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Keywords : *disaster risk reduction, climate change, disaster management, adaptation, sustainable develop-ment, Bangladesh.*

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Challenges of Integrating Disaster Risk Management and Climate Change Adaptation Policies at the National Level: Bangladesh as a Case

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Abstract - Disaster management and climate change adaptation emerges as the greatest long term threats that are challenging overall development efforts of Bangladesh. Government of Bangladesh is playing a central role for disaster management and climate change adaptation. The Ministry of Food and Disaster Management (Mo FDM) and the Ministry of Environment and Forestry (Mo EF) are the two key ministries responsible for developing and implementing various programs and policies for disaster management and climate change adaptation respectively. This paper discusses the challenges for linking disaster management and climate change adaptation in Bangladesh. Structural arrangements, policy development process, funding arrangement of the Mo FDM and Mo EF have analysed to understand the challenges for integration. We find that to some extent Mo FDM and Mo EF are institutionally linked for policy development. However, there are scopes for further integration between the two ministries especially in the areas of inter-ministerial communication and collaboration. A new approach for institutional arrangement is needed which is flexible enough to support continual collaboration of the two ministries.

Keywords : disaster risk reduction, climate change, disaster management, adaptation, sustainable development, Bangladesh.

I. Introduction

Due to geographic location, high population density, wide spread poverty and poor infrastructure, Bangladesh is historically vulnerable to natural and manmade disasters. Recently, climate change has added new dimensions to the country's already existing socio economic and environmental vulnerability. Various scientific research indicate that Bangladesh is highly likely to be one of the worst victims of climate change (GOB, 2009). Climate change is posing serious threats to country's overall programs and policies for development (GOB, 2009, GOB, 2011). Considering the disasters and anticipated impacts of climate change, the government of Bangladesh has prioritized and strengthened the areas of policy development both for the disaster management and the climate change adaptation. Two separate ministries, namely the Ministry of Food and Disaster Management (MoFDM) and the Ministry of Environment and Forestry (MoEF) are primarily responsible for disaster risk management and climate change adaptation respectively. The programs and policies of the two ministries focus on to reduce vulnerabilities to achieve development goals of the country. Given the strong similarities in the nature of work of the two ministries, we argue that there is a need for further integration. We seek to explore the relation-ships between the two ministries and find out the scope for and challenges to integration. First we compare the theoretical concepts of DRR and CCA to understand the nature and scope of work. Secondly, we analyze the institutional framework and policy development, funding process for the ministries responsible for the DRR and the CCA in Bangladesh. We argue that there are scope and immediate need for further integration between the MoFDM and the MoEF, especially in the areas of knowledge sharing and policy development. However, considerable conceptual and structural challenges are evident for integration of the two ministries.

II. Exploring the Concepts

a) Disaster Risk Reduction (DRR)

Before the 1970s, disasters were viewed as natural events which were unavoidable and needed to be managed. Consequently there was no concept of prior management of risk reduction (White, 1945, Bankoff, 2001). Since 1980s views on disaster management has shifted sharply. According to the view ecological and socio-economic vulnerability of the disasters can be reduced through proper disaster management and planning (Torry, 1978, Hewitt, 1983, Gaillard, 2007, Weichselgartner and Obersteiner, 2002).

United Nations International Strategy for Disaster Risk Reduction (UNISDR) defines DRR is "a concept and practice of reducing disaster risks through systematic efforts to analyze and reduce the causal factors of disasters. Reducing exposure to hazards, lessening vulnerability of people and property, wise management of land and the environment and improving preparedness for adverse events are all examples of disaster risk reduction" (UNISDR, 2009

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Page 10). DRR is multi-disciplinary in nature that includes disciplines like disaster management and mitigation (Pearce, 2003). DRR recognizes the importance of links between hazards, socio economic and natural environment (Lewis, 1999; Tran and Shaw, 2007). DRR strategies include hazards, vulnerability and capacity assessment. Goals of disaster risk reduction strategies are to identify solutions for disaster risk and to improve community's ability to protect itself against disaster vulnerabilities (Wisner, 2004). However, to achieve the disaster management goals, it is important that the government and the development partner's disaster management strategies have to be properly linked with grassroots strategies. Local government role is crucial for effective implementation of DRR strategies (Anderson and Woodrow, 1989; O'Brien et al., 2006).

Unsound disaster management policy and practices might increase disaster risk and disaster losses. Therefore, to reduce the vulnerability and to ensure sustainable development it is important to have a proper disaster management policy. For the development and implementation of an acceptable DRR it is important to involve the effected community, government sector, professional and private sectors and development partners (UNISDR, 2009). The objective of DRR is to create resilient community by reducing natural and manmade hazards vulnerability through proper development policies and efforts (Smith and Petley, 2009).

b) Climate Change Adaptation (CCA)

The IPCC defines "climate change adaptation is the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities" (IPCC, 2001). Adaptation includes deliberate or intent adjustments in a biological and social system due to changed environmental circumstances (Gallopin 2006; Nelson et al. 2007 cited by Adger et. al. 2009). Adaptation along with mitigation is an important policy response to protect the society and the ecosystem from the future threat of climate change.

III. Similarities and Difference- Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA)

A good number of researchers, practitioners and policy makers have recently focused on the similarities and difference between DDR and CCA (Schipper and Pelling, 2006, Birkman et al., 2009, O'Brien et al., 2006, Mercer, 2010, Schipper, 2009). These researchers have found that while there are some political and physical distinctions between the scopes of each field, there are key areas of similarities. For example both DRR and CCA focus on risk management and sustainable development. Researchers advocates the increased convergence, whilst recognizing the difference between DRR and CCA agendas (Djalante and Thomalla, 2009, Mitchell and van Aalst, 2008) and discussions have occurred across academics, governments, NGOs and development agencies on how to achieve sustainable integration (Mercer, 2010, Birkmann and von Teichman, 2010, Gero et al., 2011).

One conceptual distinction is that DRR addresses all types of hazards that include natural and manmade hazards while CCA mainly focuses on the dynamics of climate. Adaptation is viewed as a long term process for adjustments to both extreme events as well as incremental changes which are not necessarily always negative; whereas disaster is always negative (Schipper, 2009).

Some key terms are being used and understood differently by different communities in practice of DRR and CCA which could create some misunderstanding and confusions. For example, one of the well-recognized terms which have an entirely different meaning in CCA and DRR context is 'mitigation'. Under the CCA context, mitigation means "reduction of greenhouse gas emission", while in DRR "mitigation means the set of activities to reduce expected impacts of hazards" (Schipper, 2009).

Again the key actors of climate change adaptation and disaster management are different. Climate change research and programs are highly influenced by academics, scientists, donor agencies, and some specialized NGOs. Climate change adaptation policies in Bangladesh clearly influenced by top-down approach (Burton et al., 2002). On the other hand for the DRR it is the local level from where all the planning and programs starts. Due to difference in actors for the climate change adaptation and disaster risk reduction, there are differences in legislation and approaches.

Another distinction between CCA and DRR is that people can relate to disaster risk management as a tangible concept with which they have direct or indirect personal experiences. On the other hand, concept of climate change is difficult to understand. Climate change is a vague concept for many (Schipper, 2009). The similarities and differences of CCA and DRR are summarized in Table 1.

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Table 1 : Similarities and difference - DRR and CCA

Similarities	Differences
— Risk management — Focus on sustainable development — Does not apply "quick fix" approach — Protection of ecology and society are important challenges for both	— Different meaning for different terminology — Different actors responsible for policy formulation and implementation — CCA is more about responding to gradual and incremental changes. DRR is more about responding to emergencies — Generally communities have more understanding about DRR and less understanding about CCA — DRR use less technical language compare to CCA — Adaptation could be a response to positive and/or negative changes. Disaster is always viewed as negative — Sometime people perceive CCA as abstract and DRR as real

Source: (Thomalla et al., 2006, Schipper, 2009)

IV. Methodology

The objective of the study is to determine the scope and challenges of integrating the two government ministries responsible for developing and implementing disaster risk management and climate change adaptation programs and policies in Bangladesh. To address the objective, a number of data collection methods and techniques were applied. Secondary data were collected from various published documents of Bangladesh government and development partners. Ministry of Environment and Forest (MoEF), Ministry of Food and Disaster Management (MoFDM), Bangladesh climate change cell, various UN agencies, Inter governmental Panel of Climate Change (IPCC) and various scientific journals forms the secondary source of information for this research. Secondary information was collected focusing on the following topics

- Hazards in Bangladesh
- Institutional framework of the two ministries, MoEF and MoFDM
- Policy development process of the two ministries
- The various factors involved in policy development process for the DRR and CCA in Bangladesh
- The data collected for this research are mainly qualitative type. After conducting a literature survey and content analysis, the scope of and challenges to integration of DRR and CCA in Bangladesh were identified and explained.

V. Scope of Work for the Ministries Responsible for DRR and CCA in Bangladesh

Geographic location and river morphology contribute to recurring natural disasters in Bangladesh. Abnormal rainfall and earth quakes in the adjacent Himalayan range add to prevalence of disasters. According to the disaster management bureau, the major hazards in Bangladesh include floods, cyclones, riverbank erosion, storm surge, flash flood, drought, landslides, fire, and infrastructural collapse, ongoing and apprehended climate change effects are predicted to contribute to further disaster risks (GOB, 2011).

The effect of climate change have become more and more visible in last few decades in the forms of changing pattern of rainfall and temperature, prolonged drought, untimely flooding, and increased frequency and intensity of cyclones. Climate change in future will add some more disastrous events and increase intensity and frequency of current natural hazards which will have significant implications on physical, social and economic systems (GOB, 2009, GOB, 2005). Coastal resources upon which more people are dependent are likely to be severely affected due to climate variability and change. It is predicted that a 45 cm rise of sea level may inundate 10 -15% of the land by 2050 resulting in over 35 million climate refugees from the coastal districts. Increased adverse impacts would pose severe challenges to achieve the Millennium Development goals (MDGs) by 2015. The Organization for Economic Cooperation and Development (OECD) and World Bank (WB) estimated that 40% of the development assistance to Bangladesh is at risk due to various impacts of climate change (GOB, 2009).

Due to increasing frequency and intensity of disasters, disaster management and climate change adaptation are recognized crucial for development at the highest political level in the country as well as by the development partners. In the last few decades, the country along with the help of development partners has tried to shift its focus from reactive to pro-active disaster management (UNDP, 2010). In 2003, the Ministry of Food and Disaster Management (MoFDM) launched the Comprehensive Disaster Management Program (CDMP) in partnership with various international development partners like the Department for International Development (DFID), UK, United Nations Development

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Program (UNDP) and the European Commission (EC). In 2010, the government approved the National Plan for Disaster Management (NPDM), 2010-2015. The plan was developed in line with the Hyogo Framework of Action 2005-2015 and the South Asian Association of Regional Cooperation (SAARC) Framework on disaster management (GOB, 2010).

The concept of climate change adaptation is relatively new in Bangladesh. National Programmer of Action (NAPA) for Bangladesh was prepared by the Ministry of Environment and Forest (MoEF) in 2005. NAPA was prepared following the guidelines of the seventh session of the Conference of the Parties (COP7) of the United Nations Framework Conventions on Climate Change (UNFCCC). The NAPA was updated in 2009 and the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) were also developed by the government in the same year (GOB, 2005, GOB, 2009). Table 2 summarizes the key hazards in Bangladesh identified by the National Plan for Disaster Management 2010-2015 and the Bangladesh Climate Change Strategy and Action Plan 2009. It is important to note that all the national level disaster management and climate change adaptation strategies were focused on to reduce vulnerability and to ensure sustainable development of Bangladesh (GOB, 2005, GOB, 2009, GOB, 2010).

Table 2 : Hazards in Bangladesh

Key hazards identified by National Plan for Disaster Management (NPDM), 2010	Key hazards identified by Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009
Natural and manmade disasters	Natural disasters
Floods	Floods
Droughts	Droughts
Cyclones and storm surges	Cyclones and storm surges
River bank erosion	Change of river morphology
Salinity intrusion	Salinity intrusion
Earth quakes	Water pollution
Arsenic contamination	Erratic rain fall
Tsunami	Erratic tidal wave
Fire	Change in average temperature
Infrastructural collapse	Sea level rises
Landslide	Increase average temperature
	Salt water intrusion
	Land inundation
	Loss of bio-diversity

VI. Current Institutional Framework for the DRR and the CCA in Bangladesh

a) Institutional framework for DRR

Over time, Bangladesh has managed to develop somewhat efficient institutional mechanism, both at national and regional level, to response and recover effectively after extreme climatic events (Khan and Rahman, 2007). Following colossal floods in the 1980s, the government with support from the United Nations Development Program (UNDP) developed a flood action plan that initiated a proactive culture of disaster management. At that point the government introduced number of institutes for forecasting for example the Flood Forecasting& Warning Centers and initiates some pilot projects to reduce vulnerability and disasters risk. A catastrophic cyclone in the 1991 spurred additional actions. With help from the UNDP, the Government established the Disaster Management Bureau. The main objective of the bureau was reducing the human, economic and environmental costs of disasters and strengthening national capacities as well as cross-sect oral partnerships. The new bureau became the institutional foundation towards integrated approach to disaster management.Between1994 and 2002, the UNDP supported the development of policies that empower and ensure better coordination of government departments responsible for disaster management. In the early 2000s, the disaster management approach was further consolidated. The government established the National Disaster Management Council (NDMC) that embraced civil society organizations and local government authorities into disaster management. The UNDP supported this consolidation through the multi-donor Comprehensive Disaster Management Programmer (CDMP). This Programmer led to revised policies, strategies and mechanisms for disaster management in details. Bangladesh became a pioneer among the least developed countries in prioritizing disaster risk reduction in national fiscal planning (UNDP 2010).

In Bangladesh at national level, the Ministry of Food and Disaster Management (MoFDM) and the Disaster Management and Relief Division (DM&RD) coordinate overall disaster management efforts. The Earthquake Preparedness and Awareness Committee (EPAC), the Cyclone Preparedness Program Implementation Board (CPPIB), the Cyclone Preparedness

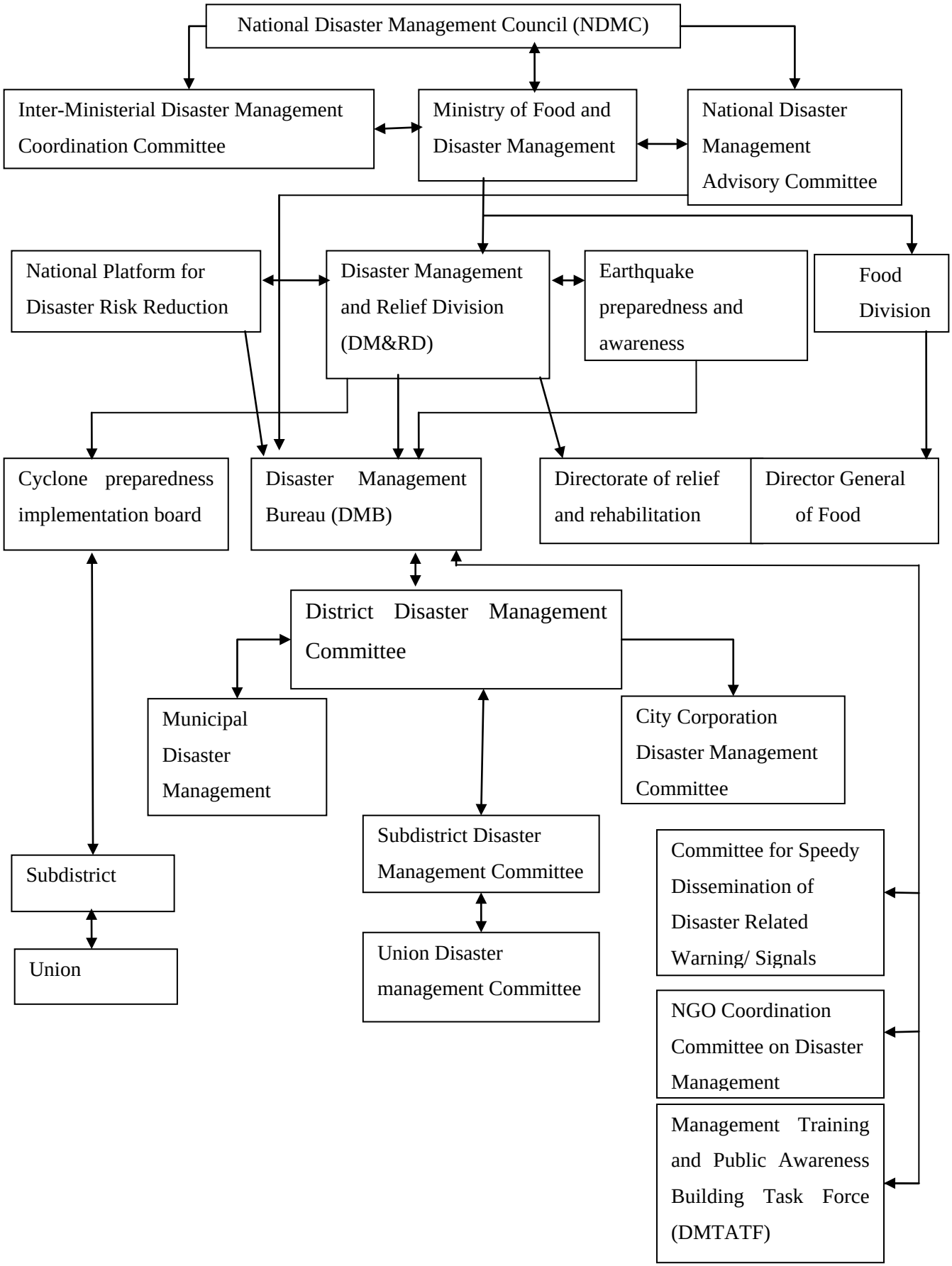
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entation Board (CPPIB), the Cyclone Preparedness Programmer Policy Committee (CPPPC) also coordinates with the Disaster Management Bureau (DMB) for implementations of their respective policies and programs. The NGO Coordination Committee on Disaster Management (NGOCC) reviews and coordinates the activities with the NGOs (as shown in figure 1).

At every district, sub-district and union level there are disaster management committees. The Disaster Management Bureau (DMB) provides all the support required by all the disaster management committee. In 1997, the ministry issued a Standing Orders on Disasters (SOD) which describes in detail the duties and responsibilities of all the concerned government agencies for disaster management. Institutional arrangements for disaster management at national, sub-national and regional level in Bangladesh are shown in figure 1.

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Figure 1 : Disaster Management institutes in Bangladesh (Source: GOB 2010 Page 43)



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b) Institutional framework for CCA

In Bangladesh, the Ministry of Environment and Forests (MoEF) is primarily responsible for development, planning and coordinating all the projects related to environment and climate change. All most all the key ministries work with MoEF for the development of pro climate change adaptation policies and projects. Many other public, private, civil society institutes, international agencies, directly and indirectly, work with the MoEF(GOB, 2009, GOB, 2005).At the regional and local level related government departments are responsible for implementing policies and programs related to environment and climate change(GOB, 2012, GOB, 2009).

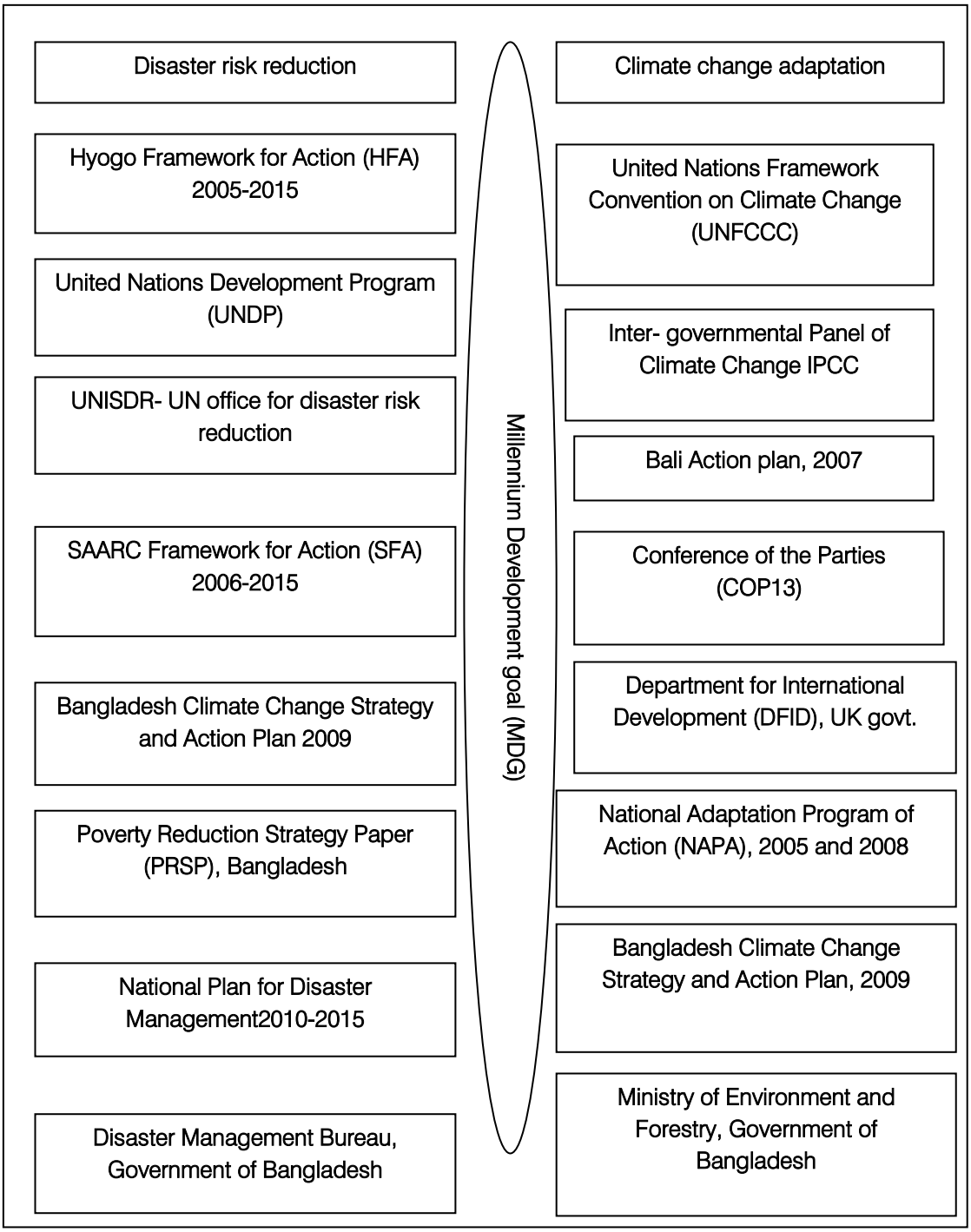
VII. Key Institutions for Policy Development for the DRR and the CCA

In Bangladesh, the major missions and visions of the government for the disaster management have been addressed in the National Plan for Disaster Management2010-2015 (NPDM 2010-2015). The NPDM was developed in coordination with various national and international institutes and agencies. Strategic goals for the comprehensive disaster management plan 2010-2015 are drawn from the South Asian Association for Regional Cooperation Disaster Management Framework 2006-2015 (SAARC-DMF 2006-2015). Other institutes and policies that have an impact on the NPDM are the Millennium Development Goals of Bangladesh, the Poverty Reduction Strategy Paper (PRSP), Bangladesh, and Hyogo Framework for Action (HFA) 2005-2015, the United Nations Framework Convention on Climate Change (UNFCCC), and the Bangladesh Climate Change Strategy and Action Plan 2009.

In 2005, the Bangladesh government has developed the National Adaptation Program of Action (NAPA), 2005 after consultation with communities across the country, professional groups, members of civil societies and following the guidelines of the United Nations Framework Convention on Climate Change (UNFCCC). After the climate change Conference of the Parties 13 (COP13) at Bali, Indonesia, in 2007, the Bangladesh government increasingly felt the need for a climate change strategy to coordinate the activities in support for the Bali action plan. The Bangladesh Climate Change Strategy and Action Plan (BCCSAP) have developed in line with the NAPA, Bangladesh. Table 3 shows the key drivers for the major policies and strategies for DRR and CCA.

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Table 3 : Global to national drivers for the DRR and the CCA policy framework



VIII. Funding for the DRR and the CCA in Bangladesh

Funding for the DRR and the CCA in Bangladesh are sourced from international donors, national budgets and private sector donors.

For the disaster management main funding sources are the government, the European Commission, the Department for International Development (DFID), UK and the United Nation Development Program (UNDP) (UNOPS, 2004). Bangladesh Climate Change Resilience Fund (BCCRF) is a multi-donor trust fund established by Sweden, The United Kingdom, Denmark, Switzerland and the European Union (EU) in 2010, together with the Government of Bangladesh and the World Bank (WB). The aim of the BCCRF is funding the projects which are recommended by the Bangladesh Climate Change Strategy and Action Plan. The fund is managed by the World Bank and the fund complements to the Bangladesh government's local fund for climate change adaptation (Sida, 2011). The World Bank (WB) does the

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review and revision of the projects recommended by the Bangladesh government. It has been argued that such role of the WB influences project design and approval (Md Shamsuddoha and Chowdhury, 2009).

IX. Scope for and Challenges of Integration

a) Scope of the work

There are similarities and differences in the nature and scope of the work of DRR and CCA in Bangladesh (see table 2). At national and regional level, CCA mainly focuses on the issues related to climatic events, where-as DRR focuses on any kind of manmade and natural disasters. Moreover, climate change information and projects have developed at a global scale, where-as the disaster management approach is mainly based on disasters which happen locally, regionally and nationally. One of the key differences is DRR focuses on emergency management and recovery along with long term sustainable development, whereas CCA mainly focuses on long term sustainability.

b) Administrative challenges

As Table 3 shows, in Bangladesh different administrative bodies with different values and principals are responsible for disaster risk management and climate change adaptation projects. Consequently, the management approach is different with different values and principles. At the same time, some area of the works for the DRR and CCA are complementary to each other, different administrative and management approaches might lead to contradicting strategies while implementing projects at the field level. For example, CCA goals mainly focus on long term adaptation whereas quick recovery from disaster is vital for DRR. It is beyond the scope of this paper to find out whether this kind of contradictions exists at the projects implementation stage. Further empirical research is recommended to find out the possible contradictions of DRR and CCA approach at project implementation stage.

c) Communication of risk and planning tools

Bangladesh has a long experience of disaster response and recovery. The country's institutional arrangements for disaster management are somewhat well organized. A good number of disaster management projects have been successfully developed and implemented at regional and community level with the support of the government, NGOs and donor agencies (ACI, 2010). On the contrary the concept and institutional arrangement for climate change adaptation in Bangladesh is relatively new. Yet interactions between the ministries responsible for climate change adaptation and disaster management in Bangladesh are limited. Lots of employees at the government level are confused about the concept of climate change (Khan and Rahman, 2007, Mirza, 2003).

d) Incoherent policy approach

An obstacle to integration of DRR and CCA can be seen in the fragmentation of development of policy from global to national level. The institutional frameworks and policy development for DRR and CCA are done mostly by different institutions with different values as illustrated in table 3. Consequently, integrating DRR and CCA become more difficult as the respective projects and policies have been developed often following the guidelines and the policies of the different institutions and legislative bodies (see table 3).

e) Different sources of funding

Different bodies are finance different projects related to DRR and CCA in Bangladesh. CCA adaptation projects are highly influenced by their donors. The World Bank (WB) plays a critical role in the disbursement and approval of the projects. On the other hand, DRR projects are mainly approved by the government at a national level and funded by the national government and international agencies (GOB, 2010). Again, at present, the funding agencies for DRR and CCA in Bangladesh are different with different norms and values. The best possible institutional arrangements for approving and funding for DRR and CCA projects is beyond the scope of this paper. However, we suggest that institutional arrangements at an international and national level for funding for both DRR and CCA projects need to be rearranged to achieve further coordination and integration.

f) Community involvement

Community participation in project development stages especially for the CCA is minimal. Greater integration of DRR and CCA can be achieved with community participation into the project planning, development and implementation stages. Communities generally do not differentiate the risks like DRR and CCA legislative bodies (Gero et al., 2010). Thus community involvement in policy development will result in robust, comprehensive and sustainable risk management. At the same time community involvement in policy development would create a link between DRR and CCA.

X. Concluding Remarks

Considering the scope of work and current institutional arrangement, it seems that the two ministries responsible for the DRR and the CCA in Bangladesh would/should remain separate for some time in future. However, there are immediate need and prospect for greater integration between the two ministries. More linkage between the ministries in terms of policy development and exchange of knowledge would reduce possibilities of duplication of efforts, increase efficiency and cost effectiveness. Evaluation of institutional arrangement is necessary to find out feasible ways for improved communication and coordination between the ministries.

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to reduce the vulnerability and to ensure sustainable development of the country.

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