

Chapter 24

“Climate Proofing” Water Resources Development Policy: The Evidence from Bangladesh

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Abstract The water sector of Bangladesh is instrumental in supporting the livelihoods of millions of people. Over the last few decades, water resources in Bangladesh have come under the severe threat of climate change impacts and the first effects of climate change are already being felt. The Intergovernmental Panel on Climate Change (IPCC) univocally confirms the future water sector vulnerabilities for Bangladesh in its Fourth Assessment Report. However, the water resource development policies of Bangladesh have insufficiently acknowledged the issue of climate change impacts on its economy and livelihood. The paper aims to examine the level of climate policy integration in newly developed water-related policies, i.e. National Water Policy (NWP), National Water Management Plan (NWMP), Poverty Reduction Strategy Paper (PRSP). The approach is conceptualized as “climate proofing” policy (integration of climate change as a cross-cutting issue). A descriptive analysis of “climate proofing” policy is presented based on a literature review. The paper finds that Bangladesh still cannot make its water policies “climate-proof” considering the high level of climate vulnerabilities. Furthermore, the lack of a wider contextual understanding of the issue has appeared as one of the major impediments. Subsequently, the paper outlines strategies for developing pro-adaptive, responsive and “climate-proof” water policies in order to sustain this valuable resource from climate change impacts. Improved coordination among the stakeholders and convergence of key policy documents has been deemed instrumental to make the policies “climate-proof” and sustainable. In addition, potential bottlenecks of developing such climate-responsive water policies occupy significant discussion in the paper.

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Introduction

Climate change is one of the most formidable long-term challenges faced by the global community. The word “crisis” is sometimes overused in the social dimension of development. But when it comes to water, there is a growing recognition that the world faces a crisis that, left unchecked, will derail progress towards the Millennium Development Goals (UN-DESA 2008) and hold back human development. Throughout history, human progress has depended on access to clean water and on the ability of societies to harness the potential of water as a productive resource. Water for life in the household and water for livelihoods through production are two of the foundations for human development (UNDP 2006). Water is probably the world’s most intensely contested natural resource. Water is not only a necessity for life but also a critical input in nearly every type of economic activity, from farming to energy production (CCCD 2009). United Nations Human Development Report 2006 states that by 2025 up to 3 billion people will be living in a water-stress situation (UNDP 2006). Climate change, the gravest threat for sustainable development, often exacerbates the water problems with possible multiplier negative impacts on lives and livelihoods. Climate change is arguably the most severe long-term threat to development facing this and future generations. By altering the hydrological cycle, climate change will exacerbate the water management problems that countries already face (Bates et al. 2008). The paper argues that a “climate proofing” water policy is an urgent call for managing sustainably the scarce water resources under the threat of climate change. The issue of mainstreaming or adaptations of climate change policies are becoming more and more crucial for all development stakeholders for “climate-proof” development. That underpins the shift of assessment paradigm to “environmental sustainability” to “climate integration”.

The paper is an assessment of the major policy documents of Bangladesh related to water management and development to examine the level of “climate proofing”. Bangladesh is one the most vulnerable countries to climate change impacts and its water resource sector is considered one of the most affected sectors, which triggers other vulnerabilities. The paper uses three major policy documents for the assessment, i.e. National Water Policy (NWP), National Water Management Plan (NWMP) and Poverty Reduction Strategy Paper (PRSP), to examine the level of “climate proofing”.

The aspiration of the paper is interdisciplinary and multidimensional, as both water-related vulnerabilities and policy documents are intertwined with an innumerable number of issues. On the one hand, climate change-related water vulnerabilities are considered to be the gravest threat not only to humankind but

also to the existence of a living planet and, on the other hand, the documents are the guiding principles for nations on the road to sustainable development. As the apex guiding documents, those documents must have guiding indications as to how the water-related climate vulnerabilities can be tackled sustainably. Therefore, the paper promises to seek a level of interaction between PRSP and adaptation to climate change.

Climate Change Impacts on Water Resources and Impacts on Development in Bangladesh

As stated earlier, the water sector is one of the most vulnerable sectors to the impacts of climate change. An enormous number of assessments, reports, findings and scientific findings endorse the statement with a very high level of confidence. It is estimated that by 2050, if present trends continue, Bangladesh’s annual incremental food production would be decrease significantly, in monetary terms the equivalent of 1% of total national GDP (MoEF 2008).

The IPCC forecasts that global warming will result in sea level rises of between 0.18 and 0.79 m, which could increase coastal flooding and saline intrusion into aquifers and rivers across a wide belt in the south of the country, although most of the area is protected by polders. Rainfall is predicted to become both higher and more erratic, and the frequency and intensity of droughts are likely to increase, especially in the drier northern and western parts of the country (Pender 2008; IPCC 2007b).

Considered one of the most vulnerable countries to climate change impacts, Bangladesh is facing tremendous negative impacts on its development aspirations. Floods, tropical cyclones, storm surges and droughts are likely to become more frequent and severe in the coming years. The water sector is projected as one of the vulnerable sectors, putting poor people’s livelihoods at stake through the various erratic patterns of behaviour, described below:

- Increased temperatures in the water bodies of Bangladesh may also impact on fisheries.
- In terms of impact on livelihoods and the economy, the most affected by a rise in surface water temperatures would be Bangladesh’s coastal shrimp-farming industry, for if the temperature goes above 32°C, the small shrimp fries would have high death rates (Pender 2008).
- Higher rainfall in the Ganges basin is projected (Stern 2006) in the monsoon period, which is likely to lead to more frequent and severe floods from swollen rivers, while less rain in the winter will mean less water in rivers in the dry season affecting river-fed irrigation, industry, fisheries, travel by launch/ferries and increasing salinity around the coast (Tanner et al. 2007).
- Agricultural production decrease significantly due to saline water, abrupt rainfall and unusual flooding and by 2050, food security will be a serious concern for the marginalized people (Ahmed 2006).

- Water sector impacts on livelihood become a challenge of development under the most adversarial changes in the dynamics of nature. Water-related impacts will threaten the significant achievements Bangladesh has made over the last 20 years in increasing incomes and reducing poverty, and will make it more difficult to achieve the MDGs (DoE 2007; MoEF 2008; GED 2008).
- Serious and recurring floods have taken place in 2002, 2003 and 2004. Cyclones originating in the Bay of Bengal have been noted to have decreased since 1970 but the intensity has increased (Mirza 2002).
- The frequency of monsoon depressions and cyclones formation in Bay of Bengal has increased (Pender 2008).
- Water shortages have been attributed to rapid urbanization and industrialization, population growth and inefficient water-use, which are aggravated by changing climate and its adverse impacts on demand, supply and water quality (Bates et al. 2008).
- Saltwater from the Bay of Bengal is reported to have penetrated 100 km or more inland along tributary channels during the dry season (Ahmed 2006).
- The precipitation decline and droughts have resulted in the drying up of wetlands and severe degradation of ecosystems (Pender 2008).
- The food security of the whole country would be severely at risk due to shortage of available water for irrigation, resulting in a decline in agricultural production (MoEF 2005).
- The very high of likelihood of spreading waterborne diseases that will increase the death toll if left unchecked (GED 2008).

“Climate Proofing” Policies

The term “climate proofing” is somewhat synonymous with the term “mainstreaming” of climate policies into development policies and action. Mainstreaming of climate policies into sectoral development plans helps to develop “climate proofing” policies and actions. Klein et al. (2007) state that “climate proofing” is the integration of policies and measures that address climate change into development planning and ongoing sectoral decision-making so as to ensure the long-term sustainability of investments as well as to reduce the sensitivity of development activities to both today’s and tomorrow’s climate. The term “climate proofing” also indicates that climate policies are integrated in the policy documents (Sperling 2003). As part of the whole development discourse, sometimes “climate proofing” development refers to “adaptation-friendly” development, especially for the countries which are suffering from adaptation deficit.

Climate change is real and its adverse impacts are already being felt. At the same time, the increasing impetuses on sustainable development push for making the policies and actions climate-proof so that they can reduce the vulnerabilities of climate change in different sectors and work towards the overall goal of sustainable development.

National Policies and Responses to Climate Change

Water is central to the way of life in Bangladesh and the single most important resource for the well-being of its people. It sustains an extremely fragile natural environment and provides a livelihood for millions of people (MoWR 1999). This vital resource sector has experienced poor management in the past and Bangladesh is experiencing the result of bad management in different forms including sedimentation, waterlogging, regular flooding, groundwater lowering and disruption of production, among others. The climate change phenomenon, especially seen in the rapid melting of the Himalayan glaciers (IPCC 2007a), puts additional severe negative impacts on the whole development aspirations of the country. Recently, the government of Bangladesh prepared a sector-based development approach. Among them, the NWP, 1999 and NWMP, 2001 were developed to regulate and manage the water resources efficiently and the 2nd PRSP, 2008 was the apex guideline for implementing the development policies over the next few years (2008–2011). This paper will carry out a thorough assessment of those documents from a “climate lens”. It will address to what extent these documents are “climate proofing” and responsive to the climate change reality. In the age of rapid climate change and as a most vulnerable country, it might be expected that the climate change issue will be necessarily reflected by those documents for “climate proofing” development.

Methods

The assessment provides an overview of the integration of adaptation to climate change and climate risks management within a subjective qualitative framework. One of the limitations that the study finds is an inadequate amount of literature on Climate Policy Integration (CPI) (Ahmad 2009) and proxy indicators were used to evaluate the “climate proofing” performances of the three selected documents. In addition, through review of some pertinent studies done by Bojö et al. (2004); Huge and Hens (2009); Kramer (2007); Prowse et al. (2009); and Klein et al. (2007) suggested a subjective qualitative framework of analysis.

Coinciding in a subjective approach of assessment, this research has used eight indicators to examine the “climate-proof” approach of the documents. Those indicators are adapted from the researches mentioned above. The indicators are as follows (Table 1):

Identification of water-related challenges due to climate change. How the documents identify the upcoming water sector-related challenges posed by climate change.

Identification of water-related vulnerable sectors and communities and solutions. Issues related to a clear identification of sectors and communities due to climate change impacts. The vulnerabilities of the water sector and water sector-dependent communities are given preference.

Table 1 The performance of NWP in regard to the indicators set for justifying a “climate proofing” document

Name of the document	Indicators						Total
	Identification of water challenges due to climate change	Identification of sectors and vulnerable communities	Identification of solutions for water related vulnerable sectors and communities	Range of adaptation options considered	Enabling proactive strategies	Attention to process of mainstreaming adaptation	
NWP	0	1	1	1	0	0	3

Range of adaptation options considered. Identification of a set of adaptation projects, priorities and a coherent institutional capacity for the implementation phase.

Enabling proactive strategies. To what degree the documents are responsive to enable making proactive strategies and decisions as far as water sector vulnerabilities are concerned.

Attention to process of mainstreaming adaptation. This is a very important issue to consider when examining a “climate proofing” document. How much attention is paid to mainstreaming the adaptation process into development activities needs to be considered.

The analysis method is a combination of the works conducted by Bojö et al. (2004) and Kramer (2007). The assessment works are very much qualitative in nature and where those two are combative, they provide a basis of comparison among the case studies. The assessment of the documents across the selected indicators is based on a qualitative judgement. All variables received a score with respect to each document’s merit, comprehensiveness, sensitivity to water sector vulnerabilities to climate change, time of preparation and necessity of inclusion:

0 = Not mentioned

1 = Identified but not elaborated

2 = Identification or elaboration of the concept

Though the assessment does not intend to be scientifically precise, it is a good indication of the level of developing “climate proofing” policies and actions. The interpretation of the scores is as follows:

0–4 = Little or no progress in the integration of developing “climate proofing” water policies for climate change and climate risk management

5–8 = The document has a growing level of awareness and understanding of the value and requirements of “climate proofing” water policies, mainstreaming, and recognizes the need for action. It may also have decided to take action

8–12 = It refers to an intermediate stage, where the document is developing plans and tools to address the requirements of “climate proofing” water action to climate change.

Results and Discussion

National Water Policy

NWP of Bangladesh was prepared in 1999 with the aim address the objectives of improved water resources management and protection of the environment. The policy envisaged that it would help to guide both public and private actions in the future to ensure optimal development and management of water, which benefits both individuals and the society at large (MoWR 1999). In its declaration, it remarked that the policies were designed to ensure continued progress towards fulfilling the national goals of economic development, poverty alleviation, food security, public health and safety, decent standard of living for the people and protection of the natural environment (ibid.).

To examine the document from a “climate proofing” perspective, it has undergone the indicators described in the methodology section. It is very surprising that the whole NWP does not even mention the term “climate change”. The document identified six objectives for better water resources development and management and also acknowledges that the water resources of Bangladesh are facing severe environmental stress but climate change is not regarded as the threat to the water sector. The document also allocated a full section, namely “Water for the environment” and at the beginning of the report there is another section, “River basin management”. It might be expected that the issue of climate change would attract considerable attention at least in those two special sections. Unfortunately neither of the sections has any clue of climate change vulnerabilities to the water sector.

As a result, the document does not meet any of the objectives by which this research paper identifies whether a document is “climate proofing”. However, this document identifies some of the vulnerable communities and sectors which may suffer from water-related problems. As stated in objective two, “to ensure the availability of water to all elements of the society including the poor and the underprivileged and to take into account the particular needs of women and children” this document points out the poor, underprivileged, women and children as vulnerable groups and communities. Besides, in the sections “River basin management”, “Water for agriculture” and “Water for the environment”, it reports some potential natural vulnerabilities and disasters such as floods, lowering groundwater table, biodiversity loss, wetland destruction, shortage of irrigation water but the linkage of climate change with those identified disasters is not at all apparent. As potential remedial action, this document proposes some policies, but again the threat of climate change was not taken into consideration. It proposes to develop a NWMP for preparing detailed action against those vulnerabilities Table 1.

The score of the assessment is 3, which indicates that in terms of climate policy integration, this document is really very poor and cannot guide the water resource sector under a changing climate.

National Water Management Plan

Parallel to the NWP, Bangladesh embarked upon the preparation of the NWMP (2005). In the course of this, a development strategy for NWMP was adopted by Bangladesh in 2001. NWMP was prepared to provide guidelines for implementing water sectoral projects and actions at national and regional level in accordance with the changing global and national demands. This plan is divided into three phases; short phase (2001–2005), medium phase (2006–2011) and long phase (2011–2025) and will be revised after each five years (MoWR 2001).

The NWMP stands on eight building blocks for rational, optimal and sustainable use and development of water resources of Bangladesh. It is a comprehensive action plan consisting of detailed hydrological zone action plans, project portfolios, budget and future guidelines. The major building blocks for developing responsive efficient water management identified by NWMP are (MoWR 2001):

- Institutional development
- Enabling environment
- Main rivers
- Towns and rural areas
- Major cities
- Disaster management
- Agriculture and water management
- Environment and aquatic management

As mentioned earlier, this is a much more comprehensive action plan, which tries to give the necessary attention according to the geophysical and institutional needs of each individual hydrological zone. For the first time, this plan mentions the threat of climate change for water sector development. Ironically, this is the only additional development that this plan has made compared to the NWP, with regard to the climate change issue. Like the NWP, there is no extended discussion on climate change, its impacts on the water sector of Bangladesh and how it can be adapted to. The document provides sufficient directions for developing water resources through institutional developments, enabling environment, disaster management, agricultural management and environment management.

However, the necessary components that can make a “climate proofing” action plan are significantly missing. By analysing the investment portfolios, programme implementation phase and budgeting, it has been found that only under the block “disaster management” are there some projects which can meet the indicators of a “climate proofing” plan. But the total budget allocation for implementing the disaster-related water management projects is only 5% of the total investment cost.

Among other things, the NWMP puts special emphasis on institutional development and water sector development in urban and rural areas. Though there is no straight connection with the climate change reality, the last three building blocks make significant strides toward adapting too the changing environmental realm. That characteristic makes this plan somewhat “climate proofing”, as some adaptation

Table 2 The performance of NWMP in regard to the indicators set for justifying a “climate proofing” document

Name of the document	Indicators						
	Identification of water challenges due to climate change	Identification of sectors and vulnerable communities	Identification of solutions for water related vulnerable sectors and communities	Range of adaptation options considered	Enabling proactive strategies	Attention to process of mainstreaming adaptation	Total
NWMP	1	1	1	1	1	1	6

measures are being considered for natural disasters, institutional strengthening and mainstreaming the water-sectoral problems as national development issues. But this can be considered a very minor level of mainstreaming considering the geo-spatial and economic vulnerabilities of climate change to Bangladesh Table 2.

The overall score 6 indicates that the document is considering that climate change can be a potential threat for development aspirations that this action plan wishes to implement. For this document, it is somewhat difficult to draw a straight-line conclusion as despite the lack of a direct link with climate change impacts, there are some projects, actions and plans which may be effective in the fight against climate change and help to adapt the water sector from further vulnerabilities.

Poverty Reduction Strategy Paper

Bangladesh is implementing its third PRSP, lasting 2008–2011, after finishing the first PRSP during the 2005–2008 period. Since 2003, Bangladesh has followed the PRSP approach of development replacing the previous national five-year development plan. The present PRSP provides a comprehensive overview and guidance for economic growth and development. In essence, PRSP (2008–2011) is the localized context of the MDGs; however, environmental concerns are heavily dominant throughout the document.

The document attaches special care to the water resources of Bangladesh. It dedicates a separate chapter to water resources management, considering water as the single most vital resource for Bangladesh. Moreover, water resources management comes across the five strategic blocks and five supporting blocks as a cross-cutting issue. The chapter related to water resources management can be summarized as follows:

The vision for the water resources sector is acquisition of water resources, optimizing various uses, and managing water resources for poverty reduction and sustainable development for securing the lives and properties of the people, especially the poor from water-related disasters. Participatory planning and implementation of water sector programmes/projects will be a continuing process.

Table 3 The performance of PRSP in terms of its “climate proofing” commitment

Name of the document	Indicators	Identification of water challenges due to climate change	Identification of sectors and vulnerable communities	Identification of solutions for water related vulnerable sectors and communities	Range of adaptation options considered	Enabling proactive strategies	Attention to process of mainstreaming adaptation	Total
PRSP	2	2	1	2	1	2	10	

The strategies of water resources development and management will be grouped under six major heads: (i) the main rivers of Bangladesh will be developed for the expansion of the multipurpose use of water resources, management for navigation, erosion control, and development of hydropower; (ii) flood protection and storm-water drainage measures will be undertaken with the rehabilitation and maintenance of existing FCD and FCD/I systems in a participatory manner and protection of rural and urban areas from floods; (iii) disaster management programmes will include provisions of cyclone protection, early warning and forecasting systems with adequate lead time, flood proofing shelters, control of riverbank erosion, drought management and rationalization of groundwater resources and climate change adaptation; (iv) adequate provisions will be made for water management for agriculture through public sector irrigation development and flood management and drainage; (v) protection of the natural environment and aquatic resources will be ensured with water pollution monitoring and control, water management for fisheries and ecologically sensitive areas and raising awareness of all stakeholders to support environmental measures; and (vi) development of institutions in the water sector will be ensured. (GED 2008).

The brief summary above gives a positive impression about the climate sensitivity of the PRSP document in regard to water resources management. The document provides a correlation between water resources and climate change. It shows how poverty can be more vulnerable due to mismanagement of valuable water resources. It also exhibits how impacts of climate change can worsen the prevailing vulnerabilities of climate change and lead livelihoods to an endangered condition. In its environmental section, a range of adaptation options are considered for climate change and adapting water resources to changing climate is one of the pioneering adaptation sectors.

At the same time, the PRSP calls for the immediate implementation of the projects identified by NWMP. The policy matrix of the PRSP clearly defines the task of different authorities related to water resources management and climate change in a coordinated manner. It is important to note that both structural and non-structural policies for water sector management from the impacts of climate change are included.

The overall score that PRSP evaluation matrix achieves is 10 which means the PRSP documents can be regarded as a “climate proofing” document (Table 3). Still some lacking appears in terms of solution identification of vulnerabilities and

enabling proactive adaptation strategies but as an apex guiding document for moving forward this is indeed a satisfactory performance.

Conclusion

The general essence that the above three documents reveal is not quite satisfactory. Bangladesh is a country which is considered one of the most vulnerable countries of the world to climate change impacts (Huq and Ayers 2007). The water sector of Bangladesh also holds huge potentiality to fight against climate change impacts. It can be a tool for community coping mechanisms which can further amplify the community-based adaptation system. From this aspiration, it is now the time—albeit late—to start action for making the development and management of the water sector “climate-proof”. Considering the nature of the impacts of climate change on the water sector, developing a climate-sensitive development plan is now imperative. Without mainstreaming climate change into water development policy and planning, Bangladesh cannot achieve sustainable development. As the key referral strategies of national development as well as water development, PRSP, NWP, NWMP should be “green” in both planning and action. A mainstreamed climate change strategy should include measures that address the underlying factors of vulnerability to climate change, particularly greater understanding of the relationship between climate change and poverty. There are several entry points for the mainstreaming of climate change into the processes, e.g. higher level of coordination among the stakeholders, convergence and cohesion of development policies. A high degree of awareness on mainstreaming climate change can be a major starting point for integration of climate change policies into the policy guidance.

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