-level circular networks described by Fritjof Capra (1996) that supports PATA as a local governance system.

Amundsen et al. (2010) focus on planned adaption to foresee the impacts of climate change based on the coordination between bottom-up and top-down decision-making approaches. A bottom-up or local approach for collaborative decision-making is appropriate for sustainable practices utilizing informal public and private networks (Van Keresbergen and Van Waarden, 2004). Similarly, de Loë et al. (2009) suggest collaborative and local decision-making is flexible to adapt to changing needs. Consultation with local knowledge holders is key to mitigate climate disturbances. In this context, Corfee-Morlot et al. (2011) asserted that multilevel governance framework can advance the broader understanding of adaptation policy and institutional capacity development.

Multi-level governance is characteristic of a dispersed and horizontal approach to decision-making from the local level (Csehi 2017). Collaborative relationships within multi-level organizations are essential to work with communities in equal partnerships (Henderson, 1994; White, 2002). Multi-level governance can work with PATA to respond to major climatic events with the participation of multiple stakeholders including representatives of poor and marginalized groups of people that are usually excluded. This paper will argue that climate change adaptation policies in Bangladesh such as BCCSAP 2009 and NAPA 2005 need to be reviewed for PATA based on community understanding of climatic impacts and culturally specific knowledge. In a broader context, this model can be applied globally especially in Canada where the importance of local Indigenous knowledge in decision-making is similar to local communities in Bangladesh.

The concept ‘adaptation’ is largely defined as adjustment in human and natural systems, including structures, processes and practices (Heller and Zavaleta 2009). Nielsen and Reenberg (2010) focus on human adaptation into the changing environment and argue that climate change adaptation is one major discourse of global warming caused by carbon emissions. Hoffman (2010) raised the question on resolving social problems with technical and economic growth models connected with RALA. Social problems and the solutions are governmentally and culturally rooted and needs to focus on PATA.

Rather than the preference in technical and economic dimension, Grebowicz (2014) focuses on applying the socioecological mechanisms in overcoming the concerns such as riverine system and employment opportunities. The socio-ecological dynamics of climatic concerns and their adaptation measures needs to be emphasized in the policy perspective (Anna et al. 2012; Jones and Boyd 2011). For example the variability in temperature and rainfall causes major challenges for agricultural practices (Mertz et al. 2009). This seasonal dynamic sheds light on human and information (knowledge, technology, and economy), social (normative, cognitive and institutional) and natural (physical and ecological) aspects and their relationship in climate change adaptation (Findlay 2020b).

The interface between science, politics and civil society can form an effective role in adaptation policy. Gillard et al. (2016) suggest focusing on the sociotechnical perspective which can be helpful for setting strategic (setting objectives and approach to gain the future goals), diplomatic (developing a plan with cooperative agreements), practical (observation and project implementation) and spontaneous (regular audit, assessment and learning from the results) goals to ensure the proper function of the socio-ecological systems in the interrelationship of communities and ecology. In this way, a deeper interrelationship between humans and all living entities is an Indigenous philosophy that can be applied to all social, economic and political decisions (Armstrong 2000). For example, the Syilx Okanagan people in what is now known as Canada live by this philosophy that can be used to combat climate change. In the context of climate change adaptation, community resilience, transition, and transformation in needed to support of social justice. Climate change policy requires a bottom-up governance approach for adaptation methods to work with an ecologically centered ideology. Indigenous philosophy is a foundation to create a paradigm shift for a change in the way decisions are made that will mitigate climate change (Netherton 2021).

Grounded in the argument for a paradigm shift that facilitates socio-economic justice for climate change, this paper focuses on four major sections. The first section, the introduction, provides an overview of the literature relevant to the main argument of the paper: Reactive Approach of Limited Action (RALA) rather than the Proactive Approach To Adaptation (PATA) in the government system is important for climate change adaptation of local communities in Bangladesh. The second section is the methodology that outlines the data sources used for the analysis and provides evidence to support the main themes of this paper. In the third section is the research findings that is divided into three sub-sections: (i) socioeconomic context of climatic concerns over the coastal people in Bangladesh, (ii) local conceptualization of climatic concerns, and (iii) RALA approach in adaptation policy of Bangladesh. Finally, the fourth section outlines the Governance Approach in Climate Change Adaptation and discusses government-policy interface in Bangladesh.

## Method

The study follows a mixed methods research approach including social surveys, Focus Group Discussions (FGDs), and workshops conducted in Bangladesh based on the research project, DECCMA (DEltas, vulnerability and Climate Change: Migration and Adaptation). In this research, social surveys were conducted with 1,384 respondents in the study areas in Bangladesh from 2016 to 2017. Additionally, 19 Focus Group Discussion (FGD), 3 workshops, and 43 Key Informant Interviews (KIIs) were completed. The survey, FGD, and KII data were collected from 14 coastal delta districts: Bagerhat, Barguna, Bhola, Chandpur, Teknaf, Cox’s Bazar, Gopalganj, Jessore, Khulna, Lakshmipur, Noakhali, Patuakhali, Pirojpur, and Satkhira as shown in Map 1.

This paper focuses mainly on the qualitative sources of data that the FGD conducted in the different villages of the coastal districts as discussed below. The data source was gender balanced with the inclusion of males and females in the three major districts of Laxmipur, Bagerhat, and Patuakhali. Among the three workshops, two were in Dhaka, and at Bangladesh University of Engineering Technology (BUET) and the Ministry of Disaster Management (MoDM), and one was at the district level. At BUET, a total 62 participants from 22 organizations attended the workshop who represented government, donor, and civil society. At MoDM, the total participants were 52 from the different ministries, departments, and bureaus. At the district level of Khulna, 85 participants from different governments, non-government, and community organizations attended the workshop. In addition, 43 Key Informant Interviews (KIIs) from government and

non-government organizations were conducted. Among the KIIs, 15 and 28 were conducted at the national and coastal level, respectively, including respondents from the United Nations Development Programme - Bangladesh (UNDP Bangladesh), Association for Land Reform and Development (ALRD), Bangladesh Bureau of Statistics (BBS), British Council, Center for Environmental and Geographic Information Services (CEGIS), Center for Global Change, and Government of Bangladesh to acquire a broader understanding of governance. All of the FGD and KII respondents are referred with pseudonyms to ensure their privacy and protect them from any potential harm under the ethics protocol in research. The research mainly depends on the KIIs in conceptualizing the government and community interface on climate change adaptation.

## Research Findings

### Socioeconomic Context of Climatic Concerns over the Coastal People in Bangladesh

The lower socioeconomic conditions in coastal areas are the leading cause of the inability of households to combat climate change. According to Siddiqui et al. (2017) about 21 percent of the total respondents has no schooling while 22 percent has very nominal primary schooling, and attended a primary school for one or two years. In the study, 50 percent of the total respondents have a permanent job and, therefore, have a better standard of living while the remainder of the local people work temporarily or seasonally and have less income and a lower standard of living. The average minimum monthly income of the coastal people is Bangladesh Taka (BDT) 14,140. An average minimum monthly expenditure is BDT 18,969 that is not enough to support a household and therefore not enough for people to even consider climate change. About 80 percent of the respondents were male who supported a household. The average family size is 4.6 who mainly depend on the head of the household for income support. One major reason for this dependency is about 44 percent of the respondents are female and work as unpaid home care taking care of the family. Temporary employment makes it difficult for households to make a living (and even think about climate change). Many do not have any alternative sources of employment to earn a living. The majority people have no land or do not have enough land to support a living. Most people depend on natural resources such as freshwater and sea water for employment opportunities but these resources are depleting on a daily basis due to environmental degradation. Thus, most of the poor people live 'hand to mouth' and are unable to secure employment opportunities often resulting in malnutrition, death, and family problems. The lower level of socioeconomic conditions is the cause for poverty. Social service programs in Bangladesh are not developed with the PATA as most follow the RALA approach.

### Local Conceptualization of Climatic Concerns

Coastal people in Bangladesh have their own conceptualization of climate change and related effects based on their individual experience. Hasmat in Shudhirpur, in the Patuakhali District, during the FGD informed us that the seasonal weather cycle has changed dramatically from the weather cycle twenty years ago. Similarly, Malek in Khazua suggests both cities experience severe drought and rainfall. *Hasna in Southkhali, at Khulna*, mentioned that it rains during the summer and there is drought during the rainy season that is seasonally abnormal. Malek and Hasna of the FGD respondents expect normal rainfall in the Bengali months of Ashar, Srabor, and Vadro (June, July, and August) but it did not happen on that time. Currently, they did not get rain after Boishakh (April-May). Only Srabon (July-August) can be considered as the rainy season. Sometimes, coastal people in Bangladesh encounter this rain in the winter season and this was unprecedented. One FGD respondent, *Hasan, elaborates that the seasonal rain abnormality is the same as having six seasons condensed into three seasons.*

Fashiatola had a major flood in 2007 as a result of above average rainfall. In 2009, the area experienced cyclone Aila (confirmed by FGD respondent Mishu). Khalek at Pasharbania in Patuakhali reported that the city is encountering higher temperatures after Sidr in 2007 but Khalek did not understand the reasons for this type of climate change. He further mentioned droughts are getting longer: sometimes five months in a year. *Hasan contributes the prolonged droughts to geographic factors such as* Fashiatola in coastal Bangladesh. In addition, *Hasan reports a higher number and level of cyclones.*

Climate change brings an increase in lightning flashes during the rainy season that is a new concern for communities. In only four years, from 2011 to 2015, Bangladesh encountered approximately 5,777 lightning flashes or thunderstorms (Farukh, 2018). In 2018, lightning flashes have caused deaths to 275 people and 30 livestock, and 126 injuries (Farukh et al. 2020). Kohinoor at Shudhirpur in Patuakhali said every year they encounter multiple climate events such as rainfall, lightning flashes, cyclones, and droughts, making living difficult.

*Hasan describes* climate change based on the sea level rise and its effect on higher water level that marked at a residential building or tree. Local people use this marker to understand the difference between the previous and current water level. He further mentioned that the higher level of water in local rivers and other water bodies because of this sea level rise are jeopardizing local habitat. Nielsen and Reenberg (2010) suggest communities understand better the need for adaptation such as PATA relevant to Fashiatola to cope with environmental changes.

A FGD respondent, Khalek in Pasharbania at Patuakhali, describes seasonal weather irregularities based on the challenges in producing crops. Field crops grow best in Ashar, Srabor and Vadro due to the availability of rain in the rainy season otherwise drought conditions are the norm. Female FGD respondent, Kamla, at the same region, describes the cracks in soil characteristic of prolonged droughts. Kohinoor in Shudhirpur at Patuakhali reports every year there are multiple climatic events such as rainfall and storms. In 2019, cyclone Fani hit in Kalapara and in Mirzaganj Upazila at Barishal that destroyed local dams and embankments causing severe flooding in 20 villages. Cyclone Fani resulted in the loss of field crops for 250 villagers including household properties (Bangla Tribune 2019). *Hasan adequately articulated the destruction from the cyclone: "we live in panic. Fear is in every step of life. We have no idea how destructive a cyclone can be for life and property. People died in Sidr, property was destroyed. They lost their relatives in Sidr. They fear now they might lose their whole family. Many leave their resident to take refuge in the shelter place even if it is a danger signal number one."* The unpredictability of cyclones and other climatic events result in socio-economic hardships.

### RALA Approach in Adaptation Policy of Bangladesh

Climate change variability such as droughts, flooding, storm surges and sea level rise are concerning for local communities as already mentioned. The irregularity of seasonal weather cycles is a concern and is a focus for government climate change policy mitigation at international levels. The government

has a major role in developing adaptation measures in climate prone coastal areas in Bangladesh. However, the international role in dealing with climate change is very limited in utilizing the Reactive Approach of Limited Action (RALA). After a specific event such as a cyclone or flood, the government provided some relief in the form of rice or saline water for poor people. Relief efforts are publicized in national print and electronic media to inform the public that the government is taking all measure to ensure the safety of vulnerable people. In terms of policy, the local government conforms to the policies implemented by the federal government. However, local and federal governments fail to adequately specify the total number of affected people needing disaster aid. Despite the major visibility of the cyclone destruction the government tends to maintain a 'business as usual' approach and leaves it up to the individual to deal with the impacts of natural disasters. No major stakeholders such as Non-Government Organizations (NGOs), civil society organizations, or local governments consider utilizing adaptation measures. Ignoring adaptation is a major barrier in coping with the climatic concerns (Anna et al. 2012).

One of the KII respondents, Badrul from the Center for Global Change, points out that the top-down approach toward adaptation activities is one of the major obstacles for helping climate-impacted victims in Bangladesh. He elaborated that when a top-level government official has an agenda, the government has a legal mandate or responsibility to initiate and support policy. In this context, there is no need to explore the feasibility, or understanding the needs of local communities. Many adaptation measures such as building a cyclone shelter or dredging a river are established that sometimes create consequences for those communities impacted.

Adaptation politics matters in the broader domain of public policy. Political leaders direct decision-making and policy development as described by Clar et al. (2013). In this way, politics shape adaptation policy in composition and implementation. Coordination with influential political leaders and donor agencies is critical to meet the needs of communities impacted by disasters. Khurshida of ALRD is very critical of negative government influence on decision-making and argues that the government and international development partners need to recognize the local community conceptualization of the climatic change impacts and their adaptation mechanisms. Khurshida's concern over the lack of coordination echoes civil society organizations and NGOs coordination of adaptation policy with government public policy in Bangladesh. As described by Khurshida, the Bangladesh Delta Plan 2100 is one example where government's preference takes precedence over public policy and its relationship with the climate change adaptation policy.

Khurshida expresses frustration about the Delta Plan 2100 and the lack of consultation with communities. Professionals in specialized fields of construction and development including Khurshida attended in a two day convention in Bangladesh. According to Khurshida there is very little knowledge about the Delta plan and its effectiveness in constructing mitigation measures according to local expertise in Bangladesh. One successful example of a country using the Delta plan is the Netherlands. The Netherlands' government developed their technical support for Delta Plan 2100. According to the commitment of government, the plan will get more than two percent of the total budget in redirecting development. A high-level delegate with a number of influential ministers visited the Netherlands to learn from their implementation of the Delta plan and appreciated their contribution in the Plan.

In response to the Netherlands' government implementation of DP2100, Khurshida argued that the Netherlands and Bangladesh have different types of conditions in the level of ability, affordability, socio-economic, and geographic context that needs to be understood in policy. A policy needs to recognize the local embedded reality of the different issues and concerns especially climate change effects. Hoffman (2010) confirms the technical side is mainly focused on adaptation that ignores the social dimensions. The result is further challenges in developing the effective adaptation approach. In the Netherlands, dams are built, roads and railways are constructed without any negative impacts to the local communities, riverine system, and biodiversity that are important and resilient components in coping with the climatic concerns especially cyclones. The Netherlands is an example of effective adaptation for local communities. It is important to understand local infrastructure in Bangladesh based on past experiences and how they impact the present.

In 2015, the collapse of an embankment flooded 15 villages and 12,000 residents at Kalapara and Mirzaganj Upazila in Patuakhail District. Three years later, in 2018, the same region experienced similar weather systems (The Independent 2015). For example, tidal waters inundated 12 villages and their 15,000 residents by collapsing an 8 kilometer long embankment and no disaster relief was taken by the government for weeks (The Independent 2018). Extreme events such as these affect people and their ability to earn an income. Sometimes the effects are inter-generational. For example, fish farms were washed away, educational institutions were closed, and water sources had salinity build up that impact the livelihoods of future generations. Other immediate and long-term impacts include: unemployment, poverty, violence against women, divorces, and displacement. Government coordination with development partners promote their own understanding of RALA adaptation measures that counter the effectiveness of local policies. Better negotiation at the international level with the government such as the Netherlands or with the United Nations is beneficial in negating climate impacts and policies made by governments.

As already mentioned, public policy fails to reflect the needs of local communities. Foreign influences in the global economy are reflected in how and what policies are implemented. RALA approach has three major outcomes on the ground that are not helpful for marginalized people. First, local people experience negative economic and social impacts from salinity, erosion, water stagnation, and arsenic contamination resulting from cyclones and floods. Second, the government constructed large-scale embankments, dredging, and barraging under DP2100. Foreign governments keep financial promises with a budget focused on technical knowledge and expertise instead of utilizing local expert knowledge. Third, government budget constraints and priority spending results in little or no money spent on communities in need and often create more problems.

One KII respondent, Borkot, from the Government in Bangladesh, reported more than 300 construction projects in Bangladesh including the coastal zone. These projects are under BCCSAP policy guidelines. Bangladesh Climate Change Trust provided approximately US\$ 400 million for construction and mitigation projects. One KII, Khurshida of ALRD, informs that some of the Trust's funding is distributed to 63 NGOs for agriculture projects such as crop diversification, raised land, but the funding was only for a limited time. Government policy decisions and financing initiatives appear to be disconnected with local interests and need for economic stability.

Another KII respondent from another KII of the British Council, Jahid, in Dhaka, asserts the Government of Bangladesh does not have any entity dedicated to deal with the issues and concerns related to climate change and displacement. The major reason is climatic concerns were described as an environmental issue under the Ministry of Environment until 2014. According to Jahid, regardless of a change in government ministry employees generally have less

knowledge and interest in climate issues and adaptation policy. Currently, Ministry of Planning and Ministry of Finance are taking the lead in combatting climatic issues that involves coordinating with the Ministry of Foreign Affairs in dealing with the international mitigation and adaptation.

The lack of effective government organizational structure and financial support are key factors contributing to the ineffective implementation of adaptation policy. KII respondent, Borkat, from the Government of Bangladesh, informed us that he reviewed 10 annual development programs that are listed as promoting climate change adaptation. According to Borkat, about 25 percent of the total people in Bangladesh live in the coastal area but only less than 10 percent of the budget is allocated to these areas. The government's inability to understand the gravity of the community's financial needs is concerning.

Insufficient financial support results in limitations in policies made for climate change adaptation in the coastal area in Bangladesh. Rahim at Fasiatola in Bagerhat District did not get any specific agricultural supports to mitigate drought effects. Rahim reported river embankment erosion and government's attempt in mitigating erosion that failed. According to Rahim, in 2012, the government reinforced the embankment but it failed to protect them from further erosion. The bank eroded three more times after the reconstruction. The government coordinated with the World Bank and built a cyclone centre in Fasiatola, according to Rahim. *Another FGD respondent, Hasna, in Southkhali at Bagerhat District expressed her frustration about the lack of early warning before the cyclone. Cyclone Sidr hit the area in 2007. The local government did not warn the district of the impending cyclone that caused substantial loss. Another example of the inadequacies of government decision-making is described by Hasan in reflection of his home in 4 Southkhali Union: the government's temporary solution to local water stagnation was the installment of a tube pipe under the road to drain out water. Higher levels of water occurred due to heavy rains associated with the cyclone that undermined the pipe. Further, the government only built a few cyclone shelters that did not help other communities in need. Gedi at Fasiatola expressed her frustration with emergency supports from the government: deep tub well and water tanks did not help during the cyclone.*

Although Khurshida of ALRD has the extensive experience in working on climate change adaptation activities, she does not know about the government record of expenditures for climate change adaptation. The government fails to use a significant amount of the climate change fund for what it is intended for – adaptation activities. Therefore, there is a surplus of donor funds that remain unused and were sent back to the donors. Sometimes, a specific department of the government uses the fund for other purposes not associated with adaptation measures. The budget year starts in July in Bangladesh. Some projects get budget decisions only after six months and they get less than six months to begin projects. The short turnaround time for projects diminishes the quality of the results that is questionable in the appropriate use of time and money spent on projects as well as the budget constraints.

KII respondent, Probir from Bangladesh Bureau of Statistics (BBS), describes the current practices of community involvement for resettlement. When the Chairman of a Union Council submits a list of the climate refugee or homeless people, the authorized staff of local governments visit every village and discuss their place on the list. One major point discussed is if there are any people who need to be added or excluded from the list. In this decision-making process, the participation and inclusion are confirmed with local communities.

Community involvement in the decision-making process is described by another KII, Probir from BBS. Probir reports that the decision-making process does not recognize the minimum participatory requirements such as inclusion of local community representatives. Probir's statement raises some major questions for: understanding the participatory approach, justifying the use of the approach, and the level of training government staff in using the approach. Based on these questions, it is assumed that local people are increasingly getting divided as heterogeneous groups by their activities. Related to community engagement in climate change adaptation, Mishu at Fashiatola suggests there are two concerns: individualism and sustainability. Individualism is explained where local people are not united anymore, as they focus more on individual interest and less attention on collective interest. Again, some people base their own initiative on some adaptation measures such as river bank protection instead of a collective measure such as river bank reinforcement.

Resettlement is a governance approach concerned about incorporating local knowledge into policy and including community representatives in the implementation process. The inclusion of community members in the implementation of the decision-making process of the state did not happen in of DP2100. Community representation in climate change adaptation is described as 'community perspective' (Mertz et al. 2009). The participatory decision-making process is focused on the community perspective as it applies to Indigenous practices.

Participatory decision-making is essential for making decisions that positively impact the community. Free, prior and informed consent by communities in decisions affecting them that specifically applies to Indigenous communities. The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) is an internationally mechanism supporting human rights and provides the minimum standards including free, prior and informed consent. UNDRIP recognizes the rights to "proper management of the environment" (UN General Assembly 2007: 9), and rights to mitigate environmental impacts (Cramer et al. 2020). The universal nature of UNDRIP articles suggests that UNDRIP pertains to all people not just Indigenous peoples and can be applied to policies made to mitigate climate change domestically, nationally and globally. Alternatively, Jeff Corntassel (2008) cautions that global human rights initiatives used to support Indigenous rights may divert attention away from the community in this process. Similarly, local community interests may not be adequately addressed. Similar to Canada's initial position, Bangladesh abstained from endorsing UNDRIP, yet, contrary to Canada that since endorsed UNDRIP, Bangladesh has yet to do the same. Endorsing UNDRIP could work with PATA in supporting local initiatives for climate change mitigation.

Local people are not interested in relief based on RALA given the top-down authoritative approach that attempts to exclude them. Communities are interested in job creation in natural resource-based employment opportunities. If these types of opportunities are not available and do not provide the incomes necessary to support households, adaptation will not be effective. Similarly, unemployment will create more social problems such as displacement and violence against women. Khurshida of ALRD makes a good point about local communities and their perspective on climate change adaptation: for generations, local people learn how to respond to seasonal weather patterns for agricultural activities. Community-based knowledge is transmitted from one generation to another based on the 'learning and by doing'. Given this traditional community-based approach, adaptation policy needs to be developed from the local perspective so livelihoods in coastal area of Bangladesh are sustainable to be utilized with the Proactive Approach To Adaptation (PATA).

## Discussion: Governance Approach In Climate Change Adaptation

Human adaptation to a changing environment is not a new phenomenon, but there is a sense of urgency for researchers, policy makers, and civil society due to the many climatic concerns and the higher level of vulnerabilities of a greater number of people, and institutions that require government intervention to deal with climate changes. Climate change causing biodiversity loss including habitat degradation, soil loss, nitrogen enrichment and acidification requires some major adaptation measures from short to long-term. In this way, the focus is away from precautionary to deterministic modes in securing livelihood activities like agricultural production and fisheries. Further, land and environmental policies need to promote conservation activities in coordination with local communities. (Heller and Zavaleta 2009). For example, Indigenous philosophies support land-centered governance from a ecological perspective. Any potential harm to the land the ecology (living and non-living) is considered in any decisions made by an Indigenous community. In this way, the community participates in long-term decisions that consider the impact on seven generations into the future. Obstacles to adaptation are an important in promoting successful adaptation planning, developing institutional structures, organizational cultures, and policy making procedures that are effective governance practices (Anna et al. 2012).

Proactive Approach To Adaptation (PATA), is a policy needed to support different sectors such as: agriculture and health care: different groups of people such as day laborer and disable people will benefit from PATA for employment and education opportunities and other socio-ecological concerns (Jones and Boyd 2011). Socio-economic issues should be addressed in adaptation policy related to climatic concerns such as flooding. For example during the flooding season, the extreme heat causes 'eye dazzling' for people when they are working in crop fields under the open sky. Policy guidelines have to address these potential health problems. Lightning flashes are another concern for local people in Bangladesh where the effects can be mitigated with effective policy. Again, the different hydrological zones have different types of socio-ecological concerns that need to be considered in policy decisions. Different sectors or groups of people encounter various types of shock that require appropriate adaptation mechanisms. In this context, local government needs to be equipped with proper official guidelines, and vertical and horizontal coordination among government, organizations and communities. The vertical and horizontal flexibility is characteristic of a multi-level governance structure that can be supportive by PATA.

The water crisis negatively affects agricultural production and other livelihood activities. To alleviate the impact of the water crisis, the government should develop water policy in conjunction with climate change adaptation. Alternative water sources are currently being sought by locals to help crop production and vegetation to help maintain the livelihoods of marginalized groups of people such as Khalek and Kamla. Local adaptation knowledge is important to develop a more effective policy to cope with the climatic events such as landslides and flooding at the individual, community, and government levels.

*Hasan's income insecurity due to climate change factors is experienced by other groups of people for generations. The future of policy adaptations should end the generational impacts to ensure people have proper institutional supports. In this context, the data collection on local community knowledge is a major important component in this governance perspective. As already mentioned, the adaptation policy related to a specific climatic concern needs to incorporate both the technical and social components of local community knowledge in developing the interface between government and local communities (Huq and Khan 2006). Otherwise, the coastal area will be gradually deserted creating more population movement, displacement and social problems in some other areas in Bangladesha and beyond.*

Local people have their own knowledge and understanding of climate concerns and adaptation measures based on their socio-economic and geographic background. Factors include: class position, employment patterns, and environmental drivers that can be mitigated with Proactive Approach To Adaptation (PATA). Again, specific knowledge should be incorporated into the policy formulation and execution process so that the programs and projects can be effective in addressing concerns. Kohinoor in Shudhirpur expect some emergency supports from the government; the city needs a deep tube-well because it has no pond for drinking water. They also need some more cyclone shelters for the given population. Cyclone activity has resulted in many people losing land due to erosion and other related factors. In this context, another KII respondent, Asma Jahan, from a semi-government organization, CEGIS, describes the importance of resettlement that the government is not addressing. For example, the government acquires land for road construction, or builds hospitals, and exclusive industrial zones. In addition, the government fails to help climate refugees. Asma Jahan argued that the government did nothing related to resettlement except provide relief support for floods or cyclones.

The government should have a specific plan for projects such as crop diversification to help people with adaptation measures such as BCCSAP. Amundsen et al. (2010) refers to this foreseeable approach as 'planned' adaption. Khurshida of ALRD suggests the difference between law and policy in securing the livelihood of the climate change affected people. Policy is a type of principle in promoting the adaptation contribution to local people. In the context of Bangladesh, policy is not enough to make the government responsible for securing the life and livelihood of climate victims as suggested by Khurshida. She emphasizes legal measures for climate refugees inside Bangladesh to ensure there are some opportunities for their survival. More specifically, from a legal perspective the government will provide compensation for lost land for every displaced household. Land reclamation is also an option to redistribute land to displaced people.

To expedite the most effective adaptation policy, the government needs to incorporate local understanding of adaptation measures as already suggested. *Local people experience climate risk and specific preparation is required to cope with damage and loss as suggested by Grebowicz (2014). Hasan in Southkhali plants trees to reduce the effects of cyclones. In the case of flood preparations, they store dry food, water, fire box and other supplies underground. Immediately after a cyclone begins, women take a leading role in performing in acquiring the reserves from the ground. Hasmat at Shudhirpur collect three or more banana trees and ropes them together so that people can grab onto the trees to not risk being swept away in a cyclone. For example, Hasmat survived the cyclone Sidr in 2007, by clasping onto a banana stockpile to stabilize herself in high winds. In the context of adjustment in human and natural systems, respondents in Bangladesh describe their understanding of the climatic concerns and also have their in-depth adaptation perspective discussed by Heller and Zavaleta (2009).*

Hasmat in Shudhirpur describes the environmental dimensions of the government's contribution towards mitigation measures for their livelihood security. The Department of Forest under the Ministry of Environment provided salinity tolerant plants like sofeda, coconut, rain tree, and plums. As described by Salehyan (2008), rather than limiting tree plantations, the ministry could take necessary steps in ensuring the sustainability of the environment.

The government needs to focus on climatic specific measures for adaptation policy. Rahim expressed his dissatisfaction with drought and erosion measures. For example, to mitigate drought, the government needs to ensure there is the availability of water systems supported by adaptation policy. As mentioned by Hasan, the temporary arrangement with the RALA is not effective and the government should develop proper water governance approaches incorporating climate change adaptation. As the seasonal calendar on rainfall, temperature, and intensity of warm or cool seasons change food security is threatened. For example, wild food harvesting, food production and food businesses are reduced. The adaptation policy, according to Jones and Boyd (2011), needs to identify the different types of social challenges such as irregular harvest time and new crop species by stakeholder involvements at local and national levels to ensure adaptation governance to climate change.

The government needs to develop proper mechanisms for adaptation policy to track specific adaptation expenditures and their outcomes in how climate affects people. In terms of expenditure, the government could develop effective financial planning for budgets used by institutions. Proper execution of the PATA without delay would ensure maximum positive outcomes of adaptation projects. In this context, the appropriate department or Ministry can take necessary preparations one year ahead of a climate event so that the execution of the projects or programs can be completed in time.

Incorporation of local practices can also be part of forming an effective adaptive policy to cope with environmental changes. The documentation of the different types of damage and loss of a previous climatic concerns like cyclone Aila can help develop effective policy for the future. In this context, categorization of the different elements and the level of sensitivity and resilience can create a scope for better preparation by institutions, societies, and cultures. Categorization is defined by elements such as: groups of vulnerable people and their level and types of damage and loss, and the sensitivity and resilience to cope with the effects of Aila. *Hasna further mentioned, local government needs to have more effective financial contribution in its adaptation measures.* Borkat from the Government of Bangladesh supports Hasna call for more financial and Borkat mentioned the regional disparity of budget allocation that needs to be addressed to develop effective financial plans for climate change adaptation. This approach for public policies (Clar et al. 2013) can be more effective in the adaptation process.

The coordination between the different policies and their implementation can provide the results that local people are requiring including a wide range of local interventions with coordinated effort, creative management, and related shifts in resources use and institutional roles. For example, land policy can be an important component in overcoming unemployment problems. Every person will have a parcel of land that they can develop for agriculture to support employment opportunities, income, domestic animals, and housing facilities - important components for effective adaptation. In the context of resilient adaptation measures, land policy needs to address the concerns of land erosion and displacement, land reclamation, and redistribution. These components are described as 'sectorial coordination' by Anna et al. (2012), in the introductory section in this paper. Again, land inequality is another major problem in localities where 75 percent of the rural population is landless or own less than 0.5 acre of land and the number is increasing (USAID 2010) due to climate change effects, poverty, and inappropriate development projects.

Asma Jahan from the CEGIS emphasizes the importance of the integrated approach to climate change adaptation to ensure coordination among different government and organizations for transportation and communication, embankment protection, functional market place, livelihood activities like income generation, water and sanitation, health, and education, and funding sources like micro-credit. In this context, the different ministries like Ministry of Transport, Agriculture, Land, Social Welfare, Health, Education, and Environment need to work in the coordinated approach as suggested by Asma Jahan. Coordination and collaboration works well with a multi-level governance systems supported by PATA.

To understand all of the factors involved both scientific and community knowledge should be consulted in formulating policy. Shariful Islam from UNDP focuses on adaptation innovation based on the multiple stakeholder involvement including scientists, farmers, fisher folk, and local governments. This innovation is important given the changing reality of environment, livelihood, and society. Due to the top-down domination over innovation, the traditional perspective is excluded in meeting the needs of local people to cope with climatic vulnerability. For this purpose, the government needs to provide research funds as well as ensure researchers' freedom to contribute. A multi-level governance collaborative approach among stakeholders needs to be established in adaptation policy as promoting social and cultural transformation.

One of the major perspectives of KII respondent Shariful Islam's adaptive innovation is to develop adaptive tracking. Shariful Islam focuses on adaptation tracking as defining some major characteristics for assessing the success of social, economic, cultural, and political life based on government efforts. Although this approach is new to the government in Bangladesh, it has a global focus as Shariful Islam suggests. According to this expert, global indicators can be used as a baseline to compare indicators important in understanding the local socio-economic and ecological concerns. The comparison between global and local characteristics can be helpful in directing adaptation activities. This approach can promote climate public expenditure for local people and policy-making processes. As donor funding is a major initiative in Bangladesh to promote climate change adaptation, it can include adaptation tracking components to understand the areas of success and those needing revision. This approach will be helpful in record keeping both in qualitative and quantitative for the total number of people benefitting in a specific geographic area. The record will help donors to review their own funding policy in the adaptation activities globally.

Rather than the current unstable institutional practices under several ministries such as the Ministry of Finance, climate mitigation and adaptation should have one specific ministry or at least a department at national and international level. The Ministry is supposed to provide people with in-depth practical and theoretical knowledge to fulfill their obligations and the expectations of local people, researchers, civil society, and business organizations. Educational curricula and the socialization process promote this governance that needs to be established with consideration for science, climate, and societal change. The ministry or department also requires employees who have knowledge of technical and social perspectives as the interface between science, politics and civil



society (Gillard et al. 2016). Community participation in decision-making processes is essential for their needs to be addressed by governments. Local participation in governance provides more flexibility to support culture, especially Indigenous culture, where decisions are made by the community and for the community. A flexible governance approach supports co-management decision-making among various stakeholders including domestic, national and trans-boundary governments for critical responses to events such as climate change.

## Conclusion

The coastal people in Bangladesh conceptualize climate change effects such as irregular seasonal patterns, flooding, droughts, riverbank erosion, salinity intrusion, and cyclones based on their experiences. The government in Bangladesh has different policies and programs aimed at mitigating the effects of these events to promote adaptation or the RALA approach. When a climate change event such as Aila, Sidr hit in the locality like coastal zone in Bangladesh, some relief was provided by the government and affected people took refuge in a shelter for a limited time. The government also had other programs such as resettlement that was very limited in scale to help people rebuild. RALA fails to incorporate major characteristics of climatic change. In this way, RALA is focused on a top-down, narrow approach, and is exclusionary to ensure the adaptation of the marginalized groups of people. Alternatively, PATA can be more effective in promoting the needs of the climate vulnerable people as a governance approach from the bottom-up. Local people develop their own strategies to cope with specific climatic events such as floods, erosion, or cyclones to support their socioeconomic needs. This perspective is supported by the FGD and KI respondents during the data collection process. The governance approach that is effective in supporting local communities is based on the coordinating among multiple stakeholders such as coastal populations, local governments, civil societies, researchers, policy makers, and business associations. This governance approach can effectively coordinate among these groups to find solutions to the barriers to adaptation. In-depth case studies and consultation with the divergent shareholders will be beneficial for adaptation planning. Coordination should be respectful in the multi-governance approach to actively engage in dialogue with various stakeholders. In addition to this participatory approach, it is also important to maintain the vertical and horizontal coordination between the different agencies in government, non-government, and private sectors that involves effective dialogue and communication. Cultural diversity is also supported by multi-level governance and collaborative relations with stakeholders. In this way, the government needs to share information related to local climatic patterns, local community vulnerabilities and support, the local government's role in developing policies, and develop collaborative programs and projects for more effective adaptation activities and institutional development. This governance approach can identify the different dynamics of PATA based on the negotiated understanding of these multiple stakeholders. In this context, it is important to create the scope supporting more research in the technical and social sciences to increase a greater understanding of adaptation governance based on the PATA. The government also needs to incorporate experiences in the past climatic concerns in current and future management practices. This approach is 'learning by doing' that needs to be incorporated into adaptation for better results to mitigate the impacts to the coastal people in Bangladesh that provides an example for other communities and countries globally.

## Declarations

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## Figures

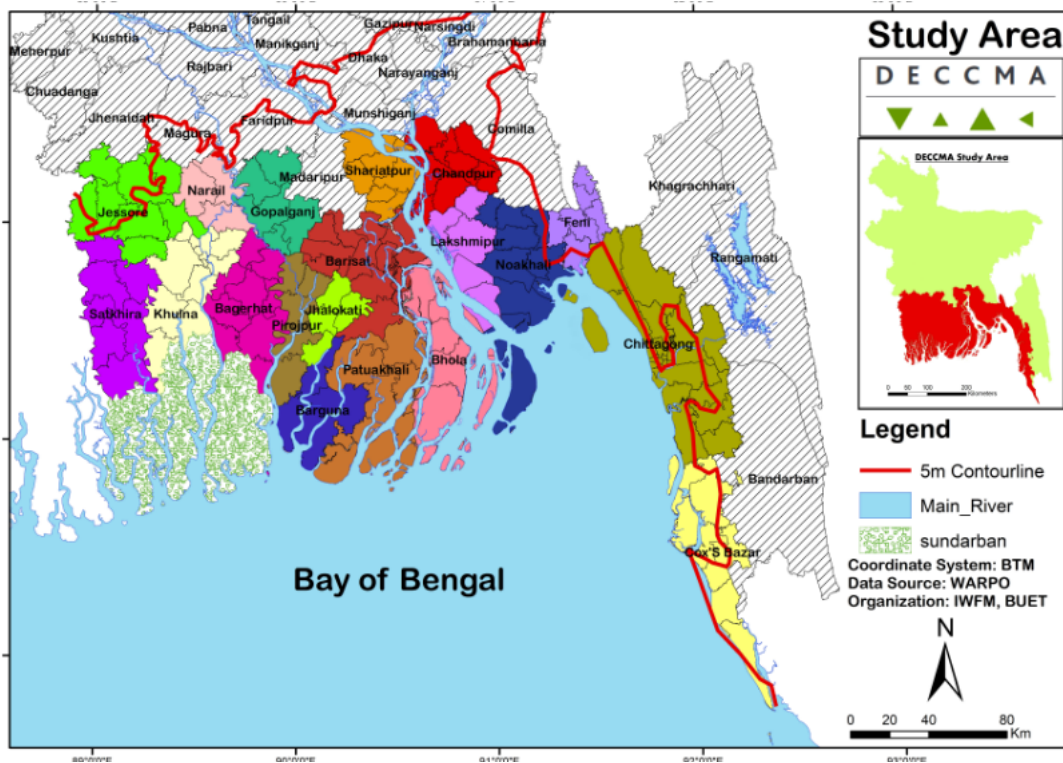


Figure 1

Map 1: The Fieldwork Area at the Coastal Zone in Bangladesh