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BANGLADESH

BANGLADESH ENVIRONMENT SECTOR ASSESSMENT AND STRATEGIC ANALYSIS: FINAL REPORT

**PROSPERITY, LIVELIHOODS AND CONSERVING
ECOSYSTEMS (PLACE) IQC TASK ORDER #8**

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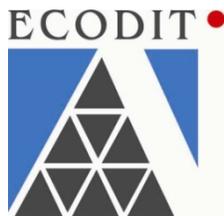
AUTHORITY

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ACRONYMS

Abbreviations and acronyms have been kept to a minimum in the text of this document. Where abbreviations or acronyms have been used, they are accompanied by their full expression the first time they appear, unless they are commonly used and generally understood abbreviations such as NGO, kg., etc. The following list is provided for ease of the readers of this document.

ADB	Asian Development Bank
AF	Arannayk Foundation
AIG	Alternative income generation
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
BECA	Bangladesh Environmental Conservation Act
BESASA	Bangladesh Environment Sector Assessment and Strategic Analysis
MDTF	Multi-Donor Trust Fund
BWDB	Bangladesh Water Development Board
CBD	UN Convention on Biological Diversity
CBFM	Community-Based Fisheries Management
CBO	Community Based Organization
CDM	Clean Development Mechanism
CHT	Chittagong Hill Tracts
CIDA	Canadian International Development Agency
CMC	Co-Management Council or Committee
CNG	Compressed Natural Gas
CWBMP	Coastal Wetlands Biodiversity Management Project
DfID	Department for International Development of the UK
DoE	Department of Environment, of the MoEF
DoF	Department of Fisheries, of the MoFL
ECA	Ecologically Critical Area
ECNEC	Executive Committee of the National Economic Council

EFR	Environmental Fiscal Reform
EU	European Union
FD	Forest Department
FFP	Fourth Fisheries Project (of the World Bank)
GCC	Global Climate Change
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
GoB	Government of Bangladesh
GTZ	<i>Gesellschaft für Technische Zusammenarbeit</i> (German Technical Cooperation)
ICFP	Inland Capture Fisheries Policy
IFAD	International Fund for Agricultural Development
IPAC	Integrated Protected Area Co-Management
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for the Conservation of Nature
LGC	Local Government Committee
LGED	Local Government Engineering Department
M&E	Monitoring and Evaluation
MACH	Management of Aquatic Ecosystems through Community Management
MDTF	Multi-Donor Trust Fund
MoEF	Ministry of Environment and Forests
MoFL	Ministry of Fisheries and Livestock
NAPA	National Adaptation Programme of Action
NEMAP	National Environmental Management Action Plan
NGO	Non-Government Organization
NRM	Natural Resources Management

NSP	Nishorgo Support Project
PA	Protected Area
POP	Persistent Organic Pollutant
PPCR	Pilot Project for Climate Resilience
PRSP	Poverty Reduction Strategy Paper
REDD	Reduced Emissions from Deforestation and Forest Degradation
RMO	Resource Management Organization
RUG	Resource Users' Group
SEALS	Sundarbans Environment and Living Security (Project)
SEMP	Sustainable Environment Management Program
SDC	Swiss Development Cooperation
UFC	Upazila Fisheries Committee
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNO	Upazila Nirbahi Officer (administrative head of an upazila)
UP	Union Parishad (elected local government, below the upazila level)
USAID	United States Agency for International Development
WB	World Bank

NATURAL RESOURCE MANAGEMENT PROGRAMMATIC OPTIONS FOR THE FUTURE

PURPOSE

USAID/Bangladesh's "Bangladesh Environment Sector Assessment and Strategic Analysis" has the following objectives:

- Identify the overall needs of the Bangladesh environment sector.
- Assess USAID's comparative advantage.
- Propose programmatic priorities given various funding levels to match with the Mission's overarching comparative advantage and goal of promoting responsible pro-poor and equitable economic growth.
- Assist the Arannayk Foundation to develop a program strategy.

The report will address the first, second and third objectives, in order to propose a set of strategic options for consideration in the design of USAID/Bangladesh's Mission Strategy for 2010 to 2015. A separate report is available on the fourth objective.

METHODOLOGY

The report is based on review of the extensive literature on environmental issues in Bangladesh, interviews with government officials at all levels and with donor and NGO representatives, and field trips to four areas representative of environmental, natural resources management and global climate change issues in the country. In all, visits were made to about ten forest Protected Areas (PAs) and three wetland areas.

The report looks first at recent positive trends in environmental management in Bangladesh, then at the constraints which continue to limit the country's development. It goes on to propose an overall strategy for future USAID support and finally recommends a set of strategic program options.

ASSESSMENT TEAM FINDINGS

STATE OF THE ENVIRONMENT (see Attachment A report for more detail)

With recent economic growth averaging over 5 percent, Bangladesh has succeeded in reducing the incidence of poverty to 40 percent of its population of nearly 150 million and shows promise of meeting several of its Millennium Development Goals. Nevertheless, the country faces huge challenges in further reducing poverty, alleviating pressure on natural resources and in reversing decades of environmental degradation.

Bangladesh suffers from environmental problems of every kind – pollution of air and water and deterioration of the quantity and quality of its natural resources: soil, water, forests, biodiversity and fisheries. Inadequate management of human use of the environment is impacting human health, causing economic damage and irreversible biodiversity losses. The World Bank has estimated that economic costs of environmental degradation amount to 4.3 percent of gross domestic product.

Indoor air pollution, from stoves burning dirty fuels, has been flagged as a major threat to human health but air pollution from vehicles and industries is also significant. While safe drinking water is now available to 80

percent of the population, adequate sanitation is much more limited. Solid waste collection and disposal is a widespread problem. Ambient water quality is unsatisfactory around major cities and industrial clusters.

Floodplains constitute one of the nation's most valuable natural resources. Fish supply 60 percent of Bangladesh's animal protein consumption and are of particular importance to the poor. Capture fisheries have been in decline for some time, as a result of physical obstructions, overfishing, pollution and inadequate management policies and institutions.

Bangladesh has limited remaining natural **forest** cover, at about 10 percent of land area, and almost all of that area is now seriously degraded, as a result of extreme population pressure for fuel wood and other forest products, as well as inadequate management. Community forests in the Chittagong Hill Tracts and private forests (homestead lots), however, bring the forest cover up to 35 percent of land. There has been a recent expansion in the number of forest protected areas from 14 to 21, although, as a percentage of land covered, they are still only 1.6 percent of the nation's territory, one of the lowest rates of coverage in the world.

Given that Bangladesh is mostly below 10 m above sea level, it is especially vulnerable to the possible impacts of sea level rise and the other expected impacts of **global climate change**. A recent UNDP policy study corroborates Bangladesh's high vulnerability to adverse effects of global climate change and projects that extreme events (cyclones, floods, droughts) will become more frequent and/or severe over the coming decades. Impacts will likely be *severe* on agriculture, *moderate* on the forest sector, and *low to moderate* on inland fisheries. The lack of institutional capacity to address these changes is also highlighted by UNDP.

Nevertheless, over the last 35 years, the Government has invested over \$10 billion to make the country less vulnerable to natural disasters. These investments (supported by development partners), include programs for flood management, construction of coastal polders, cyclone and flood shelters, raising roads above flood level and installing warning systems. However, addressing climate change adaptation and mitigation will require scaling up of investments and sound environmental management, including natural ecosystems management. This is the purpose of the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) (GoB 2009), which sets out six pillars/themes and 64 projects, mainly in the adaptation area.

POLICIES, LAWS AND INSTITUTIONS

Policies in the environment, natural resources management and global climate change areas are generally well developed but the laws stemming from them need modernization. This is particularly true for forests, where legislation consists of a series of patches on colonial-era laws. The principal institutions also urgently need restructuring and modernization. The Department of Environment, while relatively new, still has no professional "cadre" and is managed by frequently rotated generalists. The Department of Fisheries is slowly adapting to adding an extension function – to assist fisher communities – to its traditional role in regulatory enforcement. The Forest Department (FD) is also attempting a difficult transition from a controller of forest land to a partner with the community in co-management of protected areas and social forestry programs on other land. Sustainable management is also constrained by a high level of systemic corruption in all three bodies.

CO-MANAGEMENT

With the growth of democratic governance in Bangladesh, the tradition of top-down management of natural resources is beginning to give way to a more participatory approach. The best developed examples of participation are in **co-management** of protected areas and wetlands, pioneered in the USAID-supported Management of Aquatic Ecosystems through Community Husbandry (MACH) and Nishorgo Support Projects. For MACH, co-management included the formation of Resource Management Organizations (RMOs) for each water body, composed of fishers, together with local elites such as politicians, professionals and religious leaders. RMOs develop management plans, typically involving fish sanctuaries, closed seasons

and bans on destructive fishing methods. After establishment and strengthening, the RMOs are given the fishing lease for the water body and the longer-established ones show good promise of being self-sustaining. Increases in fish production and incomes have been substantial. The major challenge for the RMO model is one of replication to the many floodplain areas which could benefit from it.

The participatory system for forest protected areas is similar – the Co-Management Committee includes a combination of resource users and local elites, with a local FD officer as Secretary. Such committees are now in place or in the process of formation for essentially all of Bangladesh’s forest protected areas. Community patrolling of such areas has been shown to reduce illegal cutting substantially but is difficult to sustain in the absence of incentives for the patrollers. Forest users do not benefit directly from sustainable resource management; in fact they face a loss of livelihood. The major challenge for the forest protected areas is to develop substantial systems of alternative income generation, including social forestry, to compensate forest users for their loss of access. An additional challenge is to develop Co-Management Committees as fully effective, democratic resource managers.

USAID’s current support of natural resources management is through the Integrated Protected Area Co-Management (IPAC) Project, which now covers nearly all the forest protected areas and selected wetland sites. As the successor project to both MACH and Nishorgo, IPAC includes further development of the earlier project sites and expansion to new areas, as well as an integrated approach to co-management and its conceptual refinement. A result of the latter work was the recent issuance of a Government Order on Protected Areas, which lays out the composition and duties of the co-management bodies.

NGOs with a rural development focus are exceptionally strong in Bangladesh and several have been sub-contractors in the MACH, Nishorgo and IPAC teams, contributing materially to successful outcomes.

ISSUES AND OPPORTUNITIES (see Attachment B report for more detail)

Global Climate Change. The BCCSAP has had a highly positive reception at donor level, as shown by the formation of a Multi-Donor Trust Fund and its initial funding of \$150 million, together with an additional government fund of \$100 million. However, these ambitious plans bring into focus the limited ability of the government to ensure inter-institutional and donor coordination, administrative reform, natural resources-related policy development (including environmental fiscal reform), improved technical capacity, and the control of corruption. Policy actions to address global climate change are critical; while there are a significant number of programs (64) in the BCCSAP, policy level actions and structural reforms for natural resources are absent, although already a key part of the climate negotiations for other sectors, such as energy and industry. The BCCSAP mostly focuses on adaptation funding and assumes grant financing.

The Assessment Team recommends that USAID consider action in the following areas:

Structural reform. Strategy development and structural adjustment action in natural resources management (see below); elimination of perverse incentives, such as revenue policies which encourage illegal logging; environmental fiscal reform; and, co-financing with the Multi-Donor Trust Fund.

Institutional capacity and coordination. Partner with leading donors who have a strong interest in structural reform to mobilize national political will; development of sector strategies to operationalize the BCCSAP and to guide the definition of programs and projects.

Financing. Support the assessment of the capacity and institutional needs to attract carbon financing, especially the key issue of credibility; and, improve access to the numerous carbon funds.

Forests. The Assessment Team notes that a basic institutional and legal framework for effective forest management is not yet in place and there is a long road ahead. Moving to a more efficient and socially-

oriented forest sector in Bangladesh will require overcoming a number of barriers: leadership, financial, structural (obsolete policies, laws and regulations), institutional (an archaic administration system) and technical. In addition, it is equally important that the government introduces mechanisms for transparency and accountability, and improves the control of corruption.

There are a number of opportunities for USAID/Bangladesh to provide highly leveraged support (in collaboration with other bilateral and multilateral donors) to the forest sector. For example: providing co-financing to support a major program on capacity building for the forest sector (including identification of the root causes of constraints); assessing opportunities to minimize corruption; increasing support to advance policy and legal reforms and eliminate perverse incentives to deforestation; eliminating the collection of forestry revenue from the FD; improving data collection and analysis and informed decision-making; and, strengthening capacity to implement and manage multi-disciplinary approaches (biodiversity conservation, social mobilization, economics, financial management, business planning, and general management).

Floodplain Fisheries. The Assessment Team notes that a basic institutional and legal framework for integrated use of coastal and inland fishery resources is in place. However, it is severely constrained due to uncoordinated and sometimes adversarial enforcement efforts by different agencies. This is undermining the impact of recent projects and results in conflicts between flood control, agriculture and fisheries.

Several projects, including the approaches pioneered in MACH and consolidated under IPAC that have combined the efforts of national NGOs, Department of Fisheries, and international agencies, have demonstrated that wetland ecosystems management approaches, particularly community managed wetland habitat restoration, can be replicated in large and smaller wetland areas. Continuing investments in this approach will ensure the long-term sustainability of the fisheries sector. Opportunities for USAID-Bangladesh include:

Structural Reform. Support to change policy and institutional approaches to strengthen the fisheries sector and related inter-agency coordination - overcoming the disconnect between the Ministry of Land and the needs of sustainable management reflected in the National Fisheries Strategy is an immediate priority; reform of laws to support and enable community based conservation; promotion of a results-oriented cooperation between relevant departments.

Institutional Capacity. Support for Department of Fisheries reform, focusing on partnerships, and enabling and empowering local sustainable resource use; internalization of experiences and lessons in participatory fisheries management; strengthening capacity to implement and manage multi-disciplinary approaches (see above); collaboration across agencies to prioritize and strengthen regulatory controls on conversion of floodplain wetlands to other uses; collaboration with the FD to manage and conserve the Sundarbans wetlands as a total system.

Resources Management. Improved management of inland capture fisheries; innovative arrangements for coordinated sustainable management and conservation of riverine and coastal ecosystems by involving local communities; small grants program to support independent community-based organizations, formed to manage not only fisheries and wetland resources but also surface water; and, piloting of marine and coastal protected areas for fisheries and aquatic biodiversity.

Protected Areas. The GoB, with the support of USAID and other donors, has: introduced protected area co-management; developed protected area management plans; improved alternative income generation activities at community level in forest protected areas and wetlands, albeit at a limited scale; empowered communities and established co-management committees; provided visitor facilities; and, introduced park entry fees. The immediate sustainability (especially financial sustainability) of these achievements is a priority. Although the GoB has recently approved the introduction of park entry fees (under a revenue-sharing system

with local communities), sufficient funding is unlikely to be mobilized by this means alone and there is no other readily available funding to sustain co-management committees

The Team suggests the following opportunities (in addition to recommendations included above on Forests, which apply to PAs):

Protected Area Governance. Formulate and introduce new legislation to improve protected area governance in key aspects: institutional authority for protected areas (including the ecologically critical areas nominally managed by the Department of Environment), establishment of a national system of PAs, and co-management of PAs; improve representativeness at a regional rather than country level; and recognize the conservation value of wildlife corridors and secondary habitats, for example, in conserving elephants; support anti-corruption strategies; assess needs and improve management guidelines to enable realistic costing and estimation of financial needs at network level; and, introduce a protected area co- management planning initiative at national level, using the IPAC sites as pilots.

Protected Area Financing. Strengthen policy work related on entry fees; and introduce a comprehensive protected areas financial planning initiative to diversify revenue sources.

CURRENT AND PROPOSED PROGRAMS

Although USAID is a leading donor in natural resources management, several other donors are also important – WB in fisheries, coastal protection and, earlier, in forestry; ADB formerly in forestry; the UK and Germany in fisheries; and, UNDP/GEF, EU and Germany in protected areas. In other environmental areas, they are joined by Canada (capacity building); WB and ADB in municipal water and sanitation; Germany in air pollution and alternative energy; and UNDP and the ADB in the Chittagong Hill Tracts. In global climate change, the UK, the EU and Denmark are the first donors to the Multi-Donor Trust Fund but others are expected to join them.

USAID COMPARATIVE ADVANTAGE AND FUTURE STRATEGIC FOCUS

USAID has had a long association with Bangladesh and is fully familiar with the economic, political, cultural and social context of its assistance. USAID's current program is particularly strong in health, education, disaster management and local development, all of which may have a role in a possible future environmental and climate change program. USAID is active in the new era of donor cooperation in Bangladesh, a fact which may be crucial in the design of projects which effectively harness USAID grants for technical assistance, training and capacity building with investment funds from a loan or grant source.

The Assessment Team recommends that **USAID continue to focus its environmental assistance in Natural Resources Management**, where it has played a leading part over the last ten years, for reasons associated with the relative success of the co-management model, the need for continued and expanded support to achieve full success, the need for technical assistance and capacity building, and the dearth of other donor support in the forest sector and good cooperation between donors in floodplain fisheries. This reasoning implies a **continued focus on forest PAs and floodplain fisheries**, through a successor project to IPAC. With the expected new funding for global climate change, many options are possible, and the team suggests some preference for projects related to natural resources management and the above core program but this need not be the exclusive focus.

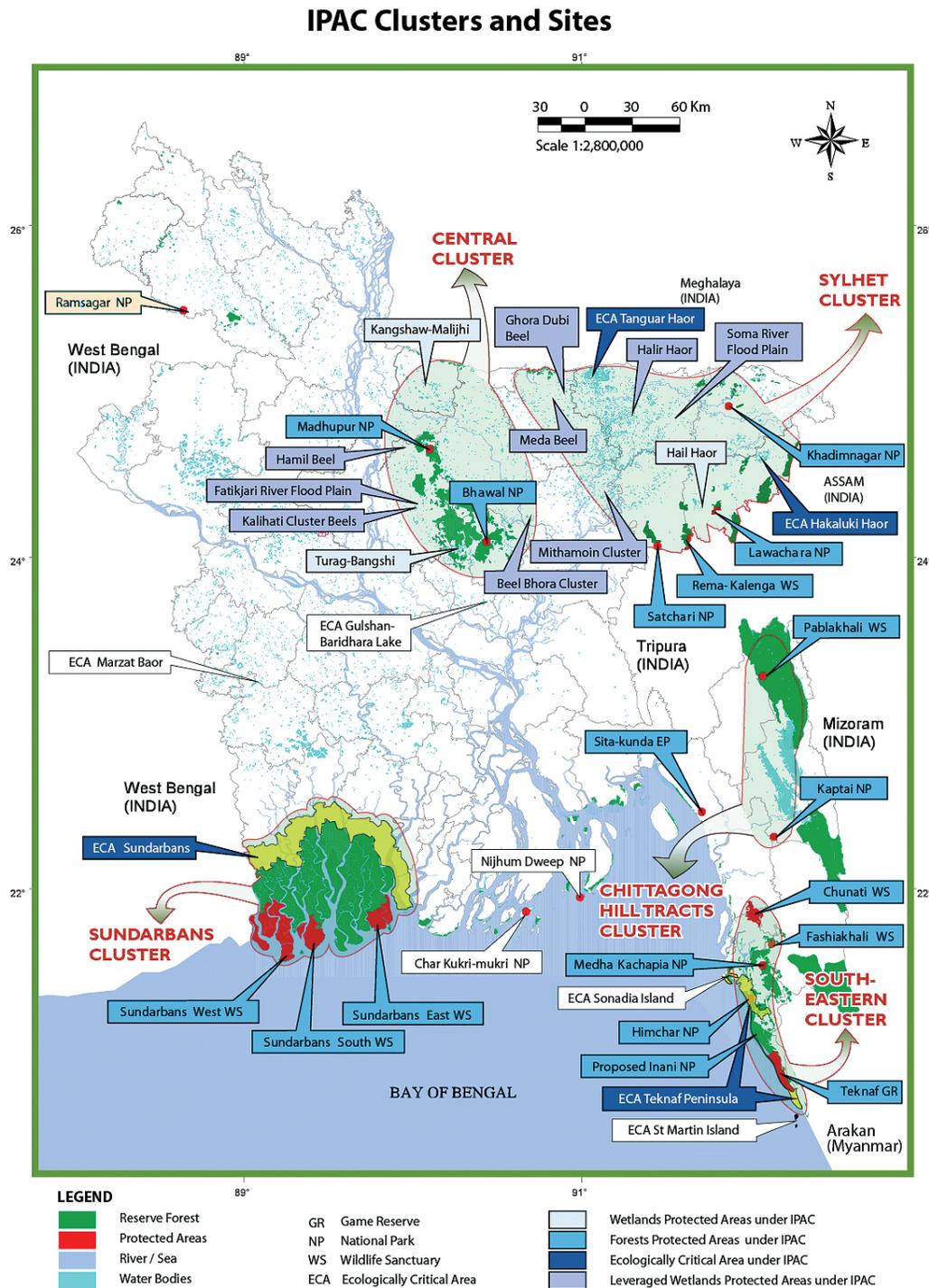
The Team proposes the following **Strategic Options (described more fully in Attachment C report)** for USAID's consideration, under three varying funding scenarios:

Table 1. Strategic Options for USAID Natural Resource Management

Option No.	Program Option Name	Total Cost	USAID Share	Duration (yrs)
		(\$ millions)		
Base Case Scenario: about \$30.0 million over five years				
C-1	Replication of the Wetland Co-management model (MACH Model)	30.0	4.5	5-8
C-2	Continued Support to Forest Protected Area Co-Management	3.0	3.0	5.0
F-1	Natural Resources Management Policy Development	0.25	0.20	1+
F-2	Ecologically Representative Protected Area System Development and Database	0.25	0.20	1.0
F-4	Capacity Building of the Departments of Forest, Fisheries and Environment	5.0	3.0	3.0
F-5	Research Partnership on Global Climate Change	10.0	5.0	5.0
N-1	Full-Scale Approach to Alternative Income Generation for Forest Protected Areas	100.0	10.0	5.0
N-2	National Reforestation/ Social Forestry Program	10.0-50.0	8.0	5.0
	Subtotal	153.5-193.5	33.9	
Intermediate Scenario: about \$50.0 million over five years				
F-3	Public Awareness	3.0-5.0	2.5	3.0
N-3	Coastal Zone Program	100.0	10.0	5.0
N-4	Chittagong Hill Tracts Watershed Management	15.0	5.0	5.0
	Subtotal	276.5-318.5	51.4	
High Case Scenario: about \$65 million over five years				
O-2	Alternative Energy Program	10.0	8.0	5.0
O-3	Rural Solid Waste	10.0	8.0	5.0
	Total	296.5-328.5	67.4	

Nearly all the above strategy options correspond closely with the priorities of the BCCSAP. Finally, the team suggests ways in which the constraints on environmental management described above might be eased, with emphasis on the thorough restructuring of the three government departments and testing of government commitment but requiring that the GoB take key steps before USAID funds are committed. Considerable scope for donor coordination (especially with the WB) is seen, as are possibilities for interstate cooperation. For the more complex proposals, feasibility studies are recommended.

Figure 1. Integrated Protected Areas Co-Management Clusters and Sites



ATTACHMENT A: ASSESSMENT OF OVERALL DEVELOPMENT NEEDS FOR THE ENVIRONMENT SECTOR

EXECUTIVE SUMMARY

This report presents a quick overview of the environment and natural resources management (NRM) sectors in Bangladesh, as a contribution to USAID/Bangladesh's "Bangladesh Environment Sector Assessment and Strategic Analysis", which has the following objectives:

- Identify the overall needs of the Bangladesh environment sector;
- Assess USAID's comparative advantage;
- Propose programmatic priorities given various funding levels to match with the Mission's overarching comparative advantage and goal of promoting responsible pro-poor and equitable economic growth; and
- Assist the Arannayk Foundation to develop a program strategy.

The report addresses the first, second and third objectives through a rapid review of the environmental, NRM and climate challenges facing Bangladesh, an assessment of the country's capacity to deal with them, identification of major needs for external support, and delineation of a number of areas where additional USAID support might be considered.

With recent economic growth averaging over 5 percent, Bangladesh has succeeded in reducing the incidence of poverty to 40 percent of its population of nearly 150 million and shows promise of meeting several of its Millennium Development Goals. Nevertheless, the country faces huge challenges in further reducing poverty, alleviating pressure on natural resources and in reversing decades of environmental degradation.

Bangladesh suffers from environmental problems of every kind – pollution of air and water and deterioration of the quantity and quality of its natural resources: soil, water, forests and fisheries. Inadequate management of the environment is impacting human health and causing economic damage and irreversible biodiversity losses. The World Bank has estimated that economic costs of environmental degradation amount to 4.3 percent of Gross Domestic Product¹.

Indoor air pollution, from stoves burning dirty fuels, has been flagged as a major threat to human health, but air pollution from vehicles and industries is also significant. While safe drinking water is now available to 80 percent of the population, adequate sanitation is much more limited. Solid waste collection and disposal is a widespread problem. Ambient water quality is unsatisfactory around major cities and industrial clusters.

Floodplains constitute one of the nation's most valuable natural resources. Fish supply 70 percent of Bangladesh's animal protein consumption and are of particular importance to the poor. Capture fisheries have been in decline for some time, as a result of physical obstructions, overfishing, pollution and inadequate management policies and institutions.

¹ World Bank 2006

Bangladesh has limited natural forest cover, at about 10 percent of land area, down from 20 percent in the 1960s, and almost all of that area is now seriously degraded, as a result of extreme population pressure for fuel wood and other forest products, as well as inadequate management policies. Community forests in the Chittagong Hill Tracts (CHT) and private land (homestead lots), however, bring the forest cover up to 35 percent of land, and private sources account for 80 percent of timber marketed². There has been a recent expansion in the number and area of forest protected areas from 14 to 21, although as a percentage of land covered they are still only 1.6 percent of the nation's territory, one of the lowest percentages in the world.

Given that Bangladesh is mostly below 10 m above sea level, it is especially vulnerable to the possible impacts of sea level rise and the other expected impacts of global climate change. Despite recent economic growth, more than 50 million of the people of Bangladesh still live in poverty. A recent policy study on "The Probable Impacts of Climate Change on Poverty and Economic Growth and the Options of Coping with Adverse Effect of Climate Change in Bangladesh" (UNDP 2009) corroborates Bangladesh's high vulnerability to adverse effects of GCC. The study projects that extreme events (cyclones, floods, droughts) will become more frequent and/or severe. Impacts will likely be *severe* on agriculture, *moderate* on the forest sector, and *low to moderate* on inland fisheries. The report also highlights the lack of institutional capacity to address these changes.

Nevertheless, over the last 35 years, the GoB invested over \$10 billion to make the country less vulnerable to natural disasters. These investments (supported by development partners), include programs for flood management, construction of coastal polders, cyclone and flood shelters, raising roads above flood level and installing warning systems. However, addressing climate change adaptation and mitigation will require scaling up of investments and sound environmental management including natural ecosystems management. This is the purpose of the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) (GoB 2009), which sets out six pillars and 64 projects, mainly in the adaptation area.

Recent studies highlight the capacity of coastal ecosystems to sequester carbon, mainly in soil. In addition to carbon sequestration, forest ecosystems provide protection from extreme weather and natural disasters, serve as fish nursery habitats and are an important source of food and income to local communities. Because many of the poor and vulnerable in Bangladesh live in coastal, remote or ecologically fragile parts of the country, sound ecosystems management is indispensable, along with programs to promote livelihoods more compatible with sustainable use of the natural resources.

Moreover, addressing GCC requires an integrated approach, involving efficient coordination and implementation among different ministries and agencies, civil society and the private sector. Action to implement GCC mitigation and adaptation in Bangladesh not only brings a monumental challenge to government agencies but also to the private sector and the international community. In this context, the current lack of institutional credibility (e.g. effectiveness, accountability and effective control of corruption) is the most significant threat to the environment.

Policies in the environment, NRM and GCC areas are generally well developed but the laws stemming from them need modernization. This is particularly true for forests where legislation consists of a series of patches on very old colonial-era laws. A similar situation is evident in the principal institutions. The Department of Environment is relatively new, still has no professional "cadre" and is managed by frequently rotated generalists. The Department of Fisheries is slowly adapting to adding an extension function – to assist fisher communities – to its traditional role in regulatory enforcement. The Forest Department is also attempting a painful transition from a controller of forest land to a partner with the community in co-management of protected areas and social forestry programs on other land. Sustainable management is also constrained by a high level of systemic corruption in all three bodies.

² World Bank 2006.

Like many Asian countries, Bangladesh has a tradition of top-down management, in which all-knowing government departments made decisions on behalf of the populations. However, with the growth of democracy, that tradition is beginning to give way to a more participatory approach. The best developed examples of participation may be co-management of Protected Areas and wetlands, pioneered in the Management of Aquatic Biodiversity through Community Husbandry (MACH) and Nishorgo Support Projects. In the case of wetlands, Bangladesh has developed extensive experience and local successes in empowering and enabling local communities to manage more sustainably *beel* and floodplain fisheries and wetlands. For MACH, this consisted of the formation of Resource Management Organizations (RMOs) for each water body composed of fishers, together with local elites such as politicians, professionals and religious leaders. RMOs develop management plans for their water bodies, typically involving fish sanctuaries, closed seasons and bans on destructive fishing methods. After establishment and strengthening, the RMOs are given the fishing lease for the water body and the longer-established ones show good promise of being self-sustaining. Increases in fish production and incomes have been impressive. The major challenge for the RMO model is one of replication to the many floodplain areas which could benefit from it.

The participatory system for forest PAs is similar – the Co-Management Committee (CMC) has a combination of resource users (poor people living in or adjacent to the protected forest) and local elites, together with a local FD officer as Secretary. CMCs are now in place or in the process of formation for essentially all of Bangladesh's forest PAs. Management plans for the restoration of the PAs are being implemented. Community patrolling of parks has been shown to reduce illegal cutting substantially but is difficult to sustain in the absence of incentives for the patrollers. Unlike the flood plain fisheries situation, forest users do not benefit directly from sustainable resource management; in fact they face a loss of livelihood. The major challenge for the forest PAs is to develop substantial systems of alternative income generation, including social forestry, to compensate forest users for their loss of access to the park resources. An additional challenge is to develop CMCs as fully effective, democratic resource managers. NGOs with a rural development focus are exceptionally strong in Bangladesh and several have been sub-contractors in the MACH, Nishorgo and IPAC teams.

Given that, for many Bangladeshis, daily survival is their principal concern, it is not surprising that environmental awareness is not widespread. However, it has been shown in many countries that governments only act on environmental and NRM issues when there is a buildup of pressure for change from the public. In this case, the relevant public is the growing middle class in the major cities, together with the press, who are conversant with the health and economic damage caused by pollution and the actions that other countries have taken with respect to these issues. There has been a rapid growth in the number of visitors to protected areas in recent years, indicating a large potential among an increasingly urban population to support conservation. However, a great deal remains to be done in public awareness at all levels and on all issues and this should be a high priority in any environmental or NRM project.

Despite the constraints mentioned above, some solid achievements in environmental management have been recorded, especially in air pollution (gas distribution and use in vehicles, removal of lead from gasoline), drinking water, floodplain fisheries and forest protected areas. However, major gaps remain in solid waste, industrial air and water pollution, alternative energy, afforestation, and coastal zone management. Implementation capacity remains limited, especially in light of emerging needs in GCC. Effective capacity building would involve the restructuring of the three departments mentioned above to address their 21st Century roles, recruitment of multi-disciplinary staffs, and a drive to minimize corruption.

Reforestation and afforestation could play a significant role in GCC mitigation, and could mobilize a significant amount of funding. Key areas for improvement include: a) decreasing high rates of forest loss and degradation, b) protecting existing endangered forest ecosystems and c) restoring lost native forest ecosystems (coastal and inland) in and outside protected areas. Because of the social implications of reducing deforestation in Bangladesh, the introduction of Reduced Emissions from Deforestation and Forest Degradation (REDD) mechanisms is strategic and has the potential to qualify for carbon-financing.

Although Bangladesh's contribution to the generation of greenhouse gases is miniscule, the GoB is committed to address emissions reduction; and there are expectations that emissions reductions can mobilize international carbon financing (which could be directed to improve inland and coastal forest management). Achieving the REDD enabling conditions will require sustained effort from the GoB, not least to convince the world that it is seriously engaged in reversing the historic trend of deforestation.

The Assessment Team has surveyed the current and proposed programs of the major donors. In Addition to the MACH and Nishorgo Projects just mentioned, and the successor Integrated Project for Co-Management (IPAC), USAID has supported the establishment of the Arannayk Foundation for Tropical Forest Conservation and has a large program of rural and social development that is complementary to its environmental work. The World Bank has an active environmental program and is also managing the newly-established Multi-Donor Trust Fund for GCC, to which the EU and UK have made major pledges. The Asian Development Bank is active in urban services and the CHT but has avoided NRM activities since its Sundarbans project ended in failure. DfID has supported the development of the BCCSAP and UNDP is also working in the CHT. Its support to coastal zone and wetlands will end next year. The EU will support IPAC in the Sundarbans, as will Germany at another site. There are numerous smaller programs.

Considering the lessons learned from ongoing NRM work, the needs of the country as expressed in the BCCSAP and biodiversity strategy documents, gaps in current assistance programs and USAID's comparative advantage, the Assessment Team, recommends that USAID continue to focus on the NRM area, with the possible addition of other work in GCC. It suggests consideration of the following program options:³

C-1	REPLICATION OF THE MACH MODEL
C-2	CONTINUED SUPPORT TO FOREST PA CO-MANAGEMENT
F-1	NRM POLICY DEVELOPMENT
F-2	ECOLOGICALLY REPRESENTATIVE PA SYSTEM DEVELOPMENT AND DATABASE
F-3	PUBLIC AWARENESS
F-4	CAPACITY BUILDING OF THREE DEPARTMENTS
F-5	RESEARCH PARTNERSHIP ON GLOBAL CLIMATE CHANGE
N-1	FULL-SCALE APPROACH TO AIG FOR FOREST PAs
N-2	NATIONAL REFORESTATION/ SOCIAL FORESTRY PROGRAM
N-3	COASTAL ZONE PROGRAM
N-4	CHITTAGONG HILL TRACTS WATERSHED MANAGEMENT
O-2	ALTERNATIVE ENERGY PROGRAM
O-3	RURAL SOLID WASTE

³ Further elaborated in Attachment C

I. BACKGROUND

This report presents a quick overview of the environment and natural resources management (NRM) sectors in Bangladesh, as a contribution to USAID/Bangladesh’s “Bangladesh Environment Sector Assessment and Strategic Analysis”, which has the following objectives:

- Identify the overall needs of the Bangladesh environment sector;
- Assess USAID’s comparative advantage;
- Propose programmatic priorities given various funding levels to match with the Mission’s overarching comparative advantage and goal of promoting responsible pro-poor and equitable economic growth; and
- Assist the Arannayk Foundation to develop a program strategy.

The report will address the first, second and third objectives through a rapid review of the environmental NRM and climate challenges facing Bangladesh, an assessment of the country’s capacity to deal with them, identification of major needs for external support, and delineation of a number of areas where additional USAID support might be considered. Needs in the NRM and global climate change areas will be explored in more depth in Attachment B.

Given limitations of time and space, this review will draw heavily on a number of recent assessments by other development partners (listed in Annex 5), especially those of the World Bank (WB) and Asian Development Bank (ADB).

2. THE STATE OF THE ENVIRONMENT IN BANGLADESH

With recent economic growth averaging over 5 percent, Bangladesh has succeeded in reducing the incidence of poverty to 40 percent of its population of nearly 150 million and shows promise of meeting several of its Millennium Development Goals. Nevertheless, the country faces huge challenges in further reducing poverty, alleviating pressure on natural resources and in reversing decades of environmental degradation.

Bangladesh suffers from environmental problems of every kind – pollution of air and water and deterioration of the quantity and quality of its natural resources: soil, water, forests and fisheries. Inadequate management of the environment is impacting human health, causing economic damage and irreversible biodiversity losses. The WB has estimated that economic costs of environmental degradation amount to 4.3 percent of Gross Domestic Product (GDP)⁴. It also singles out three priority issues which account for a 2.7 percent loss of GDP: the threat of indoor and urban air pollution; urban and industrial effluent in Dhaka; and the decline of capture fisheries.

The main threat to health from air pollution is from particulates – from indoor sources, such as cooking stoves burning dirty fuels, such as wood or animal dung – and from vehicles and industries. The latter sources are especially important in Dhaka and other industrial cities but indoor air pollution is dangerous in rural areas also. Monitoring systems remain limited, but they show that Dhaka has at least 100 days per year of unhealthy air. Other air pollution threats include heavy metals and Persistent Organic Pollutants, such as insecticides.

Bangladesh has done well in the provision of safe drinking water, which now is available to 80 percent of the population (WB), although that figure has recently declined due to the realization of the extent of pollution by naturally occurring arsenic. Sanitation is another story – while cities and towns have sewage collection systems for part of the population (only 27 percent for Dhaka), the extent of treatment plants is minimal. Only 30 to 40 percent of the rural population has access to a sanitary latrine. The inadequacy of solid waste collection and disposal facilities is a problem in urban centers of all sizes. Uncollected solid waste is not only an eyesore but may provide a breeding ground for disease vectors and block drainage channels, as well as entailing the loss of a valuable economic resource.

An impact of rapid urbanization and industrialization is deterioration of ambient water quality, which is most noticeable in and around Dhaka, where many of the lakes and rivers are too polluted for any human use and biologically dead during the dry season. More localized impacts on fisheries and other water uses are found near concentrations of industries like tanning or dyeing. Agricultural intensification has led to major increases in nutrient and pesticide runoff, as well as concerns about deterioration in soil quality⁵. Soil erosion and mudslides are severe in more steeply sloped areas, leading to sedimentation of rivers and floodplain lakes, and exacerbation of floods.

Floodplains constitute one of the nation's most valuable natural resources. Fish supply 70 percent of Bangladesh's animal protein consumption and are of particular importance to the poor. Capture fisheries have been in decline for some time, as a result of physical obstructions, overfishing, pollution and inadequate management policies and institutions.

Bangladesh has limited natural forest cover, at about 10 percent of land area, down from 20 percent in the 1960s, and almost all of that area is now seriously degraded, as a result of extreme population pressure for

⁴ World Bank 2006

⁵ According to the World Bank (2006), there is insufficient evidence that soil quality deterioration is leading to declining crop yields but better monitoring and re-balancing of fertilizer applications are recommended.

fuel wood and other forest products, as well as inadequate management policies. Community forests in the Chittagong Hill Tracts (CHT) and private forests (homestead lots), however, bring the forest cover up to 35 percent of land, and private sources account for 80 percent of timber marketed⁶.

There has been a recent expansion in the number and area of forest protected areas from 14 to 21, although as a percentage of land covered they are still only 1.6 percent of the nation's territory, one of the lowest percentages in the world.

Given that Bangladesh is mostly below 10 m above sea level, it is especially vulnerable to the possible impacts of sea level rise and the other expected impacts of global climate change. Attachment B, Chapter 2 includes a full analysis of climate change challenges and opportunities in Bangladesh.

The Bangladesh Climate Change Strategy and Action Plan BCCSAP (GoB 2009) notes that, since Bangladesh achieved Independence in 1971, GDP has more than tripled in real terms, food production has increased three-fold, the population growth rate has declined from around 2.9 percent per annum in 1974 to 1.4 percent in 2006 and the country is now largely food secure (mainly in rice). In four out of the last five years, the economy has grown at over 6 percent. Between 1991 and 2005, the percentage of people living in poverty declined from 59 percent to 40 percent and the country's Human Development Index improved from 0.347 in 1975 to 0.547 in 2005. Child mortality has fallen substantially and gender parity in primary education has been achieved. However, despite these successes, more than 50 million of the people of Bangladesh still live in poverty. Many of these people live in remote or ecologically fragile parts of the country, such as river islands and cyclone-prone coastal belts, which are especially vulnerable to natural disasters.

A recent policy study on “The Probable Impacts of Climate Change on Poverty and Economic Growth and the Options of Coping with Adverse Effect of Climate Change in Bangladesh” (United Nations Development Programme (UNDP) 2009) corroborates Bangladesh's high vulnerability to adverse effects of Global Climate Change (GCC): “Bangladesh is already vulnerable to many climate change related extreme events. It is expected that climate change will bring changes in characteristics of extreme events and gradual change phenomenon of the physical and natural systems. Due to higher level of dependency on natural resource base, overall impacts of global climate change would be significant. It is estimated that climate change could affect more than 70 million people of Bangladesh”. The study also notes that the most relevant factors contributing to such vulnerability are related to its geographic location, low elevation, high population density, poor infrastructure, high levels of poverty and dependency on natural resources and the lack of institutional capacity to meet the monumental challenges related to GCC. The UNDP Study also highlights that the impacts, in terms of increasing poverty and slowing economic growth, will be *severe* in the agricultural sector, *moderate* in the forest sector, and *low to moderate, both positive and negative* in the fisheries sector and (see details in Attachment B, Chapter 2 and Annex 1).

Over the last 35 years (long before climate change became a global concern), the Government of Bangladesh (GoB) invested over \$10 billion to make the country less vulnerable to natural disasters. These investments (supported by development partners) include programs for flood management, construction of coastal polders, cyclone and flood shelters and raising roads above flood level. In addition, community-based disaster preparedness has improved and GCC resilient varieties of rice and other crops have also been developed. More recently, a warning system for natural disasters has been introduced. However, addressing climate change adaptation and mitigation requires scaling up investments and sound environmental management including natural ecosystems management. This is critical to sustain growth and secure the well-being of people (including vulnerable groups).

⁶ World Bank, 2006. The 2009 WB figure is 30 percent. It should be noted that this is much higher than the forest area reported by the Forest Department, which does not include private homestead plantations, which now account for most of the tree cover and timber production. However, it might be debated to what extent homestead plantations are really forests, as they are typically a mix of exotic and indigenous species of economic value, without undergrowth and with limited wildlife value.

Healthy ecosystems are an indispensable instrument to mitigate and adapt to GCC (e.g. the tropical forest ecosystem's capacity to store carbon dioxide and therefore contribute to reducing global warming). Moreover, a recent study by Pidgeon (2009)⁷ discusses how highly endangered coastal habitats (such as mangrove forest) are highly effective in sequestering carbon and locking it away in soil. Coastal habitats—such as mangroves, sea grasses, and salt marshes—sequester as much as 50 times the amount of carbon in their soil per hectare as tropical forest.

In addition to carbon sequestration, forest ecosystems provide protection from extreme weather and natural disasters, serve as fish nursery habitats and are an important source of food and income to local communities. This is particularly true in Bangladesh, where healthy mangrove ecosystems can sequester carbon, provide nurseries for fish and shrimp, help to adapt to the adverse impacts of global climate change, and are indispensable to secure local livelihoods. Upland tropical forests provide important services, such as regulating water and soil quality and quantity, which in turn provide further services needed for livelihoods and health, including agriculture, energy, and potable water. Because many of the poor and vulnerable in Bangladesh live in coastal, remote or ecologically fragile parts of the country, sound ecosystems management is indispensable.

Nevertheless, despite gains in some areas, environmental management and particularly 'ecosystem management' in Bangladesh suffer from a critical level of neglect. The existing national institutions vested with responsibility for natural resources management have not been able to deal with the ever increasing threats to natural ecosystems (i.e. loss of habitat, over harvesting of resources, decreasing productivity and natural disasters) and their underlying causes.

Moreover, addressing GCC requires an integrated approach, involving efficient coordination and implementation among different ministries and agencies, civil society and the private sector. There is an urgent need to strengthen the capacity of Government agencies⁸. Action to implement GCC mitigation and adaptation in Bangladesh not only brings a monumental challenge to government agencies but also to the private sector and the international community. In this context, the current lack of institutional credibility (e.g. effectiveness, transparency and accountability and effective control of corruption) is the most significant threat to the environment.

⁷ Emily Pidgeon. Carbon Sequestration by Coastal Marine Habitats: Important Missing Sinks. The Management of Natural Coastal Carbon Sinks. IUCN. 2009.

⁸ An ADB-GEF project was cancelled in 2005, due to capacity issues in the Forest sector in Bangladesh.

3. POLICIES, LAWS AND INSTITUTIONS

3.1 ENVIRONMENTAL AND NRM POLICIES

This chapter will mention only the major policies, laws and institutions. Further detail can be found in Annex 2. Since the early 1990s, policy statements have been developed for most sectors relevant to the environment, but these are general statements of intent and often no actions have been taken to achieve them; there is also an issue of how to harmonize and coordinate policies.

The **Environment Policy and Action Plan** (1992) covered pollution, agro-chemical control, industrial pollution, maintaining wetlands, fuel efficiency, forest and biodiversity conservation, food quality, and other issues. By naming over 80 government agencies and bodies to implement the plan, the document highlighted the problem of how to coordinate such a major cross-cutting issue. The subsequent **National Conservation Strategy** and **National Environmental Management Action Plan** (NEMAP) were more detailed and led to several projects.

The **National Fisheries Strategy** and **Inland Capture Fisheries Strategy** (2006) set out a framework for community management of inland fisheries based on leasing at nominal rates, widespread conservation measures, and precautionary development of aquaculture in floodplains. However, implementation of policies set by the Ministry of Fisheries and Livestock (MoFL) is largely dependent on the policies and practice of the land administration, which controls most water bodies (*jalmohals*). The **Jalmohal Management Policy** (2009) allows for fisher organizations to lease water bodies without competitive bidding, and mentions sanctuaries and swamp forest, but does not ensure secure tenure, requires current levels of lease payment, and leaves considerable space for elite capture.

3.2 ENVIRONMENTAL LAWS

Farooque and Hasan (1996) listed 185 laws having a bearing on the environment; only the key ones are discussed here. The laws and their provisions on paper are sufficient to enable biodiversity conservation, but implementation is limited by overlapping responsibilities, lack of resources, and the ability of those with influence to bypass the law.

The **Bangladesh Environmental Conservation Act** (1995) established the Department of Environment (DoE) and signaled a move towards ecosystem approaches and regulation of developments harmful to those ecosystems, particularly pollution control and mitigation and requirements for Environmental Impact Assessments. Under it, the **Environmental Protection Regulations** (1998) cover regulations, compliance and enforcement. The Act includes provisions for declaring Ecologically Critical Areas (ECAs) to restrict potentially harmful activities in these areas. Ten such areas have since been declared.

The **Forest Act** of 1927 sets the frame for forest management and vests considerable power in the hands of the Chief Conservator of Forests to determine the use of forest lands and to penalize illegal users. While allowing for designating use rights in forest for villages, the act does not give a role to neighboring communities in any decision making, including minority communities that often had use and settlement rights in forest areas or for civil society in general. The **Bangladesh Wildlife (Preservation) Order** of 1973 (later amended and gazetted as the Bangladesh Wildlife (Preservation)(Amendment) Act of 1974) is mainly concerned with regulating hunting but also sets out the scope for declaring protected areas as wildlife sanctuaries or national parks; notably, these are not limited to forests, nor is the Order limited to Forest Department implementation. New rules for management of Protected Areas (PAs) and for social forestry now under discussion should go a long way to institutionalizing the concept of co-management (see below).

The **Protection and Conservation of Fish Act**, 1950, and related **Protection and Conservation of Fish Rules**, 1985, which cover not only fish but also amphibians and aquatic reptiles, prohibit fishing by harmful methods, pollution and other activities detrimental to fisheries, and enable declaration of closed seasons and other rules. More recently, the **Conservation, Restoration and Filling Control Act** of 2003 aims to address problems of siltation, encroachment and pollution of surface waters (rivers, canals, *beels*⁹, floodplains) as well as aquifers.

3.3 INTERNATIONAL CONVENTIONS

Bangladesh has acceded to 27 international conventions and protocols related to environment and development. However, there is still considerable scope to mainstream their provisions. For global environmental concerns, the **United Nations Framework Convention on Climate Change** (UNFCCC or Agenda 21, 1992) and the **Kyoto Protocol** (1997) are the most significant, along with the **Montreal Protocol** on Substances that Deplete the Ozone Layer (1985).

In terms of biodiversity, the most relevant are the **Convention on Biological Diversity**, which has increased attention to biodiversity issues in various sector policy and strategy documents. Bangladesh has ratified the 1971 **Ramsar Convention** (Convention on Wetlands of International Importance, especially as Waterfowl Habitat) and designated two wetlands (Sundarbans and Tanguar Haor), which has strengthened conservation efforts there (and led to Tanguar being taken out of commercial leasing). However, a wider commitment to promoting wise use (sustainable management) of all wetlands has not been strongly followed up, since the convention is seen as an environment/DoE responsibility rather than a land and fisheries issue.

3.4 PRINCIPAL ENVIRONMENTAL INSTITUTIONS

The **Ministry of Environment and Forests** (MoEF), as with all ministries, is largely staffed by rotating administrators with little specialist knowledge. For this it is dependent on the departments under its authority. Nevertheless, MoEF has taken initiatives for a wide range of related policy and strategy statements covering climate change and environmental issues. The **Department of Environment** (DoE) was established only in 1995 and has responsibilities for assessing environmental impacts of new developments, for ensuring compliance with the various international treaties and conventions, for mainstreaming climate change issues, and for environmental protection in ECAs. It also undertakes some projects directly and with NGO partners (such as in Tanguar Haor and Sustainable Environment Management Program (SEMP)). Although DoE has suitably experienced staff, they are few in number and it lacks a presence even at the district level¹⁰. Hence it has insufficient capacity even to fulfill its primary function of controlling environmentally adverse development.

The **Forest Department** (FD) has a long history dating back to the 19th century and has direct control of all official forest lands through a substantial field staff. Its primary function and expertise is in production plantations, including mangrove afforestation, with wildlife conservation and protected areas only gaining significant recognition since the Nishorgo Support Project (NSP). Its strengths are its extensive presence and its responsibility to guard forest lands in its possession, but it is strongly authoritarian in outlook, with most field staff lacking skills or real interest in community participation. FD also has had a reputation for collusion with organized illegal loggers, as evidenced by the 2007 imprisonment of the then Chief Conservator of Forests¹¹.

⁹ Permanent floodplain lakes.

¹⁰ This will change in July 2010 when the staff of the DoE will nearly triple, allowing the formation of offices in 22 Districts.

¹¹ See also recent allegations at the Rema-Kalenga PA.

Under the **Ministry of Fisheries and Livestock** (MoFL), the **Department of Fisheries** (DoF) is responsible for fisheries management, including maintaining natural fish stocks. Its role here has been largely regulatory and has only taken up water body management activities through projects, including, in the last decade or more, community based approaches. However, most of its staff and efforts (and successes) have focused on aquaculture extension. A majority of its staff retain a bias towards production rather than sustainability of natural fish stocks and their ecosystems.

The **Ministry of Land** and **district administrations** control water bodies (*jalmohals*) which are leased out as a way of generating government revenue. While possessing great power over a vital component of Bangladesh's ecosystems, and being relatively efficient at administering these areas, these officials lack any focus on biodiversity conservation, sustainable management or fostering the participation of local communities.

Among the tens of thousands of **NGOs** which play a major role in overall development, several have been active in environmental campaigns. Also a limited number have experience in working with communities for fishery and wetland management, but experience working in forest co-management is much less and the base of experienced, capable staff is limited.

4. RECENT ACHIEVEMENTS AND CURRENT ISSUES

As indicated in the last chapter, awareness of environmental issues has been growing since about 1990 and several legal measures have been put in place to address environmental and NRM issues. The formation of what is now the DoE was a major step forward, although DoE has yet to reach its full potential.

Environment has also attracted the attention of Bangladesh's development partners, and numerous action plans, programs and projects have been launched to address almost all of the major issues. Implementation, however, has been difficult and results have often fallen short of expectations. Reasons include: unrealistic project targets; impractical project design; inadequate commitment of implementing agencies; cumbersome government procedures; lack of capacity within government agencies; limited participation by intended beneficiaries; unintended consequences; and systematic corruption in the principal government agencies.

4.1 RECENT ACHIEVEMENTS

Despite the constraints just mentioned, some solid achievements have been recorded:

- **Air pollution** – extension of natural gas distribution; removal of lead from gasoline; an increasing switch to Compressed Natural Gas (CNG) as vehicle fuel; conversion of “baby taxis” from 2-stroke to 4-stroke engines or CNG; and the planned reduction of pollution from brick kilns near Dhaka.
- **Water pollution** – planned waste water treatment for industrial effluents in Dhaka.
- **Urban Services** – continuing expansion of safe water supplies to the whole country; programs to switch to Arsenic-free drinking water sources; the GoB Total Sanitation Program; and ban on thin plastic bags.
- **Soils** – very limited pilot work on erosion reduction under MACH¹²
- **Floodplain fisheries** – Inland Capture Fisheries Strategy in 2006; development and consolidation of an effective model for community based co-management of floodplain fisheries under Community-Based Fisheries Management I (CBFM-1), CBFM-2, World Bank Fourth Fisheries, MACH and IPAC^{13,14}, which have increased incomes, equity and sustainability; other projects, such as the UNDP/Global Environment Facility (GEF) Coast and Wetlands Biodiversity Management Project (CWBMP); Swiss Development Cooperation (SDC)/International Union for the Conservation of Nature (IUCN) Community Based Sustainable Management of Tanguar Haor, International Fund for Agricultural Development (IFAD)/Local Government Engineering Department (LGED) Sunamganj Community Based Resource Management Project; and, gradual re-orientation of the DoF to a service function for fishers.
- **Forests and Protected Areas (PAs)** – gradual re-orientation of the Forest Department (FD) to working in cooperation with forest users through co-management; increase in number of PAs from 14 to 21; development of a co-management model that is showing some success in reducing illegal felling¹⁵; development of eco-tourism; a resurgence of interest in protecting the Sundarbans; efforts to expand social forestry; introduction of improved cooking stoves.

4.2 DEFICIENCIES AND GAPS

There have also been some retrograde steps. One was the cancellation in 2004 of the large ADB/GEF Sundarbans Project, due to disagreements over management and anti-corruption issues. Recently, the Ministry of Land issued a new order for leasing of floodplain water bodies that imposes burdensome

¹² Management of Aquatic Ecosystems through Community Husbandry (MACH), a USAID Project.

¹³ Integrated Protected Area Co-Management (IPAC), a USAID Project.

¹⁴ See Attachment B for a detailed description.

¹⁵ Nishorgo Support Project, a USAID Project.

procedures on Resource Management Organizations (RMOs) that want to take over *jalmohal* leases (details are given in Attachment B, Chapter 4.

As detailed in Attachment B, policies and laws in NRM are somewhat of a patchwork, with some laws going back more than 80 years. They need to be replaced with a consistent legal framework that reflects the present situation in Bangladesh, modern understandings of conservation needs, and the social needs of resource users. Financial planning is almost absent at every level, from setting budgets for the government agencies, to achieving financial self-sufficiency for the CMCs. In particular, the need for forests and flood plain water bodies to generate “revenue” for the government (which dates back to Moghul times) needs to be set aside.

The following environmental and NRM issues have not received adequate attention from GoB or the donor community:

- Solid waste in urban areas, large and small (there are some small-scale projects under SEMP and Waste Concern and plans from the European Union (EU) and German Technical Cooperation (GTZ));
- Hazardous and medical waste;
- Persistent Organic Pollutants (UNDP has initiated some work);
- Industrial air and water pollution, especially around Dhaka;
- Alternative energy from wind, solar or biomass sources (see below for USAID and WB work with Grameen Shakti, as well as GTZ plans);
- Afforestation/ reforestation programs (earlier, large-scale projects have not been continued);
- Coastal Zone Management, especially in relation to mitigating the impact of shrimp aquaculture;
- Regulation of brick kilns near forest PAs;
- Lack of a model for managing major wetland PAs, such as Ramsar sites;
- Marine ballast water collection and treatment; and
- Enforcement of environmental impact procedures (despite capacity building from Canadian International Development Agency (CIDA), enforcement remains haphazard and open to corruption)

Regarding global climate change, if well managed, reforestation and afforestation could play a significant role in GCC mitigation, and could mobilize a significant amount of funding. However, access to adaptation funding, as well as mitigation, requires a serious improvement of government agencies’ capacity to effectively manage forest which has been historically neglected. Key areas for improvement include: a) decreasing high rates of forest loss and degradation, b) protecting existing endangered forest ecosystems and c) restoring lost native forest ecosystems (coastal and inland) in and outside protected areas. Because of the social implications of reducing deforestation in Bangladesh, the introduction of Reduced Emissions from Deforestation and Forest Degradation (REDD)¹⁶ mechanisms is strategic and has the potential to qualify for carbon-financing¹⁷.

Although Bangladesh's contribution to the generation of greenhouse gases is miniscule, the GoB is committed to address emissions reduction; and there are expectations that emissions reductions can mobilize international carbon financing (which could be directed to improve inland and coastal forest management). The key enabling conditions for accessing carbon financing in Bangladesh are set out in Attachment B, Chapter 2. Achieving them will require sustained effort from the GoB, not least to convince the world that it is seriously engaged in reversing the historic trend of deforestation.

¹⁶ Reduced Emissions from Deforestation and Forest Degradation

¹⁷ Approaches that seek to achieve REDD using financial flows from developed countries in return for quantified greenhouse gas emission reductions generated by national-level actions in forest-rich developing countries.

Adaptation funding depends on donor-recipient relations and tends to be small, although multi donor funding may provide financial leverage, as with the Multi-Donor Trust Fund (MDTF)¹⁸ just set up in Bangladesh (managed by the World Bank). For the MDTF to succeed, it will be necessary that project proposals are rigorously reviewed for relevance (especially consistency with the BCCSAP), efficacy and efficiency, and subject to appropriate conditionality.

4.3 STAKEHOLDER PARTICIPATION

Like many Asian countries, Bangladesh has a tradition of top-down management, in which all-knowing government departments made decisions on behalf of the populations. However, with the growth of democracy, that tradition is beginning to give way to a more participatory approach. At an early stage, the NEMAP involved an extensive process of public consultations to identify priorities for addressing environmental problems and, in the CHT, a similar process was followed by UNDP in the late 1990s. The best developed examples of participation may be co-management of PAs and wetlands, pioneered in the MACH and Nishorgo Support Projects¹⁹. In the case of wetlands, Bangladesh has developed extensive experience and local successes in empowering and enabling local communities to manage more sustainably *beel* and floodplain fisheries and wetlands, through projects such as MACH, CBFM-2, and SEMP. For MACH, this consists of the formation of RMOs for each water body composed of fishers, together with local elites such as politicians, professionals and religious leaders. The presence of the latter provides some assurance that program benefits will not be captured by the unscrupulous. RMOs develop management plans for their water bodies, typically involving fish sanctuaries, closed seasons and bans on destructive fishing methods.

After establishment and strengthening, the RMOs are given the fishing lease for the water body, and the longer-established ones show good promise of being self-sustaining. Increases in fish production and incomes have been impressive. To support the fishers, and other rural poor, during the non-fishing season, Alternative Income Generation (AIG) activities have been promoted through a project micro-credit system, with considerable success. However, the community managed water bodies still remain islands of better practice. The major challenge for the RMO model is one of replication to the many floodplain areas which could benefit from it.

The participatory system for forest PAs is similar – the Co-Management Committee (CMC) has a combination of resource users (poor people living in or adjacent to the protected forest) and local elites, together with a local FD officer as Secretary. This is an unprecedented role for the FD, which traditionally has seen its role as one of control rather than cooperation. CMCs are now in place or in the process of formation for essentially all of Bangladesh's forest PAs. However, problems remain in strengthening the voice of the poor resource users in the CMCs. IPAC is planning to introduce a Village Forum at the village level, which would elect delegates to the CMC.

Management plans for the restoration of the PAs are being implemented. Community patrolling of parks has been shown to reduce illegal cutting substantially but is difficult to sustain in the absence of incentives for the patrollers. Unlike the flood plain fisheries situation, forest users do not benefit directly from sustainable resource management; in fact they face a loss of livelihood. Useful experience in AIG has been gained but the system has not yet been developed to meet the needs of populations in the tens of thousands. With the construction of visitor facilities and publicity campaigns, eco-tourism to the PAs is growing, which is leading to some employment and revenue for the CMCs but more needs to be done. A major advance was the recent decision by the government to allow CMCs to retain 50 percent of the entrance fees to the PAs. The major

¹⁸ The MDTF will have two funding windows: an 'on-budget window' for public sector projects and an 'off-budget window' for funding projects from the civil society. The MDTF has US\$98 million, including contributions from the UK (through DfID) of US\$ 96 Million¹⁸ and Denmark of US\$ 2 million.

¹⁹ Described more fully in Attachment B.

challenge for the forest PAs is to develop substantial systems of AIG, including social forestry, to compensate forest users for their loss of access to the park resources. An additional challenge is to develop CMCs as fully effective, democratic resource managers.

NGOs with a rural development focus are exceptionally strong in Bangladesh and several have been sub-contractors in the MACH, Nishorgo and IPAC teams. The modalities of greater and more long-term NGO involvement need to be urgently explored. Partnership with private industry, mainly in eco-tourism, has made a promising start.

4.4 PUBLIC AWARENESS

Given that, for many Bangladeshis, daily survival is their principal concern, it is not surprising that environmental awareness is not widespread. However, it has been shown in many countries that governments only act on environmental and NRM issues when there is a buildup of pressure for change from the public. In this case, the relevant public is the growing middle class in the major cities, together with the press, who are conversant with the health and economic damage caused by pollution and the actions that other countries have taken with respect to these issues. Nishorgo and, now, IPAC have made considerable efforts to educate the middle class about NRM issues. There has been a rapid growth in the number of visitors to protected areas in recent years, indicating a large potential among an increasingly urban population to support conservation. The private sector has also taken some interest through sponsoring activities under NSP and making use of biodiversity and forest images. Co-management organizations have also begun to improve the awareness of resource users about the consequences of continued over-exploitation of natural resources. However, a great deal remains to be done in public awareness at all levels and on all issues and this should be a priority in any environmental or NRM project.

4.5 CAPACITY BUILDING NEEDS

Environment is a dynamic sector in Bangladesh where capacity building is a critical need and it is a continuous process. The legal framework in Bangladesh is minimally adequate, but the lack of infrastructure, trained manpower and insufficient participation of local communities challenge the sound management of environment and biodiversity, including PAs.

In recent years, establishment of the Department of Environment was the most significant development in the country's institutional capacity. In the Forest Department, the new Wildlife and Nature Conservation Circle is another important development. Some forest PAs (but not yet a majority) are now managed by this Circle. This has opened an opportunity to execute new management systems in the PAs and reserve forests. The formation of co-management bodies in most forest PAs and some wetland sites has greatly enhanced public participation. Training programs under Nishorgo, MACH and IPAC have helped develop the personal skills and capabilities of the people living around the PAs. In order to sustain the development in the environment sector, future capacity building should aim to:

- Restructure the government departments - DoE, FD and DoF - and introduce rules and procedures which facilitate their objectives in a 21st century context and eliminate corrupt behavior;
- Establish district offices of the DoE;
- Establish a management system for Ecologically Critical Areas;
- Recruit and provide a career path for staff from all relevant disciplines for the government agencies: e.g. economics, law, wildlife management, anthropology, rural development;
- Provide specialized training for the relevant Government officials and NGO staff; and
- Expand training for the local communities in new livelihood possibilities, in order to develop AIG.

Among the most important of these needs is the minimization of corrupt behavior (further explored in Attachment C, Annex 1, Brief F-4). Corrupt practices drive much of the non-sustainable behavior today and have frustrated previous reform efforts. The ambitious goals of the GoB, especially with respect to climate change adaptation, will not be achieved unless rent seeking behavior can be replaced by positive incentives to government staff.

5. CURRENT AND PROPOSED ENVIRONMENT, NRM, AND CLIMATE CHANGE-RELATED PROGRAMS

5.1 GOB PROGRAMS

Despite the country's recent moderately high economic growth, tax collections remains at a low 16 percent of GDP and the government remains highly dependent on its development partners for development expenditures. Therefore, examples of programs that are entirely government funded are few: the Total Sanitation Program is a rare example. However, change may be coming, as witnessed by the newly established fund of \$100 million equivalent for GCC adaptation.

5.2 DONOR PROGRAMS

Donor programs and projects are numerous and this section will only attempt to mention the major and more recent ones.

USAID

Projects MACH, Nishorgo and IPAC have been briefly summarized in the previous chapter. Together, they represent a USD 40 million investment in NRM. In addition USAID was also instrumental in setting up the Arannayk Foundation (AF) for tropical forest conservation, which is funded through a debt for nature swap. AF (described more fully in Report #5) has begun a program of pilot projects and project support. USAID has numerous other programs which directly or indirectly contribute to environmental conservation and climate change mitigation and adaptation (Table 1).

Table 1: Environmental and Climate Change Impacts of Other USAID Programs

Program	Environmental Impact	Climate Change Impact
Health and family planning	Reduced population pressure	Reduced population pressure
Strengthening of local government	Better support to co-management	Better disaster preparedness and response
Transparency and anti-corruption	Better support to co-management	Better disaster preparedness and response
Gender equality	Better support to co-management	
Rural electrification	Less reliance on dirty fuels Better AIG opportunities	Reduced carbon emissions by substituting gas for fuelwood
Renewable energy - solar	Less reliance on dirty fuels Better AIG opportunities	Reduced carbon emissions
Food for local development (PL 480)	Better AIG opportunities	Better disaster preparedness and response
Cyclone shelters		Better disaster preparedness and response
Disaster response systems		Better disaster preparedness and response
Education	Improved public awareness	Improved public awareness

Source: USAID/ Bangladesh website.

World Bank

Since publishing its Country Environmental Analysis in 2006, the WB has completed its Fourth Fisheries Project, which had a major emphasis on floodplain fisheries, included a GEF component on aquatic biodiversity (as well as major co-financing from DfID) and supported the development of the Inland Capture Fisheries Strategy (with support from MACH). While the project did emphasize community-based management, the institutions established through the DoF were not as effective as those of MACH and project outputs fell below expectations and were rated *Moderately Satisfactory*.

The WB has not supported the forestry sub-sector in recent years. An earlier Forest Resources Management Project which supported a community-based approach to upland and mangrove forest replanting was rated *Satisfactory* on completion. It is currently identifying assistance to the Sundarbans, focusing on community level infrastructure and AIG in the landscape zone to complement USAID's IPAC and the European Union's Sundarbans Environment and Livelihood Security (SEALS) projects. A one-year study will be the first step.

The WB has been active in the provision of water and sewerage to Dhaka and Chittagong since the 1960s and is planning to add industrial effluent control under the Dhaka Environment and Water Program Project (about \$60 million), which will also build regulatory capacity. An Arsenic Mitigation Water Supply Project was rated *Moderately Satisfactory* on completion. The Water Management Improvement Project is expected to improve the operation of drainage and flood control projects through community management and strengthening of the government agencies concerned.

The recently approved Clean Air and Sustainable Management Project supports improved traffic management in Dhaka and reduction of emissions from brick kilns. The earlier Air Quality Project successfully phased out the use of two-stroke engines in "baby taxis" in Dhaka. The WB is also supporting solar energy in rural areas.

Lessons learned from an Embankments Rehabilitation Project, which was rated *Moderately Satisfactory* and *Unlikely* to be sustained, were incorporated into the ongoing Emergency 2007 Cyclone Recovery and Restoration Project, which is seen as the first phase of a 15 year program of disaster risk reduction. It includes rebuilding of embankments and shelters, restoration of the agriculture sector, and disaster risk management. Another major project for coastal embankments is under preparation.

A project for Rivers Information and Conservation will emphasize hydrology and strengthening the Bangladesh Water Development Board (BWRB). A Livestock and Fisheries Project is under preparation that reportedly will include floodplain fisheries, through scaling up of the MACH co-management approach.

A major preoccupation for the WB in the near future will be the MDTF, for which it is the implementing agency. A secretariat is being established. DfID, EU, Denmark and Sweden have already pledged contributions and other donors are expected to join. The MDTF is a vehicle for implementing the BCCSAP's six pillars: food security, social safety and health, comprehensive disaster management, infrastructure; research and knowledge management; mitigation and a low carbon development and capacity building. The MDTF will apply the "Paris principles" of ownership, harmonization, rationalization, predictability and mutual accountability; and the GoB has also set a Climate Change Fund to support the implementation of the BCCSAP.

In addition, Bangladesh will also benefit to the tune of \$50 million from a global Pilot Program for Climate Resilience (PPCR) being managed by the bank's headquarters. The PPCR will have two phases: technical assistance and investment. The WB and ADB are making a joint effort to identify suitable projects.

Asian Development Bank (ADB)

ADB has also had a long association with provision of water supply and sewerage services in major cities – Dhaka, Chittagong and Khulna. An earlier project in small-scale water resources development, which incorporates community-based management was rated *Successful* and a new project is planned.

A flood damage rehabilitation project, following the floods of 1998, was rated *Successful* but *Less likely* on sustainability, with concerns about corruption. On that front, the ADB has funded the strengthening of the Anti-Corruption Commission but remains dissatisfied with its powers. A Disaster Risk Management operation is planned for 2011.

ADB is planning a Clean Fuel Sector Development Program to expand the distribution of natural gas. A year ago, it also prepared a Climate Change Implementation Plan and is participating, with the WB, in the PPCR, with an emphasis on energy, agriculture and urban issues. ADB will not contribute to the MDTF but will help Bangladesh to access the fund.

The ADB has completed a first project of \$30 million for all three districts of the Chittagong Hill Tracts and is planning a second phase. The approach includes rural infrastructure, livelihood support and institutional strengthening but not – it appears – NRM interventions, like reforestation, erosion control or water management.

Following a *successful* project with the FD on social forestry, the ADB, in 1998, planned a large, ambitious and complex project to safeguard biodiversity, develop FD capacity and support livelihoods in and around the Sundarbans. However, the innovative management approaches promoted by ADB were not welcomed by the FD and financial irregularities were not addressed promptly²⁰. ADB suspended disbursements on the loan and gave the government some time to address the problems but was not satisfied with those efforts and cancelled the project after about 25 percent of the funds, which included a GEF grant, were disbursed. The project was rated *Unsuccessful*, with sustainability rated *Unlikely*, and the performance of both the borrower and ADB rated *Unsatisfactory*. This experience appears to be still inhibiting ADB from close involvement in NRM issues.

United Nations Development Programme (UNDP)

UNDP has been a major supporter of GCC capacity building in Bangladesh and has funded several strategy papers and action plans and expects to have substantial funding for adaptation. On mitigation it has supported conversion of baby taxis to CNG and improved technology at brickfields.

Its flagship environmental project has been the Coast and Wetlands Biodiversity Management Project (CWBMP), which targeted the coastline between Sonadia and St. Martin's Islands in the south-east and Hakaluki Haor in the north-east, both ECAs. That project will end in 2010 and the work in the south-east will be continued under the umbrella of a new, joint UN Development Assistance Framework, centered on assisting the Rohingya refugees from Burma. However, it is not clear the extent to which the ECA objectives will be pursued. No further UNDP assistance for Hakaluki is planned but it has been placed under IPAC's northeast cluster. A new UNDP program of mangrove afforestation has just been announced.

UNDP is beginning a new phase in its CHT Program, which emphasizes capacity building, education, health and economic development but not NRM issues.

A project with the Ministry of Land includes development of zoning laws and village development.

²⁰ See Attachment B and ADB's Validation Report for a fuller account of what went wrong and the lessons learned.

European Union (EU)

The EU has allocated 10 percent of its 2007-13 program for environment and disaster management and intends to mainstream environmental considerations into all its assistance. It has recently pledged Euro 10 million for the Sundarbans Environment and Living Security (SEALS) Project, to be implemented in close coordination with IPAC and to start in July 2010. This will include support to the FD to improve its management of the forest resources and also AIG funding (through NGOs) for the landscape zone. Other projects include municipal waste management and solar energy.

The EU has made a major commitment of Euro 83 million to the MDTF, to be available for anything in the government's strategy. Its future program is likely to focus on disaster management, including ship breaking and the urban environment.

UK Department of International Development (DfID)

Environmental concerns are a cross-cutting theme in DfID's country portfolio. Global climate change is an increasingly prominent feature of the portfolio and in their cooperation and coordination with other donors, with the Bangladesh Rural Advancement Committee currently being the primary local partner. In addition to supporting Bangladesh's development of a climate change strategy and action plan, they are cooperating with UNDP and Sweden regarding development of community risk reduction measures, with UNDP/UN Habitat regarding urban slum issues (with the main focus being on environmental risk reduction), with NGOs regarding sustainable livelihoods development, including a *char* livelihoods program (for vulnerable populations on recently accreted islands) and with the government regarding the development of climate change indicators. Government capacity to respond to climate change is currently very limited, but discussions are ongoing as to how to improve this situation. Government is setting up new structures and DfID's approach will be to support these structures (the entry point being disaster management) rather than providing fragmented support to individual projects. Climate change and related programs in Bangladesh are expected to attract several hundred million dollars in donor funding over the next 5 to 6 years.

Canadian International Development Agency (CIDA)

CIDA has funded two projects since 2000 to build the capacity of DoE, focusing on training, IT and other equipment, and demonstration projects. It worked actively on the CNG conversion and plastic bag issues. CIDA agrees that further work is needed to make DoE fully effective but does not expect to have any further funding for such a program, or in environment and GCC generally.

Gesellschaft für Technische Zusammenarbeit (GTZ)

GTZ focuses on governance, health and energy, with some innovative projects for solar, efficient lighting, solid waste with methane collection, and improvement of rice mill boilers. A project on wetland protection has just started and a Euro 2.5 million project for reforestation in the Chunati PA is about to do so. This will be implemented through the FD and other bodies.

Other Donors

Denmark has made a modest contribution of \$1.8 million to the MDTF but expects to contribute more once the fund is operational. It is also co-financing UNDP's CHT and agriculture projects and has a fisheries project with DoF. The Swiss Development Corporation (SDC) is supporting the Tanguar Haor wetland project. The Organization of the Islamic Council has agreed to finance a marine fisheries research vessel. The International Fund for Agricultural Development is funding a major floodplain fisheries project (Sunamganj Community Based Resource Management Project) through the Local Government Engineering Department. With completion of the CWBMP next year, GEF will have no ongoing biodiversity projects in Bangladesh.

However, the GEF Secretariat did indicate to the Assessment Team that it was interested in resuming support to Bangladesh in biodiversity and that GEF had had favorable experience in establishing ecological funds in many countries (see Report #5). In addition, GEF allocates about \$250 million per year worldwide for GCC, as well as about \$150 million per year for biodiversity. In recent years, Bangladesh has not been very proactive in applying for these funds.

6. OPTIONS FOR USAID CONSIDERATION

6.1 GAPS IN CURRENT AND PROPOSED PROGRAMS

The list of program “gaps” in Chapter 4 may be reorganized as follows:

Major National or Regional Programs:

- Solid waste in urban areas, large and small
- Industrial air and water pollution
- Alternative energy from wind, solar²¹ or biomass sources
- Afforestation/ reforestation programs emphasizing assisted natural regeneration
- Coastal Zone Management, especially in relation to the environmental damage from shrimp aquaculture
- Developing a model for wetland PAs, such as Ramsar sites

Smaller or Niche Projects – could be components of a larger program:

- Hazardous and medical waste
- Persistent Organic Pollutants
- Regulation of brick kilns near forest PAs
- Marine ballast water collection and treatment
- Enforcement of environmental impact procedures

6.2 USAID’S COMPARATIVE ADVANTAGE

USAID has had a long association with Bangladesh and is fully familiar with the economic, political, cultural and social context of its assistance. It is also familiar with the constraints on successful program implementation, especially archaic and cumbersome government procedures and systematic corruption. In addition to NRM support, USAID’s current program is particularly strong in health, education, disaster management and local development, all of which may have a role in a possible future NRM/GCC program.

As a grant donor, USAID has more control over the expenditure of its funds than a lending institution and can design mechanisms that depend on implementation outside the government system, for example, through NGOs and possibly (in the future) on public-private partnerships. It is active in the new era of donor cooperation in Bangladesh, a fact which may be crucial in the design of projects which effectively harness USAID grant assistance for TA, training and capacity building with investment funds from a loan or grant source. This is already starting in the Sundarbans and Chunati National Park.

USAID’s experience also equips it to undertake projects in complex social environments, through its emphasis on participatory management and community-driven development.

²¹ USAID already has a successful program in this area, which could be expanded.

6.3 SELECTION CRITERIA

The Assessment Team proposes that the following list of selection criteria be refined and then used by USAID, in consultation with the GoB, to choose priorities for its future program.

- Priority for Bangladesh, as indicated in GoB policy papers and strategies
- Compatibility with US Government criteria for various programs
- Potentially significant (and measurable) impacts on natural resources conservation and/or climate change mitigation or adaptation, as well as on economic and social well-being of the population
- Support to democracy and governance objectives
- Building on past successes and lessons learned
- Filling of gaps and avoidance of overlaps with other ongoing or planned GoB or donor programs
- External support needs that are oriented more to technical assistance, with capital investments in a supporting role or supplied by others
- Costs that are comparable with the likely availability of funds

6.4 OVERALL STRATEGY

The Assessment Team recommends that the **Core** of USAID’s work on environmental, NRM and GCC issues continue to be in the NRM area, with continued emphasis on biodiversity and forests/PAs and floodplain fisheries. These programs have made a sound start under MACH and Nishorgo, which is now being consolidated and expanded under IPAC; they have already shown results in terms of effective co-management, better conservation of biodiversity and improved livelihoods for resource users, although the forest areas still have a fairly long way to go in all these aspects. The Team suggests that Core support be continued through the following two proposals, which may well be combined for ease of operation:

Replication of the MACH Model

For wetlands, the Team suggests that USAID direct its efforts at expanding the successful MACH model (or variants thereon) to other parts of the country, in a measured and phased way and in close cooperation with other development partners, like the WB, which may have major investment funds.

Continued Support to Forest PA Co-Management

The model for forest PAs is now being applied to nearly all the PAs in the country but work will be needed for several years to ensure its sustainability and to identify additional opportunities for developing the economic potential of PAs to benefit the poor. While some of the longer established CMCs may be ready to “graduate” from external support by the end of the IPAC project period, the newer ones assuredly will not and thus further assistance to them should be considered.

Attachment B gives a more detailed description of what could be planned in these two **core areas**.

The following sections assess the potential of other possible areas of assistance, some in NRM, some not.

6.5 OTHER OPTIONS FOR USAID CONSIDERATION

The assessment team proposes the following program options for USAID considerations. Some might be considered components of larger projects. A very brief description is provided, with more details in Attachment C. An NRM focus is shown with a + and a climate change focus with a *.

Foundational Programs

NRM Policy Development+

Although policies are generally satisfactory for floodplain fisheries, PA development is being handled through a series of “patches” to older laws, such as the recent Government Order on Co-Management and the forthcoming PA Rules and Social Forestry Rules. The time is coming when a new law on protected area management – going beyond the forest sector – will be needed. At the site level, more work on PA financial planning and AIG business planning is needed.

Representative PA System Development and Database+

This would be a “gaps analysis” of endangered ecosystems and species and the adequacy of the present PA system to protect them; additional or expanded PAs might be recommended. A database of information on ecosystems and species would be established, including maps and inventories.

Public Awareness+*

Public awareness is fundamental to any successful environmental program. This might be incorporated into each program or considered as a stand-alone effort. All levels could be considered: schools; PA dependent people; officials; middle class citizens.

Capacity Building of Three Departments – Forest, Fisheries & Environment+*

This would need to be a thoroughgoing effort looking at structure, personnel policies, recruitment and promotion policies and remuneration. However, it would be fundamental not only to the success of USAID’s future program but to other climate change and NRM donors as well.

Research Partnership on Global Climate Change*

This would harness the skills of major US and Bangladeshi universities on critical knowledge gaps in climate change and adaption needs.

NRM Programs

Full-Scale Approach to AIG for Forest PAs+

This would address the problem of the small scale of AIG efforts up to now by taking a macro approach – calculating the amount of investment needed to raise landscape zone incomes to the level needed to replace income from the PA and then putting together a package tapping into all sources: CMCs; national and local government programs; major NGO own funds; private sector and the project itself.

National Reforestation/ Social Forestry Program+*

Subject to the findings of the January team, this would re-activate national reforestation programs, possibly using carbon credits, at a variety of sites – PAs, reserved forest, other forests, community and homestead forests, coastal land and *chars* – with a balance of short and long rotation species and a bias to native species and assisted natural regeneration of natural forest. Wherever possible, local communities would be involved through co-management or social forestry models. The pre-conditions for obtaining REDD funding are set out in Attachment B, Section 2.1 Perhaps the most challenging will be to establish the *credibility* of Bangladesh – that forests established for carbon sequestration are not prematurely harvested.

Coastal Zone Program+*

Described in more detail in Annex 4, this concept envisages a comprehensive approach to environmental and disaster management in the coastal zone. Core activities could include reforestation (with potential for REDD or other carbon financing), marine fisheries and sanctuaries, and mitigation of environmental damage from shrimp cultivation. Co-management would be used.

CHT Watershed Management+

Existing programs of ADB and UNDP do not include NRM – forests, soils and water. A watershed management approach could be overlaid on existing project sites or elsewhere.

GCC and Other Programs

Industrial Air and Water Pollution

A model for addressing pollution in industrial hotspots is being tested by the WB but there are many places that need it, including some adjacent to PAs. This might lend itself to a public-private partnership approach, for example, through the World Environment Center in New York.

Alternative Energy Program – wind, solar, biomass, maybe gas distribution+*

A set of pilot projects is proposed, primarily at the village level. Extension of the gas pipeline to Teknaf might also be studied.

Rural Solid Waste*

Given the magnitude of this problem, a strategic approach would be needed. Programs should include: collection; sorting; recycling; disposal through engineered landfills; and methane recovery. USAID's comparative advantage may suggest a focus on rural areas.

ANNEX I: POWERPOINT SUMMARY



BANGLADESH ENVIRONMENTAL SECTOR ASSESSMENT AND STRATEGIC ANALYSIS

Assessment of Overall Development Needs for the Environment Sector

Presentation to Bangladesh Donors



Peter Whitford

December 17, 2009



TEAM MEMBERS

- Peter Whitford – Team Leader
- Marlon Flores – E & GCC Specialist
- Richard Salter – International Biodiversity Specialist
- Parvin Sultana – Environmental Policy & Institutions Expert
- Khairul Alam – Biodiversity Expert, Flora
- Monirul Khan – Biodiversity Expert, Fauna



 **USAID | BANGLADESH**
FROM THE AMERICAN PEOPLE
**BANGLADESH ENVIRONMENT SECTOR ASSESSMENT
AND STRATEGIC ANALYSIS**

- Objectives
- Scope
- Methodology



 **USAID | BANGLADESH**
FROM THE AMERICAN PEOPLE

SITE VISITS

- Cox's Bazar
- Srimangal/ Sylhet/ Sunamganj
- Chittagong Hill Tracts
- Sundarbans





Persons Met

USAID Washington and Dhaka
Minister EF, Secretaries, DGs
Donors – WB, ADB, UNDP, EU, DfID, GTZ,
CIDA, Denmark,
IPAC HQ and field staff
Arannayk Foundation
RMOs, CMCs, affiliates
Forest users, fishers...



OBSERVATIONS

- Co-management
- Forestry and Wetlands Issues
- Environment Issues





CLIMATE CHANGE (1)

- Reform: structural, policy, program and project-level**
- Alternative income for forest users**
- Compensation for negative impact of avoided DD**
- Reference scenarios and performance measures for REDD**
- Operational scale for REDD (PAs, buffer zones, wider landscapes)**
- Monitoring systems for REDD**
- Information and communication mechanisms**



CLIMATE CHANGE (2)

- Rigorous enforcement**
- Eliminate perverse incentives**
- Standards for carbon rights allocations**
- Pro-poor process standards**
- Diversification of funding sources**
- Conditionality in donor-based funding**



RECENT ACHIEVEMENTS – ENABLING CONDITIONS

- Air Pollution
- Urban Services
- Wetlands Conservation
- Forests and PAs



DISABLING CONDITIONS

Policies

Priority – budget

Institutional structures and capacity

Archaic approval procedures

Corruption



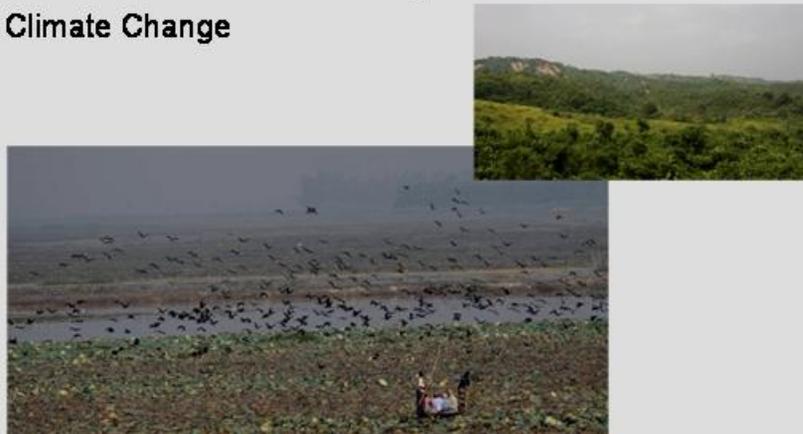
PROGRAM GAPS

- Water Pollution
- Solid Waste
- Soils Management
- Alternative Energy
- Extension of Wetland Models
- Coastal Zone Management



USAID PROGRAM FOCUS

- Natural Resources Co-Management
- Climate Change





USAID PROGRAM OPTIONS (1)

- Representative PA System Development and Database
- PA Financing and Business Plans
- Public Awareness
- Capacity Building of Three Departments – Forest, Fisheries & Environment
- Research Partnership on Climate



USAID PROGRAM OPTIONS (2)

- Full-Scale Approach to AIG for Forest PAs
- National Reforestation/ Social Forestry Program for CC Mitigation and Adaptation
- Coastal Zone Program
- CHT Watershed Management



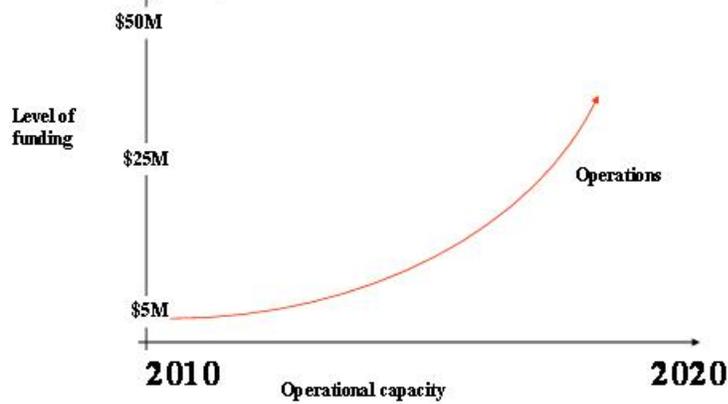


USAID PROGRAM OPTIONS (3)

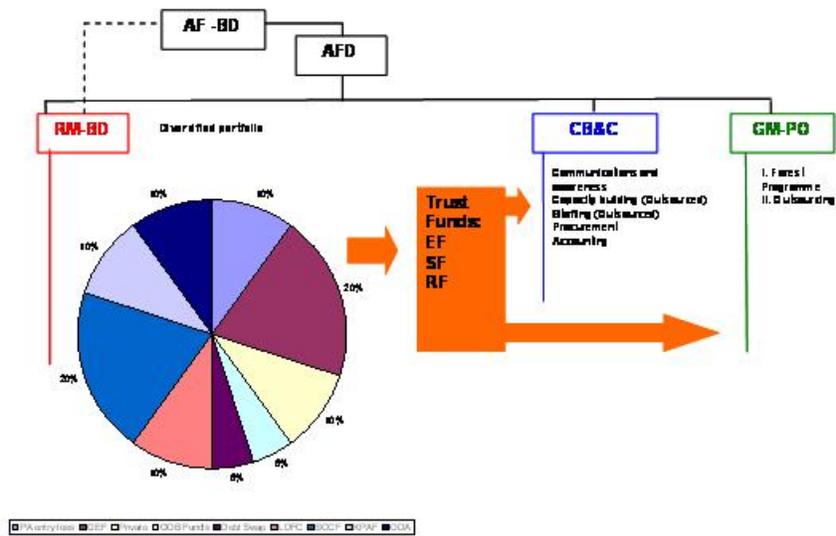
- Industrial Air and Water Pollution
- Alternative Energy Program – wind, solar, biomass, maybe gas distribution
- Solid Waste



Funding = Operations



Finance Fund-Plus Model (Financing)



OTHER CONSIDERATIONS

- Support from other USAID programs
- Donor cooperation
- International cooperation
- Feasibility studies
- Demonstrating government commitment

ANNEX 2: ENVIRONMENTAL POLICIES, LAWS AND INSTITUTIONS

Policies

Since the early 1990s, policy statements have been developed for most sectors relevant to the environment, but these are general statements of intent and often actions have not been taken to achieve them; there is also an issue of how to harmonize and coordinate policies.

The **Environment Policy and Action Plan** (1992) were wide ranging, covering agro-chemical control, industrial pollution, maintaining wetlands, fuel efficiency, forest and biodiversity conservation, food quality, and other issues. By naming over 80 government agencies and bodies to implement the plan, it highlighted the problem of how to coordinate such a major cross-cutting issue. The subsequent **National Conservation Strategy** and **National Environmental Management Action Plan** (NEMAP) were more detailed and led to several projects in specific sites.

The **National Fisheries Policy** (1998) focused on fish production and poverty reduction, but included an objective of conserving biodiversity and conserving inland open water bodies. It is now superseded by the **National Fisheries Strategy** (2006), which sets out a framework for community management of inland fisheries based on leasing at nominal rates, widespread conservation measures, and precautionary development of aquaculture in floodplains. However, implementation of policies set by the Ministry of Fisheries and Livestock is largely dependent on the policies and practice of the land administration which controls most water bodies (*jalmohals*). The most recent **Jalmohal Management Policy** (2009) allows for fisher organizations to lease water bodies without competitive bidding, and mentions sanctuaries and swamp forest, but does not ensure secure tenure, requires current levels of lease payment, and leaves considerable space for potential influences on who gains control of fisheries.

Other relevant policies include the **National Water Policy** (1999), which stresses river basin management, water rights and environmental considerations, and the **Agriculture Policy**, which puts emphasis on increased irrigation from surface water sources (wetlands), without considering the impact on aquatic biodiversity. The **Land Use Policy** (2001) identifies issues of water body loss and degradation, emphasizes the need to harmonize policies, and the need to address deforestation and land degradation in terrestrial ecosystems. The **Tourism Policy** (1992) focuses on generating foreign exchange by developing infrastructure, including in the natural environment through, for example, safari parks. It does not lay any special emphasis on eco-tourism or achieving compromise between the needs of increasing numbers of visitors to environmentally important but sensitive areas and biodiversity conservation.

Key Laws

Farooque and Hasan (1996) listed 185 laws having a bearing on the environment; only the key ones are discussed here. In several areas, there has been a lack of updating to fit with changes in policy and best practices. The laws and their provisions on paper are sufficient to enable biodiversity conservation, but implementation is limited by overlapping responsibilities, lack of resources, and the ability of those with influence to bypass the law.

The **Bangladesh Wildlife (Preservation) Order**, 1973 is mainly concerned with regulating hunting to a limited schedule of species for permit holders (although this includes one globally threatened species), it also sets out the scope for declaring protected areas as wildlife sanctuaries or national parks, notably these are not limited to forests nor is the act (order) limited to Forest Department implementation.

The **Protection and Conservation of Fish Act**, 1950 and related **Protection and Conservation of Fish Rules**, 1985, which cover not only fish but also amphibians and aquatic reptiles, prohibit fishing by harmful methods, pollution and other activities detrimental to fisheries, and enable the declaration of closed seasons and other rules.

The **Forest Act** 1927 gives the department sweeping powers to manage and protect forests, including taking over “waste land”, regulating shifting cultivation and assigning rights in forests to villages. The **Private Forests Ordinance** 1959 requires owners of private forests to develop working plans (implying a prohibition on private forest conservation) and empowers the Forest Department to take over land that is not cultivated for three years and is suitable for trees.

The **Bangladesh Environmental Conservation Act** (1995) established the Department of Environment and signaled a move towards ecosystem approaches and regulation of developments harmful to those ecosystems particularly pollution control and mitigation and requirements for Environmental Impact Assessments. Under it, the **Environmental Protection Regulations** (1998) cover regulations, compliance and enforcement. The Act includes provisions for declaring Ecologically Critical Areas to restrict potentially harmful activities in these areas. The **Environmental Court Act**, 2000 (amended 2002) provides for the establishment of one or more Environmental Courts, primarily in every Division, to deal with offences under the Environment Conservation Act and subsequent rules.

More recently the **Conservation, Restoration and Filling Control Act** of 2003 aims to address problems of siltation, encroachment and pollution of surface waters (rivers, canals, *beels*, floodplains) as well as aquifers.

International Conventions

Bangladesh has signed, ratified, and acceded to 27 international conventions and protocols related to environment and development. However, there is still considerable work needed to mainstream their provisions. Considering global environmental concerns the **United Nations Framework Convention on Climate Change** (UNFCCC or Agenda 21, 1992) and the **Kyoto Protocol** (1997) are probably the most significant, along with the **Montreal Protocol on Substances that Deplete the Ozone Layer** (1985).

In terms of biodiversity, the most relevant are the **Convention on Biological Diversity** (CBD), which has increased attention to biodiversity issues in various sector policy and strategy documents. Bangladesh has ratified the 1971 **Ramsar Convention (Convention on Wetlands of International Importance, especially as Waterfowl Habitat)** and designated two wetlands (Sundarbans and Tanguar Haor), which has strengthened conservation efforts there (and led to Tanguar being taken out of commercial leasing). However, a wider commitment to promoting wise use (sustainable management) of all wetlands has not been strongly followed up, since the convention is seen as an environment/DoE responsibility rather than a land and fisheries issue.

Other relevant conventions include:

- the 1972 Convention concerning the **Protection of World Cultural and Natural Heritage**, under which parts of the Sundarbans are designated as a “World Heritage Site”;
- the **Convention on International Trade in Endangered Species of Wild Fauna and Flora** (CITES) which has helped limit former exports of wildlife; and
- the **Convention on Migratory Species** which could strengthen conservation of several groups including marine turtles and water birds.

Principal Environmental Institutions

The **Ministry of Environment and Forests** (MOEF), as with all ministries, is largely staffed by rotating administrators with little specialist knowledge or this it is dependent on the departments under its authority. However, it has taken initiatives for a wide range of related policy and strategy statements covering global climate change and environmental issues.

The **Department of Environment** (DoE) was only established in 1995 and has responsibilities for assessing environmental impacts of new developments and clearing these (or not), for ensuring compliance with the various international treaties and conventions, for mainstreaming climate change issues, and for environmental protection in ECAs. It also undertakes some projects directly and with NGO partners (such as in Tanguar Haor and SEMP). Although DoE has suitably experienced staff, they are few in number and it lacks a presence even in each district²². Hence it has insufficient capacity to even fulfill its primary function of controlling environmentally adverse development. Moreover, it lacks a professional “cadre” which limits staff recruitment and promotion. Its managers are drawn from the generalist Administrative cadre, which further dampens staff morale.

The **Forest Department** (FD) has a long history dating back to the 19th century and has direct control of all official forest lands through a substantial field staff. Its primary function and expertise is in production plantations, including mangrove afforestation, with wildlife conservation and protected areas only gaining significant recognition since 2000. Its strengths are its extensive staff and ability to guard forest lands in its possession, but it is strongly authoritarian in outlook with most field staff lacking skills or real interest in participatory management, even though that is now FD policy. It also has had a reputation for collusion with organized illegal loggers, as evidenced by the 2007 imprisonment of the then Chief Conservator of Forests.

Under the **Ministry of Fisheries and Livestock** (MoFL), the **Department of Fisheries** (DoF) is responsible for fisheries management, including maintaining natural fish stocks. Its role here has been largely regulatory, but it lacks any direct means to achieve this, since oversight of water body management is with the **Ministry of Land**, and DoF has only taken up activities through projects, including, in the last decade or more, community based approaches. However, most of its staff, effort, and successes, have focused on aquaculture extension – promoting carp polyculture in private ponds, and to a lesser extent technical and quality control support to brackish water shrimp farming. Ultimately, a majority of its staff retain a bias towards production rather than sustainability of natural fish stocks and their ecosystems.

The **Ministry of Land** and **district administrations** control water bodies (*jalmobals*), which are leased out as a way of generating government revenue. While possessing great power over a vital component of the Bangladesh’s ecosystems, and being relatively efficient at administering these areas, they lack any focus on biodiversity conservation, sustainable management or fostering participation of local communities.

Among the tens of thousands of NGOs which play a major role in overall development, several have been active in environmental campaigns. Also, a limited number have experience in working with communities for fishery and wetland management, but experience working in forest co-management is much less and the base of experienced capable staff is limited.

Public Awareness and Participation

Since the early 1990s, public participation and awareness on environmental issues have grown considerably in Bangladesh. At an early stage, the NEMAP involved an extensive process of public consultations to identify priorities for addressing environmental problems, and in the Chittagong Hill Tracts a similar process was

²² This will change in July 2010 when the staff of the DoE will nearly triple, allowing the formation of offices in 22 Districts.

followed by UNDP in the late 1990s. Also in the early 1990s, much of the criticisms of the Flood Action Plan focused on adverse environmental impacts of embankments, and on the need for public participation in projects.

Since the mid 1990s, Bangladesh has developed extensive experience and local successes in empowering and enabling local communities to manage more sustainably *beel* and floodplain fisheries and wetlands through projects such as MACH, CBFM-2, and SEMP. Through Nishorgo and IPAC, participatory co-management has been extended to forest protected areas. However, the community managed water bodies still remain islands of better practice while the majority of water bodies are leased for revenue by the land administration to fisher cooperatives and individuals without ensuring active participation of poor fishers or sustainable management plans for wetland resources. Moreover, the latest *jalmohal* policy developed by Ministry of Land lacked any process of public consultation or debate.

Awareness and civil society campaigns over environmental issues have strengthened considerably since 2000, supported by the press and public interest groups, particularly on issues such as water pollution and encroachment on waterways, and even in cases of felling trees in well known public places. Although public awareness on biodiversity conservation is lower, there has been a rapid growth in the number of visitors to protected areas in recent years, indicating a large potential among an increasingly urban population to support conservation. The private sector has also taken some interest through sponsoring activities under NSP and making use of biodiversity and forest images. However, there is a strong need to better inform the public and private sector on the need for in-situ conservation and protected areas.

ANNEX 3: CAPACITY BUILDING

Environment is an expanding sector in Bangladesh, where capacity building is a critical need and a continuous process. The legal framework in Bangladesh is adequate, but the lack of strategic plans, infrastructure, and trained manpower, as well as insufficient participation of local communities, challenge the sound management of environment and biodiversity, including the Protected Areas.

In recent years, establishment of the Department of Environment is the most significant development in the country's institutional capacity. A new Circle in the Forest Department, called Wildlife and Nature Conservation Circle, is another important development. Seven of the forest Protected Areas are now managed by this Circle. This has opened an opportunity to execute different management systems in the Protected Areas and commercial forests. The formation of Co-management Councils and Committees in some protected forest and wetland sites have greatly enhanced the public participation and have given the public a voice. Different training programs under Nishorgo, MACH and IPAC have helped develop the skills and capabilities of the people living around the Protected Areas.

In order to sustain development in the environment sector, future capacity building should focus on the following –

- Establish district offices of the Department of Environment.
- Establish field offices for all the forest and wetland Protected Areas, as well as Ecologically Critical Areas.
- Make provisions to recruit some experts or technical personnel (in a variety of disciplines) in the Forest, Environment and Fisheries Departments and in the Environment and Forests, and Fisheries and Livestock Ministries.
- Facilitate sufficient training for the relevant Government and NGO officials.
- Facilitate sufficient training for the local communities in order to develop alternative income generating activities.

ANNEX 4: NEEDS IN THE COASTAL ZONE

In searching for areas for future USAID assistance, it seems that coastal zones have been relatively neglected, at least in their NRM potential. They are likely to be of great interest in GCC adaptation planning, because of the obvious vulnerability of Bangladesh to the impacts of sea level rise, and also in mitigation, because coastal environments have a very strong potential for carbon sequestration (Attachment B).

Therefore donor interest is likely to be high and coordination of assistance will be essential. The following discussion does not necessarily include the Sundarbans, which already has its own set of projects, but many of the same considerations will apply there.

Objectives

1. Ensure environmental sustainability.
2. Contribute to GCC adaptation
3. Support poverty alleviation (given that these zones are generally among the poorest)

Scope

Describes an overall program, probably financed from several sources. Items of particular interest to USAID, in view of its previous interest and comparative advantage, are shown with an *.

- Research and modeling studies*
- Repair cyclone-damaged coastal embankments
- Raise coastal embankments
- Resettle displaced persons from embankment and other infrastructure construction.
- Rehabilitate and expand cyclone shelters, food storage etc.
- Improve preparedness and warning systems, including basic meteorology*
- Communications infrastructure – roads; telecoms
- Other productive infrastructure behind embankments – agriculture, livestock, fisheries
- Other social infrastructure – education, health, family planning*
- Poverty alleviation/ livelihoods programs (probably through NGOs)*
- Afforestation – on and adjacent to coastal embankments*
 - Co-management for the above
 - On newly accreted land and *chars*
- Improved management of marine fisheries*
 - Regulatory issues: seasons; size and catch limits; species conservation...
 - Establishment of marine sanctuaries, especially in mangrove areas, some with tourism potential (as at St. Martin's Island)
 - adapt co-management model for marine fisheries
- Rehabilitate/ restore land and water bodies heavily degraded by shrimp cultivation e.g. Chakaria Sundarban*
- Strengthen regulation of shrimp aquaculture to minimize future environmental damage*
- Control oil pollution e.g. in Karnaphuli estuary
- Regulate ship-breaking, including worker health and safety and disposal of hazardous materials

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ATTACHMENT B: NATURAL RESOURCES SECTOR ASSESSMENT

EXECUTIVE SUMMARY

USAID-Bangladesh is conducting the “Bangladesh Environment Sector Assessment and Strategic Analysis (BESASA)” to help inform the Mission’s new five-year strategy starting from FY 2010. This report identifies opportunities and interventions related to natural resources management and climate change adaptation and mitigation, focusing on the forestry and fisheries sectors, including protected areas. This report will contribute to clarifying USAID’s comparative advantage in these sectors, taking into account other proposed interventions by the Government of Bangladesh (GoB) and other donors.

The **Global Climate Change (GCC)** assessment draws upon various documents developed by the GoB, principally, the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) of 2009, which includes six pillars (thematic areas): food security, social safety and health, comprehensive disaster management, infrastructure, research and knowledge management, mitigation and low carbon development and capacity building; and 44 programs distributed among these six pillars.

In four out of the last five years, the economy of Bangladesh has grown at over 6 percent and between 1991 and 2005, the percentage of people living in poverty declined from 59 percent to 40 percent. However, despite these successes, more than 50 million of the people of Bangladesh still live in poverty. A recent UNDP Study on the impacts of GCC on economic growth corroborates that Bangladesh is highly vulnerable to many climate change related extreme events due to higher level of dependency on its natural resource base. In terms of increasing poverty and slowing economic growth, the impact will be *severe* in the agricultural sector, *moderate* in the forest sector and both positive and negative (*low to moderate*) in the fisheries sector. Over the last 35 years, the GoB has invested over \$10 billion to make the country less vulnerable to natural disasters. However, scaling up investments and sound environmental management (and the related capacity building) are critical to sustain growth and secure the well-being of the poor.

Bangladesh is committed to addressing emissions reduction and accessing carbon funding. However, there are number of challenges (enabling conditions) to be addressed, for example, accelerating and scaling-up the provision of alternative (and sustainable) forest and non-forest based income generation opportunities, setting reliable reference emission reduction scenarios and performance measures, and defining standards for carbon rights allocation and verification. Carbon rights in Bangladesh may be retained by the Government, and, therefore, equitable benefit sharing agreements will be important. Other important aspects that need attention include monitoring and evaluation systems for reduced emissions from deforestation and forest degradation (REDD), compensation mechanisms to minimize the adverse impact of phasing out some important ‘degradation’ activities for the rural poor, defining the operational scale for the REDD, eliminating perverse incentives that promote deforestation and forest degradation (such as the requirement that the Forest Department collect revenue from its forests). Finally, it is essential that the GoB introduce environmental fiscal reform aimed at linking private sector carbon financing revenue with REDD schemes, for example, potential earnings resulting from applying the “polluters-pay” principle in the brick manufacturing sector. Donor-based adaptation funding has advanced remarkably worldwide. Transactions depend on donor-recipient relations and tend to be small, although multi donor funding may provide significant financial leverage, as with the Bangladesh Multi-Donor Trust Fund (MDTF), managed by the World Bank. It is the main vehicle for funding the implementation of the BCCSAP’s 44 programs. It includes confirmed US\$98 million, including contributions from the UK Government (through DfID) of US\$ 96 million and Denmark (US\$ 2 million). An additional US\$ 52 million from the EU is expected soon. Moreover, the GoB has also set up a Climate Change Fund of \$100 million to support to the implementation of the BCCSAP.

The BBCCSAP is a significant step forward taken by the GoB to simultaneously address global climate change, economic growth and poverty. This strategy has had a highly positive reception at the donor level; and creates a unique opportunity to address the significant number of capacity and corruption issues that potentially undermine this strategy.

Addressing GCC requires multiple actions at both the site level (projects) and national-level policy interventions. The flow of GCC related funds depends highly on institutional credibility, which is precisely what is severely lacking in Bangladesh. Policy reform in the forest sector, for example, will add value -not only because it will increase the sustainability of interventions after the projects are completed but also by helping to focus the Government's attention on REDD, which could bring long-term benefits even without international financing. In addition, the introduction of conditionality in GCC adaptation funding will help to reduce the above –mentioned issues regarding institutional credibility.

It is also critical that USAID extend the current project-based financial support to strategy development and structural adjustment for those sectors in which USAID operates. To this end, USAID could partner with leading MDTF donors with a strong interest in structural reform (e.g. WB, DfID, Denmark and/or UNDP). USAID could co-fund a robust intervention to reform government agencies responsible for natural resources management.

The situation of the forest sector in Bangladesh is dramatic. Bangladesh forest resources have been severely degraded in the last decades. It has one of the lowest rates of forest/per capita, less than 0.02 ha per person (GoB). Forest degradation and deforestation in Bangladesh continues to be the result of population pressure, resulting in land clearing for agriculture, and other land use changes such as encroachments, grazing, fire, uncontrolled logging, felling for plantations, and fire wood collection for domestic use and for brick production. The underlying causes for forest degradation include poverty/inequity, political instability, lack of land use planning, obsolete land tenure rules, unregulated internal demand for forest products, low institutional capacity of the FD, poor law enforcement, and systemic corruption.

The Forest Act of 1927 (which governs the forest sector) vests considerable power in the hands of the Forest Department (FD). However, it does not provide a role for communities in any decision making. A revised framework covering recognition for communities and NGOs in long term conservation of non-FD areas and their roles inside FD lands is needed. The current social forestry framework is not appropriate for participatory long-term conservation, and the Social Forestry Rules of 2004, which focus on benefit sharing, are currently being revised. For example, the Ministry of Finance continues to put pressure on the FD to deliver revenue from forest management. Both, the current and past level of revenue are insignificant in relation to the total revenue budget. Thus, this legal provision is a perverse incentive to deforestation.

Chapter 3 provides a list of key areas for policy reform in the forest sector. Many of the senior FD officials interviewed by the Assessment Team agreed that new leadership on community-forestry and protected areas co-management is indeed required, that the FD has below minimal technical capacity to manage forestry production and is poorly equipped to carry out forest protection duties (and lacks the financial means to carry out basic maintenance of equipment). The Assessment Team also concluded that the existing budget is barely enough to cover salaries and minimal operating costs and is thus critically insufficient to cover the basic needs of the forest sector.

Like the earlier USAID-funded Nishorgo Support Project, the Integrated Project for Co-Management (IPAC) project (Chapter 6) is, to the extent of its capacity, addressing the various issues regarding leadership and institutional capacity. The IPAC project is providing critical support to strengthen institutional and individual capacity on key aspects such as: protected area co-management and an innovative (and indeed needed) training program on carbon financing. Although this support is highly successful, there is even more that a project like IPAC could do to address the huge national-level capacity gap.

Moving to a more efficient and socially-oriented forest sector in Bangladesh will require overcoming a number of barriers: leadership (unskilled and poorly motivated managers), financial (insufficient government transfers), structural (obsolete policies, laws and regulations), institutional (archaic administration system) and technical (technical knowledge below basic needs). In addition, it is equally important that the government introduces mechanisms for transparency and accountability, and improves the control of corruption reported in the forest sector. According to data from (Kaufmann et al., 2009), in the last ten years, the percentile rank of control of corruption has deteriorated from 33.0 in 1996 to 10.6 in 2008; and, according to Transparency International Bangladesh (2006), corruption has lowered economic growth by about 3 percent.

The Assessment Team identified several opportunities for the USAID Mission in Bangladesh that can provide highly leveraged support (in collaboration with other bilateral and multilateral donors) to the forest sector. For example: i) provide co-financing to support an in depth capacity building barriers analysis (including root causes) and the design and implementation of a major program on capacity building for the forest sector, ii) assess opportunities to improve corruption control in the forest sector and develop and fund an anti-corruption strategy, iii) increase support to advance policy and legal reform within the forest sector and eliminate perverse incentives to deforestation, iv) improve informed decision-making by supporting the development of a nation-wide forestry information system.

The situation in the fisheries sector is not as dramatic as in Forests. The Bangladesh fishery is the third largest freshwater fishery in the world and the people of Bangladesh have an historical dependency on the floodplain system for their livelihood security. About 70 percent of rural households catch fish for food or to sell during monsoon, and fish contribute about 60 percent of the animal protein consumed. This sector provides full time employment for 1.2 million people and part-time income for 11 million people. For the poor, fish are a crucial source of nutrition and income. Moreover, shrimp farming has been both an important growth industry (but also a source of environmental and social issues) since the 1980s. However, the quality and quantity of the country's inland capture fishery continues to decline despite isolated seasonal bans on *Jatka* fishing, for example, but at the cost of hardship for poor fishers.

The major threats to fisheries continue to be the result of: over fishing and harmful fishing practices, unregulated access to fisheries such as rivers and coastal waters, short-term leases of water bodies, embankments for flood control, siltation of water bodies, pollution, privatization of common fisheries and enclosing of private floodplains. Out of Bangladesh's 260 freshwater fish species, more than 40 percent are now threatened with national extinction (IUCN Bangladesh 2000). An underlying reason for these persistent threats is the limited institutional capacity of the agencies in charge of managing the sector.

The Ministry of Fisheries and Livestock and its Department of Fisheries (DoF) have the responsibility to conserve and enhance fisheries and fish production, and have set policies, strategies and rules. However, these agencies do not directly control the use of water bodies ("*jalmobals*"), which are under the control of the Ministry of Land, which leases out fishing rights for the purpose of collecting "revenue". As in the case of forests, this revenue makes a minuscule contribution to the national budget but the system creates a significant institutional challenge. The DoF has limited powers to enforce fishing restrictions, being dependent more on the will of fishers and leaseholders, with support from magistrates.

The 2006 National Fisheries Strategy supports sustainable growth in production through community participation, leading to a more equitable distribution of benefits by engaging Community-Based Organizations (CBOs). It also emphasizes conservation fisheries, through appropriate ecosystem management. However, for the approximately 12,000 public water bodies controlled by the civil administration operating under the directives of the Ministry of Land, no sustainable fishing plans are required in the leasing agreement. In general, access for fishers has been compromised, as middlemen pay the lease and take effective control, using lists of their "fishers". However, in 2009 the Ministry of Land

introduced a new management policy that encourages sanctuaries and swamp forest restoration; and could end competitive leasing of water bodies. Chapter 4 includes a list of key areas for reform in Fisheries policy.

Similar to the Forest Department, the DoF suffers from lack of leadership at many organizational levels. Compartmentalized thinking and narrow vision is also common. Most of the DoF managers still lack basic understanding of modern concepts and approaches to sustainable fisheries management. Consequently, they are ill equipped to provide adequate leadership. Field staff, however, is becoming more accustomed to community based fisheries management. Moreover, the project-driven approach used by the DoF has significantly contributed to building capacity on pond aquaculture, which has now taken off with private investments, using well-known technologies and supplied by private hatcheries.

The most important floodplain fisheries projects include Management of Aquatic Biodiversity through Community husbandry (MACH) (USAID-GoB), Fourth Fisheries Project (WB, DfID, GEF, GoB) and Community Based Fisheries Management 1 & 2 (Ford Foundation, DfID, International Fund for Agricultural Development).

Fishery management is largely self-financed by the private sector – for aquaculture by landowners, and for capture fisheries by those taking *jalmohals* on lease. Public and donor funding (over US\$100 million between 1990 and 2009) have been mostly for projects (including the USAID/GoB funded MACH Project (1999-2008, US \$ 9.5 million)). The current level of project funding of DoF is estimated to be just over US\$ 12 million a year, mostly from GoB resources. Given the important level of donor project support, funding gaps are not as severe as in the Forest Sector.

The Assessment Team finds that a basic institutional and legal framework for integrated use of coastal and inland fishery resources is available. However, it is severely constrained due to uncoordinated and sometimes adversarial enforcement efforts by different agencies. This is undermining the impact of the projects and results in conflicts between flood control, agriculture and fisheries.

The following are opportunities for USAID Bangladesh in the fisheries sector: i) support policy and institutional reform and related inter agency coordination (e.g. with the MoFL, Ministry of Land over water bodies management), ii) reform of laws to advance CBO participation, partnerships, local knowledge, sub-sector planning, iii) internalization of experiences and lessons in participatory fisheries management, iv) improve approaches to ecology conservation, social mobilization, economic valuation, financial management and business planning, v) improve collaboration with the FD to manage and conserve the Sundarbans wetlands as a total system, vi) improved management of inland capture fisheries (critically important to livelihoods as well as to wetland biodiversity), vii) a small grants program to support independent CBOs, and viii) innovative approaches to sustainable management and conservation of riverine ecosystems.

Protected Areas in Bangladesh are inadequately managed and severely underfunded. There are 19²³ Protected Areas (PAs) in Bangladesh covering 2,458 km² and representing 1.68 percent of the country's surface area or 16 percent of the total area managed by the FD, which has the mandate for management of PAs. Management of forest PAs has been visible in the conservation agenda of Bangladesh since 1997. The ADB-funded Forestry Sector Project (1997-2004), in partnership with FD, introduced PA planning and management concepts and supported management plans. From 2003 to 2008, the "Co-Management of Tropical Forest Resources in Bangladesh" (Nishorgo Support Project) worked closely with the FD and introduced the initial aspects of PA co-management and management plans at five initial pilot PAs.

However, there is still a long road ahead. In Bangladesh, as in many other countries, the simple declaration and establishment of PAs has not been sufficient to ensure the achievement of conservation (and social) objectives. PAs are not representative of all ecosystem types and thus do not include all habitats and species

²³ With two more to be added shortly.

important for conservation. In addition, the nomenclature of PAs needs to be harmonized with IUCN and CBD standards and other modern standards to manage sustainable tourism in different types of PAs. The development of a Bangladesh PA *System* will be a critical move to improve conservation and financial sustainability.

Threats to PAs in Bangladesh are related to the continuous high demand for timber resources and fuel-wood for brickfields and other commercial purposes (and related corruption), and the need of an expanding population of poor people to have access to PA resources; and they include both threats to forest and fisheries. The above include: lack of people's awareness, outdated and incoherent laws and regulations (and inadequate enforcement), corruption, destruction of habitat, indiscriminate hunting and poaching of animals (and over fishing), and natural shocks (including climate change effects) like flooding, storm surge, etc.

As part of a reorganization of FD in 2001, the "Wildlife and Nature Conservation Circle" (WNCC) was established, with a total allocation of 378 staff. Unfortunately, staff members from the Conservator of Forests to the Forest Guards move regularly, every three years, on transfer, even to divisions under other Circles (including staff trained in conservation management). This is a significant constraint, which undermines the retention of trained staff. Under WNCC, the management of PA is cumbersome and creates the perfect grounds for corruption. WNCC's staff lack most of the basic skills required for providing sound leadership in modern PA management, co-management, conservation science and PA financing. The need for a new PA Department under the MoEF should be considered.

In Bangladesh, PAs' financing squarely fits in the traditional model, where PAs are highly dependent on very limited government funding, growing but still very limited support of a trust fund (Arannayk Foundation) and international projects that can only partly and temporarily address the financial situation of PAs (e.g. Nishorgo and IPAC). A centralized entry fee (revenue-sharing) mechanism has been introduced but it is not yet fully operational. In Bangladesh, the lack of funding is the most important obstacle to the improvement of PA management (and co-management). Evidently, the real cost of PA management is not yet known and information on costs, financial needs and gaps is not available. Financial analysis is not part of the annual planning process of the FD. The existing budget is critically insufficient to cover the actual management needs of PAs and the sustainability of the PA co-management model may be at risk due to lack of funding to support co-management organizations in the future.

The most important recent successes at improving PA management have been achieved with substantial donor support include: introduction of PA co-management councils and committees; development of PA management plans; improvement of alternative income generation activities, albeit at a limited scale; and provision of visitor facilities and introduction of PA entry fees.

There are a number of opportunities for USAID-Bangladesh with respect to PAs: i) Formulate and introduce new legislation to improve protected area governance in: institutional authority on PAs (including national and sub-national actors), ii) definition of the PA system or subsystems; iii) Anti-corruption strategy; iv) assess needs and improve PA management guidelines; v) strengthen policy work to cover the wide range of aspects related on PA entry fees. In addition, the introduction of a PA Financial Planning initiative should be considered top priority. This will aim at mobilizing funding to implement PA management plans. This initiative will include analysis of enabling conditions, financial analysis of the PAs (costs, needs, gaps, and cost reduction options), selection and diversification of market-based and non-market financial mechanisms (including revenue-sharing options), formulation of financial and business plans, which will tap the economic potential of the PAs.

The main lessons from USAID's previous and current projects in the environment/natural resources management are summarized in Chapter 6, namely: the growing effectiveness of co-management through CBOs, and the need for an "exit strategy" for USAID as CBOs become self-sufficient; the potential of the CBOs in resources conservation in wetlands and PAs; the inadequacies of government support (as described

above); the importance of alternative income generation to compensate resources users for denial of access, especially in respect of PAs; the need for rigorous monitoring and evaluation to understand the positive and negative effects of any intervention; and, the importance of the participation of and benefits to women in the USAID projects through CBOs.

The report concludes by noting that there is much scope to involve **women** in community organizations and thereby as community representatives in co-management bodies. In both, forest and fisheries, livelihood support for women could also focus more on adding value, improved marketing, and novel sources of employment. With adequate training and equipment, enterprises should be more than just handicrafts but include potential growth areas related to rural services such as para-vets and solar energy technicians.

I. CONTEXT

USAID/Bangladesh is conducting the “Bangladesh Environment Sector Assessment and Strategic Analysis (BESASA)” to help inform the Mission’s new five-year strategy starting from FY 2010. The key objectives of the assessment include: (1) identify the overall needs of the Bangladesh environment sector, (2) assess USAID’s comparative advantage, and (3) propose programmatic options to match with the Mission’s overarching comparative advantage and goal of promoting responsible, pro-poor and equitable economic growth. This report is part of BESASA.

USAID/Bangladesh’s current environment strategy empowers poor people by giving them a central role in natural resource management; and strongly promotes a transparent process of environmental governance. To this end, two USAID projects – the Management of Aquatic Ecosystems through Community Husbandry (MACH) and Nishorgo Support Project (NSP) – pioneered co-management models for freshwater wetlands and protected forest areas. In addition, an ongoing 5-year initiative, the Integrated Protected Area Co-management (IPAC) project, began in July 2008. The IPAC project will scale-up and institutionalize co-management in Bangladesh and will also facilitate addressing global climate change mitigation and adaptation issues. Although donor support in Bangladesh’s environment sector has decreased in the past few years, some positive developments continue under the umbrella of climate change mitigation and adaptation.

This report assesses the forestry and fisheries sectors and protected areas. It also identifies climate change adaptation and mitigation opportunities and interventions. This report will contribute to clarifying USAID’s comparative advantage in the targeted sectors, taking into account other proposed interventions by the GoB and other donors. This report addresses, but is not limited to, the following key aspects:

- Sector issues that affect natural resources management in the context of equitable economic growth at a landscape level.
- GoB agencies and other key stakeholders’ current capacity and future role in supporting natural resources management.
- Effectiveness of the co-management approach in natural resources management and poverty alleviation (IPAC Project’s approach)
- Strategic objectives and effectiveness of the Arannayk Foundation¹.
- Sector opportunities to address climate change adaptation and mitigation (including enabling conditions).

Based on this assessment, this report will attempt to respond to the following framing questions:

1. What are the current key gaps in the Government of Bangladesh strategies for natural resources management in the forest and fisheries sector, protected areas and climate change mitigation and adaptation?
2. What are the key opportunities (and competitive advantages vis-à-vis other donors) for the USAID Bangladesh Mission to support GoB efforts to improve forest, fisheries and protected area management and address climate change mitigation and adaptation objectives?
3. What are the key lessons from the MACH, NSP and IPAC Projects with respect to improving forest, fisheries and protected area management and addressing climate change mitigation and adaptation objectives?

This report includes an overview of global climate change (GCC) issues in Bangladesh and analyses of the Forest and Fisheries Sectors and Protected Areas. Each of these analyses includes conclusions and opportunities to improve natural resources management and address climate change mitigation and adaptation. Finally, this report provides, in highly summarized form, the main features of USAID’s previous and ongoing projects - MACH, NSP and IPAC - and key lessons learned.

2. CLIMATE CHANGE MITIGATION AND ADAPTATION

This section draws upon various documents developed by the Government of Bangladesh (GoB). Most importantly, the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) of 2009 which includes six pillars (thematic areas):

1. Food security,
2. Social safety and health,
3. Comprehensive disaster management,
4. Infrastructure,
5. Research and knowledge management, and
6. Mitigation and low carbon development and capacity building.

The plan describes 44 programs distributed in these six pillars (Annex 1 Includes the list of pillars and its respective programs). In addition, this section draws upon the National Adaptation Programme of Action (NAPA) of 2006, Poverty Reduction Strategy Paper (2009-11), and the 2010 Biodiversity Target National Assessment and Fourth National Report to the Convention on Biological Diversity (draft, 2009).

As noted in the BCCSAP (2009), since Bangladesh achieved Independence in 1971, GDP has more than tripled in real terms, food production has increased three-fold, the population growth rate has declined from around 2.9% per annum in 1974 to 1.4% in 2006 and the country is now largely food secure (mainly in rice). In four out of the last five years, the economy has grown at over 6%. Between 1991 and 2005, the percentage of people living in poverty declined from 59% to 40% and the country's Human Development Index improved from 0.347 in 1975 to 0.547 in 2005. Child mortality has fallen substantially and gender parity in primary education has been achieved. However, despite these successes, more than 50 million people still live in poverty. Many of these people live in remote or ecologically fragile parts of the country, such as river islands and cyclone-prone coastal belts, which are especially vulnerable to natural disasters.

Bangladesh is one of the most vulnerable countries to the adverse impacts of GCC. Floods, tropical cyclones, storm surges and droughts are likely to become more frequent and severe in the coming years²⁴; and are major threats to the significant achievements Bangladesh has made over the past 20 years (e.g. in increasing incomes and reducing poverty). However, a full assessment of the impact of these threats will require a significant amount of additional research.

A recent Policy Study on “The Probable Impacts of Climate Change on Poverty and Economic Growth and the Options of Coping with Adverse Effect of Climate Change in Bangladesh” (UNDP, 2009), corroborates Bangladesh’s high vulnerability to adverse effects of GCC: “Bangladesh is already vulnerable to many climate change related extreme events. It is expected that climate change will bring changes in characteristics of extreme events and gradual changes phenomenon of the physical and natural systems. Due to higher level of dependency on natural resource base, overall impacts of climate change would be significant. It is estimated that climate change could affect more than 70 million people of Bangladesh”. The study also notes that the most relevant factors contributing to such vulnerability are related to Bangladesh’s geographic location, low elevation, high population density, inadequate infrastructure, high levels of poverty and dependency on natural resources. The report also cites the important issue of lack of institutional capacity to meet the monumental challenges related to GCC. The overall objective of the UNDP Study (which is based on expert

²⁴Bangladesh Climate Change Strategy and Action Plan, 2009

opinion and available quantitative analysis²⁵) was to equip the General Economic Division (GED) with technical know-how and policy choices, in order for GED to respond, from a planning perspective, to climate change challenges in Bangladesh. To this end, the study provides important guidance to: a) Understand the probable impacts of climate change, by sector, on poverty (income and social) and economic growth (overall GDP and contribution by sector); and b) Formulation of a strategy to address and mainstream adaptation and mitigation to GCC at national and sector level including options to improve policy, strengthen institutional capacity and establish sector integration.

At sector level, the Study highlights the following key impacts:

- In the agricultural sector, it notes that “reduction of crop yield by gradual change and total or partial damage due to extreme events are key impacts facing by the crop agriculture sector.” The study notes that a 50 percent reduction of crop production would increase poverty by the same percentage. It also notes that the effects of cyclones are more severe than those of floods.
- Positive and negative impacts are expected in the fisheries sector. On the positive side, a possible increase in the open water area during floods may increase fish production, and negatively, because floods and cyclones will affect the livelihoods of the poor fishermen and decrease the quality of nutrition of the rural poor. The impact of other shocks (erratic rainfall, heat waves, cold waves, and foginess) is expected to be low to moderate.
- The livestock sector will be seriously affected because increased flood, drought, cyclone, and sea level rise will cause loss of livestock, damage pasturelands, increase fodder scarcity, destroy shelters, decrease production and increase incidence of diseases. However, it is expected that GCC effects on livestock will affect poverty and economic growth only moderately because grasses can regenerate quickly.
- In the forest sector, the adverse impacts of GCC, such as cyclones and storm surges, affect poverty and growth differently. For example, marginal communities in the coastal forest areas (e.g. the Sundarbans, where the poor are highly depend on forest resources) are the most vulnerable to severe impact. This was evident in the aftermath of Cyclone Sidr. Other shocks, such as saline intrusion, flood and drought are expected to have a moderate impact on poverty and economic growth; impacts from erratic rainfall and temperature variation should be low.

See Annex 2 for additional details on the expected impacts of GCC on poverty and economic growth in the agriculture, livestock, fisheries and forest sectors.

Over the last 35 years (long before the concern with GCC started), the Government of Bangladesh has invested over \$10 billion to make the country less vulnerable to natural disasters. These investments (supported by development partners) include: programs for flood management, construction of coastal polders, cyclone and flood shelters, and the raising of roads and highways above flood level. In addition, community-based disaster preparedness has improved and climate change resilient varieties of rice and other crops have also been developed. More recently, a warning system for natural disasters has been introduced.

However, addressing climate change adaptation and mitigationⁱⁱ (CCAM) requires scaling up investments and sound environmental management, including natural ecosystems management. This is critical to sustain growth and secure the well-being of people (including vulnerable groups). However, scaling up investments without parallel development of management capacity at all levels will likely prove futile.

²⁵ The quantitative sector analysis was based on households' dependence and exposure to different climatic events and their frequency.

Global awareness of the adverse impacts of GCC and the need for action is dramatically increasing²⁶, international funding and technical support to address GCC mitigation and adaptation is being mobilized at a significant scale, and GCC high-risk countries such as Bangladesh may be still rewarded, despite their advanced level of deforestation, resulting from poor forest governance (see Chapter 3).

Healthy ecosystems are an indispensable instrument to mitigate and adapt to GCC (e.g. the tropical forest ecosystem's capacity to store carbon dioxide and therefore contribute to reducing global warming). Moreover, a recent study by Pidgeon (2009)²⁷ discusses how highly endangered coastal habitats (such as mangrove forest) are highly effective in sequestering carbon and locking it away in soil. Coastal habitats—such as mangroves, sea grasses, and salt marshes—sequester as much as 50 times the amount of carbon in their soil per hectare as do tropical forests.

In addition to carbon sequestration, forest ecosystems provide protection from extreme weather and natural disasters, as well as fish nursery habitats, and are an important source of food and income to local communities. This is particularly true in Bangladesh, where healthy mangrove ecosystems are indispensable to securing local livelihoods and can store carbon, provide nurseries for fish and shrimp, and help to adapt to the adverse impacts of climate change. Upland tropical forests provide important services, such as regulating water and soil quality and quantity, which in turn provide further services needed for livelihoods and health, including agriculture, energy, and potable water. Because many of the poor and vulnerable in Bangladesh live in coastal, remote or ecologically fragile parts of the country, sound ecosystems management is indispensable.

Nevertheless, despite gains in some areas (Attachment A), environmental management and particularly 'ecosystems management' in Bangladesh suffer from a critical level of neglect. The existing national institutions vested with responsibility for natural resources management have not been able to deal with the ever increasing threats to natural ecosystems (i.e. loss of habitat, over harvesting of resources, decreasing productivity and natural disasters) and their underlying causes.

Moreover, addressing GCC requires an integrated approach, involving efficient coordination and implementation amongst different ministries and agencies, civil society and the private sector. There is an urgent need to strengthen the capacity of Government agencies²⁸. Action to implement CCAM in Bangladesh not only brings a monumental challenge to government agencies but to the private sector and the international community. The main Government Ministries involved in GCC include the following:

- **Environment and Forests** and its agencies (e.g. the Department of Environment –DoE and the Forest Department –FD);
- **Food and Disaster Management** (MoFDM), which includes the Disaster Management Bureau and the Comprehensive Disaster Management Programme (CDMP);
- **Water Resources**, which includes the Bangladesh Water Development Board and other research and forecasting organizations;
- **Local Government, Rural Development and Cooperatives**, which includes the Local Government Engineering Department (LGED) and the Department of Public Health Engineering;
- **Agriculture**, including the National Agricultural Research System
- **Livestock and Fisheries**
- **Power, Energy and Mineral Resources**
- **Health and Family Welfare**

²⁶ The Conference of Parties 15 of the UNCCC took place in Copenhagen (Dec. 2009) during the BESASA.

²⁷ Emily Pidgeon. Carbon Sequestration by Coastal Marine Habitats: Important Missing Sinks. The Management of Natural Coastal Carbon Sinks. IUCN. 2009.

²⁸ An ADB-GEF project was cancelled in 2005, due partly to capacity issues in the forest sector in Bangladesh.

- **Roads and Railway Division**
- **Communication**
- **Foreign Affairs**
- **Planning Commission**, which is charged with the framing of development plans, as well as approval of programs and projects.

Similar to the situation in other developing nations, the agencies in charge of environmental management in Bangladesh have limited decision-making power, staff capacity and financial resources. This is particularly evident in the Forest and Fisheries sectors, where agencies still use obsolete top-down (command and control) administration dating from the colonial days. The roles and responsibilities of key organizations listed above are included in Annex 3.

However, in the evolving context of GCC impact, institutional credibility (effectiveness, transparency and accountability) are indispensable to sustain access to significant revenue streams that may be available for adaptation and mitigation. In Bangladesh, a strong protected area (PA) and forest sector could play an instrumental role in leading the achievement of the goals of the BCCSAP, in connection with the PRSP.

Reforestation and afforestation activities could play a significant role in GCC mitigation. Adaptation funding, as well as mitigation, requires a serious improvement in the capacity of government agencies to effectively manage a number of actions such as: a) decreasing high rates of forest loss and degradation, b) protecting existing endangered forest ecosystems and c) restoring lost native forest ecosystems (coastal and inland) in and outside protected areas. The last is particularly important to the GoB because most of Bangladesh's tropical forest has been degraded and coastal mangrove forest ecosystems are being degraded at an alarming rate. According to FAO (2005), 2,600 hectares of forest or about 1.0 percent are lost every year (including approximately 412 hectares of mangrove forest). However when compared to countries with significant areas of tropical forest neither the area deforested annually nor the percentage rate of annual deforestation are likely to attract attention.

Mitigation funding will require effective strategies to improve the health of forest ecosystems by reducing deforestation and therefore CO₂ emissions. Because of the social implications of reducing deforestation in Bangladesh, the introduction of REDD²⁹ mechanisms is key. REDD actions have a potential to qualify for carbon-financing (approaches that seek to achieve REDD using financial flows from developed countries in return for quantified greenhouse gas emission reductions generated by national-level actions in developing countries with forests). Because of the comparatively low rate of deforestation and the small area of forest remaining Bangladesh is not likely to attract the attention of investors interested in financing the maintenance of carbon sinks or carbon sequestration.

The government is demonstrating commitment to CCAM through several strategic policies, such as the multi-sector BCCSAP. However, this strategy lacks the operational mechanisms and structural support (capable institutions and enabling legal and regulatory framework) needed to be successfully implemented.

2.1 CARBON FINANCING

Global emissions from deforestation and forest degradation are one of the major contributors to GCC (global warming). They represent between 17 and 25 percent of annual emissions (IPCC 2007). Bangladesh's contribution to the generation of greenhouse gases is minisculeⁱⁱⁱ. Nevertheless, the GoB is committed to address emissions reduction; and there are expectations that emissions reductions could mobilize

²⁹ Reduced Emissions from Deforestation and Forest Degradation

international carbon financing (which could be directed, *inter alia*, to improve inland and coastal forest management).

Currently, deforestation and degradation in Bangladesh is caused by population pressure and internal demand for income and energy (firewood). The legal and regulatory framework governing the forest sector is in dire need of reform. However, the leadership and institutional capacity to engage in structural reform (civil sector reform), sector policy reform, sector level programming and formulating projects based on sector-level needs is not yet in place. The absence of these enabling mechanisms will undermine, for example, the establishment of credible emissions reduction scenarios and impact monitoring. This situation is likely to change only slowly in the immediate future in Bangladesh.

The following are some of the enabling conditions for accessing carbon financing funds in Bangladesh. These conditions are aimed at meeting standards of regulated and/or voluntary markets and donor-based funding^{iv} that seek to minimize investment risk:

1. Accelerate and scale-up the provision of alternative (and sustainable) forest and non-forest based income generation opportunities for the rural population whose livelihoods depend on forest resources. Current programs are still at pilot level (in the forest sector) and based on projects with limited scope.
2. Develop capacity and institutional credibility to set reliable reference scenarios, performance measures (that define where REDD activities will result in measurable emission reductions).
3. Define and introduce standards for carbon rights allocation and verification. Carbon rights in Bangladesh may be retained by the Government and therefore equitable benefit sharing agreements will be important.
4. Establishment of monitoring systems for REDD to cover different forest categories including protected areas and wider land categories such as tropical and mangrove coastal forests, which may be the most important carbon sinks.
5. Establishment of compensation mechanisms to minimize the adverse impact of phasing out some important ‘degradation’ activities for the rural poor (e.g. shifting cultivation).
6. Define the operational scale for the REDD system: from a project-based approach to national scale (or a combination of both)^v.
7. Establishment of a permanent information and communication mechanisms to deal with the complexities of access and implementation of carbon financing/REDD.
8. Introduce rigorous enforcement mechanisms and risk reduction strategies.
9. Assess and introduce a strategy to progressively eliminate perverse incentives that promote deforestation and forest degradation (such as the requirement that the FD collect revenue from its forests).
10. Introduce fiscal reform aimed at linking private sector carbon financing revenue with REDD schemes. For example, potential earnings from emissions reductions in the manufacturing sector and “sinners-payers” earmarked taxes, fees, surcharges. Brick manufacturing is a case in point. The GoB and the World Bank³⁰ in collaboration with the private sector are about to launch a new carbon financing project related to the improvement of Kiln Efficiency in the Brick Making Industry in Bangladesh^{vi}. This project could serve as a platform to promote further fiscal reform in the brick industry.

³⁰ See project details at <http://wbcarbonfinance.org/Router.cfm?Page=Projport&ProjID=49154>

2.2 DONOR-BASED ADAPTATION FUNDS

Donor funding depends on donor-recipient relations and tend to be small, although multi donor funding may provide financial leverage, as with the Multi-Donor Trust Fund (MDTF) just set up in Bangladesh and managed by the World Bank, and may be linked or depend on levels of sector aid.

According to the MDTF Concept Note from December, 2008, the MDTF is a vehicle for implementing the BCCSAP's six pillars (thematic areas) and the 44 programs that support these pillars. The proposed governance structure includes: a Policy Council responsible for formulating the Fund's policies and setting the strategic direction, a Management Committee responsible for project review and a Secretariat responsible for the day to day management of the Fund and support to the indicated government structure. The MDTF will have two funding windows: an 'on-budget window' for public sector projects and an 'off-budget window' for funding projects from the civil society. It is expected that projects funded by the MDTF will be rigorously reviewed to ensure viability and consistency with the BCCSAP; and the MDTF will apply the "Paris principles" of ownership, harmonization, rationalization, predictability and mutual accountability. The application of the above indicated principles represent a significant challenge to the institutional capacity of the GoB.

The total available funding in the MDTF is US\$150 million, including contributions from the UK Government (through DFID) of US\$ 96 Million³¹, the Danish Government of US\$ 2 million and US\$ 52 million (soon) from the EU. It is expected that other multilateral and bilateral donors will soon join. USAID has no current plans to join the Fund.

The GoB has also set up a Climate Change Fund (CCF) to support the implementation of the BCCSAP. Similarly, the CCF faces multiple challenges. For example, the CCF has recently issued a 20-day response call for project proposals (from the government and NGO sectors). Given the current capacity and level of inter-institutional coordination, it is unlikely that government or NGOs will effectively respond within the proposed time frame; and if they do, it is likely that such proposals will be mostly stand alone strategies (poorly developed) with low or no prospect of impact.

2.3 CONCLUSIONS

- The BCCSAP, on one hand, is a tangible and significant step forward taken by the GoB to simultaneously address climate change, economic growth and poverty. This strategy has had a highly positive reception at the donor level. On the other, it creates a unique opportunity to address the significant number of capacity issues such as the ability of the GoB to carry out sound inter-institutional coordination, multi-donor coordination, administrative reform, natural resources-related policy reform (including environmental fiscal reform³²), improve technical capacity, and the equally important issue of corruption.
- Addressing GCC requires multiple actions at both the site level (projects) and national-level (policy interventions e.g. fiscal reform to support GCC finance and sector level structural reform in the public sector). For example, there are a significant number of programs (64) in the BCCSAP [2009

³¹ £60 Million. Exchange rate £1=US\$ 1.6 (Nov. 2008). MDTF Concept Note, December 2008.

³² Environmental fiscal reform refers to a range of taxation or pricing instruments that can raise revenue, while simultaneously furthering environmental goals. This is achieved by providing economic incentives to correct market failure in the management of natural resources and the control of pollution. Through EFR it is possible to: 1) mobilize revenue for governments; 2) improve environmental management practices and conserve resources; and 3) reduce poverty. By encouraging more sustainable use of natural resources, and reducing pollution from energy use and industrial activities, EFR can address environmental problems that threaten the livelihoods of the poor, and revenues raised by EFR can also be used to finance poverty reduction measures (World Bank, 2005).

edition], but policy level actions and structural reform are not evident. The flow of CCAM funds depends highly on institutional credibility, which is precisely what is severely lacking in Bangladesh.

- Policy action in the BCCSAP is critical and should have a prominent place. Policy is already a key part of the climate negotiations for other emitting sectors, such as energy and industry. Policy reform in the forest sector will add value, not only because it will increase the sustainability of interventions after the projects are completed but also can help to focus the Government’s attention on REDD actions that can bring long-term benefits even without international carbon financing.
- The BCCSAP mostly focuses on adaptation funding (assuming donor grants). The current limited conditionality attached to donor-based funding represents a major risk to the successful implementation of adaptation action because of the above –mentioned issues regarding leadership and institutional credibility.

This study is a significant step forward to support the operationalization of the BCCSAP and opportunities for USAID to coordinate with another major player, such as UNDP.

2.4 RECOMMENDATIONS

STRUCTURAL REFORM

- There is an opportunity for USAID to extend project-based financial support to strategy development and structural adjustment action for those sectors in which it operates. For example, USAID may well be in a strategic position to propose to the MDTF that a significant part of the existing funding is programmed together with USAID resources to fund a robust intervention to reform the administrative and financial structure of government agencies responsible for natural resources management, mainly Environment, Forest and Fisheries, including protected areas. (i.e. one USAID dollar for every dollar earmarked by the multi donor trust). These reforms (see Attachment C) should focus on the following key aspects: improving administration and financial management systems; hiring and contracting procedures; autonomy, transparency and accountability; and roles and responsibilities. Both USAID and MDTF funding for this activity could be managed through the Arannayk Foundation (See Program Strategy Options Report for the Arannayk Foundation Report) upon achievement of the substantial restructuring recommended in the Program Strategy Options Report for the Arannayk Foundation Report.
- Introduce sector reform conditionality to adaptation funding (and other sector support programs) Key aspects to be considered for conditionality and their priority level are suggested below.

Conditionality	Priority level		
	L	M	H
Administrative reform on the NR sector (benchmarks)			X
Elimination of perverse incentives or subsidies			X
Specific environmental fiscal reform (polluters pay)			X
Financial autonomy of PAs (benchmarks)			X
Increase of government budget allocation to DF/PAs			X

INSTITUTIONAL CAPACITY AND COORDINATION

- Partner with one or two leading MDTF donors which have a strong interest in structural reform (e.g. DfID and/or Danida) to mobilize national political will to development of sector level strategies to operationalize the BCCSAP and to guide the definition of programs and projects under the sector-level strategies. A partnership with UNDP could pave the way to this effort.

FINANCING

- Support the assessment of the capacity and institutional needs to address REDD including key policy interventions that are critical, together with the above mentioned structural reform; and capacity to design and implement REDD projects (considering issues related to land tenure, transfer mechanisms, national private sector funding) to ensure successful access and implementation of GCC related interventions.
- Promote and support the introduction of a mechanism to ensure access to diversified GCC financial mechanisms, including: the GEF Trust Fund, the UNFCCC Climate Change Funds (Least Developed Countries Fund for adaptation and the Special Climate Change Fund and the Kyoto Protocol Adaptation Fund), the Bangladesh Multi-Donor Trust Fund and regulated and voluntary carbon markets. The responsibility for the diversification of GCC funding may be placed within a new public-private business development unit at the General Economic Division and operated in coordination with the Ministry of Environment and the Arannayk Foundation. This self-financed unit (via project management fees) could also serve as a quality control mechanism for CCAM project formulation and quality assurance.

3. THE FOREST SECTOR

3.1 CONSERVATION STATUS AND THREATS

Bangladesh's natural forest resources, which comprise both upland forests and extensive mangroves, have been severely degraded over the last several decades. Currently Bangladesh has one of the world's lowest areas of forest per capita (less than 0.02 ha), reflecting both the limited area of remaining forests and a very large human population relative to the small size of the country. Total forest area is currently estimated as 2.5 million hectares (approximately 17.2% of national area; Table 1), but this includes extensive areas of Forest Department lands and Unclassified State Forests (controlled by District Administrations) currently with no or severely degraded tree cover, as well as village forests which largely comprise fruit, fuel wood and other planted tree species. The annual deforestation rate has recently (Khan *et al.* 2004) been estimated as 3.3%, although the rate of annual forest loss may have decreased over the past five years. The forestry sector currently contributes approximately 1.76 percent of national GDP (GoB 2008), and employs approximately 97,600 persons per year (FAO 2005).

Table 1. Classification of Forest in Bangladesh

Category of forests	Area (Million ha)	Percentage
Forest Department Managed Forests	1.53	10.54
Unclassified State Forests	0.73	5.07
Village Forests	0.27	1.88
Total	2.53	17.49

Source: FD (2004)

THREATS

Forest degradation and deforestation in Bangladesh are the result of population pressure, resulting in land clearing for agriculture, and other land use changes such as encroachment by settlements, grazing, fire, uncontrolled logging, felling for plantations, (and fire wood collection for domestic use and for brick production. The underlying causes for forest degradation include poverty (inequitable access to economic opportunity), limited economic development, poor law enforcement, lack of land use planning, obsolete land tenure systems, socio-political instability and unregulated internal demand for forest products. Local economic conditions provide strong economic and financial incentives to those involved in encroachment and illegal felling. In addition, the weak organizational structure of the FD, staff capacity and tolerance of illicit forest harvesting by some FD personnel adds to deforestation.

3.2 LEGAL AND REGULATORY FRAMEWORK

Management of forest resources is governed by the Forest Act of 1927, by the Wildlife Conservation Act 1974 covering Protected Areas, and by the Social Forestry Rules covering recent participatory plantations on other public lands.

The Forest Act 1927 sets the frame for forest management and use of all Reserve Forests and so is directly relevant to biodiversity conservation, since Reserve Forests are of considerable biodiversity importance and often border the Protected Areas. The Forest Act of 1927 vested considerable power in the hands of the Forest Department, particularly its head, the Chief Conservator of Forests, to determine use of forest lands and to gazette forest as reserves. While allowing for designating use rights in forest for villages, it does not give a role for neighboring communities in any decision making, including minority communities which often

had use rights and had settled in forest areas, or for civil society in general. Moreover there was no framework for community participation in forest conservation and management, neither was there recognition of community managed forests other than social forestry, which is aimed primarily at fast growing exotics to generate income for poor people. A revised framework covering recognition for communities and NGOs in long term conservation of non-Forest Department areas, such as swamp forest and forest patches in the CHT, and their roles inside Forest Department lands is needed.

The social forestry framework is appropriate for participation where trees will be felled – as in some buffer areas to provide an income to displaced forest users, but not for long term conservation, Social forestry rules of 2004, developed through ADB and World Bank projects, determine benefit sharing. Social forestry plantations within Forest Department lands, where settlers can live and manage trees, have been proposed in buffer areas adjacent to (and, potentially, inside) PAs. This is the main way that Forest Department interacts with local people and addresses government priorities of poverty reduction. The most common formula for benefit sharing allows participants to grow crops on land and benefit from approved thinning, and allocates 45 percent of harvested revenue to the government, 45 percent to the beneficiaries, and 10 percent for a revolving fund to cover costs of replanting the same land. The regulatory framework of forest benefits distribution is currently being revised.

Legislation outside the forest sector is equally important and requires reform. For example, as a result of the introduction of the ban on tree felling in 1989 (primarily directed at FD-managed forests), it has been expected that forests would show significant recovery. However, the Ministry of Finance continues to put pressure on the FD to deliver revenue from tree production. After the ban, according to the FD, revenue from forestry has decreased an estimated 20-25 percent (from US\$ 13 million in 2007 to US\$ 10 million in 2009). Both, the current and past level of revenue are insignificant in relation to the total revenue budget, and the legal provision that mandates the DF to generate revenue from forestry is a perverse incentive to deforestation (i.e. revenue has to come from seizures of illegally cut wood and thus encourages illegal cutting and promotes corruption). In order to sustain forest recovery, the modification of this regulation requires immediate attention.

The current most important issues, risk (with potential to undermine USAID support to the Forest Sector) and areas for reform are included in Table 2.

Table 2. Key issues, risks and areas for reform in laws governing the Forest Sector.

Laws and regulations	Key issues	Level of risk			Suggested areas for reform
		L	M	H	
Bangladesh Wildlife (Preservation) Order, 1973	Very outdated focus on hunting schedules, needs updated provisions for protected areas. Places protected areas under FD.			x	Needs far-reaching debate and review to cover habitat and ecosystems protection, and extend responsibilities to a range of agencies.
Revenue Law affecting Forest	Incentive to deforestation			x	Elimination
Forest Act 1927	Territorial administration of forests overrides conservation based management Forming village forests – allows community management agreements with responsibilities and use conditions.		x		Need s to define new forest conservation priorities in both forest PAs and reserve forests covering forest and wildlife protection and sustainable uses. Reform to allow and recognize traditional use rights. Need to introduce community management framework for “unclassified state forest”
Private Forests Ordinance 1959	Requires owners to make working plans (i.e. manage for production rather than conservation) Allows Department to take over forests.		x		Include conservation plans and allow co-management schemes.
Social forestry rules of 2004	Not clear how forest can be used in wider landscape zones: protected areas, reserve forest and other public land		x		Introduce rules and responsibilities for zoning and community management of forest areas
PA Governance (see Chapter 5 for more details)	Poor guidelines on PA management and co-management, poor PA representation, extremely limited PA funding.			x	Formulate new PA regulation that clearly defines and expands PA co-management, creation of new PAs, financial autonomy of PAs, enabling PAs to generate and retain revenue generated at site-level and fiscal reform to support PA financing.

3.3 LEADERSHIP, INSTITUTIONS AND MANAGEMENT CAPACITY

The Forest Department, under the Ministry of Environment and Forests, is mandated to take responsibility for the management and development of government-managed forests. The FD is lead by the Chief Conservator of Forest. The Forest Department is divided into four wings. Each wing is administered by a Deputy Chief Conservator of Forest (DCCF). Similarly, there are nine Circles in the FD. Each Circle is headed by a CF. The administrative categories under the Circles are the Divisions. There are 44 Forest Divisions and each Division is headed by Divisional Forest Officer (DFO)/ Deputy Conservator of Forest (DCF). The FD's structure (which is largely territorial rather than functional) is outdated and provides limited support to the existing needs of the Sector.

In the last decade, the mandates of the FD have been shifted from “production forestry” to “people- oriented forestry” and thus the activities of the FD have expanded from the Reserved Forests to the village levels. Only recently, the conservation of biodiversity through protected areas management has emerged as a major concern of the FD – a clear result of Nishorgo (Chapter 6). Considering this, the Government in 2001 instituted organizational reforms to the FD (Ref.: MoEF/Sec.-2/For. [Adm. Reform]- 22/98(6)296, dd. 24.6.01). This reorganization was a step forward for the FD: the creation of the “Wildlife and Nature Conservation Circle” (WNCC) for protected areas management and a staff increase (from 5,224 to 8,681) to further support the shift from traditional forestry to social and conservation oriented forestry. However, WNCC only manages 7 out of 21 PAs at this time.

The most significant achievements of the FD, with support from USAID funded projects and other bilateral and multilateral donors, include the advances in shifting from “production forestry” to “people- oriented forestry” and the introduction of protected areas co-management (Community Based Co-management Committees).

Nevertheless, like many other departments in Bangladesh, the FD suffers from lack of leadership at all organizational levels. Compartmentalized thinking and narrow vision is common. Most of the FD staff at still lack basic understanding of modern concepts and approaches to natural resource management, and therefore, are not in a position to provide leadership.

During the last one and a half decades, field staff of the FD has become more accustomed to a more participatory forestry approach. However, the views of the staff at field level who are already involved in community forestry and co-management are still not reflected in the current leadership and decision-making, possibly due to the still strong top-down administrative structure.

Leadership at the FD is still driven by colonial revenue collection from forest plantations and infrastructure development. However, many of the high level officials interviewed by the Assessment Team agreed that new leadership on community-forestry and protected areas co-management is indeed required. It has been mentioned that the FD has below minimal technical capacity to manage forestry production and is poorly equipped to carry out forest protection duties (and the financial means to carry out basic maintenance of equipment). For example, as reported by a recent assessment of the Sundarbans Reserved Forest (SRF) Protection³³, “the current forest protection in SRF is inadequate to protect the forest from unsustainable extraction of forest produce or wildlife poaching.

The majority of FD posts were found to be insufficiently staffed, armed, and fuelled (Hossain et al. 2009). The living conditions for staff were also poor; many camps had damaged buildings, make-shift toilets, broken jetties, and freshwater holes filled with saline water (Hossain et al. 2009)”. The report also noted the lack of a communications system and boats to support patrolling. Additionally, the system used to record patrolling

³³ Sundarbans Reserved Forest Protection Assessment: Target State. Technical Report (Draft 1), November 2009. DF, Wildlife Trust of Bangladesh (WTB) commissioned by the EU-SEALS Project.

does not allow verification. During a short visit to the SRF, the Assessment Team noted that illegal logging incidents are still recorded in an archaic (pre-colonial) manner and the information is merely used to fulfill legal processes and misses the opportunity to improve patrolling and conservation effectiveness. The EU Sundarbans Environment and Livelihood Security (SEALS) Project has identified such weakness and is programming support to address such issues.

Like the Nishorgo Project, the IPAC project (Chapter 6) is, to the extent of its capacity, addressing the various issues regarding leadership and institutional capacity. The IPAC project is providing critical support to strengthen institutional and individual capacity on key aspects such as: applied conservation biology, protected area co-management, and an innovative (and indeed needed) training program on carbon financing. The IPAC project is also planning a follow-up strategy to ensure that trainees are retained and put to work where their capacity is most needed. Although this support is highly successful, there is even more that a project like IPAC could do to address the huge national-level capacity gap.

3.4 FINANCIAL ASPECTS

Funding to the FD comes from the central revenue budget and also from annual development budgets. This funding supports both salaries and the above mentioned recurrent forestry activities. The funding for the major afforestation and reforestation projects comes from international development partners.

For example, the above mentioned WTB/SEALS assessment (draft report) of the SRF found that approximately half of the FD 2008 operating budget for SRF (Taka 126,411,009) is spent on salaries (Taka 55,337,602) and very little of the remaining half is available for patrolling related activities e.g. fuel, infrastructure, water vessels, equipment (See Annex 4). As in most underfunded PA systems around the world, the operations budget is based on the spending in the previous years. Only a 10 percent increase is permitted every year.

Financial information regarding the cost, financial needs and gaps related to the administration and operational programs of the FD is not available. It is assumed that the FD used an obsolete budgeting approach under which costs and needs are not assessed. Financial analysis is not part of the annual planning process of the FD. Consequently, it is difficult to determine the real level of financial needs. The Assessment Team assumes that the existing budget is critically insufficient to cover the basic needs of the forest sector.

3.5 CONCLUSION AND OPPORTUNITIES

In conclusion, moving to a more efficient and socially-oriented forest sector in Bangladesh will require overcoming a number of barriers: leadership (unskilled and poorly motivated managers), financial (insufficient government transfers), structural (obsolete policies, laws and regulations), Institutional (archaic administration system) and technical (technical knowledge below basic needs). In addition, it is equally important that the government introduce mechanisms for transparency and accountability, and improve the control of corruption reported in the forest sector (e.g. managing revenue from illegal logging). Data from (Kaufmann et al., 2009) indicates the persistent and extremely low levels of percentile rank of governance indicators in Bangladesh for 2008: government effectiveness (22.7), regulatory quality (20.8), rule of law (27.3) and control of corruption (10.6). Governance in Bangladesh has not had any significant improvement in the last ten years. In fact, according to the indicated data, the percentile rank of control of corruption, for example, has deteriorated from 33.0 in 1996 to 10.6 in 2008. Annex 5 includes governance trends in the above mentioned indicators from 1999 to 2008. Corruption in Bangladesh is severely undermining economic growth and poverty reduction. According to Transparency International Bangladesh³⁴, corruption has lowered economic growth by about 3 percent. Higher growth would have been possible and, according to

³⁴ Measuring Corruption in Bangladesh, Iftexhar Zaman, Transparency International Bangladesh. Presentation at the DAC Heads of Information Conference 2006 on “*The Aid Agenda: Corruption, Governance & Aid Effectiveness*”. Canberra, 17-19 May 2006.

their estimates, 75 percent of the more than \$35 billion received in aid since independence has been lost to corruption. Assessing and understanding the root causes of these barriers is indispensable to eliminate them through an effective sector reform and capacity building program in the Forest Sector.

There are a number of opportunities for the USAID Mission in Bangladesh to provide highly leveraged support (in collaboration with other bilateral and multilateral donors) to the forest sector. For example:

- Provide co-financing to support an in depth capacity building barriers analysis (including root causes) and the design and implementation of a major program on capacity building for the forest sector. This program should address institutional reform to introduce administrative efficiency, develop leadership building, and close technical knowledge gaps. This program should emphasize high-leverage (technology-based) training methods supported by traditional workshop (problem solving workshops) and exchange events. Regional exchanges (with neighboring countries) should target key areas such as: policy reform, administrative reform, fiscal reform, financial planning, in addition to the technical aspects that are being addressed at project level (carbon financing, social forestry, alternative income generation and co-management).
- Assess opportunities to improve corruption control in the forest sector and develop and fund an anti-corruption strategy for improving forest management in collaboration with UNDP, DFID, Danida (and other donors) and key national actors such as the Anti Corruption Commission of Bangladesh (ACC) which was reorganized in February 2007, the Office of the Auditor General of Bangladesh and the Ministry of Finance. The strategy should also include PAs and the Fisheries management.
- Increase support to advance policy and legal reform within the forest sector and eliminate perverse incentives to deforestation. Eliminate regulations regarding the collection and transfer of forestry revenue from the DF to the revenue budget. This is critical to sustain forest recovery and also facilitate transfers of climate change-related funding. This reform could be the next breakthrough in forest conservation in Bangladesh.
- Improve informed decision-making. Most of the agencies interviewed by the Assessment Team agreed that there is a fundamental lack of data regarding forest management. The development of a nation-wide forestry strategy is also a high priority and should be supported by an efficient information system that should cover all aspects of forest management (all types of forest ecosystems, forest science, finance and management).

Additional recommendations related to PAs which apply to the Forest Sector are included in Chapter 5.

4. THE FISHERIES SECTOR

4.1 CONSERVATION STATUS AND THREATS

Bangladesh is endowed with an enormous network of aquatic ecosystems because of its location in the delta of three major rivers. The four million hectares of open waters in Bangladesh are among the world's richest and most complex fisheries, including rivers, *beels* (permanent lakes), *baors* (oxbow lakes), and *haors* (large deeply flooded depressions). These wetlands support an exceptional diversity of 260 species of freshwater fin fish, as well as shrimps, turtles, snails, and other wetland resources. The Bangladesh fishery is the third largest freshwater fishery in the world and the people of Bangladesh have an intricate, historical dependency on the floodplain system for their livelihood security. The coastal and marine fishery is based on over 400 species considered to be “marine” fish.

About 70 percent of rural households catch fish for food or to sell during monsoon, and fish contribute about 60 percent of the animal protein consumed. Inland capture fisheries remain the largest single contributor to total fish production in the country at 41 per cent, with inland culture fishes contributing 39 per cent, and marine fishes 24.5 per cent (DoF 2009). This sector contributes 5 percent of GDP, 4.2 percent of exports, full time employment for 1.2 million people and part time income for 11 million people. For the poor, fish are a crucial source of nutrition and income.

However, during recent decades, the quality and quantity of the country's inland capture fishery has declined. In the decade from 1985, natural carp spawn catches declined by 75 percent, and are now negligible, and major carp and large catfish have declined by half in national catches. Fish consumption fell by 11percent between 1995 and 2000 (but by 38 percent for the poorest households) and it is estimated that inland capture fisheries catches fell by 38 percent between 1995 and 2002 (Muir 2003). As a result, fish prices have increased in real terms at the rate of 2.8 percent per year. Fish used to supply 80 percent of the animal protein consumed, but now supply less than 60 percent. Even catches of the national fish “*Hilsa*” have declined, mainly due to over fishing of juveniles (*Jatka*). Recently DoF has had some success in seasonal bans on *Jatka* fishing but at the cost of hardship for poor fishers.

THREATS

As just explained, the freshwater fisheries of Bangladesh are in decline. Wetlands in the past were thought to be “wastelands” and a government goal was to drain and “recover” them for agriculture. Recent trends are also the result of:

- over fishing and use of harmful fishing practices including dewatering;
- unregulated access to fisheries such as rivers and coastal waters (unregulated fishing vessels and no demarcation of fishing grounds);
- short-term leases of water bodies which encourage maximum exploitation;
- construction of roads and embankments for flood control which restrict water spread and fish migration;
- siltation of water bodies from upstream erosion and loss of dry season water
- water pollution (industrial and agro-chemicals);
- privatization of common fisheries and enclosing of private floodplain lands; and
- climate change, particularly potentially increasing droughts in the dry season and changing salinity in coastal regions.

In addition, in coastal areas, shrimp farming has been both an important growth industry and a source of environmental and social issues since the 1980s. For example, 2,000 ha of mangrove forest were cleared in

Chakaria Sundarban in the belief that it could be used for shrimp cultivation. However, this was abandoned when the soil acidity was found to be too high and the area has reverted to low value salt production. . Despite the growth of shrimp hatcheries, there is still over fishing of target shrimp larvae by poor people, during which large numbers of other fish and shrimp larvae are destroyed.

Of Bangladesh's 260 freshwater fish species, more than 40 percent are now threatened with national extinction (IUCN Bangladesh 2000) (see also Report #3). Despite changes in national policies that call for an end to drainage of remaining wetlands (MWR 1999), wetlands continue to be encroached for agriculture, industry, brickfields and aquaculture with no sign of abatement. Most recently "floodplain aquaculture" based on enclosing seasonally flooded private land with bunds and stocking with carps has rapidly expanded in the last decade, and is being encouraged by some projects (e.g. Katalyst) and DoF. However, studies have shown that, even where locally established companies do this, the poor gain little benefit, losing access to former natural floodplain fisheries, with only a few being able to afford shares in the enterprise or getting work from the companies. Also, although fish yields can be high, so are costs and associated borrowing, so the financial returns to shareholders may be modest.

4.2 LEGAL AND REGULATORY FRAMEWORK

This section focuses on inland fisheries. Although the Ministry of Fisheries and Livestock and its DoF have the responsibility to conserve and enhance fisheries and fish production, and have set policies, strategies and rules, these agencies do not directly control the use of water bodies. Water bodies ("*jalmohals*") are under the control of the Ministry of Land, which leases out fishing rights for the purpose of collecting "revenue". As in the case of forests, this revenue makes a minuscule contribution to the national budget. This system creates a significant number of management-related barriers affecting fisheries.

The Protection and Conservation of Fish Act (1950) and related Protection and Conservation of Fish Regulations (1985) prohibit fishing by harmful methods, pollution and other activities detrimental to fisheries, and enables the declaration of closed seasons and other rules. However, the DoF has limited powers to enforce fishing restrictions, being dependent more on the will of fishers and leaseholders, with support from magistrates.

The National Fisheries Policy approved in 1998 focused on fish production and poverty reduction. It also included an objective of conserving biodiversity and conserving inland open water bodies. However, this is now superseded by the 2006 National Fisheries Strategy and its associated action plan, developed by the DoF. In inland capture fisheries, the Strategy aims to support sustainable growth in production, and management of open water fisheries through community participation, leading to a more equitable distribution of benefits, based on gradually reserving *jalmohal* leases for supervised Community-Based Organizations (CBOs) against nominal lease payments. It advocates a measured precautionary approach to expanding floodplain aquaculture. It also emphasizes conserving the environment and biodiversity of fisheries through appropriate ecosystem management regimes, including conservation and restoration of wetlands and fisheries and stronger cooperation with and support from other agencies.

There are about 12,000 public water bodies "*jalmohals*", which are controlled by the civil administration at district and upazila levels working under the directives of the Ministry of Land, which sets rules under a remit dating back to the 1950 State Acquisition and Tenancy Act. Essentially fishing rights are leased out for three years in "closed waters"; in rivers and "open waters" there has been no leasing since 1995 and they are now open access. No sustainable fishing plans are required by the competitive leasing process.

According to GoB records, the responsibility for around 300 *jalmohals* has been handed over for 10 years to CBOs³⁵ formed through various projects (including MACH, see below) to manage them sustainably^{vii}. Project

³⁵ Different names are used by various projects; for MACH, they are called Resource Management Organizations.

reports and evaluations indicate that, in most cases, community based management has established sanctuaries and closed seasons, and restored habitat (limited empirical data is available). Where surveys have been done, as in MACH, such measures have been shown to have restored fishery productivity (by more than double) and biodiversity, improved the livelihoods and fish consumption of local communities (most fishers are poor), and the CBOs have continued to function and operate their management plans after project support ended.

By comparison, the majority of *jalmohals* leased under the traditional competitive system have experienced over exploitation, declining catches, and a lack of conservation measures, since fishers are usually poor and leases have to be paid at the start of the year. Access for fishers has been compromised, as middlemen pay the lease and take effective control using lists of their “fishers”. However, the leasing process for non-handed over *jalmohals* (the majority) has recently changed. In 2009 the Ministry of Land introduced its latest *Jalmohal* Management Policy. This policy (1) could expand recent successful experiences in community management of wetlands and fisheries, (2) encourages sanctuaries and swamp forest restoration, and (3) could end competitive leasing of *jalmohals*. Instead, a registered CBO would receive the lease. It will be a three-year lease, which includes a lease fee set at 5 percent above the last lease rate. The new policy has significant implementation challenges due to weak institutional capacity (in the local administrations and the DoF) and potential political interference from Members of Parliament, who have been given a role in advising on which CBO will get a lease, and from powerful individuals who constantly try to take control of wetlands that CBOs depend on and have invested in restoring.

Key issues with potential to undermine USAID support to the Fisheries Sector and areas for reform are included in the Table 3.

Table 3. Key issues, risks and areas for reform in the framework governing wetlands and capture fisheries.

Laws and regulations	Key issues	Level of risk			Suggested areas for reform
		L	M	H	
Bangladesh Environmental Conservation Act (1995)	Poor management guidance on ECAs (most of which are wetlands). Places ECAs under DOE which has no capacity to manage them.			X	Develop model ECA planning and management. Transfer wetland ECAs to DoF or develop mechanisms for cross-agency management/ co-management.
National Fisheries Strategy 2006	Includes community management, conservation, and using leases to control access, not based on revenue. DoF lacks implementation capacity and a strategy for inland open waters.			X	Development enforcement mechanisms. Gradually phase out Ministry of Land role in favor of local administrations and MoF for management of access to water bodies. Build capacity at both levels: government and co-management
<i>Jalmohal</i> Management Policy (2009)	Top-down approach. Lacks clear incentives for long term community management and restoration of fisheries			X	Reform to follow approach in inland capture fisheries component of Fisheries Strategy, and incorporate into policy.
Protection and Conservation of Fish Act (1950); Protection and Conservation of Fish Regulations (1985)	Enforcement very difficult. Size limits impractical. No recognition to fish sanctuaries.		X		Include recognition of a range of different sanctuaries in wetlands and fisheries, and management agency. Allow for recognizing community initiatives. Update rules on harmful fishing practices, improve enforcement mechanisms.
Government Fisheries (Protection) Ordinance 1959	Allows any public water body to be placed under direct government managed licensing system. Obsolete, top-down management. Lacks coherency with recent Fisheries Policy (1980s to early 1990s.	X			Eliminate
Marine Fisheries Ordinance 1983	Allows for declaring marine reserves, bans explosive fishing, and covers licensing of vessels. Lacks guidance for wider marine conservation and enforcement regulations (sanctions).		X		Introduce territorial fishing rights. Link with resource management plans or sustainability. Make cross-agency use of marine reserve provision.

4.3 LEADERSHIP, INSTITUTIONS AND MANAGEMENT CAPACITY

The Ministry of Fisheries and Livestock (MoFL) is mandated to ensure coordination of national policy on fisheries. It is also responsible for planning and overseeing the conservation and management of fish and other aquatic resources. The Department of Fisheries (DoF) is the principal agency responsible for executing fisheries policy and programs. It also provides technical advice to MoFL and undertakes collection of data on fisheries, their compilation and publication. Also under MoFL are the Bangladesh Fisheries Development Corporation (BFDC), with no significant role in capture fisheries except for the management of Kaptai Lake, and the Bangladesh Fisheries Research Institute (BFRI), which has limited capacity in freshwater capture fisheries. As far as inland fisheries are concerned, DoF activities were traditionally concentrated on enforcement of laws/regulations, but since the early 1990s a number of projects have been undertaken to establish community based management and restore fishery productivity with national NGO and external donor partners. The DoF now sees its other major role as providing extension services (technical advice) but, to date, that role has focused mainly on freshwater and shrimp aquaculture, including quality assurance. DoF staff lack skills to provide technical advice on other key aspects of the aquaculture production value chain. The need for sustainable biological management of open waters through fishing communities has increased in significance and offers an opportunity for DoF to gain influence over waters controlled by the Ministry of Land.

Similar to the Forest Department, the DoF suffers from lack of leadership at many organizational levels. Compartmentalized thinking and narrow vision is also common. Most of the DoF managers still lack basic understanding of modern concepts and approaches to sustainable fisheries management. Consequently, they are ill equipped to provide adequate leadership. Field staff, however, is becoming more accustomed to community based fisheries management. The Assessment Team suggests that strengthening leadership is a priority for the DoF, although the situation is not as critical as in the Forest Sector.

The project-driven approach used by the DoF³⁶ has significantly contributed to building leadership and capacity on pond aquaculture, which has now taken off with private investments, using well-known technologies and supplied by private hatcheries. Between 1990 and 2007, a range of donor funded fisheries projects were launched. In particular, in a renewed effort to improve inland fisheries management, CBOs have been established for fishery management under several projects, and rights to water bodies have been reserved for these local user organizations. The CBOs are registered with government agencies as legal entities. However, there has been limited follow up by the DoF to support these arrangements after project support ends. DoF has limited staff in each Upazila, and most staff is strongly oriented to aquaculture rather than having skills in community mobilization, conservation, and conflict resolution. The local level institutions are formed to establish and maintain the rights of the fishers and link this with more sustainable management practices. Since early 2007 a network among about 250 floodplain and fisheries CBOs has been supported by action research grants from IDRC and DFID to strengthen learning and adoption of good practices and innovations in integrated floodplain management.

There are also fundamental differences from the forest sector: use rights and responsibilities have traditionally been transferred through leases by government to individuals, cooperatives, middlemen, or (in the new arrangements) the CBOs. Such decentralization has been key to improving management. The CBOs and fishers have a direct incentive to conserve and manage fisheries responsibly once they have longer access rights, as well as advice and support for initial investments such as sanctuaries and habitat restoration. The incentive is higher overall catches when the productivity of these fisheries is restored. The MACH Project was particularly successful at strengthening independent and registered CBOs and their co-management

³⁶ DoF currently has 46 projects underway or planned for the next two years – most with external donor support.

committees. However, due to poor inter-agency coordination, often different and inconsistent types of development have taken place in the same floodplain locations.

Table 4 provides an overview of the investments, scope and impact of major fisheries projects in the last decade: MACH (USAID-GoB), Fourth Fisheries Project (WB, DFID, GEF, GoB) and Community Based Fisheries Management 1 & 2 (Ford Foundation, DFID, IFAD). The institutional set-up for these projects is included in Annex 6.

Table 4. Major projects working on community management of wetlands and fisheries (1999-2007)

	MACH	FFP	CBFM I & 2
Funding sources	USAID, GoB	World Bank, DFID, GoB, GEF	Ford Foundation, DFID, IFAD
Duration	1999-2008	2000-2006	1996-2000, 2001-2007
Budget (US\$ actual costs)	9.57 mill	About 11 mill (open waters component estimate)	About 13 mill (separate grants to each partner in phase 1)
No. of sites	3 large wetlands	Start 62, end 39 water bodies	19 water bodies in phase 1; 10 clusters plus 37 scattered water bodies in phase 2
No of CBOs	16 for wetland management, 13 for livelihood support	45 for fishery management	134 for fishery management
Dry season water area (ha)	4,600	7,300-9,400	4,000-5,600
Wet season water area (ha)	25,070	17,000-21,800	10,400-15,100
No of villages	107	561	442
No households	About 172,000	Over 140,000	Over 109,000
No fisher households	Likely about 25,000	Over 22,000	Over 23,000
Cost per fisher household	US\$ 380	US\$ 500	US\$ 560
Cost per ha (wet season)	US\$ 380	US\$ 500-640	US\$ 860-1,250
Cost per ha (dry season)	US\$ 2,080	US\$ 1,100-1,500	US\$ 2,320-3,250
Cost (US\$/dry seas ha/year)	208	220	250
Benefits	Average >100% increase in fish production, plus AIG benefits and trees; significant increase in fish consumption	40-65% fish production gain claimed, but lacking reliable data; control water bodies reported falling yields	40-50% fish production gain (excluding stocked beels)
Economic return	56% IRR	33% IRR	Not known

4.4 FINANCIAL ASPECTS

Fishery management is largely self-financed by the private sector – for aquaculture by landowners, and for capture fisheries by those taking *jalmohals* on lease. Public and donor funding (over US\$100 million between 1990 and 2009) has been mostly for projects (including the USAID/GoB funded MACH Project (1999-2008, US \$ 9.5 million)) introducing new technologies, capacity building, investments to bring qualitative changes in fishery and wetland management (including community organizations), and shrimp farming and aquaculture.

The DoF is co-financing the project-based approach. The current level of project funding of DoF is estimated to be just over US\$ 12 million a year, mostly from GoB resources. Of this 34 percent is aquaculture related, 29 percent for marine fisheries, 23 percent for mixed area based and capacity building projects, 12 percent for sustaining inland capture fisheries, and 2 percent for floodplain aquaculture. A list of these projects is provided in Annex 7. This compares to DoF's "revenue budget" for administration and other basic operations of Taka 895.5 million (\$ 13 million) in 2009-10.

As in the Forest Sector, financial information regarding the cost, financial needs and gaps related to the administration and operational programs of the DoF is not available. The Assessment Team assumes that, given the important level of donor project support, funding gaps are not as severe as in the Forest Sector, but empirical data are not available.

4.5 CONCLUSIONS AND OPPORTUNITIES

The Assessment Team agrees that a basic institutional and legal framework for integrated use of coastal and inland fishery resources is available. However, it is severely constrained due to uncoordinated and sometimes adversarial enforcement efforts by different agencies. This is undermining the impact of the projects and results in conflicts between flood control, agriculture and fisheries.

Several projects, including MACH, that have combined efforts of national NGOs, DOF, and international agencies (contractual arrangements depend on each donor, and most field implementation is carried out by local NGOs, overseen by consultants) have demonstrated that wetland ecosystem management approaches, particularly community managed wetland habitat restoration can be replicated in large and smaller wetland areas. Thus, continuing investments in this approach will ensure the long-term sustainability of the fisheries sector. Opportunities for USAID-Bangladesh include:

POLICY AND LEGAL CHANGE

- Overcoming the "disconnect" between the Ministry of Land approach and the needs of sustainable management, reflected in the National Fisheries Strategy, is an immediate priority.
- Reform of laws to support and enable community based conservation (see earlier).
- Promotion of results-oriented cooperation between DoF, DoE and MoL. For instance, the need for cooperation in wetland management is not shared at the Ministry of Land and it will require an intervention at the highest level (e.g. to reform the objective and conditions of *jalmohal* leasing).

INSTITUTIONAL SUPPORT

- Support for DoF to reform, develop and extension role with respect to floodplain fisheries, focus on partnerships, and enable and empower local wise resource use, through a sub-sector strategy that can invite support from different donors.
- Internalization of experiences and lessons in participatory fisheries management.
- Strengthening capacity to implement and manage multi-disciplinary approaches, other than traditional aquaculture: ecosystem conservation, social mobilization, economics, financial management, business planning, and general management.

- Collaboration across agencies to prioritize and strengthen regulatory controls on conversion of floodplain wetlands to other uses. This collaboration is needed to mitigate the impact of the rapid growth of aquaculture in floodplains, which encroaches on floodplain systems and when combined with flood protection embankments and sluices, impacts the lifecycle of many native fish species.
- Collaboration with Forest Department to manage and conserve the Sundarbans wetlands as a total system including not only trees and terrestrial fauna but also fish, crabs and other aquatic life.

RESOURCE MANAGEMENT

- Improved management of inland capture fisheries. This is critically important to livelihoods as well as to wetland biodiversity.
- Innovation of new arrangements for coordinated sustainable management and conservation of the main river and coastal ecosystems by involving local communities. This should cover fish stocks and water birds that depend on river and coastal *chars*. There have been no significant projects in this area, except for one site of the MoEF CWBMP and the new three-year GTZ project in Pabna District. There is an opportunity to link riverine wetland management with DFID's large program focusing on *char* livelihood security.
- Small grants program to support independent CBOs formed to manage not only fisheries and wetland resources but also surface water.
- Pilot projects to establish marine and coastal protected areas for fisheries and aquatic biodiversity.

5. PROTECTED AREAS

5.1 CONSERVATION STATUS AND THREATS

There are 19 Protected Areas (PAs)³⁷ in Bangladesh covering 2,458 km² and representing 1.68 percent of the country's surface area or 16 percent of the total area managed by the Forest Department (FD records as on July 2007). The Forest Department has the mandate for management of these protected areas. The protected areas are declared in the country under the “Bangladesh Wildlife (Preservation) (Amendment) Act, 1974”. The Act recognizes three official categories of PAs: National Parks, Wildlife Sanctuaries and Game Reserves.

Management of forest PAs has been visible in the conservation agenda of Bangladesh since 1997. The ADB-funded Forestry Sector Project (1997-2004), in partnership with FD, introduced PA planning and management concepts and supported the formulation of comprehensive management plans for two protected areas (Lawachara National Park and Rema-Kalenga Wildlife Sanctuary) and framework management plans for five others (Hazarikhil Wildlife Sanctuary, Chunati Wildlife Sanctuary, Himchari National Park, Madhupur National Park and Teknaf Game Reserve). The NSP tapped into these foundational developments.

From 2003 to 2008, USAID supported the program for “Co-Management of Tropical Forest Resources in Bangladesh” (Nishorgo Support Project -NSP). The NSP worked closely with the FD and key conservation stakeholders to develop and successfully introduce the initial aspects of PA co-management and PA management plans at five initial pilot PA sites, namely, (i) Lawachara National Park, (ii) Rema-Kalenga Wildlife Sanctuary (iii) Satchari Reserve Forest (now National Park), (iv) Teknaf Game Reserve, and (v) Chunati Wildlife Sanctuary. With the success of NSP and MACH, co-management for conservation is now being extended to Madhupur, Khadimnagar, Medha Kacchapia, Fashiakhali, Kaptai, Publakhai and the three Protected Areas in the Sunderbans (and, potentially, others), under the new USAID supported IPAC project (follow-up to NSP).

In Bangladesh, as in many other countries, the simple declaration and establishment of PAs has not been sufficient to ensure the achievement of conservation (and social) objectives. As noted by S. A. Mukul, et al (2008)³⁸, if PAs are to be effective in conserving biodiversity, the PA system must be representative of all ecosystem types. In Bangladesh, PAs do not effectively represent all ecosystems (alternative options also need to be assessed), and thus do not include all habitats and species important for conservation. In particular, the status of ECAs needs to be clarified and the need for extensive protection of other terrestrial and marine ecosystems and species evaluated. The creation of PAs in Bangladesh is not yet based on any assessment of ecological representation (gap analysis). In addition, the nomenclature of PAs needs to be harmonized with IUCN and CBD standards and other modern standards to manage sustainable tourism in different types of PAs.

Development of a Bangladesh PA *System* is critical to improve conservation management and financial sustainability. For example, there are many management programs that require network level action, not just site level action. For example, ecological representativeness and PA expansion, policy reform, financial management (including the setting and collection of PA fees). Such activities affect all PAs in the network. A PA system will facilitate the coordination effort and support from several government institutions. Some activities can be delivered in a more cost-effective manner if provided at system-level, for example, training, conservation monitoring, financial management and monitoring. Also, fundraising plans can be more effective if coordinated at system level, since it will reduce competition between sites and will facilitate the establishment of cross-subsidies between PAs. An effective PA system would include ideas like wildlife corridors, elephant ranges and other critical species protection strategies.

³⁷ Plus an additional two areas proposed for PA status. See Report #3 for more detail on all PAs.

³⁸ Protected Areas of Bangladesh: Current Status and Efficacy for Biodiversity Conservation. S. A. Mukul, M. B. Uddin, M. S. Uddin, et al, 2008

THREATS TO PAS

The threats to PAs in Bangladesh include two interrelated aspects. On the one hand, the demand for timber resources and fuel-wood for brickfields and other commercial purposes, and the involvement of the “elite” (including corrupt FD officials) in capturing these resources, using the rural poor to do the “dirty work” for them; and on the other, the need of an expanding population of poor people to have access to PA resources; and they include both threats to forest and fisheries.

As noted by Monoj Kanti Roy (2004) and others, the major threats to protected area as well as biodiversity include:

- Lack of awareness;
- Outdated and incoherent laws and regulations and their inadequate enforcement;
- Corruption and poor corruption control (to minimize infractions and sanctioning of illegal activities by corrupt officials);
- Destruction of habitat: over-exploitation (e.g. firewood collection for domestic and urban use, sawmills and brick fields), agriculture and grazing inside PAs, indiscriminate use of agro-chemicals and oil spills, encroachment of PAs with settlements;
- Change in land use pattern and conflict between different land uses;
- Indiscriminate hunting and poaching of animals, and over fishing; and
- Natural shocks (including climate change effects) like flooding, storm surge, etc.

5.2 LEADERSHIP, INSTITUTIONS AND MANAGEMENT CAPACITY

The Wildlife (Preservation) Order, 1973, Wildlife Preservation (Amendment) Act 1974 and subsequent Notifications provide the legal basis for protection of wildlife and habitats, at least in forest ecosystems. The Wildlife Order defines three types of protected areas (game reserve, national park and wildlife sanctuary) and aims to preserve fauna (but not flora) within those protected areas. The Act, its Amendment and the Order did not take community management into consideration (nor was it based on modern concepts of biodiversity) and is now under revision. In addition to the Wildlife Act recognized PA categories, the Government has acted to increase the number of parks, mainly through the creation of a number of Eco-Parks and Safari Parks on Reserved Forest Land. These newly created parks, however, are extremely small by comparison to the official PAs, and are designed to serve a "nature recreation" need rather than a large-scale “nature conservation” need. Nevertheless, in a country starved for opportunities to encounter nature, they serve a useful function. Additionally, the conservation value of these areas lies primarily in the opportunity to provide environmental education and awareness programming to a large number of visitors and will also serve as pilots for expansion/replication.

Under the auspices of The Forest Act, 1927, section 28A, Subsection (4) and (5) and Section 76, and the above mentioned (Preservation) Order 1973, section 47 the Government has drafted, “The Protected Area Co-management Rules, 2009”, a legal instrument recognizing the declaration of buffer zones, co-management committees, and revenue sharing mechanisms by stakeholders, will, when approved, provide a sound foundation for PA management, which also takes into account the needs of the surrounding populations for livelihood support in place of degrading the PA. Importantly, it is expected that these Rules will demarcate core areas of full protection (big enough to support viable populations of key species such as hoolock gibbons and capped langurs in Lawachara), as well as buffer zones – which can be within the present PA boundaries, as well as adjacent reserved forest – for livelihood activities, notably social forestry. Only in this way, can sufficient land be provided (at one acre per family) to compensate for lost income. In return, the core zones would receive full protection. Strong science back up is required for this effort to be successful.

The situation with respect to conservation of non-forest areas is less clear. However, the Bangladesh Environmental Conservation Act of 1995 includes a provision whereby, if the Government is concerned that the degradation of an ecosystem has reached "a critical state" of degradation, it may declare the area to be an "ecologically critical area" (ECA). In April 1999, this authority was exercised for the first time by the Director General of the Department of the Environment in officially notifying the establishment of six separate wetland areas as ECAs, covering approximately 40,000 ha. During the subsequent preparation of a GEF project, two more sites were added to the list of notified ECAs. In 2009, four rivers around Dhaka were added, for a total of 12 sites.

As part of a reorganization of the FD in 2001, the "Wildlife and Nature Conservation Circle" (WNCC) was established and headed by a Conservator of Forests, reporting directly to the Chief Conservator of Forests (CCF), with a total allocation of 378 staff. The WNCC divisions are considered part of the permanent set up of the Forest Department (although no staff at the professional or at any level could be considered permanent). Staff members from the Conservator of Forests to the Forest Guards move regularly, every three years, on transfer, even to divisions under other Circles (including staff trained in conservation management). This is a significant management constraint which undermines the retention of trained staff. Under WNCC, there are four Wildlife and Nature Conservation (WNC) Divisions, each headed by a Divisional Forest Officer (DFO): (i) WNC Division, Dhaka; (ii) WNC Division, Chittagong; (iii) WNC Division, Khulna; and, (iv) WNC Division, Sylhet. Each WNC Division has the mandate to manage the protected areas within the territory of the Division. By May 2009, all four divisions had become operational. However, due to institutional capacity gaps, many of the PAs are still under the administrative control of territorial forest divisions.

Under the present circumstances and given the high level of centralization, top-down management, and knowledge gaps, the WNCC managers still lack most of the basic skills required to provide sound leadership in modern PA management, co-management, conservation science and PA financing.

Recently, the Nishorgo Support Project has provided an opportunity for some departmental staff, at both professional and sub-professional levels, to gain experience in the co-management approach. In addition, recent overseas study programs have helped to promote the idea of co-management of PAs among many professionals but this has been difficult to sustain because of frequent staff transfers.

Most of the field staff currently working at Range and Beat levels have had very little exposure to PA management. Most of them were recruited as Foresters at least two decades ago (due to a long extended hiring freeze) and received general forestry training from Sylhet Forestry School. Yet others have been absorbed from development projects without any forestry training. Most of the older staff think protected area management consists of checking game hunting and protecting game animals from out of season poaching. They need to receive thorough orientation training in PA management before being posted in a PA. This is currently a serious staffing problem within the FD.

A major weakness of the WNC Circle is that there is no position for a PA Manager who could support co-management. In addition, the WNC Circle has no position of ecologist, anthropologist, economist, financial analyst, lawyer or other professionals needed to support PA co-management. Also there is no provision for career development if such personnel were to be recruited and the Department would have a difficult time nurturing their career development.

Though the Department of Environment (DoE) has extended its mandate towards natural resource management through the ECAs, this activity is mostly project driven, e.g. the Coastal and Wetlands Biodiversity Management Project (CWBMP) with support from GEF and UNDP as stated below. This project will end in 2010. The institutional framework of ECA management in DOE is very weak; at present there are only two ECA Management Officers posted at two CWBMP sites.

It is evident from the above discussion, that PA management in Bangladesh lacks a systematic institutional structure, staffing pattern and capacity at the institution and personal level.

Consideration might be given to the establishment of a new PA Department under the MoEF, through upgrading of the WNCC of FD and incorporating the nature conservation activities of ECAs under DoE. In a broader approach, the selected wetland sanctuaries could also be brought under the new established Department (principally the larger permanent water bodies with high conservation value for both aquatic and riparian ecosystems, such as the present ECAs and Ramsar sites). But such a reform would be a real challenge in the Bangladesh context.

Finally, the MoEF/DOE have taken nominal charge of the national obligations regarding wetlands and fisheries under the Ramsar Convention, Convention on Biodiversity and ECAs. However, as noted before, they lack capacity and financial resources to respond to these challenges. Such capacity needs to be built, whether in DoE, DoF or a new PA Department.

5.3 FINANCIAL ASPECTS

Financially sustainable protected areas are essential strategic instruments for ensuring long-term production of ecosystem services, including biodiversity conservation, water provision and regulation, soil conservation, carbon sequestration, and adaptation and resilience to climate change.

“Financial sustainability” of PAs refers to the ability of a country to meet all costs associated with the management of a protected area (or system of PAs) and all the related ecosystems functions. At system level, it includes the costs of individual PAs and central level operations including investments and recurrent costs. Financial sustainability needs to focus on both “supply” aspects (generating more revenue across the system) and the equally important “demand” aspect (the challenge of ensuring that expenditures are sufficient to allow the PAs to be managed in a fully sustainable way).

As indicated above, under the current high level of centralization, top-down management and knowledge gaps, it is unlikely that, in the next few years, the network of PAs in Bangladesh can move towards financial sustainability. Most modern methods for PA financing require at least a moderate level of institutional autonomy. Therefore, at this point, it is fundamental to investigate and analyze the structural foundations (institutions and laws) that constitute the barriers to development of a financially sustainable PA system.

In Bangladesh, PAs financing squarely fits in the traditional model, where PAs are highly dependent on very limited government funding, growing but still very limited support of a trust fund (Arannayk Foundation) and international projects that can only partly and temporarily address the financial situation of PAs (e.g. Nishorgo and IPAC). A centralized entry fee (revenue-sharing) mechanism has been introduced but it is not yet fully operational. In Bangladesh, the lack of funding is the most important obstacle to the improvement of PA management (and co-management).

The real cost of effective PA conservation programs is not yet known. Information on costs, financial needs and gaps is not available. As noted in Chapter 3, the DF/WNCC uses an obsolete budgeting approach under which cost and needs are not assessed. Financial analysis is not part of the annual planning process of the FD. The Assessment Team observes that the existing budget is critically insufficient to cover the actual management needs of PAs. The sustainability of the PA co-management model may be at risk due to lack of funding to support CMCs in the near future³⁹.

³⁹ The GoB and donors interested in the PA system might want to look at the system for financing conservation areas in Costa Rica. USAID has played an important role in developing this model through the FORESTA project which was established an NGO, FUNDECOR, to support conservation activities in one of several “conservation areas.”

5.4 CONCLUSIONS AND OPPORTUNITIES

CONCLUSIONS

The most important recent successes at improving PA management have been achieved with substantial donor support (e.g. ADB, IUCN, EU, USAID and NGOs). The GoB, with the support of these projects, has achieved key conservation milestones, such as:

- Introduction of PA co-management within the PA regulatory framework;
- Development of PA management plans;
- Improvement of AIG activities at community level in PA (terrestrial and wetlands) and buffer zones, albeit at a limited scale;
- Empowerment of communities and establishment of PA co-management committees (CMCs); and
- Provision of visitor facilities and introduction of PA entry fees within the PA regulatory framework.

The immediate sustainability (especially financial sustainability) of these achievements is a priority for the USAID Mission in Bangladesh. However, PA financing in Bangladesh is lagging behind. For example, assessment of enabling conditions and PA financial planning (needs analysis, assessment of financial mechanisms (with emphasis on diversified revenue-sharing options), cost reduction opportunities, formulation of a system-level financial strategy and site-level business plans. Although the enabling conditions such as decentralization, incentives for engaging the private sector, transparency, and accountability are not there yet, it is critical that, in the immediate future, capacity building in these areas is provided. Currently, there is no individual or institutional capacity for PA financing, and there is a huge gap regarding the legal and regulatory framework governing PAs financing. This situation is a high-level threat to the sustainability of the achievements of USAID funded projects because it is unlikely that the GoB will increase funding to PAs in the next future.

Although the government has recently approved the introduction of PA entry fees (under a revenue-sharing system with local communities), sufficient funding is unlikely to be mobilized through entry fees (given the precarious conditions of tourism facilities in PAs and tourism management capacity at site level); and there is no other readily available funding (from government sources) to continue to support co-management schemes.

In many developing countries, payments for environmental services (PES) are a significant part of PA financing. However, opportunities to establishing ecosystem-based PES in Bangladesh, in addition to tourism, are limited because of the existing political and social context. Nevertheless, given the current level of growth in the economy and growing middle class in urban areas, ecosystem services such as fresh water (in relation to drinkable water, flood mitigation and hydro-power) are key areas that will require detailed assessment in the next future, and should be part of a comprehensive PA financial planning process. PES may have particular application in the CHT, where the population could be compensated reversing environmental degradation of their watersheds. In addition, carbon financing under REDD programs related to mangrove forest is another promising option (as discussed in Chapter 2).

OPPORTUNITIES (in addition to recommendations included in Chapter 3, on Forests, which apply to PAs)

PA Governance

- Formulate and introduce new legislation to improve protected area governance in key aspects: institutional authority for PAs (including national and sub-national actors), establishment of the national system of PAs (and sub-systems), co-management of PAs to cover various important aspects of PA management other than CMC patrolling (e.g. PA financing, sustainable tourism enterprise development, private sector co-management), private PAs and concessions.
- For the definition of the PA system or subsystems consider: a) improve representativeness at a regional rather than country level (e.g. Sundarbans), and b) recognize the conservation value of secondary habitats as in specific PAs or portions of PAs. For example, and although requiring further investigation, Bangladesh could probably expand the extent of its PA system quite dramatically by establishing one or more protected areas to be managed specifically for elephant conservation (Managed Elephant Ranges). The US has been active and effective in supporting elephant conservation globally and this might be a good option for USAID support in Bangladesh.
- Anti-corruption strategy (as noted in Chapter 3).
- Assess needs and improve PA management guidelines: harmonization with international standards (including IUCN categories and CBD standards, sustainable tourism and other modern standards for managing game and wildlife reserves), and equally important, the standardization of PA management programs to enable realistic costing and estimation of financial needs at PA network level.
- The introduction of a PA co-management planning initiative at national level using the IPAC sites as pilots. This initiative would aim at developing standards for PA co-management plans officially adopted by the GoB, national level formulation of co-management plans and implementation, and exchange of lessons learned

PA Financing

- Strengthen policy work related on PA entry fees. Most important, link supply and demand and investing in tourism related infrastructure. This is indispensable because Bangladesh has a large customer base (large emerging urban middle class), and the PA entry fee system, if designed appropriately, has a large financial to support, PA investment (to support investment in tourism-related infrastructure) and shares to benefit local communities involved in co-management. Therefore attention should be put on key interrelated aspects of entry fee design: diversified type of entry passes (one PA or multiple PAs); special service passes (photography, canoeing, camping); individual, groups and corporate passes; passes with different validity (daily, monthly, annual), payment type (cash, credit card), different points of purchase (PA, Supermarket, Western Union Kiosk). The entry fee policy must clearly include a distribution of revenue: community share; investments and maintenance and other purposes. This action will require significant support from external experts.
- The introduction of a PA Financial Planning initiative should be considered top priority. This will aim at mobilizing funding to implement PA management plans. This initiative will include analysis of enabling conditions, financial analysis of the PAs (costs, needs, gaps, and cost reduction options), selection and diversification of market-based and non-market financial mechanisms (including revenue-sharing options), formulation of financial and business plans.

Additional specific recommendations on PA financing, finance-related training, PA economic valuation, funds management, and communications are included in Annex 8.

6. LESSONS FROM USAID SUPPORTED PROJECTS: MACH, NSP AND IPAC⁴⁰

In this chapter we present, in highly summarized form, the main features of USAID's previous projects in the environment/ Natural Resources Management (NRM) field in Bangladesh. The Team then draws some important lessons learned, which should be kept in mind in considering the issues raised in the previous chapters.

6.1 PROJECT MACH

Management of Aquatic Ecosystems through Community Husbandry (MACH) (1998-2008)⁴¹ institutionalized co-management of floodplain water bodies in three large wetland systems, totaling about 4,600 ha of dry season water area and 25,000 ha of wet season water (3 percent of all such water bodies). Sixteen Resource Management Organizations (RMOs), comprising poor fishers, farmers and local leaders, now hold fishing leases for their water bodies and are implementing management plans, which typically involve creation of sanctuaries, a closed season to allow breeding, bans on destructive fishing methods, restocking with native species and some infrastructural investments (excavation of water bodies and dredging of canals to restore fish habitat). A parallel micro-credit system is supporting livelihoods for the fishers and other poor wetland users through 13 Federations of Resource User Groups owned and run by their members. Five Upazila Fisheries Committees form co-management bodies which link the community based organizations with the Union Parishads, Department of Fisheries (DoF), Upazila administration and other government agencies. The project also undertook pilot activities for swamp forest, riparian plantations and soil conservation, to restore habitat and demonstrate methods of reducing sedimentation of water bodies.

The results were impressive. Fish catches increased two- to five-fold from baseline values (average 140 percent). Fish consumption increased about 45 percent, with the landless poor benefiting as much as richer households. The micro-credit program has helped about 5,200 poor households increase their incomes by about 50 percent. The Upazila Fisheries Committees have received endowment funds to help sustain project gains. A sanctuary of 100 ha was created in Hail Haor and is attracting large numbers of birds and other wildlife, with Ramsar designation a possibility.

Two five-year phases of MACH were needed to reach this level of results. It should also be noted that the project was rather staff intensive – staff of the contractor's NGO sub-contractors customarily attended each meeting of the RMOs and FRUGs until the last three years, when facilitation support was gradually phased out. Also, the project provided numerous training opportunities, both in fisheries management and in Alternative Income Generation (AIG), including formal training in subjects like sewing and auto mechanics.

6.2 NISHORGO SUPPORT PROJECT

Beginning in 2003, Nishorgo introduced co-management to five forest Protected Areas (PAs), including the establishment and strengthening of Co-Management Councils and Committees (CMCs), setting up community patrolling groups, provision of visitor facilities, efforts to promote eco-tourism, and pilot projects for AIG. Parts of and in some cases the entire PA targeted were severely degraded or deforested, though some valuable habitats remained. Several differences from the wetlands situation should be noted:

- MACH was carried out at arm's length from the DoF (although this was later recognized as less than optimal), while Nishorgo had to work with a Forest Department (FD) that had previously had total control of the natural resource (as discussed in Chapter 3).

⁴⁰ Some additional minor comments are not recorded here but have been passed on to the IPAC team.

⁴¹ See Winrock Int'l *et al.* "MACH II Completion Report", 2 vols, USAID, June 2007.

- Although MACH could include only some of the many fishers using wetlands as members of RMOs, and in Hail Haor the waterbodies under RMO management comprise only a third of the total waterbodies in the haor, the benefits of habitat restoration, sanctuaries and other conservation measures have restored fish productivity over the whole systems, benefiting many thousands more people than are members of the RMOs. The populations dependent on the Nishorgo PAs also numbered in the tens of thousands, posing problems of representation in the CMCs when no community organizations of poor users are formed.
- AIG in MACH areas could reach a significant proportion of those needing assistance, while for Nishorgo such an approach was not feasible and activities were more demonstration in nature.
- Perhaps the greatest difference is that improved fisheries management led within two years to a substantial increase in catches and thus incomes for all wetland users in the areas outside of sanctuaries, whereas managing forest PAs to reduce illegal cutting was likely to lead to reduced incomes for resource users. While Nishorgo sought to address this by demonstration AIG, training, tourism promotion, and funds for small-scale infrastructure, provision of adequate alternative incomes remains a major challenge.

Given the relative shortness of time, the Nishorgo model cannot yet be considered self-sustaining, although positive trends can be seen in:

- The attitude of many (though not all) FD officials has changed to greater acceptance of PA goals and to active participation in co-management.
- Some of the established CMCs are beginning to work actively in conservation and social development activities. The recent agreement for them to receive 50 percent of entry fees should provide a boost to self-sustainability, although the amounts will be modest in the near future. Publicity efforts have resulted in large increases in visitor numbers, especially from the Bangladeshi middle class who have the power to influence national policies, aided by an active and vigilant press. Nevertheless, the visitors' current lack of understanding of rules for visiting protected areas, the limited understanding of sustainable tourism management by CMCs and the existing very limited tourism infrastructure in the overall PA network constitutes a barrier to making tourism environmentally and financially sustainable. These aspects will require priority attention.
- Nishorgo has shown that a well orchestrated effort among the FD (better enforcement), the CMC (social pressure), and the community patrolling groups can significantly reduce illegal logging, although it has proved difficult to sustain all three factors for very long.

6.3 PROJECT IPAC

The Integrated Protected Area Co-Management (IPAC) Project, begun in September 2008, is now USAID's flagship operation in NRM and forms the successor to MACH and to Nishorgo. IPAC is providing continuing support to the co-management organizations for the MACH sites and is prepared to offer support (not yet clearly defined) for a number of other sites, such as Tanguar Haor (benefiting from a Swiss/IUCN project), Hakaluki Haor (where a UNDP/GEF project is close to completion) and the so-called "leveraged" sites from an earlier WorldFish Program. IPAC also aims to fully institutionalize co-management systems for the Nishorgo sites and expand the concept to nine new sites, including the large Sundarbans PAs and two sites in the Chittagong Hill Tracts. At the policy level, IPAC has already facilitated the agreement for sharing of entry fees at forest PAs and a Government Order regularizing the membership of CMCs, and is working on important revisions of Rules for PAs and for social forestry. A high-level Policy Advocacy Group has been formed to improve access to decision-makers.

6.4 LESSONS LEARNED

Co-Management. Both MACH and Nishorgo showed that co-management (with all stakeholders represented) is more effective than either a top-down, governmental approach or working only with CBOs composed only of the powerless. However, the experience between the two projects differs – the MACH RMOs are approaching self-sustainability (although the operation of UFCs is dependent on the whims of higher levels of government), while many problems remain for CMCs: FD support; empowering the poor resource users and women; balancing stakeholder interests and representation on the CMC and avoiding dominance by the elite; and, encouraging an attitude of self-reliance and the ability to carry out conservation, AIG and visitor services activities.

Resource Conservation. The MACH model has shown considerable success in achieving conservation objectives in the wetlands. RMOs, so long as they retain access to water bodies, have so far continued to follow sustainable fishery management, with the Upazila Fisheries Committees providing a potential weapon against any return to destructive practices or attempted takeovers by previous leaseholders. However, the Ministry of Land, which has little interest in conservation, remains a barrier (as indicated in Chapter 4). While Nishorgo did show success in reducing illegal felling when all the three factors mentioned above were in place, this quickly reversed during the interregnum between Nishorgo and IPAC. While conservation management plans have been produced for many of the IPAC PA sites (involving replanting with native species, control of fires...), they have not been given high priority because of the need to establish co-management first.

Government Support. Cumbersome and time-consuming government approval procedures, especially for associated infrastructure investments, were a major barrier for both the earlier projects and are now affecting IPAC. While the lack of capacity of the DoF was not a major issue for MACH, it needs to be addressed under IPAC, as part of an exit strategy, so that DoF can provide ongoing extension services to RMOs. The FD role in Nishorgo/IPAC presents a variety of issues: lukewarm support to co-management from some individuals; a lingering attitude that only the FD “controls” land within the PA and hence a reluctance to accept the need for buffer zones within that perimeter; lack of a recognized cadre of conservation specialists; unwillingness to give the Wildlife and Nature Conservation Circle jurisdiction over all PAs and to provide a career path for those who have received training in conservation; ineffective law enforcement; and, systematic corruption.

Alternative Income Generation. Given the smaller scale of the problem under MACH (primarily the need to support fishers during the no fishing season), it is not surprising that more progress was made under that project than in Nishorgo. However, for forest PAs, a solution may be in sight – provision of land in buffer zones for social forestry, with such zones located either inside or outside the gazetted protected area. Another important lesson is that, for PAs, AIG needs to be planned at the landscape level rather than through isolated demonstration efforts.

Intensity of Effort. While a clear lesson of MACH is that a staff-intensive approach can produce dramatic benefits, it will be important now to see if comparable results can be achieved with a lower level of effort from project staff, in order to increase the pace of replication, given that most of the country’s wetlands are yet to be covered. For forest PAs, experience shows that a high intensity of effort will be needed for the foreseeable future and there is some danger that the greatly expanded number of sites under IPAC may dilute that effort too greatly.

Monitoring and Evaluation (M&E). MACH benefited greatly from a comprehensive and rigorous M&E system which has generated much useful information on resources use and incomes. Nishorgo developed a number of systems and was especially strong in biodiversity monitoring. However, it did not attempt to monitor the impact of the project on household incomes.

IPAC at present lacks a rigorous monitoring and evaluation (M&E) system, although there are plans to address that soon. As was the case for MACH, such a system could be very illuminating in demonstrating the value of the project interventions to skeptics, whether in the government or the donor community. It could also shed light on whether a MACH-lite model might be used for replication, taking into account the simpler model being followed by IUCN at Tanguar Haor. For forest PAs, an M&E priority would be to establish a baseline for household income and employment, so that it can be ensured that the project is having a positive and not a negative effect.

Participation and roles of women. In the Forest sector, many of the people extracting bamboo and firewood from forest PAs are women. In NSP, women's patrol groups were formed; initially these women were provided with uniforms and paid for guarding the forest in teams. Now they receive no incentive. The women report that they still undertake patrols in the daytime, but they need some regular pay or return, otherwise it is not worthwhile for them to guard the forest. Support to develop handicrafts has targeted women but without a clear link to forest protection. There are women in the CMCs, but they do not hold any significant positions and tend to fill the back rows and lack the recognition, status and confidence to voice their opinions. Also the CMCs do not have action plans that distinguish and specify the roles and activities for women and men.

In forest PAs women (trained and equipped) could combine guarding with sustainable livelihoods from defined areas of forest. Groups of women could be given responsibilities to protect the forest within defined areas of buffer zone or reserve forest and associated PA, and at the same time rights to harvest selected products such as bamboo on a sustainable basis to a plan agreed in the CMC and PA management plan. There is also scope to help the same groups of women to add value to these products through handicrafts, or other enterprises such as livestock, as long as they do not harm the PAs. Strengthening the responsibilities and organization of these groups would also help empower their leaders to represent them in the CMCs.

In the fisheries sector, although it is rare for women to fish, women do harvest other aquatic products and make fishing gear and process fish and aquatic foods. MACH included women in both Resource User Groups (RUGs – for livelihood development and revolving funds) and Resource Management Organizations (RMOs – for wetland resource management) by maintaining quotas. Poor women have access to loans from the Federations of RUGs (FRUGs) and hold positions in the FRUGs and RMOs. Representatives of these women were supposed to also be included in the Upazila Fisheries Committees, but this does not appear to be happening.

Similarly to Forest, in wetlands there is scope to involve women in community organizations and thereby as community representatives in co-management bodies. In both, forest and fisheries, livelihood support for women could also focus more on adding value, improved marketing, and novel sources of employment. With adequate training and equipment, enterprises should be more than just handicrafts but include potential growth areas such as growing medicinal plants and flowers, and technicians in emerging rural services such as para-vets and solar energy technicians.

ANNEX I: BCCSAP: THEMATIC AREAS AND PROGRAMS

Source: BCCSAP, 2009

Theme	T1: Food Security, Social Protection and Health
Programme	<ul style="list-style-type: none"> P1. Institutional capacity for research towards climate resilient cultivars and their dissemination P2. Development of climate resilient cropping systems P3. Adaptation against drought P4. Adaptation in fisheries sector P5. Adaptation in livestock sector P6. Adaptation in health sector P7. Water and sanitation programme in climate vulnerable areas P8. Livelihood protection in ecologically fragile areas P9. Livelihood protection of vulnerable socio-economic groups (including women)
Theme	T2: Comprehensive Disaster Management
Programme	<ul style="list-style-type: none"> P1. Improvement of flood forecasting and early warning P2. Improvement of cyclone and storm surge warning P3. Awareness raising and public education towards climate resilience P4. Risk management against loss on income and property
Theme	T3 : Infrastructure
Programme	<ul style="list-style-type: none"> P1. Repair and maintenance of existing flood embankments P2. Repair and maintenance of cyclone shelters P3. Repair and maintenance of existing coastal polders P4. Improvement of urban drainage P5. Adaptation against Floods P6. Adaptation against tropical cyclones and storm surges P7. Planning and design of river training works
Theme	T4: Research and Knowledge Management
Programme	<ul style="list-style-type: none"> P1. Establishment of a centre for knowledge management and training on climate change P2. Climate change modelling at national and sub-national levels P3. Preparatory studies for adaptation against sea level rise P4. Monitoring of ecosystem and biodiversity changes and their impacts P5. Macroeconomic and sectoral economic impacts of climate change
Theme	T5: Mitigation and Low Carbon Development
Programme	<ul style="list-style-type: none"> P1. Improved energy efficiency in production and consumption of energy P2. Gas exploration and reservoir management P3. Development of coal mines and coal fired power stations P4. Renewable energy development P5. Lower emission from agricultural land P6. Management of urban waste P7. Afforestation and reforestation programme
Theme	T6: Capacity Building and Institutional Strengthening
Programme	<ul style="list-style-type: none"> P1. Revision of sectoral policies for climate resilience P2. Main-streaming climate change in national, sectoral and spatial development programmes P3. Strengthening human resource capacity P4. Strengthening institutional capacity for climate change management P5. Main-streaming Climate Change in the Media

ANNEX 2: POSSIBLE IMPACTS FROM GCC ON POVERTY AND ECONOMIC GROWTH

Source: The Probable Impacts of Climate Change on Poverty and Economic Growth and the Options of Coping with Adverse Effect of Climate Change in Bangladesh (UNDP, 2009). Extracts from the Study's Executive Summary.

Agriculture. The analysis from expert interviews revealed that reduction of crop yield by gradual change and total or partial damage due to extreme events are key impacts facing by crop agriculture sector. It is also to be noted that most of the crops are affected at flowering to grain-filling stage and thus impacts vary by agro-ecological zone. It has been revealed that 50% reduction of crop production would increase poverty at the same percentage. Assessment of impacts on economic growth is difficult to find but it appears that it could reduce 12% of GDP contribution for a particular disaster. Effects of cyclone are more severe than flood. The experts agreed that 60% damage of crop by a cyclone increases poverty at the same percentage affecting their resources and livelihoods, and decreases economic growth by 15% for the respective period. Thus, MDG 1 (Poverty eradication and hunger) is badly affected and pushed backward. Besides, drought, cold spell, river bank erosion etc. have remarkable impacts on crop agriculture and consequently on poverty and economic growth.

Livestock. The consultation with key experts' state that livestock sector is badly affected by climate variability and shocks. Flood, drought, cyclone, sea level rise etc. are the major climate induced natural disasters which cause loss of livestock, damage pasturelands, increase fodder scarcity, destroy shelters, decrease production, increase management cost through incidence of diseases etc. It is also perceive that severe impacts of climate change and extremes on livestock affect poverty moderately. But the impacts of sea level rise affects poverty and economic growth of this particular sector severely as stated by the key experts. Drought, salinity intrusion and heat wave affect the sector moderately and consequently, both poverty and economic growth are moderately affected. Thus, the impacts of climate change on livestock affect poverty reduction activities and in attaining the MDGs.

Fisheries. In the fisheries sector climate change will have both negative and positive impacts. The positive impact is possible increase in the open water fisheries during flood. It appears that the impacts would not be remarkable in national context rather it would affect investment at individual level. The key experts' interviews and consultation workshops revealed that flood and cyclone affect culture fisheries severely while effects of other shocks such as drought, salinity intrusion, erratic rainfall, heat wave, cold wave, fogginess is low to moderate. This leads to loss of livelihoods of the poor fishermen and decrease nutrition status of the rural poor. Moreover, frequent warnings of cyclone lead the fishermen to stay at home for longer periods and thus their income decreased which increased their poverty level.

Forest. The impacts of extreme weather events especially, cyclone and storm surge on forestry affect poverty and economic growth in different ways. The supper cyclone Sidr destructed one-quarter of the Sundarbans and almost 100% afforested trees along its path. Poverty is severely affected by cyclone in the context of severity of impact on forestry. Livelihoods of the poor and marginal communities in the forest areas, especially in the Sundarbans area mostly depend on forest resources. Very pertinently, impacts of shocks on forestry affect the poor of that particular livelihood group. It is perceived that salinity intrusion severely affect forest trees and resources especially in the coastal region. This has moderate impacts on poverty and economic growth. The other shocks like flood and drought have moderate impacts on forestry which has low impacts on poverty and economic growth. Besides this, erratic rainfall and temperature variation have low impacts on forestry and lower impacts on poverty.

ANNEX 3: ROLES AND RESPONSIBILITIES OF KEY ORGANIZATIONS INVOLVED IN THE IMPLEMENTATION OF THE BCCSAP 2009

The *Ministry of Environment and Forests* is the focal ministry for all work on climate change, including international negotiations. It provides the Secretariat for the recently-established National Environment Committee, which ensures a strategic overview of environmental issues and is chaired by the Chief Adviser. Immediately after the Bali Conference (COP 13), the Government formed the National Steering Committee on Climate Change. It is headed by the Adviser, Environment and Forests and comprises secretaries of all relevant ministries and civil society representatives. It is tasked with developing and overseeing implementation of the national Climate Change Strategy and Action Plan. Five technical working groups were also constituted on adaptation, mitigation, technology transfer, financing and public awareness.

In 2005, the Government of Bangladesh launched its National Adaptation Programme of Action (NAPA), in partnership with other stakeholders, which highlights the main adverse effects of climate change and identifies adaptation needs. The Climate Change Cell in DoE under the Ministry of Environment and Forests supports the mainstreaming of climate change into national development planning and has developed a network of 34 'focal points' in different government agencies, research and other organisations.

The *National Disaster Management Council (NDMC)*, headed by the Chief Adviser/Prime Minister, is the highest-level forum for the formulation and review of disaster management policies. The Inter-Ministerial Disaster Management Coordination Committee is in charge of implementing disaster management policies and the decisions of the NDMC, assisted by the National Disaster Management Advisory Committee.

The *Ministry of Food and Disaster Management* is the focal ministry for disaster management. Its *Disaster Management Bureau (DMB)* is the apex organisation responsible for coordinating national disaster management interventions across all agencies. It is a technical arm of the Ministry of Food and Disaster Management. It oversees and coordinates all activities related to disaster management at national and local levels. In 2000, the Government published *Standing Orders on Disaster*, which provide a detailed institutional framework for disaster risk reduction and emergency management and defines the roles and responsibilities of different actors. The *Comprehensive Disaster Management Program (CDMP)*, a donor funded programme, aims to strengthen the DMB and shifts the emphasis away from relief to disaster preparedness and risk reduction.

The Meteorological Department and SPARSO, under the Ministry of Defence, and the Flood Forecasting and Early Warning Centre of Bangladesh Water Development Board, under the Ministry of Water Resources, are two of the key institutions in this field.

Other ministries. There are 35 or more other ministries also responsible for sectors that are vulnerable to the effects of climate change, including agencies responsible for water resources, health, agriculture, urban planning, roads and transport.

ANNEX 4: YEARLY OPERATIONAL BUDGET FOR SRF 2006/7 TO 2008/9

Source: Sundarbans reserved Forest protection Assessment: Target State. Technical Report Draft 1.

Code no	Name of the item	2006-07	2007-08	2008-09	Average of the three years (EURO €)
4501	Salary of the officers	1,287,229	1,245,339	2,592,071	16,762
	Sub-total	1,287,229	1,245,339	2,592,071	16,762
4601	Salary of the lower staff	52,344,197	53,240,497	55,337,602	526,344
	Sub-total	52,344,197	53,240,497	55,337,602	526,344
4701	Dearness allowance	0	0	9,694,074	31,707
4705	House rent allowance	21,396,082	22,880,340	23,980,984	223,256
4709	Rest & Recreation allowance	1,506,460	1,541,770	804,775	12,602
4713	Festival allowance	8,326,503	8,396,870	8,907,938	83,835
4717	Medical allowance	6,140,859	6,201,916	6,155,709	60,505
4721	Hill allowance	0	39,313	7,735	154
4725	Laundry allowance	7,675	17,639	19,998	148
4737	Charge allowance	0	42,094	0	138
4741	Retainer allowance	0	1,818,000	662,250	8,112
4755	Tiffin allowance	1,196,225	1,171,433	1,157,406	11,530
4765	Travel allowance	163,238	177,033	169,538	1,667
4769	Additional work allowance	0	50,000	50,000	327
4777	Training allowance	0	129,700	0	424
4795	Other allowance	50,000	33,040	9,686	303
	Sub-total allowance	38,787,042	42,499,148	51,620,093	434,709
4801	Travel cost	500,000	550,000	580,000	5,331
4803	Income tax	0	22,768	10,329	108
4806	Office rent	33,750	4,750	12,500	167
4810	Municipal tax	184,002	223,928	178,403	1,918
4811	Land tax	38,479	94,512	74,750	679
4815	Post/mail	16,000	45,000	22,000	271
4816	Telephone	120,000	170,000	148,940	1,436
4818	Registration fee	0	0	0	0
4819	Water	100,784	98,918	87,410	939
4821	Electricity	320,505	332,658	359,500	3,312
4822	Gas and fuel	0	0	0	0
4823	Petrol and lubricant	470,000	708,563	750,000	6,308
4828	Stationery, seal and stamp	0	2,000	25,000	88
4831	Book and newsweek	0	6,000	6,000	39
4833	Circulation and advertisement	0	200,000	220,000	1,374
4834	Sports materials	0	0	0	0
4836	Uniform	500,000	518,505	515,000	5,016
4840	Training expenditure	0	0	0	0
4846	Transportation cost	1,450,000	1,668,821	500,000	11,836
4854	Using materials	0	10,000	3,000	43
4854	Fish and livestock feed	40,000	60,000	75,000	572
4879	Arms and ammunition	0	130,000	59,000	618
4882	Law cost	35,000	192,507	165,025	1,284
4883	Honorarium etc	0	0	0	0
4884	Exam fee/related cost	0	0	0	0
4886	Suvey	0	0	0	0
4888	Computer materials	2,000	15,000	25,000	137
4890	Programs/festivals	140,000	140,000	140,000	1,374
4892	Royalty/revenue share	0	1,094,900	153,200	4,082

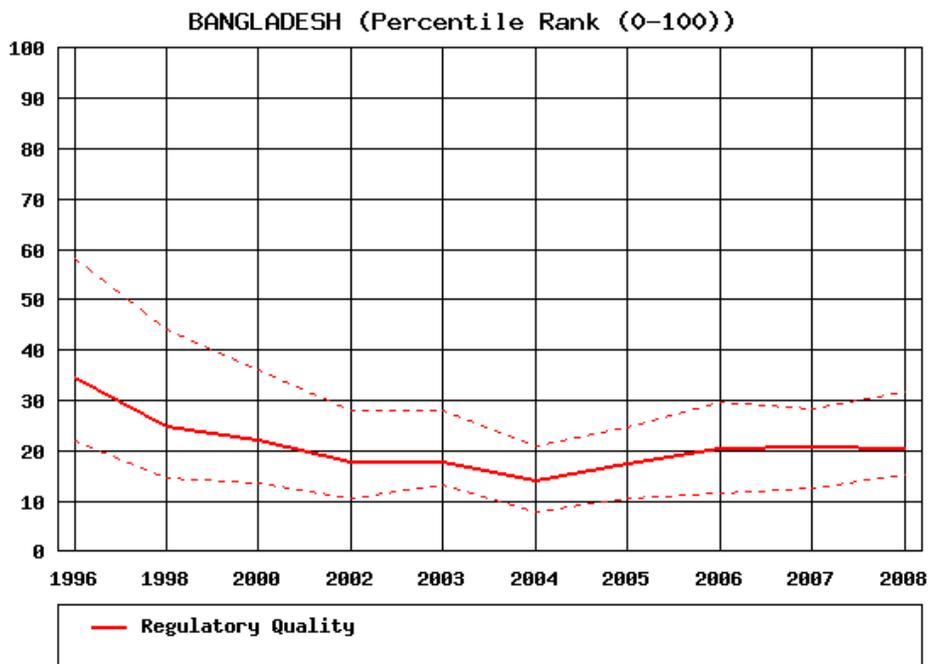
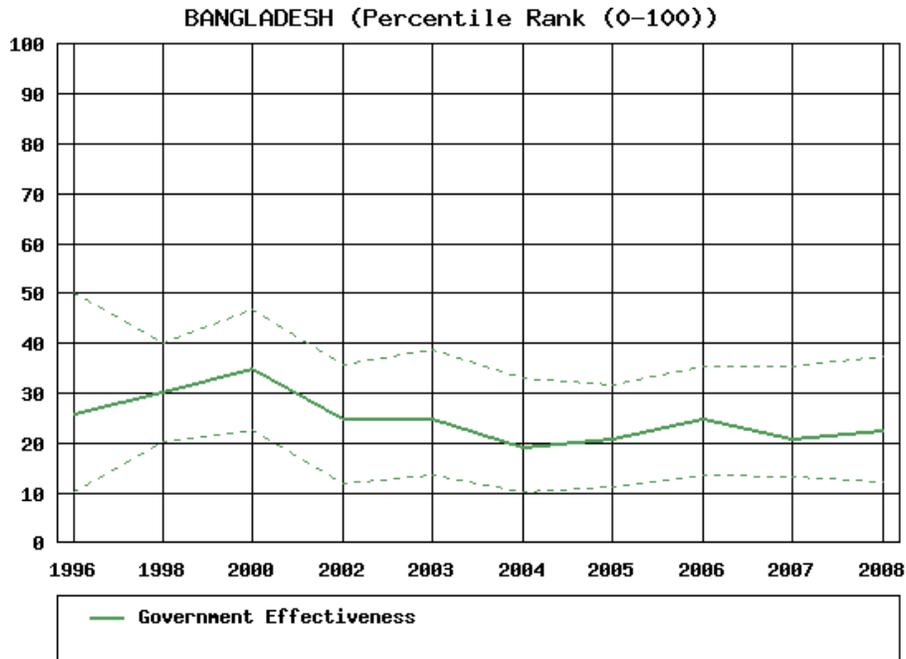
Code no	Name of the item	2006-07	2007-08	2008-09	Average of the three years (EURO €)
4893	Hiring charge	0	0	0	0
4899	Others cost	70,000	70,000	70,000	687
	Sub-total	4,020,520	6,358,830	4,180,057	47,621
4901	Vehicle and transport	240,260	230,000	212,610	2,234
4906	Furniture	1,500	6,500	15,000	75
4911	Computers and office goods	1,500	15,000	15,000	103
4916	Instrument and materials	15,000	30,000	25,000	229
4921	Office buildings	15,000	390,000	1,721,000	6,954
4926	Quarters	18,000	450,000	1,520,576	6,504
4931	Other buildings and infrastructures	0	50,000	1,821,000	6,120
4936	Roads, bridges and highways	0	100,000	15,000	376
4955	Signal/ wireless	0	150,000	50,000	654
4961	Electrical goods	0	0	9,000	29
4976	Water vessel	5,021,098	5,546,140	7,210,000	58,146
4986	Recovery	150,000	0	0	491
4991	Other repair and maintenance	0	9,000	9,000	59
	Sub-total	5,462,358	6,976,640	12,623,186	81,973
5965	Special grant	0	0	0	0
	Sub-total	0	0	0	0
6813	Machines and other equipments	0	5,000	10,000	49
6819	Office goods	0	13,000	25,000	124
6821	Furniture	0	10,000	13,000	75
6827	Electrical goods	0	0	10,000	33
6845	Plantations	0	0	0	0
6850	Well and parts	0	0	0	0
	Subtotal	0	28,000	58,000	281
	Grand total (Taka)	101,901,346	110,348,454	126,411,009	1,107,690

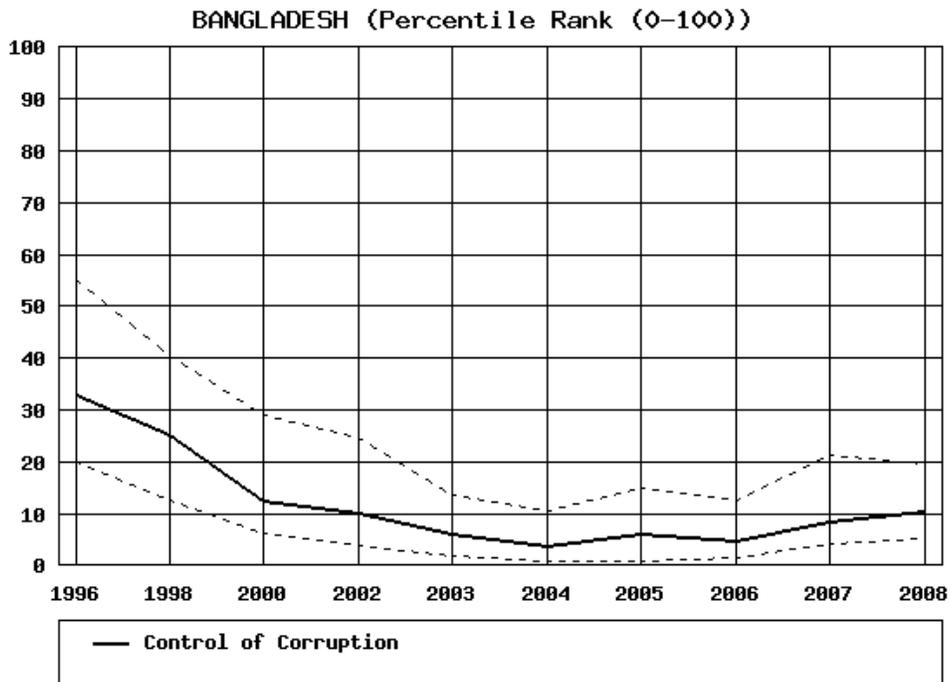
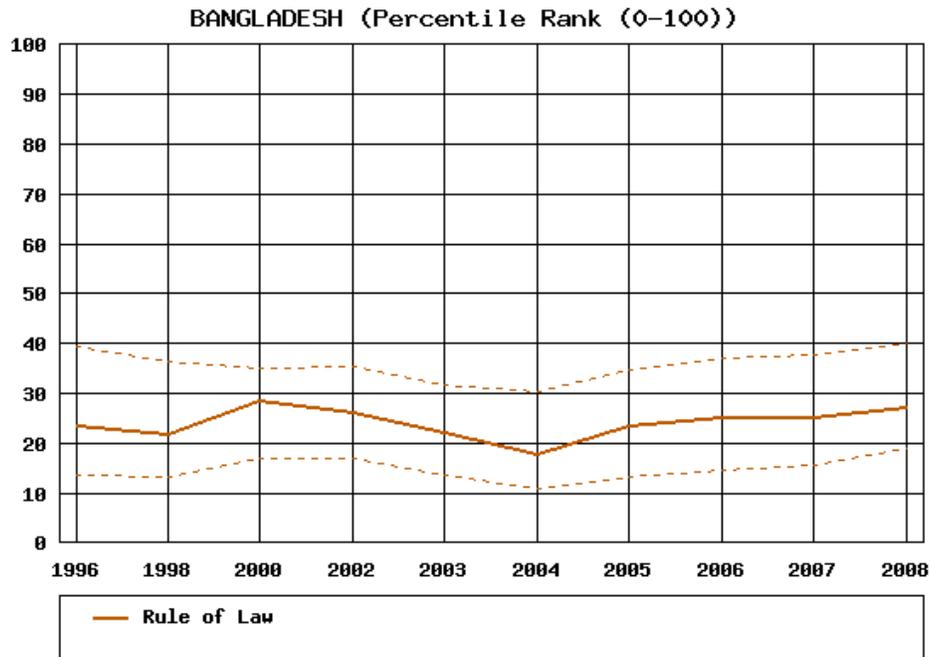
* Exchange rate used 1 Euro = 101.912 BDT (rate on 28 Oct 09)

* Source: FD Khulna Circle records

ANNEX 5: SELECTED GOVERNANCE INDICATORS IN BANGLADESH

Source: Kaufmann et al., 2009.





Source: Kaufmann D., A. Kraay, and M. Mastruzzi 2009: Governance Matters VIII: Governance Indicators for 1996-2008
 Note: The governance indicators presented here aggregate the views on the quality of governance provided by a large number of enterprise, citizen and expert survey respondents in industrial and developing countries. These data are gathered from a number of survey institutes, think tanks, non-governmental organizations, and international organizations. The WGI do not reflect the official views of the World Bank, its Executive Directors, or the countries they represent. The WGI are not used by the World Bank Group to allocate resources.

ANNEX 6: MAJOR PROJECTS WORKING ON COMMUNITY MANAGEMENT OF WETLANDS AND FISHERIES (1999-2007): INSTITUTIONAL ARRANGEMENTS

	MACH	FFP	CBFM I&2
Fisheries management	Resource Management Organizations (RMOs) registered	Fishery Management Committees (FMC) registered	Beel and River Management Committees registered
	Represent all stakeholders; 60% from Resource User Groups (RUGs) of poor wetland users; 20% women	Represent mainly fishers (target 80%), Some membership based (fishers)	Membership based (fishers) Some represent all stakeholders
	Sub-committees, functions and some area based	Fishery Sub-Committees (FSCs) – village based but limited role	Groups under CBOs but only for AIGA
Livelihood support (Alternative Income Generating Activities - AIGA)	Separate RUGs, federated, registered and own transferred micro-credit revolving funds	None, except short term pilot in few sites (grants or handed over funds)	Groups (basis for fisheries management), no separate identity, loan funds not owned by groups – some now transferred to the CBOs
	Different NGO from fisheries management	Different NGO from fisheries management	Same NGO as fisheries management
Co-management and linkages	Upazila Fisheries Committee includes CBOs, UP chairs and UZ officers (UFO member-secretary)	MOU between FMC and DOF sets out responsibilities of both parties	No formal co-management body, jalmohals handed over through MOFL/DOF and DOF keeps some contact with CBOs
	RMOs attend UP meetings, UP advisor role		UP advise (some have advisory group)
	Adjacent RMOs of large wetland system meet and coordinate	Only one FMC in an area	Adjacent CBOs meet in a cluster committee
	Coordination over larger wetlands and funding to RMOs (through endowments)	Advising FMC	Advising B/RMC

ANNEX 7: RECENT PROJECTS CO-FINANCED BY THE DEPARTMENT OF FISHERIES

A. List of On-going Projects as of mid 2009

Sl. no.	Name of Project	Duration	Estimated Cost (lakh Tk.)	Estimated Cost (million US\$)
1.	Fresh Water Prawn Culture Extension Project	July 2005- June 2010	1,093.0	1.61
2.	Fisheries Habitat Restoration Project in Inland Open water Bodies	July 2005- June 2010	1,286.0	1.89
3.	Aquaculture Development and Extension Project in Chittagong Hill Tracts	July 2005- June 2010	636.0	0.94
4.	Infrastructure Development for Floodplain Aquaculture in Comilla District (Daudkandi Model) Project (DoF Part)	July 2006- June 2011	709.8	1.04
5.	Chalan Beel Fisheries Development Project	July 2006- June 2010	2,100.0	3.09
6.	Restoration of the Natural Breeding Habitats of the Halda River	July 2006- June 2011	1,369.0	2.01
7.	Regional Fisheries and Livestock Development Project (Barisal Component, Danida)	July 2007- June 2012	1,008.9	1.48
8.	Bangladesh Marine Fisheries Capacity Building Project	July 2007- June 2012	11,946.6	17.57
9.	Bagda Shrimp Culture Technology Extension Project (2 nd Phase)	July 2007- June 2012	1,931.1	2.84
10.	Brood Bank Establishment Project (2 nd Phase)	July 2007- June 2012	1,250.0	1.84
11.	Fisheries Diploma Course Implementation Project	January 2008 - June 2012	618.0	0.91
12.	Greater Pabna Fisheries Development Project	January 2009 - June 2013	1,112.0	1.64
13.	Emergency 2007 Cyclone Recovery and Restoration Project (DoF Part)	August 2008 - June 2013	3,447.5	5.07
14.	Jatka Conservation, Alternate Income Generation for the Jatka Fishers and Research Project (DoF Part)	July 2008 - June 2013	2,200.0	3.24
15.	Strengthening of Fish Inspection and Quality Control Services in Bangladesh	July 2003 – Dec 2009	3,773.0	5.55
16.	Strengthening Institutional Capacity of DoF Project	October 2006 –Sept 2011	1,540.0	2.26
17.	National Agricultural Technology Project (DoF Part)	July 2007 - June 2012	4,916.2	7.23
18.	Developing a National Shrimp Certification Project	July 2007 - Dec 2009	318.0	0.47
	Total		41,255.1	60.67

B. List of Proposed Projects for FY 2009-10 (some are ongoing as of end of 2009)

Sl. no.	Name of the Project	Duration	Estimated Cost (in lakh Tk.)	Estimated Cost (in million US\$)
1.	Union level aquaculture technology extension project	2009-2014	3,450.0	5.07
2.	Project on Aquaculture and Fisheries Management in Bhabodaha Area, Jessore	July 2009-June 2014	985.6	1.45
3.	Fisheries Resources Survey System Strengthening Project	July 2009-June 2014	8,338.3	12.26
4.	Integrated Protected Areas Co-management Project (USAID)	2009-2013	3,803.0	5.59
5.	Hura Sagar Aquaculture and Fisheries Development Project	July 2009-June 2014	1,823.0	2.68
6.	Greater Faridpur Aquaculture project	2009-2014	8,198.0	12.06
7.	Project on Poverty Reduction and Livelihoods Security for the Peoples of Economically Depressed Areas	July 2009-June 2014	21,805.0	32.07
8.	Fishermen Registration, Issuing of Identity Card and Disaster Rehabilitation Project	July 2009-June 2014	15,000.0	22.06
9.	Project on Aquaculture and Management of Floodplain Areas	July 2009-June 2014	15,566.1	22.89
10.	Better Work and Standards Programme (BEST)	January 2010 - December 2014	7,398.5	10.88
11.	Project on Establishment of Beel Nursery and Fingerling Stocking in Inland Open Water Bodies	July 2009-June 2014	16,440.6	24.18
12.	Fisheries Infrastructure Renovation and Development Project	July 2009-June 2014	12,636.8	18.58
13.	Strengthening of FIQC Laboratory to Food Safety Requirement for Domestic and Export Market	July 2009-June 2014	8,666.4	12.74
14.	Aquaculture Development Project in Greater Jessore Region	July 2009-June 2014	6,000.0	8.82
15.	Project on Poverty Alleviation Through Aquaculture in Flood Control and Irrigation Areas and Other Water Bodies of 29 District	July 2009-June 2014	5,504.0	8.09
16.	Project on Procurement of Two Water Transport for Coast-Guard for the Hilsa Management	July 2009-June 2014	15,000.0	22.06
17.	Wetland Biodiversity Rehabilitation Project (GTZ)	2009-2014	2,633.0	3.87
18.	Inland Capture Fisheries Development Project	2009-2024	280,700.0	412.79
	Total		433,948.1	638.16

ANNEX 8

Additional specific recommendations on PA financing, finance-related training, PA economic valuation, funds management, and communications.

- The introduction of training on PA Financial Planning should also be considered top priority. This will aim at building financial management capacity. It will include different interactive processes involving numerous stakeholders and promote a broad-based ownership across constituencies, systematize actions and attract investment to PAs in a stable long-term manner. The training could focus on two key aspects:

PA Financing	Policy and legal / regulatory reform:
(i) Financial analysis and result-oriented cost accounting	(i) Environmental Fiscal Reform planning and management
(ii) Optimization of financial management systems	(ii) PA Valuation planning and management
(iii) Assessing cost-saving opportunities and developing strategies	(iii) High-leverage communication and persuasion strategies (to influence decision-makers and politicians)
(iv) Screening and selection of revenue-sharing financial mechanisms	(iv) Formulation of finance-related funding proposals and PA finance project management
(v) Financial feasibility analysis	(v) Fundraising strategies
(vi) Formulation of PA financial strategies	(vi) Public Awareness Campaign planning
(vii) Formulation of PA business plans and business management	

- Establishment of a valuation and financial sustainability unit to implement the PA financial strategy within the “Wildlife and Nature Conservation Circle” or a new independent PA Management Agency.
- Introduction of a public PA management committee with mandate to monitor revenue and expenditure of PAs, including representatives of private sector, donor community, protected area authority, Ministry of Finance, the Bangladesh Auditor General’s Office (National Audit Office), local stakeholders, local government stakeholders (e.g. Tourism/Industry), and PA co-management committees. Key monitoring functions may include: PA income and expenses, compliance with PA broad financial policies, objectives and guidelines; selection, appointing and reviewing the performance of a Chief Financial Officer; and annual budgeting process.
- Develop a comprehensive communications strategy to persuade senior government officials, top level decision-makers, key executives of the private sector and the civil society of the pressing financial needs of PAs in Bangladesh (and their role in GCC adaptation and mitigation). The strategy could focus on: i) the contributions of PAs to economic productivity and social development, ii) the need for increasing funding to PAs based on realistic needs and gaps assessments, iii) the cost of not acting to mitigate and adapt to GCC, and iv) the commitment of the PA authorities to strengthen their financial management capacity, including higher levels of transparency and accountability⁴². This strategy will help to negotiate an agenda to gradually increase funding to the PAS in Bangladesh, with participation and support of the private sector.

⁴² Through a benchmark systems possibly linked to funding increases.

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ATTACHMENT C: PROGRAMMATIC OPTIONS FOR USAID/BANGLADESH

EXECUTIVE SUMMARY

USAID/Bangladesh’s “Bangladesh Environment Sector Assessment and Strategic Analysis” (BESASA) has the following objectives:

- Identify the overall needs of the Bangladesh environment sector;
- Assess USAID’s comparative advantage;
- Propose programmatic priorities given various funding levels to match with the Mission’s overarching comparative advantage and goal of promoting responsible pro-poor and equitable economic growth; and
- Assist the Arannayk Foundation to develop a program strategy.

The report will address the first, second and third objectives, in order to propose a set of strategic options for consideration in the design of USAID/ Bangladesh’s Mission Strategy for 2010 to 2015.

The report is based on review of the extensive literature on environmental issues in Bangladesh, interviews with government officials at all levels and with donor and NGO representatives, and field trips to four areas representative of environmental, NRM and Global Climate Change (GCC) issues in the country: Chittagong – Cox’s Bazaar – Teknaf; Chittagong Hill Tracts; Srimangal – Sunamganj – Sylhet; and, the Sundarbans. In all, visits were made to about ten forest Protected Areas (PAs) and three wetland areas.

The report looks first at recent positive trends in environmental management in Bangladesh, then at the constraints which continue to limit the country’s development. It goes on to propose an overall strategy for future USAID support and finally describes a set of promising program options.

Concern over environmental management is fairly recent in Bangladesh and awareness of the potential impacts of GCC even more recent. Public awareness of environmental issues is still limited but growing, especially among the rising middle class, encouraged by a free and lively press, which reports almost daily on egregious examples of degradation or government malfeasance.

One landmark was the establishment of the Department of Environment (DoE) within the Ministry of Environment and Forest (MoEF) in 1995. However, while DoE is able to implement environmental impact assessment procedures and issue environmental permits, its capacity in the NRM and GCC areas remains very weak. Also under MoEF is the Forest Department (FD), a long-established institution that is slowly adapting itself to 21st Century realities. The Department of Fisheries (DoF), under the Ministry of Fisheries and Livestock (MoFL), is also slowly changing from a regulatory body giving some support to aquaculture to adoption of a more client driven focus, including floodplain fisheries management.

In its earlier and current programs, USAID has striven to support the concept of Co-Management, in which groups of resource users, together with the relevant government officials and other stakeholders, are given major responsibility for management of those resources. Co-management was pioneered for floodplain fisheries under the MACH⁴³ Project, and for forest Protected Areas (PAs) under the Nishorgo Support

⁴³ Management of Aquatic Ecosystems through Community Husbandry.

Project (NSP). Progress is now being consolidated under the IPAC⁴⁴ Project, which covers nearly all the PAs and a number of floodplain sites. Experience shows that co-management is capable of delivering a high degree of protection to vulnerable ecosystems, while ensuring that the incomes of poor users are not eroded and that benefits are shared with some degree of equity. However, building capacity to the level where the Community-Based Organizations (CBOs) are fully self-sustaining is difficult and time consuming, especially in the forest sector.

Progress is also being made in combating pollution, especially in air quality, through the introduction of unleaded gasoline, banning of two-cycle engines for three wheel taxis and their subsequent conversion to Compressed Natural Gas (CNG). However, pollution from diesel engines remains unchecked. Solid waste collection is inadequate almost everywhere and modern disposal facilities nearly non-existent. The government continues to make steady progress in providing safe drinking water and sanitation in urban and rural areas and is addressing the problem of arsenic contamination (from naturally occurring groundwater sources).

Preparations for the Copenhagen Conference on GCC have galvanized both the government and public over the past year or more. There have been strategies, action plans, conferences, press conferences and considerable public debate, much of it to depict Bangladesh as a victim of global climate change and thus worthy of substantial external support. The Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009 presents a very credible list of priorities, actions and 44 project areas, although it says little about the critical issue of implementing capacity. Even before Copenhagen, concern over GCC resulted in a Multi-Donor Trust Fund (MDTF), managed by the World Bank (WB). The MDTF has already received pledges of \$ 150 million, mainly from the EU and the UK. Setting a noteworthy precedent, the government has pledged the equivalent of \$100 million in a Global Climate Change Adaptation Fund of its own.

Despite the heartening progress that has been made in many areas of environmental management in Bangladesh, further development is likely to be severely hampered by a number of long-standing and widespread constraints.

Priority and Commitment. Perhaps because of Bangladesh's historic dependence on donors for most development funding, and a tendency in some cases for donors to design projects that suit their own priorities, it is often the case that it only becomes apparent after some time that the government was never fully committed to the project concept, design or institutional structure.

Project Approval Processes. Commentators have been writing for decades that the elaborate set of procedures for project approval is totally counterproductive and an unnecessary relic of the socialist doctrines of the 1960s. Yet they persist because of the vast number of people who have a vested (or corrupt) interest in the system.

Institutional Weaknesses. The three principal agencies that USAID deals with for NRM – FD, DoF and DoE – suffer from a variety of institutional weaknesses: unclear or evolving mandates; staffing structures from a bygone era; a very narrow range of staff disciplines; rigid promotion and compensation policies; low salaries; frequent staff rotation; a lack of equipment and vehicles; politics; imperial attitudes and reluctance to work with the common people; and systemic corruption.

Corruption. It is widely acknowledged that corruption is systemic in Bangladesh but government efforts to minimize it have rarely penetrated very deeply or lasted very long, despite some donor support around the edges.

⁴⁴ Integrated Protected Areas Co-Management

The Assessment Team would like to propose an overall framework for USAID assistance over the next five years in the environment, NRM and GCC areas. USAID has had a long association with Bangladesh and is fully familiar with the economic, political, cultural and social context of its assistance. In addition to NRM support, USAID's current program is particularly strong in health, education, disaster management and local development, all of which may have a role in a possible future environmental and GCC program. USAID is active in the new era of donor cooperation in Bangladesh, a fact which may be crucial in the design of projects which effectively harness USAID grants for technical assistance, training and capacity building with investment funds from a loan or grant source. USAID's experience also equips it to undertake projects in complex social environments, through its emphasis on participatory management and community-driven development.

In Chapter 3, the Assessment Team proposes a list of selection criteria be refined and then used by USAID, in consultation with the GoB, to choose priorities for its future program.

The Assessment Team recommends that **USAID continue to focus its environmental assistance in NRM**, where it has played a leading part over the last ten years, for reasons associated with the relative success of the co-management model, the need for continued and expanded support to achieve full success, the need for technical assistance and capacity building, and the dearth of other donor support in the forest sector and good cooperation between donors in floodplain fisheries. This reasoning implies a **continued focus on forest PAs and floodplain fisheries**, through a successor project to IPAC.

With the expected new funding for GCC, many options are possible, and the team suggests some preference for projects related to NRM and the above core program but this need not be the exclusive focus.

The Team proposes the following Strategic Options (described more fully in Annex 1) for USAID's consideration, under three varying funding scenarios:

Option No.	Program Option Name	Total Cost	USAID Share	Duration (yrs)
		(\$ millions)		
C-1	Replication of the MACH Model	30.0	4.5	5-8
C-2	Continued Support to Forest PA Co-Management	3.0	3.0	5.0
F-1	NRM Policy Development	0.25	0.20	1+
F-2	Ecologically Representative PA System Development and Database	0.25	0.20	1.0
F-4	Capacity Building of Three Departments	5.0	3.0	3.0
F-5	Research Partnership on Global Climate Change	10.0	5.0	5.0
N-1	Full-Scale Approach to AIG for Forest PAs	100.0	10.0	5.0
N-2	National Reforestation/ Social Forestry Program	10.0-50.0	8.0	5.0
	Subtotal	153.5-193.5	33.9	
F-3	Public Awareness	3.0-5.0	2.5	3.0
N-3	Coastal Zone Program	100.0	10.0	5.0
N-4	Chittagong Hill Tracts Watershed Management	15.0	5.0	5.0
	Subtotal	276.5-318.5	51.4	
O-2	Alternative Energy Program	10.0	8.0	5.0
O-3	Rural Solid Waste	10.0	8.0	5.0
	Total	296.5-328.5	67.4	

In Chapter 4, the concordance of the above recommendations with the priorities of the BCCSAP is set out. Finally, the team suggests ways in which the constraints on environmental management described above might be eased, with emphasis on the thorough restructuring of the three government departments and testing of government commitment but requiring that the GoB take key steps before USAID funds are committed. Considerable scope for donor coordination (especially with the WB) is seen, as are possibilities for interstate cooperation. For the more complex proposals, feasibility studies are recommended.

I. BACKGROUND

USAID/Bangladesh’s “Bangladesh Environment Sector Assessment and Strategic Analysis (BESASA)” has the following objectives:

- Identify the overall needs of the Bangladesh environment sector;
- Assess USAID’s comparative advantage;
- Propose programmatic priorities given various funding levels to match with the Mission’s overarching comparative advantage and goal of promoting responsible pro-poor and equitable economic growth; and
- Assist the Arannayk Foundation to develop a program strategy.

The report will address the first, second and third objectives, in order to propose a set of strategic options for consideration in the design of USAID/ Bangladesh’s Mission Strategy for 2010 to 2015. The report follows on from the BESASA Attachment A, which is a rapid review of the environmental, natural resources management (NRM) and climate challenges facing Bangladesh, an assessment of the country’s capacity to deal with them, identification of major needs for external support, and delineation of a number of areas where additional USAID support might be considered. Needs in the NRM and global climate change areas are explored in more depth in Attachment B. This report will not repeat material from the earlier reports but rather builds on their conclusions.

The report is based on review of the extensive literature on environmental issues in Bangladesh, interviews with government officials at all levels and with donor and NGO representatives, and field trips to four areas representative of environmental, NRM and Global Climate Change (GCC) issues in the country: Chittagong – Cox’s Bazar – Teknaf; Chittagong Hill Tracts; Srimangal – Sunamganj – Sylhet; and the Sundarbans. In all, visits were made to about ten forest Protected Areas (PAs) and three wetland areas.

The report looks first at recent positive trends in environmental management in Bangladesh, then at the constraints which continue to limit the country’s development. It goes on to propose an overall strategy for future USAID support and finally describes a set of promising program options.

2. ENABLING CONDITIONS

2.1 RECENT DEVELOPMENTS

Concern over environmental management is fairly recent in Bangladesh and awareness of the potential impacts of GCC even more recent. Public awareness of environmental issues is still limited but growing, especially among the rising middle class, encouraged by a free and lively press, which reports almost daily on egregious examples of degradation or government malfeasance.

One landmark was the passage of the Bangladesh Environmental Conservation Act (BECA) in 1995 and the subsequent establishment of the Department of Environment (DoE) within the Ministry of Environment and Forest (MoEF). While DoE is able to implement environmental impact assessment procedures and issue environmental permits, its capacity in the NRM and GCC areas remains very weak. Also under MoEF is the Forest Department (FD), a long-established institution that is slowly adapting itself to 21st Century realities. The Department of Fisheries (DoF), under the Ministry of Fisheries and Livestock (MoFL), is also slowly changing from a regulatory body giving some support to aquaculture to adopting a more client driven focus, including floodplain fisheries management.

In its earlier and current programs, USAID has striven to support the concept of Co-Management, in which groups of resource users, together with the relevant government officials and other stakeholders, are given major responsibility for management of those resources. Co-management was pioneered for floodplain fisheries under the MACH⁴⁵ Project, and for forest Protected Areas (PAs) under the Nishorgo Support Project. Progress is now being consolidated under the IPAC⁴⁶ Project, which covers nearly all the PAs and a number of floodplain sites. Although the evidence at this point is mainly from the floodplain fisheries side, experience shows that co-management is capable of delivering a high degree of protection to vulnerable ecosystems, while ensuring that the incomes of poor users are not eroded and that benefits are shared with some degree of equity. However, building capacity to the level where the Community-Based Organizations⁴⁷ (CBOs) are fully self-sustaining is difficult and time consuming, especially in the forest sector.

Progress is also being made in combating pollution, especially in air quality, through the introduction of unleaded gasoline, banning of two-cycle engines for three wheel taxis and their subsequent conversion to Compressed Natural Gas (CNG). However, pollution from diesel engines remains unchecked. Banning plastic bags has made a contribution to solving solid waste management; however, the issue remains largely unsolved, as solid waste collection is inadequate almost everywhere and modern disposal facilities nearly non-existent. The government continues to make steady progress in providing safe drinking water and sanitation in urban and rural areas and is addressing the problem of arsenic contamination (from naturally occurring groundwater sources).

Preparations for the Copenhagen Conference on GCC have galvanized both the government and public over the past year or more. There have been strategies, action plans, conferences, press conferences and considerable public debate, much of it to depict Bangladesh as a victim of global climate change and thus worthy of substantial external support. The Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009 presents a very credible list of priorities, actions and 44 project areas, although it says little about the critical issue of implementing capacity (see below). Even before Copenhagen, concern over GCC resulted in the establishment of a Multi-Donor Trust Fund (MDTF), managed by the World Bank (WB). The MDTF has already received pledges of \$ 150 million, mainly from the EU and the UK. The government has promised to use streamlined approval procedures for MDTF projects. Setting a noteworthy precedent, the

⁴⁵ Management of Aquatic Ecosystems through Community Husbandry.

⁴⁶ Integrated Protected Areas Co-Management.

⁴⁷ The names of the co-management bodies vary between programs,

government has pledged the equivalent of \$100 million in a Global Climate Change Adaptation Fund of its own, which is being administered by a Steering Committee headed by the MoEF State Minister. Substantial additional money for climate change adaptation is expected as a result of the Copenhagen conference.

2.2 DISABLING CONDITIONS

Despite the heartening progress that has been made in many areas of environmental management in Bangladesh, further development is likely to be severely hampered by a number of long-standing and widespread constraints.

Priority and Commitment. Perhaps because of Bangladesh's historic dependence on donors for most development funding, and a tendency in some cases for donors to design projects that suit their own priorities, it is often the case that it only becomes apparent after some time that the government was never fully committed to the project concept, design or institutional structure. This shows up in glacial approval of documents, failures to post qualified staff or to allocate enough budget and many other ways. To counter this, the Assessment Team suggests that new programs test the commitment of the government by defining critical activities that can be carried out before USAID funds are committed, such as organizational changes or staff postings needed for project success. Even though USAID may have moved away from such "conditions precedent" in recent years, it should carefully consider new ways to ensure full GoB commitment and support, in planning an expanded program of assistance.

Project Approval Processes. Commentators have been writing for decades that the elaborate set of procedures for project approval – Project Proformas, Planning Commission, ECNEC etc. – are totally counterproductive and an unnecessary relic of the socialist doctrines of the 1960s. Yet they persist because of the vast number of people who have a vested (or corrupt) interest in the system. While a direct assault on the system is unlikely to succeed, USAID should monitor carefully whether the streamlined procedures promised for the MDTF actually work in practice and, if they do, insist that they be applied to future US programs. If they don't, and the MDTF has committed no money after a year or two, one may suppose that all the donors will be ready for "frank discussions".

Institutional Weaknesses. The three principal agencies that USAID deals with for NRM – FD, DoF and DoE – suffer from a variety of institutional weaknesses: unclear or evolving mandates; staffing structures from a bygone era; a very narrow range of staff disciplines; rigid promotion and compensation policies; low salaries; frequent staff rotation; a lack of equipment and vehicles; politics; imperial attitudes and reluctance to work with the common people; and, systemic corruption. The situation at DoE, which has been designated to take the lead on GCC programs, is even worse – it has no professional "cadre" and no professional management. The recent decision to nearly triple its staff (in order to post staff at the District level, mostly for regulatory work) is only partly welcome, as the new staff is unlikely to be effective without a better management structure. To address this situation will require a thorough restructuring of the three departments (see Chapter 4) and a good deal of time and external guidance. However, if this does not happen, USAID should be very cautious about committing major new funds.

Corruption. It is widely acknowledged that corruption is systemic in Bangladesh but government efforts to minimize it have rarely penetrated very deeply or lasted very long, despite some donor support around the edges. In the three departments of concern, money is channeled upwards – starting with bribes from contractors or polluters, or from illegal fellers or poachers, then used by field staff to purchase better postings or promotions, and then by senior staff to meet demands from the political level for election funds. Apart from the moral questions involved, this system explains why many desirable changes are never acted on and other counterproductive ones (such as frequent staff rotation) persist. While donors can design measures to ensure that their own funds are not misused, they have tended to turn a blind eye to what their government counterparts were doing. This is unlikely to change unless the donors can work in unison on the issue.

3. STRATEGIC OPTIONS FOR USAID

In this chapter, the Assessment Team would like to propose an overall framework for USAID assistance over the next five years in the environment, NRM and GCC areas. More detailed Program Options are set out in Chapter 5.

USAID's comparative advantage is discussed in Attachment A, Chapter 7. USAID has had a long association with Bangladesh and is fully familiar with the economic, political, cultural and social context of its assistance. In addition to NRM support, USAID's current program is particularly strong in health, education, disaster management and local development, all of which may have a role in a possible future GCC program.

USAID is active in the new era of donor cooperation in Bangladesh, a fact which may be crucial in the design of projects which effectively harness USAID grants for technical assistance, training and capacity building with investment funds from a loan or grant source. USAID's experience also equips it to undertake projects in complex social environments, through its emphasis on participatory management and community-driven development.

The Assessment Team proposes that the following list of selection criteria be refined and then used by USAID, in consultation with the GoB, to choose priorities for its future program.

- Priority for Bangladesh, as indicated in GoB policy papers and strategies;
- Compatibility with US Government criteria for various programs;
- Potentially significant (and measurable) impact on natural resources conservation and/or climate change mitigation or adaptation, as well as on economic and social well-being of the population;
- Support to democracy, governance and gender equality objectives;
- Building on past successes and lessons learned;
- Filling of gaps and avoidance of overlaps with other ongoing or planned GoB or donor programs;
- External support needs that are oriented more to technical assistance, with capital investments in a supporting role; and
- Costs that are comparable with the likely availability of funds.

With that in mind, the Assessment Team recommends that **USAID continue to focus its environmental assistance in NRM**, where it has played a leading part over the last ten years. Reasons for this include:

1. The co-management model that was pioneered under the earlier projects (MACH and Nishorgo) has shown substantial benefits in the case of fisheries (and other aquatic resources) and promises to do so in forest PAs;
2. To achieve full benefits will require continued support to the forest areas and expansion of the area covered in the floodplains;
3. The needs are primarily for technical assistance and capacity building, areas where USAID has a comparative advantage; and
4. There is little other donor support in the forest sector and good cooperation between donors in floodplain fisheries.

This reasoning implies a **continued focus on forest PAs and floodplain fisheries**, through a successor project to IPAC (or possibly a modification to the ongoing project) – the type of support is outlined in Chapter 4. With the expected new funding for GCC, many options are possible, and the team suggests some preference for projects related to NRM and the above core program but this need not be the exclusive focus.

4. PROGRAM OPTIONS FOR USAID

In Annex 1, the Assessment Team has set out 14 Program Concepts in a brief, standard format, grouped as follows: Core Programs; Foundational Programs; NRM Programs; and, Other Programs. It must be emphasized that these are not projects – they are concepts that could be combined in different ways to produce a set of projects, large or small in number or cost. The Team’s work is primarily at the pre-programming stage; the following stage of programming will be equally important, in shaping these ideas into a coherent set of projects to match whatever level of funding is available and taking into account further analysis of implementation capacity.

4.1 CORE PROGRAMS

C-1 REPLICATION OF THE MACH MODEL

MACH was successful in pioneering a strong co-management model based on Resource Management Organizations (RMOs) for each water body (combining poor fisher members with local elite persons, such as professionals, merchants or religious leaders), which were able to establish fish sanctuaries, closed seasons and bans on destructive fishery techniques. This resulted in more than doubling fish catches, while restoring ecosystems and species. MACH also included a micro-credit component which might, in the future, be replaced by agreements with ongoing NGO programs, where available. For the wetlands component of the core program, the Team suggests that USAID direct its efforts at facilitating the expansion of the MACH model (or variants thereon) to other parts of the country, in a measured and phased way and in close cooperation with other development partners, like the WB, which may have major investment funds. The DoF should have an expanded role in providing extension services, especially at sites which have “graduated” from project support.

C-2 CONTINUED SUPPORT TO FOREST PA CO-MANAGEMENT

The model for forest PAs is now being applied to nearly all the PAs in the country but work will be needed for several years to ensure its sustainability. While some of the longer established CMCs may be ready to “graduate” from external support by the end of the IPAC project period, the newer ones assuredly will not and thus further assistance to them should be considered⁴⁸. The continuation phase should have a strong emphasis on financial and staffing needs for successful PA management, delineation of core and buffer zones and the design of AIG programs (including social forestry) for the latter. In addition it will be important to assess which additional national policies and regulations need to be reformed or introduced in order to ensure complete local ownership and long-term sustainability.

4.2 FOUNDATIONAL PROGRAMS

F-1 NRM POLICY DEVELOPMENT

Although policies and laws are more satisfactory for floodplain fisheries, PA development is being handled through a series of “patches” to older laws, such as the recent Government Order on Co-Management and the forthcoming PA Rules and Social Forestry Rules. At the site level, more work on PA financial autonomy, financial planning (needs assessment, cost reduction, selection of revenue mechanisms, formulation of PA financial and business plans), and AIG business planning is needed.

⁴⁸ While other major donors (such as EU and GTZ) are now starting to support USAID’s pioneering efforts in PA conservation, it is reasonable that USAID should continue to take the lead for the near future.

F-2 ECOLOGICALLY REPRESENTATIVE PA SYSTEM DEVELOPMENT AND DATABASE

The Team recommends that USAID consider supporting a detailed Ecological Gap Analysis⁴⁹ review of endangered ecosystems and species, habitat coverage and the adequacy of the present PA system to protect them; additional or expanded PAs might be recommended (although this may bring additional management and financial burdens). The availability of habitat in neighboring countries should be taken into account. A database of information on ecosystems and species would be established, including maps and inventories. This activity could be completed with the support of a major conservation organization, such as the Worldwide Fund for Nature, the Nature Conservancy or Conservation International

F-3 PUBLIC AWARENESS

Public awareness is fundamental to any successful environmental program; this might be incorporated into each program or considered as a stand-alone effort. All levels could be considered: schools; PA dependent people; officials; middle class citizens; and the private sector.

F-4 CAPACITY BUILDING OF THREE DEPARTMENTS – FOREST, FISHERIES & ENVIRONMENT

This would need to be a thoroughgoing effort looking at structure, personnel policies, recruitment and promotion policies and remuneration, including effective anti-corruption measures, in addition to the traditional approach of in-service training. However, such restructuring would be fundamental not only to the success of USAID's future program but to other GCC donors as well.

F-5 RESEARCH PARTNERSHIP ON GLOBAL CLIMATE CHANGE (INCLUDING GCC FINANCING)

This would harness the skills of major US and Bangladeshi research institutions and regional policy and finance think tanks on critical knowledge gaps in climate change and adaption needs. Additionally, topics should include other critical aspects related to GCC such as policies, economics and carbon trading.

4.3 OTHER NRM PROGRAMS

N-1 FULL-SCALE APPROACH TO ALTERNATIVE INCOME GENERATION (AIG) FOR FOREST PAS

This would address the problem of the small scale of AIG efforts up to now by taking a macro approach – calculating the amount of investment needed to raise landscape zone incomes to the level needed to replace income from the PA and then putting together a package tapping into all sources: Co-Management Committees; national and local government programs; major NGO own funds; private sector and the project.

N-2 NATIONAL REFORESTATION / SOCIAL FORESTRY PROGRAM

Subject to the findings of the forthcoming consulting team⁵⁰, this would re-activate national reforestation programs, possibly using carbon credits, at a variety of sites – PAs, reserved forest, other forests, community and homestead forests, coastal land and chars – with a balance of short and long rotation species and a bias to native species and assisted natural regeneration of forests. Wherever possible, local communities would be involved through co-management or social forestry models. The pre-conditions for obtaining REDD funding are set out in Attachment B, Section 3.1 Perhaps the most challenging will be to establish the *credibility* of Bangladesh – that forests established for carbon sequestration are not prematurely harvested.

⁴⁹ Ecological Gap Analysis (EGA), as recommended by the Convention on Biological Diversity.

⁵⁰ Investment Planning for Sustainable Forest Resource Development in Select Ecologically Important Landscapes.

N-3 COASTAL ZONE PROGRAM

Described in more detail in Annex 4, this concept envisages a comprehensive approach to environmental and disaster management in the coastal zone. Core activities could include reforestation (with potential for REDD or other carbon financing), marine fisheries and sanctuaries, and mitigation of environmental damage from shrimp cultivation. Co-management would be used. The Sundarbans PAs and reserved forest constitute a coastal hot spot of global significance; however, ongoing projects from USAID (IPAC) and the EU (SEALS), together with possible new assistance from the WB, would appear to cover its needs for the next five years or more.

N-4 CHITTAGONG HILL TRACTS (CHT) WATERSHED MANAGEMENT

Existing programs of ADB and UNDP in the CHT do not include NRM – forests, biodiversity, soils and water. A watershed management approach, which would integrate environmental, economic and social considerations, could be overlaid on existing project sites or elsewhere.

4.4 OTHER PROGRAMS

O-1 INDUSTRIAL AIR AND WATER POLLUTION

A model for addressing pollution in industrial concentrations is being tested by the WB but there are many places that need it, including some adjacent to PAs. This might lend itself to a public-private partnership approach, for example, through the World Environment Center in New York

O-2 ALTERNATIVE ENERGY PROGRAM – WIND, SOLAR, BIOMASS, MAYBE GAS DISTRIBUTION

A set of pilot projects is proposed, primarily at the village level. Extension of the gas pipeline to Teknaf might also be studied.

O-3 RURAL SOLID WASTE

Given the magnitude of this problem, a strategic approach is needed. Programs should include: collection; sorting; recycling; disposal through engineered landfills; and methane recovery. USAID's comparative advantage may suggest a focus on rural areas.

4.5 CONCORDANCE WITH GOB PRIORITIES

As Table 1 below indicates, there is a high degree of agreement between the BESASA Team's proposals and the government's Bangladesh Climate Change Strategy and Action Plan (BCCSAP):

Table 1: BESASA – BCCSAP Concordance (Attachment B, Annex 1)

BESASA		BCCSAP (2009)		Notes
No.	Title	No.	Title	
C-1	Replication of the MACH Model	T1P4	Adaptation in fisheries sector	
C-2	Support to Forest PA Co-Management	T5P7	Afforestation and reforestation	
F-1	NRM Policy Development	T5P7	Afforestation and reforestation	
F-2	Representative PA System Development			No direct link
F-3	Public Awareness	T2P3	Awareness raising and public education	
		T6P6	Mainstreaming climate change in the media	
F-4	Capacity Building of Three Departments	T6P5	Strengthening institutional capacity for GCC	Close link
F-5	Research Partnership on Global Climate Change	T4P1	Establishment of a Center for research, knowledge management and training	Close link
N-1	Full-scale Approach to AIG	T1P8	Livelihood protection in ecologically fragile areas	
		T1P9	Livelihood protection of vulnerable socio-economic groups (including women)	
N-2	National Reforestation/ Social Forestry	T5P7	Afforestation and reforestation	Close link
N-3	Coastal Zone Program	T1P4	Adaptation in fisheries sector	
		T3	Infrastructure – especially P1, P2, P3 and P6	
		T5P7	Afforestation and reforestation	
N-4	CHT Watershed Program	T1P8	Livelihood protection in ecologically fragile areas	
		T1P9	Livelihood protection of vulnerable socio-economic groups (including women)	
O-1	Industrial Air and Water Pollution			No direct link
O-2	Alternative Energy Program	T5P4	Renewable energy development	Close link
O-3	Solid Waste	T5P6	Management of urban waste	

The government has also indicated its priorities for USAID environmental and climate change assistance in a letter from Environment and Forests State Minister, Dr. Hasan Mahmud, to the USAID/ Bangladesh Mission Director dated December 10, 2009 (Annex 3). It states: “*It is very apprecia[ted] that the USAID has identified some new areas of cooperation in the environment sector such as institutional capacity building, natural resources co-management with a special focus on empowering and improving the livelihoods of the poor, and global climate change adaptation with a special focus on carbon financing*”. The letter also mentions a number of other areas in the BCCSAP, which are included in the Team’s recommendations. The DoF has also, less formally, provided a written list of requested assistance to the Team, which mentions: *baor* based wetland resource development; strengthening established CBOs; climate change issues in the fisheries sector; and Sundarbans wetlands biodiversity study, among a long list.

4.6 PROGRAMMING SCENARIOS

As set out in the Statement of Work and further clarified by USAID/ Bangladesh, the Assessment Team has arranged its proposed program options by priority and in accordance with three programming scenarios; Base; Medium; and, High, corresponding to the availability of funds at around \$20.0 million, \$30.0 million, and \$50.0 million respectively for 2010 to 2015. It needs to be recognized that the cost figures for each program are to some extent only illustrative, as they depend on choices about the scale and duration of each program and the levels of government and other donor funding.

Table 2: BESASA Proposed Programming Scenarios

Option No.	Program Option Name	Total Cost	USAID Share	Duration (yrs)	Comments
		(\$ millions)			
Base Case Scenario: about \$30.0 million over five years					
C-1	Replication of the MACH Model	30.0	4.5	5-8	
C-2	Continued Support to Forest PA Co-Management	3.0	3.0	5.0	
F-1	NRM Policy Development	0.25	0.20	1+	
F-2	Ecologically Representative PA System Development and Database	0.25	0.20	1.0	
F-4	Capacity Building of Three Departments	5.0	3.0	3.0	
F-5	Research Partnership on Global Climate Change	10.0	5.0	5.0	
N-1	Full-Scale Approach to AIG for Forest PAs	100.0	10.0	5.0	
N-2	National Reforestation/ Social Forestry Program	10.0-50.0	8.0	5.0	
	Subtotal	153.5-193.5	33.9		
Intermediate Scenario: about \$50.0 million over five years					
F-3	Public Awareness	3.0-5.0	2.5	3.0	
N-3	Coastal Zone Program	100.0	10.0	5.0	
N-4	Chittagong Hill Tracts Watershed Management	15.0	5.0	5.0	
	Subtotal	276.5-318.5	51.4		
High Case Scenario: about \$65 million over five years					
O-2	Alternative Energy Program	10.0	8.0	5.0	
O-3	Rural Solid Waste	10.0	8.0	5.0	
	Total	296.5-328.5	67.4		

It should be noted that all cost figures are highly tentative at this stage and are subject to further review. Also, the relatively low figures for C-1 and C-2 are based on the assumption that the associated program concepts F-1, F-2, N-1, N-2 will proceed at the same time. All six concepts could be bundled as a single project. Several high cost proposals assume some degree of parallel co-financing.

4.7 IMPLEMENTATION, COORDINATION AND PARTNERSHIP

As a victim of global climate change, Bangladesh is clearly entitled to additional support from more developed nations, to help it adapt to coming changes and it is heartening to note that donors have already pledged additional money, with the prospect of more to come after Copenhagen. While the government has prepared a credible action plan (BCCSAP) for these resources, neither it nor the donors appear to have fully analyzed the extent to which capacity constraints may impede the timely expenditure of these new funds. The Team has the following suggestions to USAID to address this problem:

- i) Argue strongly for restructuring the three NRM departments under F-2;
- ii) Give priority to activities in the NRM sector which do not demand greatly increased institutional capacity e.g. C-1; C-2; N-2; and the lower cost proposals F-1; F-2; F-3; F-5; N-1;
- iii) Work with the donor community to expedite action by government on the “disabling conditions”, especially on institutional rigidity, approval processes and corruption.

The program briefs in Annex 1 indicate where the environmental/GCC proposal could be supported by or integrated with other USAID programs, especially PL480, although detailing this was beyond the scope of BESASA.

Interstate Cooperation. The proposals also provide some scope for regional integration, especially those related to PAs (C-2; F-1; F-2 and F-5). The Sundarbans PA work, in particular, could benefit greatly from cooperation with India on very similar problems. Small building blocks like these could very well facilitate joint work on bigger issues like water sharing. Option F-5 is similar to an existing USAID proposal to establish a regional network of centers of excellence in GCC. It is particularly important that interstate cooperation also target aspects related to policy reform, environmental fiscal reform, institutional reform and PA financing; and collaboration with sector outside the environment sector (promote collaboration with the non-converted) such as Ministries of Finance, Tourism, Planning and National Audit Offices.

Donor Coordination. The program options provide excellent opportunities for working closely with other donors. For example, proposal N-3 for coastal zone management could well be linked with the proposed WB operation for coastal embankments by undertaking such components as re-vegetation, co-management, marine fisheries etc. Similarly, option C-1 to expand co-management in inland fisheries, could benefit from being linked with a proposed large WB project, which could take care of infrastructure needs. Option N-4 for watershed management in the CHT is envisaged as an overlay to the ongoing ADB and UNDP programs in that area.

Feasibility Studies. The Assessment Team strongly suggests that its major proposals in areas new to the USAID program be preceded by full feasibility studies, so that the full implications of the project can be understood before a decision is made to take it up. More details are given in Annex 1.

Government Commitment. Although lack of government commitment is unlikely to be a problem for the core options, which continue the existing USAID program, such commitment should be carefully tested for any new program areas. This is especially true for F-4 (capacity building of three departments), which will likely cut across deeply-entrenched vested interests. The Team recommends that USAID devise some tests of commitment, in the form of government actions to be taken prior to commitment of USAID funds, for example, appointment of key staff, issuance of regulations, or approval of counterpart funds.

ANNEX I: PROGRAM OPTION BRIEFS

C-1	REPLICATION OF THE MACH MODEL
C-2	CONTINUED SUPPORT TO FOREST PA CO-MANAGEMENT
F-1	NRM POLICY DEVELOPMENT
F-2	ECOLOGICALLY REPRESENTATIVE PA SYSTEM DEVELOPMENT AND DATABASE
F-3	PUBLIC AWARENESS
F-4	CAPACITY BUILDING OF THREE DEPARTMENTS
F-5	RESEARCH PARTNERSHIP ON GLOBAL CLIMATE CHANGE
N-1	FULL-SCALE APPROACH TO AIG FOR FOREST PAS
N-2	NATIONAL REFORESTATION/ SOCIAL FORESTRY PROGRAM
N-3	COASTAL ZONE PROGRAM
N-4	CHITTAGONG HILL TRACTS WATERSHED MANAGEMENT
O-2	ALTERNATIVE ENERGY PROGRAM
O-3	RURAL SOLID WASTE

PROGRAM OPTION C-I

Title: Replication of the MACH Model

Priority: I

Objective: To restore the productivity and biodiversity of large wetland systems by promoting ecologically sound management and wise use of wetland floodplain resources for the benefit of the poor.

Expected Outputs: For each selected major wetland system: a set of independent community based organizations with long term use rights over the main water bodies, that have implemented management plans resulting in wetland sanctuaries covering 5% of dry season water area, closed seasons, habitat restoration (excavation and swamp forest) and fish reintroduction; fish catches averaging at least 250 kg/ha (wet season area); restored fish and water bird diversity; higher fish consumption; enhanced livelihoods for poor wetland users; and a co-management committee comprising of CBO leaders, local government and local administration overseeing a coordinated management plan for the wetland system.

Summary Description: Starting from existing inventories of major wetlands and an assessment of the extent constituent jalmohals are dominated by elites, replication sites of either existing or potential national importance for wetland biodiversity will be selected, each averaging at least 5,000 ha wet season extent. Participatory planning will be conducted with communities using each major part of each system. In each area, community organizations will be formed and support provided to implement wetland restoration and conservation plans. This will be complemented where appropriate with provisions for environmental education and ecotourism. As an incentive for the poor to invest in conserving fish and reducing fishing pressure, NGOs will be supported to extend training and micro-credit access (largely with their own funds) for alternative occupations for poor wetland users. To coordinate and oversee the efforts of community organizations and government, co-management committees will be formed for each wetland system and their capacity built to plan and resolve conflicts. Lessons learned in the USAID Coastal Resource Management Project, implemented by the University of Rhode Island in the 1980s and 90s, especially the establishment of Special Management Zones. Program should be adapted as appropriate.

Location: Ten haors or similar large wetland systems primarily in north east Bangladesh

Implementation responsibilities: Suitably experienced national NGOs would be contracted to facilitate the process, working with Department of Fisheries and local administrations and international advisors. Ministry of Land will have to reserve long term use rights to jalmohals in these systems for community management through organizations formed and facilitated by the program. Ultimately responsibilities will lie with the community-based organizations formed by the program and with the co-management committees covering a range of government agencies and local administration.

Linkages to other USAID projects: Based on the approach developed by the earlier MACH project and if appropriate, the USAID Coastal Resource Management Project.

Duration: Based on the MACH project a total of 8 years broken down into a main phase of 5 years and a consolidation/phasing out period with reduced support of 3 years.

Potential Cost: About US\$ 3 million per wetland system, US\$ 30 million in total, with 25 percent from government sources and 60 percent from the WB for infrastructure.

Scope for donor cooperation: The International Fund for Agricultural Development supports the Sunamganj Community Based Resource Management Project which develops infrastructure, self help groups and management of smaller water bodies in these systems. Swiss Development Cooperation is supporting a

similar initiative in one large wetland – Tanguar Haor. Several smaller projects work on livelihood issues in the haors.

Notes: As the project model is well developed, project preparation would consist mainly of physical and socio-economic surveys of the selected regions.

PROGRAM OPTION C-2

Title: Continued Support to Forest PA Co-Management

Priority: I-II, dependent on results of current co-management support

Objective: to extend the timeframe and/or geographic extent of co-management support currently provided through IPAC

Expected Outputs: within each forest protected area targeted for co-management support, 1) one or more community-based organizations with long-term use rights and co-management responsibility for sustainably harvestable natural resources (primarily plant resources, and **not** including any vertebrate wildlife species, which require complete protection consistent with protected area management principles); 2) an agreed management plan integrating biodiversity conservation and community-based sustainable use of designated natural resources; and 3) effective oversight of resource conservation and co-management of sustainable use by community leaders, community members, and the responsible government organizations

Summary Description: drawing on currently developing experience in Bangladesh and (potentially) other successful models of forest resources co-management, community participation in sustainable use and management of natural resources will be extended to other designated protected areas in Bangladesh. In each area, community organizations will be formed to enable co-management and sustainable use of natural resources within carefully considered and agreed constraints imposed by the primary goal of conservation of all biodiversity resources. Training and technical guidance will be provided, with the ultimate aim of making the community organizations self-sustaining and self-sufficient partners with the relevant government organizations having responsibility for protected areas and biodiversity conservation and management.

Location: forest protected areas, to be determined.

Implementation responsibilities: qualified and well-experienced NGOs will be contracted to facilitate the development and implementation of the co-management process, working with relevant local government bodies and advised as necessary by national and international specialists. It is anticipated that co-management committees comprising community members and relevant government organizations will be assigned oversight of the process in each protected area or (in large areas) resource management subarea.

Linkages to other USAID projects: the process will draw on experience currently being developed under IPAC and similar co-management activities in other developing countries.

Duration: an initial pilot phase of one year should be sufficient for organization and for identifying issues that might require technical or other advisory inputs. Based on experience with other similar initiatives advisory/oversight inputs should subsequently be available as required for a period of five years or more.

Potential Cost: costs will be driven by degree of cooperation and success, but based on similar ongoing initiatives indicative costing is US\$1-2 million per protected area over a five year period.

Scope for donor cooperation: as the outcome of this initiative is intended to be permanent maintenance of extensive areas of vegetation cover and included biodiversity, there is scope for cooperation with both biodiversity conservation and climate change mitigation initiatives.

Notes: Elite capture of benefits and/or control of the co-management process at the expense of other community members have been and continue to be a problem in similar initiatives in Bangladesh. While participation of local elites is a necessary ingredient of success, fair and equitable distribution of benefits to

the poor and disenfranchised elements of local communities needs to be at the forefront of this initiative and adequately incorporated in its design.

PROGRAM OPTION F-1

Title: Natural Resources Management Policy Assessment and Reform

Priority: I

Objective: Harmonize policies with current needs of NRM in Bangladesh, including Forests (including PAs) and Fisheries. This is a fundamental enabling condition that will determine success at improving NRM in Bangladesh.

Expected Outputs:

1. Policies governing the Forest (and PAs) and Fisheries Sectors are modernized, harmonized with international sustainability standards and sustainable community-based management. Policies include mechanisms to improve transparency and accountability.
2. Environmental fiscal policies supporting the financing of the Forest (and PAs) and Fisheries Sectors are modernized and harmonized amongst sectors and in the national context. There is a strong focus on revenue sharing (other than AIG activities) to support local communities and reduce dependency on natural resources.
3. Natural resources management-related policies governing transparency, accountability, control of corruption are modernized and enforcement is improved.

Summary Description:

Output 1. The key activities of this output will include a comprehensive assessment of the existing policy, laws and regulatory framework governing the Forest (incl. PAs) and Fisheries sectors. The assessment will identify bottlenecks, gaps and opportunities to improve policy at national, regional and local level. For example, key laws and regulations to be targeted in the Forest and Fisheries sectors are included in Tables 1 and 2 (below). PA Policy may include new legislation to improve institutional authority over PAs (including national and sub-national actors), and the establishment of the national *system* of PAs (and sub-systems). For additional areas for reform in the Forest, PAs and Fisheries sectors see Attachment B, Chapters 3, 4, and 5.

Table 1. Key issues, risks and areas for reform in laws governing the Forest Sector.

Forest: Laws and regulations	Key issues	Level of risk			Suggested areas for reform
		L	M	H	
Bangladesh Wildlife (Preservation) Order, 1973	Very outdated focus on hunting schedules, needs updated provisions for protected areas. Places protected areas under FD.			x	Needs far-reaching debate and review to cover habitat and ecosystems protection, and extend responsibilities to a range of agencies.
Revenue Law affecting Forest	Incentive to deforestation			x	Elimination
Forest Act 1927	Territorial administration of forests overrides conservation based management Forming village forests – allows community management agreements with responsibilities and use conditions.		x		Need to define new forest conservation priorities in both forest PAs and reserve forests, covering forest and wildlife protection and sustainable uses. Reform to allow and recognize traditional use rights. Need to introduce community management framework for “unclassified state forest”
Private Forests Ordinance 1959	Requires owners to make working plans (i.e. manage for production rather than conservation). Allows Department to take over forests.		x		Include conservation plans and allow co-management schemes.
Social forestry rules of 2004	Not clear how forest can be used in wider landscape zones: protected areas, reserve forest and other public land			x	Introduce rules and responsibilities for zoning and community management of forest areas
PA governance (see Chapter 5 for more details)	Inadequate guidelines on PA management and co-management, poor PA representation, extremely limited PA funding.			x	Formulate a new PA regulation that clearly defines and expands PA co-management, creation of new PAs, financial autonomy of PAs, enabling PAs to generate and retain revenue generated at site-level and fiscal reform to support PA financing.

Table 2. Key issues, risks and areas for reform in laws governing the Fisheries Sector

Fisheries: Laws and regulations	Key issues	Risk level			Suggested areas for reform
		L	M	H	
Bangladesh Environmental Conservation Act (1995)	Poor management guidance on ECAs (most of which are wetlands). Places ECAs under DOE, which has no capacity to manage them.			x	Develop model ECA planning and management. Transfer wetland ECAs to DoF or a new PA Dept. or develop mechanisms for cross-agency management/ co-management.
National Fisheries Strategy 2006	Includes community management, conservation, and using leases to control access, not based on revenue. DoF lacks implementation capacity and a strategy for inland open waters.			x	Development enforcement mechanisms. Gradually phase out MoL role in favor of local administrations and MoF for management of access to water bodies. Build capacity at both levels: government and co-management
<i>Jalmohal</i> Management Policy (2009)	Top-down approach. Lacks clear incentives for long term community management and restoration of fisheries			x	Reform to follow approach in inland capture fisheries component of Fisheries Strategy, and incorporate into policy.
Fish Protection and Conservation Act (1950); Fish Protection and Conservation Reg. (1985)	Enforcement very difficult. Size limits impractical. No recognition to fish sanctuaries.		x		Include recognition of a range of different sanctuaries in wetlands and fisheries, and management agency. Allow for recognizing community initiatives. Update rules on harmful fishing practices, improve enforcement mechanisms.
Government Fisheries (Protection) Ordinance 1959	Allows any public water body to be placed under direct government managed licensing system. Obsolete, top-down management. Lacks coherency with recent Fisheries Policy (1980s to 1990s).	x			Eliminate
Marine Fisheries Ordinance 1983	Allows for declaring marine reserves, bans explosive fishing, and covers licensing of vessels. Lacks guidance for wider marine conservation and enforcement regulations (sanctions).		x		Introduce territorial fishing rights. Link with resource management plans or sustainability. Make cross-agency use of marine reserve provision.

Output 2. The activities of this output will aim at assessing opportunities and attaining (introducing) key environmental fiscal reform (EFR) in the indicated sectors. EFR refers to "a wide range of taxation or pricing instruments that can raise revenue, while simultaneously furthering environmental goals. This is achieved by "providing economic incentives to correct market failure in the management of natural resources and the control of pollution" (World Bank, 2005)⁵¹. EFR can address environmental problems that threaten the livelihoods of the poor (revenues raised by EFR can be used to finance pro-poor investments) and contribute to reverse the loss of environmental resources. Key areas for reform include the introduction of "polluter-pays" and "user-pays" principles, applied to industries that use forest and fisheries resources and ecosystems services. For example: the construction sector (brick industry), hydro-energy, commercial fisheries, transport and tourism.

Output 3. The key activities of this output will include a comprehensive assessment of the existing policy and regulatory framework for eliminating corruption and how this regulatory framework is applied in the Forest (incl. PAs) and Fisheries sectors. The assessment will identify bottlenecks, gaps and opportunities to improve policy, regulations at national, regional and local level, for example, the policy and regulatory framework governing revenue collection from illegal logging. See more detail in Attachment B, Chapter 3 and 5.

Location: Bangladesh - national and regional levels

Implementation responsibilities:

Outputs	Project Formulation	Assessment Phase	Reform Phase	M&E
Output 1*, 2** and 3***	USAID Staff, GoB, and national consultants	GoB and national consultants, supported by USAID staff and an international expert	GoB, supported by national consultants, international expert and USAID	GoB, USAID (UNDP, Transparency International and other donors for Output 3)

* GoB: Output 1: MoEF, FD, DoF;

**GoB: Output 2: MoEF, FD, DoF, Ministry of Finance, Ministry of Tourism, Ministry of Energy, National Audit Office (NAO);

***GoB and Civil Society: MoEF, FD, DoF, NAO, General Economic Division (GED), Ministry of Finance, Law Enforcement Agencies, Transparency International-Bangladesh.

Linkages to other USAID projects: IPAC Project.

Duration: Assessment phase: 1 year

Reform Phase (Implementation): 3 years

Potential Cost: Program Formulation and Assessment Phase: US\$ 500,000

Reform Phase (Implementation): US\$ 4 million, including the establishment and equipment of corruption control systems.

⁵¹ EFR can be used to: 1) mobilize revenue for governments; 2) improve environmental management practices and conserve resources; and 3) reduce poverty. By encouraging more sustainable use of natural resources, and reducing pollution from energy use and industrial activities. Source: Environmental Fiscal Reform: What should be done and how to achieve it (World Bank, 2005).

Scope for donor cooperation: Wide scope for donor cooperation and mutual benefit. There are a number of on-going initiatives (at national and regional level) related to NRM policy and control of corruption supported by a range of donors: UNDP, WB, EU, Germany, Denmark, ADB, Transparency International.

PROGRAM OPTION F-2

Title: Ecologically Representative Protected Areas System Development and Database

Priority: I

Objective: To complete the development of a protected areas system that is representative, to the extent currently possible, of all major ecosystems and floral and faunal communities of Bangladesh, and to manage the system for the effective, long-term conservation of all biotic elements contained therein. The system shall include, as appropriate, forest, wetland and marine areas. A database paralleling system development will incorporate the ecological and geographic (map-based) information required for effective management.

Expected Outputs: The expected output is a legally established, ecologically representative system of protected areas, including forests, wetlands and coastal/marine areas that are managed in accordance with international standards for the long-term protection of included biodiversity resources and landscapes. It is recognized that due to high population densities and a long history of human use of biodiversity resources, international standards for protected area systems (10-15% of each ecosystem in the country under protected area management) are no longer attainable in Bangladesh. Therefore, pending further analysis, targets will be adjusted according to pragmatic criteria (*e.g.*, if a given ecosystem is well-represented in the protected areas systems of adjacent countries, establishment of additional protected areas in this ecosystem type in Bangladesh can be assigned relatively lower priority). Consideration will also be given to protected area types that permit multiple uses and/or that recognize the conservation value of secondary vegetation (*e.g.*, Managed Elephant Ranges) while still serving a primary objective of biodiversity conservation, based on internationally accepted standards.

Summary Description: This initiative builds on a relatively long history of successful protected areas interventions in Bangladesh, including the ADB-supported Forestry Sector Project (1998-2002), which began to set the stage for modern protected area management in forested areas in Bangladesh, the USAID-funded MACH and Nishorgo Projects, which established co-management models in wetland and forested areas, respectively, and the current USAID-funded IPAC Project (2008-2013), which continues support to protected area co-management. It will take a fresh look, based on best available data, at the current and potential representativeness of protected areas in Bangladesh, ranging from strictly protected areas of intact habitats, which are likely to be relatively small, to more extensive areas supporting various types and levels of human use, but retaining significant biodiversity conservation value. It will also examine the potential utility of special categories of protected areas, including but not necessarily limited to: 1) Managed Elephant Ranges, which are extensive areas of primarily secondary vegetation that provide critically important habitats for elephants and other species of conservation significance adapted to secondary vegetation; 2) Multiple Use Areas, which are specifically managed for conservation benefits but also include a variety of compatible human uses (for example, in buffer zones); 3) Wildlife Corridors to allow wildlife to migrate between isolated, small PAs; and 4) Transboundary Protected Areas, which span national borders, and effectively increase protected areas extent and effectiveness within a shared territorial and management commitment.

Location: Representative wetland and forest areas throughout Bangladesh (pending selection)

Implementation responsibilities: The initial assessment process is likely within the existing capacity of local and international NGOs or private sector organizations currently established in Bangladesh or the surrounding region, in cooperation with the FD. The FD has the requisite Geographic Information Systems capabilities but this may also currently be available in the NGO community, and certainly in the private sector in Bangladesh.

Linkages to other USAID projects: primarily IPAC but potentially including other environmental/land use interventions

Duration: minimum one year for data gathering, assessment and analysis, and an additional two-three years for area establishment, depending on effectiveness of linkages with other interventions (*e.g.*, IPAC).

Potential Cost: approximately US\$250,000 for assessment phase. Cost of implementation phase dependent on linkage with IPAC or other ongoing initiatives.

Scope for donor cooperation: as the outcome of this initiative is intended to be permanent maintenance of extensive areas of vegetation cover and included biodiversity, there is scope for cooperation with both biodiversity conservation and climate change mitigation initiatives.

PROGRAM OPTION F-3

Title: Public Awareness

Priority: II

Objective: For the majority of Bangladeshis to understand the value of biodiversity and likely impacts of global climate change, and to be supportive of biodiversity conservation and make use of this knowledge in adopting better adapted, low carbon lifestyles and supporting biodiversity conservation initiatives.

Expected Outputs: Basic knowledge of Bangladesh biodiversity significance and threats, and of global climate change processes, predictions and impacts incorporated in all primary, secondary and religious education curricula. Nearly all people living within 10 km of protected areas and ECAs have attended or received at least two types of public awareness activity/product on biodiversity and global climate change. All Union Parishad and Municipal council members and all teachers have been oriented on biodiversity and global climate change. General support for green cities with reduced water, air and noise pollution.

Summary Description: This could be a set of separate projects or a funding and coordination mechanism, depending on how public sector and NGO and private sector components can best be supported and coordinated. A demand led funding mechanism is proposed, where the quality of proposals and activities is carefully assessed and monitored. Components could include: school and *madrassa* curriculum development and teacher training; orientation of journalists; support for radio and TV series; help for NGOs to support nature clubs in schools and youth groups; orientation and small grant programs through local government (union parishads); field visits for urban school children; sponsorship for Bangla language books and posters (e.g. field guides), local drama shows; capacity building for activist NGOs and civil society groups.

Location: Nationwide, but with emphasis on populations in the vicinity of protected areas, ECAs and urban populations.

Implementation responsibilities: A pool of funds managed by a contractor or possibly the Arannayk Foundation and providing grants to NGOs, government agencies and community organizations. Key partners – NGOs active in environment and non-formal education, DoE, Ministry of Education.

Linkages to other USAID projects: Could be linked with Arannayk Foundation.

Duration: pilot for three years, with follow up to make it long term.

Potential Cost: \$3.0 to 5.0 million, depending on adopted scope.

Scope for donor cooperation: Very suitable.

PROGRAM OPTION F-4

Title: Capacity Building of Three Departments

Priority: I

Objective: To restructure and strengthen the Departments of Environment, Forests and Fisheries (and their parent Ministries and associated research institutes) to enable them to be effective and efficient implementers of expanded programs of environmental and natural resources management, including expected major programs in global climate change mitigation and adaptation.

Expected Outputs: For each department: clear mandates and lines of responsibility; reorganization of head office and field units to reflect new mandates; position descriptions, recruitment and promotion criteria; development of multi-disciplinary trained staffs; accountability and minimization of corruption; ability to deliver an expanded work program with efficiency and high quality.

Summary Description: This task would start with a diagnosis of each department and an assessment of previous capacity building efforts. Working groups, representing all stakeholders, would be formed to review options for each major area of reform, resulting in an action plan and phases for implementation in the above areas. Risks would be candidly assessed. At each stage, “champions” would be identified to promote the politically very difficult decisions that would be required to bring about real organizational change. Part of the work could be a study to determine the feasibility of converting the Wildlife Circle of FD to a separate department under MoEF, with responsibility for all PAs, forest or otherwise.

Location: Nationwide.

Implementation responsibilities: The Ministers and Secretaries for Environment and Forest and Fisheries and Livestock would have primary responsibility for program implementation, with links to the Department of Administration, Ministries of Finance and Law, and the Prime Minister’s office highly desirable. Two methods of implementation could be considered: i) a small advisory team in the Secretariat, recruited on an individual basis; or, b) a firm of management consultants.

Linkages to other USAID projects: Would support all other projects with these departments.

Duration: A thoroughgoing restructuring of the type envisaged will probably take ten years to be fully implemented. However, it is suggested that the work be divided into phases of about three years, to allow progress be reviewed before going on to the next stage.

Potential Cost: The first phase may cost about \$5 million. To demonstrate its commitment to the outcome, the government contribution should be 30 to 50 percent.

Scope for donor cooperation: Strong coordination with donors already building capacity in these departments, principally Canada with DoE, will be essential. There will be opportunities for other donors to pick up pieces of the task. If this task succeeds, other donors may want to apply the same methods in other development departments

Notes: This program concept is unlikely to be successful without very strong commitment from the government as a whole, at both the political and bureaucratic levels. While senior officials have expressed the need for capacity building to the assessment team, it is not yet clear whether this goes beyond the conventional approach of adding staff and putting on workshops that has had very limited impact in the past. One way to approach this would be to start a pre-program phase in which a small team of USAID staff/consultants explores the depth of interest of major stakeholders and tries, if possible, to identify “champions”

– powerful individuals with a strong desire for change. The team should then identify a set of initial steps that would demonstrate the GoB’s commitment to serious reform. Only after these steps have been taken would USAID commit funds for the program itself.

PROGRAM OPTION F-5

Title: Research Partnership on Global Climate Change

Priority: II

Objective: To harness the skills of major US and Bangladeshi research institutions on critical knowledge gaps in global climate change and adaptation needs, to disseminate such new knowledge, and to provide training in global climate changes issues.

Expected Outputs: New knowledge on expected impacts of global climate change and the efficacy of various mitigation and adaptation interventions; effective dissemination of such findings; trained manpower.

Summary Description: A center of excellence would be established in Bangladesh, inter alia, to act as a bridge between US and Bangladesh universities and research institutes. While various models are possible, it is proposed that the center would not have in-house research capacity but would act as a broker between institutions. It would also have a role in disseminating research findings and in training manpower in subjects related to global climate change. As its research program would cover a wide diversity of subject matter, a multi-disciplinary staff would be called for.

Location: Among the options are: a) co-location with a major research or education institution in Dhaka; or b) at a new location in the coastal zone (both to publicize its unique role and to support decentralization).

Implementation responsibilities: Again, many options are available, including the MoEF/DoE, the Ministry of Education, or Dhaka University.

Linkages to other USAID projects: The center would link to all other USAID climate change programs and to the Arannayk Foundation. It should be part of a proposed USAID- initiated network of centers in Southeast Asia.

Duration: A one-year planning period, followed by two years of building and staff recruitment, followed by two years of initial operations might be supported.

Potential Cost: Possibly \$10 million, but would depend on the size of institution adopted.

Scope for donor cooperation: A GoB contribution of about 25 percent (and a commitment to meet all operating costs) should be negotiated; there would be considerable scope for participation from other donors.

Notes: If USAID wishes to pursue this option, it should announce its intentions quickly, to avoid an unhealthy competition between donors. Project preparation would likely take one year and would need a specialized team. Design and implementation should be coordinated with USAID's upcoming regional climate change initiative.

PROGRAM OPTION N-1

Title: Full-Scale Approach to AIG for Forest PAs

Priority: I

Objective: To facilitate income growth in the landscape zones of selected forest PAs, through the coordinated efforts of all major stakeholders, in order to reduce substantially the exploitation of forest resources.

Expected Outputs: Illegal cutting (and other unsustainable uses) substantially reduced; incomes in landscape zone stabilized or increased; stakeholder coordinating mechanism established.

Summary Description: In contrast to Nishorgo, IPAC and many other NGO programs, this program would begin with a macro look at the whole landscape zone and survey present household incomes and their dependence on the PA for income. It would then design a series of activities for the major stakeholders: central and local governments (infrastructure and public works, formal job training); USAID (ensuring stakeholder coordination, co-management support, local training, PL480, possibly endowment funds); Arannayk Foundation (possible endowment or revolving funds); major NGOs (micro-credit, training, with own funds); private sector (e.g. eco-tourism).

Location: First phase could cover the five Nishorgo sites. If successful, it could be replicated elsewhere.

Implementation responsibilities: it is proposed that the main responsibilities would be with the office of the Deputy Commissioner in each District involved. At the local level, the Co-Management Committees would be closely involved in all decision-making.

Linkages to other USAID projects: Ongoing health, education and PL480 programs.

Duration: Five years for the first phase.

Potential Cost: The total program cost would be based on a “needs” approach and would be quite substantial e.g. in the order of \$100 million. In order to maintain credibility, USAID would need at least a ten percent stake (i.e. \$10 million or more). A major portion would need to come from GoB, through additions to regular government programs. The willingness and ability of major NGOs to contribute substantial funding would need to be explored.

Scope for donor cooperation: Provided that this is seen as a single program for each area, other donor contributions would be welcome. Alternatively, once the program model is agreed with all parties, other donors could adopt their own PAs.

Notes: A pre-requisite for the program would be a clear commitment from GoB that the needs of biodiversity conservation require special treatment in the landscape zones (in the same way that it has special programs in cyclone affected regions) and demonstration of that commitment by the allocation of GoB funds, simplifying of approval procedures and facilitation of the project coordination arrangements. A Feasibility Study of about \$250,000 is recommended. There may be a substantial overlap with N-2.

PROGRAM OPTION N-2

Title: National Reforestation/ Social Forestry Program

Priority: I

Objective: To re-activate national reforestation programs, possibly using carbon credits, and to establish co-management systems.

Expected Outputs: Restoration of biodiversity elements; carbon sequestration; supply of forest products; poverty alleviation; community empowerment.

Summary Description: A national program is envisaged, at a variety of sites – PAs, buffer zones, reserved forest, other forests, community and homestead forests, coastal land and *chars* – with a balance of short and long rotation species and a bias to native species and assisted natural regeneration of forests. Wherever possible, local communities would be involved through co-management or social forestry models. The pre-conditions for obtaining REDD funding are set out in Attachment B, Section 3.1 Perhaps the most challenging will be to establish the *credibility* of Bangladesh – that forests established for carbon sequestration are not prematurely harvested.

Location: National but with a focus on the landscape zones of the five Nishorgo PAs.

Implementation responsibilities: FD, together with Co-Management Committees, existing or to be formed. USAID contractor to supply technical assistance and, through partner NGOs, social mobilization.

Linkages to other USAID projects: Close linkage to IPAC, as well as proposals C-2 and N-2

Duration: Five years with a possible second phase.

Potential Cost: \$10 to \$50 million, depending on adopted scope and available funds.

Scope for donor cooperation: MDTF, GEF and carbon funds are distinct possibilities.

Notes: Potential project scope and cost will be much clearer after forthcoming study “Investment Planning for Sustainable Forest Resource Development in Select Ecologically Important Landscapes.” There may be a substantial overlap with N-1.

PROGRAM OPTION N-3

Title: Coastal Zone Program

Priority: II

Objective: To ensure sustainable management of the coastal zone of Bangladesh in both natural resources management and socio-economic dimensions, in the light of increasing threats from global climate change factors.

Expected Outputs: Restoration and/or stabilization of ecosystems such as marine fisheries, mangrove forests and embankment plantings; income improvement and poverty alleviation; increased climate change resilience.

Summary Description: The overall program could include elements such as: coastal embankments; water management and drainage infrastructure; cyclone warning, evacuation and shelter systems; sustainable marine fisheries planning and management; tree and grass plantings on embankments; mangrove plantings outside embankments and on chars; clean up of areas impacted by shrimp cultivation (e.g. Chakaria Sundarban); improved agricultural systems; AIG; community empowerment and introduction of co-management.

Location: All coastal regions, except perhaps the Sundarbans, where several major projects are about to start.

Implementation responsibilities: Many ministries would potentially be involved but Environment and Forests, Livestock and Fisheries, Water Resources, Food and Disaster Mitigation, and Agriculture would have prominent roles. A USAID contractor could facilitate NRM activities and community empowerment and co-management. NGOs would have a major role in delivering services to the population.

Linkages to other USAID projects: The proposal would link with many other USAID programs, especially those for cyclone preparedness, local government, agricultural adaptation, health and education, and PL480, as well as N-1 and N-2

Duration: 5 years.

Potential Cost: The cost of the overall program is likely to be very large e.g. the WB is said to be planning \$300 million for coastal embankments alone. At this early stage, the Team is assuming an overall cost of \$100 million, with a USAID program in the NRM and community empowerment area of \$10.0 million.

Scope for Donor Cooperation: Very strong donor coordination arrangements would be needed. Perhaps a GoB/ Donor Steering Committee could be envisaged.

Notes: Cooperation with the WB and other donors should begin as soon as possible to ensure coherence between programs and avoid gaps and overlaps. A full feasibility study is envisaged, which might cost \$500,000 for the proposed USAID program, with an emphasis on marine fisheries, about which relatively little is known at present.

PROGRAM OPTION N-4

Title: Chittagong Hill Tracts (CHT) Watershed Management

Priority: II

Objective: To ensure sustainable natural resources management in the CHT, as well as alleviating poverty, through watershed management.

Expected Outputs: Reduced soil erosion; **reduced flood peaks;** improved dry season water availability; sustainable forest management; replacement of annual with permanent crops on steep slopes; enhanced household incomes and reduction of poverty; community empowerment.

Summary Description: This seen as an NRM overlay on the ongoing programs of ADB, UNDP and others. For each watershed, a survey of existing land use would be made and threats to sustainability analyzed, leading to an amelioration program, which would attempt to find models which increase incomes at the same time as they conserve resources. This would be implemented through existing (or, if necessary, new) community groups, using co-management to the extent possible.

Location: One pilot watershed of about 10,000 ha in each of the three CHT Districts is proposed.

Implementation responsibilities: The CHT Regional Council might have overall coordinating responsibility, with technical ministries playing an advisory role.

Linkages to other USAID projects: The Team understands that, apart from IPAC, USAID is not yet active in the CHT. This program could provide an introduction. It would also be highly suitable for Arannayk co-financing.

Duration: \$5.0 million.

Potential Cost: As a pilot program, this proposal could have a range of sizes. The Team suggests that, for initial planning, a figure of \$15 million, with a USAID contribution of \$5.0 million be proposed. The balance could come from the Arannayk Foundation, the Global Environmental Facility or other sources.

Scope for donor cooperation: See above. In addition, a memorandum of understanding with ADB and/or UNDP might be important.

Notes: The question of land rights makes any investment in the CHT problematical. It is suggested that USAID press the GoB to agree at least on land *use* rights for the present occupiers before designing such a program.

PROGRAM OPTION O-2

Title: Alternative Energy Program

Priority: III

Objective: To demonstrate at a pilot scale the viability of small-scale renewable energy in rural Bangladesh.

Expected Outputs: Improved household access to electric or gas power; reduced reliance on fuel wood or animal dung; improved forest conservation; increased availability of manure for agriculture; reduced disease vectors from solid waste; financial viability; climate change mitigation.

Summary Description: The program could cover some or all of the following⁵²: wind power (for pumping or power generation); solar power (for power generation or for cooking); waste collection, recycling and disposal of organic residues (including agricultural and animal wastes) through biomass digestion, with methane collection. A component for improved stoves might be included. A feasibility study for extending natural gas distribution to areas where fuel wood collection is having an adverse impact (e.g. the Teknaf Peninsula) might be considered. The project would target rural areas which are unlikely to be connected to the power grid in the foreseeable future and those near PAs. Training of technicians to maintain the systems would be important.

Location: About four sites in different parts of the country are suggested, with one upazila selected in each area.

Implementation responsibilities: Like the present solar power project through Grameen Shakti, NGOs could execute this kind of program, with limited support from local administrations and technical government departments.

Linkages to other USAID projects: Primarily the Grameen Shakti project but also options N-1, N-2, N-3 and N-4

Duration: A duration of three years might be enough for a pilot phase with a five-year program to follow.

Potential Cost: A planning figure of \$10 million, with a USAID contribution of \$8 million is suggested. This could be raised or lowered depending on the number of sites, number of components, and duration.

Scope for donor cooperation: Very suitable, especially with GTZ, which has a substantial program.

Notes: Overlaps partly with O-3. A full feasibility study of about \$300,000 is recommended. Program should carefully review progress in these fields in neighboring countries.

⁵² Assuming that sustainable fuel wood production is addressed under Options N-1, N-2 or elsewhere.

PROGRAM OPTION O-3

Title: Rural Solid Waste

Priority: III

Objective: To demonstrate sustainable methods of collecting and disposing of solid waste in rural Bangladesh.

Expected Outputs: Increased sanitary disposal of solid waste; income from recycling; production of compost and/or methane; reduced diseases vectors (rats, flies, mosquitoes); civic pride.

Summary Description: Selection of pilot villages, data collection on present situation, participatory planning of collection and disposal options; installation of management system; implementation; operation; monitoring and evaluation.

Location: About four sites in different parts of the country are suggested, with one Upazila selected in each area.

Implementation responsibilities: While formal responsibility would need to be with local administrations (Upazila Nirbahi Officers and Union Parishads), NGOs would be suited for carrying out much of the work. A high degree of stakeholder participation would be needed.

Linkages to other USAID projects: Could easily be linked to other local level programs, such as strengthening local government, health, education, and PL480

Duration: Five years but might be shorter, if seen as a pilot.

Potential Cost: A planning figure of \$10 million, with a USAID contribution of \$8 million is suggested. This could be raised or lowered depending on the number of sites and duration.

Scope for donor cooperation: Very suitable, especially with any donors already active in this area.

Notes: Overlaps partly with O-2. A full feasibility study of about \$250,000 is recommended. Program should carefully review progress in this field in neighboring countries.

ANNEX 2: BIBLIOGRAPHY

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NOTES

ⁱ The Arannayk Foundation (AF), also known as The Bangladesh Tropical Forest Conservation Foundation, was established under the auspices of the TFCA and Debt Reduction Agreements signed in September 2000 by the United States Governments (USG) and Government of Bangladesh (GOB). The USG and the GOB signed two agreements: the Debt Exchange Agreement and the Tropical Forest Agreement (TFA). Under these agreements, interest payments on outstanding Government of Bangladesh debt totaling approximately \$8.5 million will be paid in Taka to the AF, instead of the U.S. Government.

ⁱⁱ Mitigation requires reducing the intensity of radiative forcing in order to reduce global warming. It is distinguished from adaptation, which involves acting to minimize the effects of global warming. Most often, mitigations involve reductions in the concentrations of greenhouse gases, either by reducing their sources or by increasing their sinks (The Stern Review (2005) identifies several ways of mitigating climate change: reducing demand for emissions-intensive goods and services, increasing efficiency gains, increasing use and development of low-carbon technologies, and reducing non-fossil fuel emissions. Adapting to or coping with climate change will become necessary in certain regions and for certain socioeconomic and environmental systems. The need for adaptation may be increased by growing populations in areas vulnerable to extreme events. According to the IPCC, “adaptation alone is not expected to cope with all the projected effects of climate change, and especially not over the long term as most impacts increase in magnitude.”

ⁱⁱⁱ Bangladesh's contribution to emission of green house gas (GHG) is miniscule. In 2005, the total GHG emissions were estimated at 18.2 billion tons of CO₂ equivalent (excluding Land Use, Land Use Change and Forestry - LULUCF. Bangladesh is a low energy-consuming country (but also energy-starved country). Its energy consumption in 2004-05 was 89 kg per capita. Despite the low level of energy use, the country is unable to meet the present demand for energy. This demand is likely to rise at least 50 percent faster than GDP per capita in coming years. The other major sources of GHG emission in Bangladesh are methane from flooded rice fields and waste, particularly in urban areas.

^{iv} Voluntary markets (large financial flows) will require, for example, more clearly defined land tenure rights and may focus more on efficiency than equity. Voluntary markets are much smaller but more flexible and oriented to corporate social objectives. Donor funds depend on donor-recipient relations, are likely to be small (although multi donor funding may provide financial leverage) and may be linked to levels of sector aid.

^v In the project –based approach REDD financing may be contingent to a reduction of forest loss within the project area and compared with an agreed scenario, and credits could be awarded to project implementers (e.g. local communities). The national approach includes national reference scenario for reduced forest loss linked to a national monitoring and accounting systems. The Government will receive payments and will decide how to use the funding to achieve the targeted emissions reductions. The national approach will be more centralized and will require institutional efficiency to deliver benefits in a timely manner. However, this approach could lower transaction costs and contribute to strengthening of government structures (Based on Peskett et al., 2008).

^{vi} The project will purchase emission reductions from 20 new energy efficient Hybrid Hoffman Kilns (HHK) in Bangladesh. Each HHK will reduce GHG emissions by approximately 5,800 tCO₂e per annum or by 116,000 tCO₂e per annum for the 20 kilns. The project will comprise two Project Design Documents and use AMS II.D: Energy efficiency and fuel switching measures for industrial facilities. The bundling agent is the Industrial & Infrastructure Development Finance Company Ltd (IIDFCL). The revenues from the sale of the emission reductions will be shared between the IIDFCL and the kiln owners. The Danish Government has also signed an emission reductions purchase agreement with IIDFCL for the Project.

^{vii} Tanguar Haor is the single special case of a set of *jalmohals* that have been taken out of leasing and handed over to MOEF (Department of Environment) for conservation. But a similar precedent has been set through

MACH where 8 *jalmobals*, including the 3 that form Baikka Beel sanctuary in Hail Haor, have been taken out of revenue generation leasing to be permanent sanctuaries managed by CBOs under MOFL/DOF supervision.