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Forest-Based Adaptation to Climate Change: Moving Forward with Multiactor Governance and Legal Pluralism[1]

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Abstract *Forests for adaptation' requires judicious use of forest services and improved access for local communities. Forest ecosystems provide services that reduce the vulnerability of communities and broader society to climate change. According to a recent estimate, total forest land in Bangladesh is about 2.5 million hectares or 17% of the land surface of the country. The history of forestry in Bangladesh is one of continuous depletion of forest resources both in terms of area and quality. Since the early 1980s, forestry in Bangladesh has witnessed a rapid succession of social forestry programmes in an attempt to redress public alienation and to allow for wider participation of local people in forest use and management. Establishment of large scale plantation in the degraded forestland and in marginal land may be seen not only as rehabilitation programme for degraded forestland but also promotion of ecosystem based adaptation in the country. About 4.65 million hectares of such land has been identified for future rehabilitation and restoration purposes through social forestry programme. But allocation for Annual Development Programme (ADP) of the forestry sector is far less than planned target of the Forestry Sector Master Plan. Therefore, the inquiry is two pronged: first, to assess whether and to what extent Bangladesh's existing legal authorities can be used to support the development of a formal, "scaled-up"*

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1 Views expressed in this paper are those of authors and in no way should be implicated to their employers

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forest-based adaptation strategy and second, to identify gaps and recommend future changes or additions to strengthen the legal framework in support of an ecosystem based approach. A framework for facilitating forest-based adaptation is discussed and a review of adaptive actions presented in this paper.

***Keywords**: forest-based adaptation, ecosystem based adaptation, community forest management (CFM), Forest Governance, legal framework, reducing emission from deforestation and forest degradation (REDD+)*

1. Introduction and Background

Bangladesh is situated in north eastern part of South Asia between 20° 34' and 26° 38' north latitude and between 88° 01' and 92° 41' east longitude. It lies in the active delta of three major rivers viz Padma, Meghna and Jamuna and their numerous tributaries. The country covers an area of 1,47,570 sq.km and bounded by India from the west, north and most of east. Myanmar lies on the southeastern edge and Bay of Bengal on the south. The southwestern region consists of a large number of dead and cut-off rivers. The coastal part of Bangladesh includes the famous Sundarbans Mangrove Forest. Forest, and the goods and services they provide, are essential for human well-being. Together with existing socioeconomic processes (e.g. deforestation, forest fragmentation, other forms of habitat loss and population growth), however, climate change could lead to significant changes in the delivery of such services.

According to a recent estimate, total forest land in Bangladesh is about 2.5 million hectares or 17% of the land surface of the country (Bangladesh Economic Review, 2002). The forest land of Bangladesh is broadly categorized as state forest land (2.2 million hectares) and private forest land (0.4 million hectares). Of the state forest land 1.3 million hectares of natural forests and plantations are under the jurisdiction of the Forest Department (FD) in the Ministry of Forest and Environment (MOFE).

The history of forestry in Bangladesh is one of continuous depletion of forest resources both in terms of area and quality (FMP 1994). Most deforestation in government forests has occurred due to the inadequacy of the bureaucratic custodian approach to forest management (Khan 2001). Since the early 1980s, forestry in Bangladesh has witnessed a rapid succession of social forestry programmes in an attempt to redress public alienation and to allow for wider participation of local people in forest use and management (Mustafa, 2002). Establishment of large scale plantation in the degraded forestland and in marginal land may be seen not only as rehabilitation programme for degraded forestland but also promotion of planted forests in the country. Degraded forestland and

Table 1: Available land for social forestry programme in Bangladesh

No.	Available Land	Area in Million Hectare
A	Degraded & denuded land of Un-classed State Forest Land	1.00
B	Khas lands	0.56
C	Degraded government forest land	0.27
D	Marginal strip land	0.08
E	Homestead marginal land	0.27
F	Degraded tea garden land	0.06
G	Degraded private forest land	0.05
H	Cropland Agroforestry on private agricultural lands	2.36
Total Available Land for Social Forestry		4.65

Source: *Foest Department, 2010*

marginal land are the target areas for social forestry programme in Bangladesh. About 4.65 million hectares of such land has been identified as shown in Table 1 for future rehabilitation and restoration purposes through social forestry programme.

2. Forestry Sector Financing

Allocation in the Annual Development Programme (ADP) for the forestry sector is far less than the planned target of the Forestry Sector Master Plan (1995-2015).

Table 2 : ADP allocation in the forestry sector of Bangladesh

Year	ADP Allocation (in lakh Tk.)	Expenditure (in lakh Tk.)
2000-2001	11913.49	10453.217
2001-2002	10491.00	9016.871
2002-2003	9687.00	7140.464
2003-2004	11260.00	9924.914
2004-2005	9885.00	2120.861
2005-2006	11771.00	11173.401
2006-2007	5609.00	5351.86
2007-2008	5898.00	5336.26
2008-2009	3667.00	3606.57
2009-2010	3323.00	3346.938

Source: *Forest Department 2010*

According to the Master Plan, annual allocation requirement is Tk.80000.0 lakh. But average ADP allocation has been only Tk.20000.0 lakh since 1995 and in recent years this figure has been reduced to just Tk.10000.0 lakh due to the absence of donor financing. As such, inadequate financing is considered as the main challenges for successful implementation of Master Plan in Bangladesh. Last 10 years' ADP allocation in this sector is given in Table 2. Development partners like Asian Development Bank and World Bank may come forward to finance development projects to achieve the target of the Forestry Sector Master Plan (1995-2015) and thus can contribute to the implementation of the Forest Instrument of United Nations Forum on Forest (UNFF).

3. Forests and adaptation

The linkages between forests and adaptation are twofold (Locatelli et al. 2010). First, as climate change will affect forests, adaptation measures are needed for forests to reduce negative impacts and maintain ecosystem functions (adaptation for forests). Second, forest ecosystems contribute to adaptation by providing local ecosystem services that reduce the vulnerability of local communities and the broader society to climate change (forests for people's adaptation). Forest ecosystems contribute to adaptation by providing local ecosystem services that reduce societies' vulnerability to climate change (Vignola et al. 2009). It is increasingly being recognized that well-managed ecosystems can help societies to adapt to both current climate hazards and future climate change by providing a wide range of ecosystem services (Turner et al. 2009). For example, mangroves protect coastal areas against storms and waves, forest products provide safety nets for local communities when agricultural crops fail and hydrological services (such as base flow conservation, storm flow regulation, and erosion control) are of utmost importance for buffering the impacts of climate change on water users (CBD 2009). Ecosystem-based adaptation (EbA) is an emerging approach to adaptation that takes into account the role of ecosystem services in reducing the vulnerability of society to climate change, in a multisectoral and multilevel approach (Colls et al. 2009, Vignola et al. 2009, World Bank 2009).

In September 2010, the Adaptation Fund of the UNFCCC accepted its first two projects. One of these projects ('Addressing Climate Change Risks on Water Resources in Honduras: Increased Systemic Resilience and Reduced Vulnerability of the Urban Poor') aims to improve water management and decrease water problems for the poor in the Honduras capital region of Tegucigalpa. This project extensively considers the role of forests, including how they capture mist from the atmosphere and the negative impacts of deforestation

in water catchment areas. The project document states that no mechanisms are currently in place to conserve the forests and the 'green belts' that provide important ecosystem services and that are threatened by deforestation and urbanisation. In addition to this emphasis on 'forests for adaptation', the project also addresses 'adaptation for forests' by aiming to increase the connectivity between protected areas around Tegucigalpa, in order to increase ecosystem resilience as climate changes. This project is a positive sign of an emerging mainstreaming of forests into adaptation policies, as well as adaptation into forest management.

4. Ecosystem-based Adaptation: an Emerging Concept

Ecosystem-based adaptation (EbA), an emerging concept both in science and in international discussions on climate change and biodiversity, offers opportunities for both ecosystems and ecosystem-dependent communities to overcome the challenges (IUCN, 2009). EbA is a set of adaptation policies or measures that consider the role of ecosystem services in reducing the vulnerability of society to climate change in a multi-sectoral and multi-scale approach (Vignola et al. 2009). Such policies and measures also aim at reducing the vulnerability of ecosystems and their services to different threats, including climate change and land-use change.

In order to ensure that ecosystems like forests contribute to the adaptation of broader society and to provide multiple co-benefits, EbA must reduce current threats to ecosystem services (e.g., deforestation and forest degradation) as an important first step for reducing forest ecosystem vulnerability. However, it should also aim at reducing future threats by implementing forest adaptation to climate change. In this sense, EbA is an overarching framework for forests and adaptation, in which 'adaptation for forests' is needed to ensure the role of 'forests for adaptation' (Locatelli et al., 2010).

In places where ecosystem conservation and sustainable management are already being implemented and non-climatic threats are minimized, specific adaptation measures can be incorporated into those practices. Forest adaptation measures for example can aim to buffer forests from perturbations or facilitate evolution of the ecosystem towards a new state that meets altered conditions (Guariguata et al., 2008). Buffering measures focus on preventing perturbations such as invasive species, insects and diseases. Measures that facilitate system shift or evolution do not aim at resisting or reverting changes, but rather at easing transitions and managing natural adaptation processes that would lead the ecosystem towards a socially-acceptable state. An example of a facilitating measure is the reduction of

landscape fragmentation to enhance connectivity between habitats which in turn eases species migration. Another facilitating measure for forests consists of conserving a large spectrum of forest types for their value and resilience; for instance, ecosystems across environmental gradients or biodiversity hotspots.

5. Active Community Participation

Forest ecosystems are of great importance to millions of people whose livelihoods largely depend on them. These ecosystems have immense potential for reducing the impacts of climate change. Tropical forest fringe communities are most vulnerable to climate change variability and long-term changes. Therefore, measures introduced by governments and development stakeholders to protect, restore, and sustainably manage the forests are considered to be vital climate change management instruments. Communities around the forests are using various adaptation strategies to improve agriculture, biodiversity conservation, and water resources management in order to minimize the impacts of the climate change.

Community participatory management is the right approach for protecting and developing forest resources and mitigating climate change. Conservation and proper management of forests is not possible without an active participation by the local people. Community engagement can contribute to improving climate change policy outcomes by assisting community members to develop informed understanding of climate change trends, impacts and consequences and maximizing opportunities for citizens and communities to contribute to public debate about climate change issues and actions. To achieve these goals, the Forest Department needs to facilitate an active engagement of forest fringe communities in the protection and management of forests.

6. Community Forest Management

Community forest management (CFM) combines two things: type of resource (forests) and a class of owner/manager (communities) (Chhatre and Agarwal 2008). Here the term CFM used broadly to refer to many different specific forms: participatory: participatory forest management (PFM), joint forest management (JFM), forest co-management and community based forest management (CBFM). The viability of each management approach depends on the characteristics of the resource systems and their contexts, formal property rights arrangements, informal practices of use and governance, and relations of power and inequality. The power relations interplay within communities, among them and between communities and higher-level actors (Ostrom 2003).

Community forests are often contrasted with forests under open access, government ownership or ownership by private actors. But forest management in practice is complex within these broad categories, and can combine elements across them (Schlager and Ostorm 1992; Agarwal et al. 2008). For the last 10 years, the co-management approach is widely tested in Bangladesh in natural resources management especially in forestry and fisheries. Earlier studies suggested that community management would inevitably lead to degradation and a tragedy of commons. But a recent experience shows that communities can manage forests sustainably in different contexts, particularly when forest policy at the micro-level enables local governance efforts. On the other hand, government forest department often cannot manage resources sustainably and may fail to distribute forestry benefits equitably. Lax enforcement coupled with the high value of forest products and the land on which forest stands, has led to corruption in the forestry sector and losses of revenue for government and benefits for local communities.

7. Linking REDD+ with national adaptation strategies

The linkage between forests and adaptation are two-fold: Adaptation is needed to maintain forest functioning and forests play a role in adaptation of forest-dependent communities and broader society (Locatelli, B et al., 2011). Forests are vulnerable to climate change and implementing forest adaptation measures can reduce the negative impacts (Locatelli, B et al., 2008 as quoted by Locatelli, B et al., 2011). The heavy dependence on nature for livelihoods and in key economic activities, for example rain-fed agriculture, and fuel wood energy from forests, means that adaptation of forests should be part of the strategy of maintaining key sectoral functions in the long run, and reducing emissions from deforestation and forest degradation (REDD+) could prove useful in doing this.

Second, forests play a role in adaptation of communities and broader society (forests for people's adaptation). In this regard forest ecosystems contribute to adaptation by providing local ecosystem services that reduce societies' vulnerability to climate change (Vignola, R et al, 2009 as quoted by Locatelli, B et al., 2011). It is increasingly recognized that well managed ecosystems can help societies to adapt to current climate hazards and to future climate change by providing a wide range of ecosystem services.

While private sector involvement will be key to ensure long-term sustainable financing for REDD through existing and future voluntary and compliance markets, it is currently low in the region. Some good examples of public-private partnerships for REDD do exist, but potential investors have generally tended to

shy away due to uncertainties in the global climate change deal, high transaction costs, and perceived risks in forest carbon offsets, particularly in Bangladesh with a history of illegal logging and corruption. Obstacles to investment and associated risks will need to be mitigated to encourage greater private sector financing.

8. Legal Pluralism and Multiactor Governance in Forest Management

The government and NGO decision-makers and resource managers generally reflect support for and acceptance of the co-management approach to forests management, both as a way of meeting community subsistence needs and as a means to ensure more effective protection for climate change vulnerability. There is a widespread understanding that the models are working and that momentum for co-management is building – it is not a question of whether to scale up, but how. Of course, not everyone takes the same view of how co-management should function, and questions have been raised (among others) about such issues as the relative roles of communities and government in the co-management scheme. Nevertheless, the support of agencies and NGOs is crucial to both the continued implementation of co-management and the adoption of more fundamental legal changes to enable this approach in the long term.

8.1 Who can manage forests better than those living within or beside them?

Many have argued that greater recognition of community rights and more power over forests for communities may help achieve forest outcomes (Arnold and Stewart 1991; Charnley and Poe 2007). With REDD+ redefining the forest management and conservation landscape, community forest management (CFM) can contribute to reduce forest emission and increased resilience of the forest dependent communities. Communities in many regions of the world have always used and managed forest near their settlements. Recognizing the potential of CFM, government and NGOs should formally support different versions of CFM.

8.2 Although the framework environmental laws do not formally authorize co-management in forestry areas, they provide some authority for participatory resource management. Since the fundamental environmental and natural resource laws in Bangladesh (1927 Forest Act, 1950 Protection and Conservation of Fish Act, 1974 Wild Life (Preservation) (Amendment) Act, 1995 Environment Conservation Act) predate introduction of the co-management concept, there is no explicit mention of co-management in the current legal framework. However, this does not mean that Bangladesh lacks legal authority to undertake co-management projects. Some of the laws and their accompanying rules do espouse participatory concepts of resource management, and agencies are

using other legal tools at their disposal to move their co-management efforts. The 1927 Forest Act (as amended in 2000) provides some authority for participatory approaches to forest management. Section 28 of the Forest Act authorizes social forestry programs in the forests, and triggered the development of Social Forestry Rules (and a social forestry program) in 2004. Section 28 also authorizes the establishment of village forests, and rules to implement this provision are currently being written.

8.3 Agencies are using rules, administrative orders, policies, and strategies to implement pilot co-management activities, although a more coherent strategy is needed. Since the bedrock laws do not explicitly authorize co-management of forestry areas, agencies are using rules, administrative orders, policies, strategies, and related "soft law" authorities to implement their pilot co-management activities. For example, the National Forestry Policy (1994) espouses "active participation of the people" (along with NGO involvement) in promoting afforestation efforts, including in reserve forests. The Social Forestry Rules have also been cited as possible support for a co-management approach in forest protected areas. The two-volume 1993 Forestry Master Plan also discusses participatory approaches, although this document does not appear to be currently used by the Forest Department.

8.4 The current legal framework in Bangladesh raises a host of jurisdictional questions with respect to protected areas management. One issue involves overlapping jurisdiction between the 1927 Forest Act and other laws, which creates a risk of regulatory conflicts. For example, because protected forest areas, which fall under the authority of the 1974 Wildlife Act, are located within reserve forests, they are also subject to the Forest Act. Similarly, while the treatment of fish falls under the Protection and Conservation of Fish Act, fish caught in forested areas are considered forest produce, and also implicate the Forest Act. The draft Ecologically Critical Area Rules also introduce jurisdictional confusion, by vesting the Department of Environment with authority over land use and zoning in areas, such as forests and fish sanctuaries, that fall under the authority of the Forest and Fisheries Departments and their respective laws. A countervailing question arises as to how to promote a landscape-level approach to forest management when the resources within a single ecosystem or landscape fall under the control of different departments. Presently, the Forest Department cannot address activities, such as tea gardens, on the borders of protected areas that do not fall under its control (rather, these gardens operate on long-term leases from the Ministry of Lands).

8.5 The volatile issue of land tenure, while far too complex to address under a co-management approach, illuminates some of the difficulties in determining how the legal system should facilitate community access, particularly for indigenous communities, to natural resources. In some cases, community resource use predates the establishment of protected areas, and tensions have arisen over the claims of communities that currently reside in protected areas. At the same time, co-management can and should address long-term use rights by local communities, including historic claims to these rights. Granting such rights, under appropriate conditions, can provide communities with incentives for sustainable, long-term resource management and strengthen both resource protection and community livelihoods. Elements of use rights that should be considered include (i) rights of exclusion; (ii) rules governing resource use; and (iii) rights of enforcement. Agencies have already begun to establish use rights through such initiatives as the draft Fish Sanctuary Law proposed by the Department of Fisheries and the Social Forestry Rules under the Forest Act.

8.6 Another issue entails whether and how to institute a zoning system within the legal framework governing protected areas. While the laws do not formally provide for zoning, some protected areas appear to have de facto buffer zones, with income-generating activities operating around their borders. The Forest Department, in its report on Lessons Learned from Co-management under Nishorgo, has called for the delineation of buffer zones around protected forest areas for social forestry plantations, and staff members within the Department have even proposed the creation, through an administrative order, of separate buffer zones within select large-scale protected areas, such as Teknaf Game Reserve (USAID 2008). However, it may be more useful to provide legal authority to create flexible use zones that are tailored to particular areas (e.g. protected areas rather than larger landscapes), without mandating their establishment.

8.7 Benefit sharing is a critical component of the co-management approach, and arguably constitutes the foundation upon which co-management must be structured, for co-management will not succeed without addressing the subsistence and livelihood needs of local communities living near protected areas. Examples of benefit sharing approaches include the apportioning of revenue from resource-based activities such as ecotourism and resource harvesting (fisheries leases, timber sales); the sustainable harvesting by communities of resources (such as non-timber forest products and intermediate harvest) within and adjacent to protected areas.

9. Conclusion and Recommendation

About 4.65 million hectares of degraded and marginal land has been identified by the Forest Department for future rehabilitation and restoration purposes through social forestry programme. But allocation for Annual Development Programme (ADP) of the forestry sector is far less than planned target. According to the Master Plan, annual allocation requirement is Tk.80000.0 lakh. But average ADP allocation has been found only Tk.20000.0 lakh since 1995 and in recent years this figure has been reduced to Tk.10000.0 lakh only due to the absence of donor financing. In such a context, the social forestry programme may be targeted through community based approach i.e. forest department may issue lands for forest concession to the forest dependent community for a given tenure. The community with technical assistance from the department may undertake plantation, nursing and logging activities. The commercial banks may come forward to finance the community groups as part of their longer term green financing and/or refinancing schemes.

Moreover, REDD+ outcomes can be enhanced by selecting community forest management sites with user group and contextual characteristics associated with successful forest outcomes. These includes a stable technological and policy environment, low levels of intergroup conflict, and small to medium-sized, forest dependent user groups that have management experience. Greater recognition of community rights and more power over forests for communities may help achieve forest outcomes. The viability of the approach depends on the characteristics of the resource systems and their contexts, formal property rights arrangements, informal practices of use and governance, and relations of power and inequality.

Looking ahead, several priorities for near-term action emerge. The first one is to get the 2008 Amended Wildlife Preservation Act approved, although the Act could be strengthened by several additions, such as a general provision on the participatory preparation of management plans for protected areas and measures to harmonize, or at least resolve jurisdictional conflicts between the Wildlife Act, (new) Wildlife Policy, and the Forest Act. Once the Act is finalized, specific co-management rules (addressing such issues as benefit sharing with community) could be developed. A second priority is to approve the draft "Guideline for the Collection and Utilization of Revenue Earned from the Protected Areas," which would institute a much-needed revenue sharing approach. A third priority is to approve the administrative order proposed by the Forest Department to create buffer zones in protected forest areas for community use. In the medium-to-long term, revisions to the 1927 Forest Act could be used to considerably strengthen the legal framework in support of co-management.

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