



Adaptation or conflict? Responses to climate change in water management in Bangladesh



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ABSTRACT

The potential of climate change to impact local conflict and cooperation over natural resources has received relatively little attention. Bangladesh floodplains are highly vulnerable to environmental stresses that are worsening with climate change, and community organisations have to respond to water insecurity – seasonally too little or too much. Two case studies based on action research in contrasting water and climate stressed floodplain environments in Bangladesh investigate local conflicts over water management that worsened when water regimes changed. By overcoming conflicts and improving adaptation for all local actors the cases reveal the importance of local knowledge, innovations in institutions, external facilitation, and incentives provided by disadvantaged groups who contribute towards costs in return for a share in decision making power and better adapted water management. The cases show how community organisations diversified their responsibilities and took up the challenge of water management to address local priorities and overcome conflicts. Without a more flexible and enabling approach, public investments in adaptation are likely to focus on strengthening existing water management infrastructure without understanding local social interactions and complexity. This may strengthen elite dominance and local conflicts if there is no comparable investment in developing robust and fair local institutions.

1. Introduction

1.1. Cooperation, conflict and climate change

It has been argued that whether or not climate change contributes to conflict in a given society will, to a large extent, depend on its resilience and character; for example the magnitude of shock that a society can absorb, the nature and capacity of social organisations, and the ability to adapt (Adger and Tompkins, 2004; Bob, 2010). Much of the literature on community based management and commons has highlighted how natural resource challenges can lead to collaboration and rules to minimise conflict – local conflict resolution mechanisms are a necessary part of effective community institutions (Ostrom, 1990). However, conflicts can also create opportunities to participate in resource management (Yasmi et al., 2009). Traditional institutions may have a long evolution, but current environmental changes and stresses are more rapid or outside the range of variation anticipated by existing local institutions.

There has been increasing media, policy and academic interest in the risk of violent and large scale conflict that may be associated with climate change, although this is still contested (Barnett and Adger

2007; Scheffran et al., 2012). The fifth assessment report of the Intergovernmental Panel on Climate Change argued that “Climate change can indirectly increase risks of violent conflicts in the form of civil war and inter-group violence by amplifying well-documented drivers of these conflicts such as poverty and economic shocks.” However, there is a lack of evidence on how climatic factors and associated environmental changes may strengthen or undermine local collective action, and on how resulting local conflicts can be transformed. Adger et al. (2014) highlighted the need for theories and data that explain how formal and informal institutions help avoid violent outcomes of climate change.

This paper addresses this gap by providing case study based evidence. The main question we attempt to address in this paper is: How can local adaptation be achieved through cooperation, rather than competition and conflict? It focuses on institutional arrangements and factors that enable community based adaptation. It documents participatory processes leading to local change, which attempt to redress criticisms that participation fails to understand local power relations or lead to empowerment (Cooke and Kothari, 2002). This may inform climate adaptation and water policies and their application on the ground.

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Action research sought to understand in detail local water management conflicts and facilitate local change to restore cooperation. The two contrasting case studies documented here represent issues and common findings from two water insecure parts of the country, although one is an entirely community led system and the other involves community operation of public infrastructure.

1.2. Water management in Bangladesh

Bangladesh is widely recognised to be on the front line of climate change having a large population densely packed into a delta vulnerable to changes in sea level, floods and cyclones. Major public investments since the 1960s have built water management infrastructure (particularly embankments) in much of the country to protect land and people from floods, tides and storms. There is also a history of informal local collective action in water management (Duyne, 1998), and water security for agriculture in many areas depends on private small scale irrigation using ground water. While salinity intrusion and storm surges affect coastal areas, increasing unpredictability of rainfall and dry season water shortages are perceived by local people in the case studies.

Since the early 1990s Bangladesh has adopted participatory approaches to surface water management. The 1999 National Water Policy called for inclusive water management, to achieve the national goal of poverty alleviation. Subsequently good practice from both concerned agencies – Bangladesh Water Development Board (BWDB) and Local Government Engineering Department (LGED) – was brought together and formalised in a participation guideline for all public funded water resource projects (Ministry of Water Resources, 2001). Management of smaller water control projects (up to 1000 ha) has been devolved to community organisations, formalised as cooperatives, that become owners of infrastructure constructed by LGED. In larger projects BWDB adopts a multi-tier model of collaborative management where local water management groups are federated into associations, for example its Blue Gold Project in 2016 worked in 14 coastal polders with 339 water management groups organised into 31 associations. These multi-tier co-management systems often do not yet work as intended. For example, Bernier et al. (2016) found that water timing and release often depend on local elites (and may require payments), diverting water for their interests can reduce local water availability in the dry season at the cost of crops or fisheries in other parts of the system.

This paper focuses on two contrasting water environments.

In southwest Bangladesh the landscape comprises of large floodplains that have been modified by embankments and sluices over past decades, with responsibilities for operation partly devolved to community based organisations (CBOs). Coordination between CBOs is a challenge when the wider landscape is subject to changes such as more irregular rains outside the monsoon, increasing intrusion of saline surface water in the dry season, and conversion of lands to aquaculture (more profitable than crops) which disrupts water flows (Sultana, 2012).

In northeast Bangladesh there is the paradox of abundant monsoon water which quickly floods extensive basins known as *haors* with several metres of water for about half of the year, making agriculture only possible in the dry season. But water is needed to irrigate that single rice crop, resulting in competition for declining dry season surface water flows.

So both areas, and our cases within them, represent typical aspects of climatic insecurity facing farmers in South Asia and elsewhere – excess or untimely water can damage or destroy crops, and lack of rain or water can severely reduce yields. In addition, Bangladesh floodplains are not just important for crops, they form extensive monsoon season common pool resources, supplying wild fish, aquatic plants (used as fodder, human food and for construction), and snails that can be sold as duck or fish feed (Shankar et al., 2004; Sultana and Thompson, 2008).

2. Method

The case studies are the outcome of participatory action research where the research is embedded in a process expected to empower the disadvantaged and to facilitate change (Chevalier and Buckles, 2013). The approach adopted merges elements from adaptive management, social learning, and action research. CBOs were facilitated in an annual adaptive management cycle of review, revision and learning (Fabricius and Cundill, 2014). From social learning we facilitated iterative critical reflection and multiple-loop learning (Armitage et al., 2008) including the triple-loop where communities changed governance arrangements if this could overcome conflict. It involved networks of stakeholders (effectively communities of practice) meeting to address the challenges (conflicts) they identified. The basis was a cooperative inquiry approach to participatory action research (Reason and Bradbury, 2008) where actors can negotiate and learn their way through cycles of action and reflection in an open ended process.

In both case studies the action research processes took three years from 2014 to 2016. The research team and existing CBOs were already familiar with one another and mutual trust had been established through past involvement in development projects. In case one while 43 CBO members were closely involved in the process, about 500 households interacted in the process; in case two about 70 CBO members were closely involved but over a thousand people were engaged or were represented in different meetings. In each case several initial visits were made by research assistants to introduce the approach to the CBO, develop profiles of the local social-ecological system and how it has changed, understand the role (if any) of climate factors and policies, and document any past and current cooperation and conflicts. Problems or conflicts related to natural resources (distinguishing local conflicts and problems was a challenge best not addressed in understanding issues with the communities) were identified and prioritised along with potential actions through a participatory action plan development process (Sultana and Abeyasekera, 2008). The conflicting actors met separately in small groups, followed by joint meetings to share their concerns and views. Thereafter stakeholder groups and CBOs had multiple meetings with their constituents, while the research team helped facilitate meetings between conflicting actors and with government where appropriate. Stakeholder proposals were discussed with the CBO members in detail, leading to negotiations, innovations and actions by the CBOs. The number of local meetings over three years was determined by community dialogues, but the CBOs observed an annual planning cycle. The process was also informed by the CBO leaders attending six-monthly workshops of an adaptive learning network where they shared their experiences and received feedback from peers for further adaptation and innovation (Sultana and Thompson, 2012).

Campbell (2002) argued that limitations are rarely considered regarding participatory methods, and that the research process should be documented, which we attempt here. An obvious limitation is that action research progresses on a path unique to each case. The facilitator role is clearly important to the process. Although it is difficult for researchers to gauge their own transparency, we attempted to ensure a neutral perspective, and to be open to review and questioning from the CBO members and in the learning network of CBOs. Also findings and issues were discussed with local government officials, non-government organisation representatives and the CBO leaders in informal regional learning forums. However, the limited scope of disadvantaged people to approach locally powerful stakeholders meant that the researchers helped to voice the views and interests of the disadvantaged.

The time required to build trust with communities is a challenge (Pratt, 2007), but as the team had already undertaken research in these communities and facilitated networking between CBOs there was already a basis for trust. Time is also required for communities to take up adaptive actions. Moving beyond local physical actions to transformative institutional change, the limitations increase along with the governance hierarchy, and local government agencies became receptive

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