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RAISE PLUS-LIMITED SCOPE OF WORK FINAL REPORT

**EVALUATION OF USAID/BANGLADESH
ENVIRONMENT PROGRAM**

June 2006

This publication was produced for review by the United States Agency for International Development.
It was prepared by Weidemann Associates, Inc.

EVALUATION OF USAID/BANGLADESH ENVIRONMENT PROGRAM

FINAL REPORT

Submitted by:

Weidemann Associates, Inc.

In cooperation with:

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Submitted to:

USAID

Contract No.:

AEG-I-00-04-00010-00 Task 03

Period of Performance:

April-June 2006

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LIST OF ACRONYMS

ADB	Asian Development Bank
AIG	Alternative Income Generation
BCAS	Bangladesh Center for Advanced Studies
CODEC	Community Development Center, Chittagong
CNRS	Center for Natural Resource Studies
DFID	Department for International Development, of the United Kingdom
DoE	Department of Environment, of the MoEF
DoF	Department of Fisheries, of the MoFL
ECNEC	Executive Committee of the National Economic Council
FD	Forest Department, of the MoEF
FFP	Fourth Fisheries Project (of the World Bank)
FRUG	Federation of Resource Users' Groups
GEF	Global Environment Facility
ICFP	Inland Capture Fisheries Policy
IRG	International Resources Group
ISMP	Infrastructure Support to MACH Project
LGC	Local Government Committee
M&E	Monitoring and Evaluation
MACH	Management of Aquatic Ecosystems through Community Husbandry
MoEF	Ministry of Environment and Forests
MoFL	Ministry of Fisheries and Livestock
NACOM	Nature Conservation Management
NGO	Non-Government Organization
NSP	Nishorgo Support Project

PA	Protected Area
RDRS	Rangpur Dinajpur Rural Service
RMO	Resources Management Organization
RUG	Resource Users' Group
SO6	Strategic Objective 6
USAID	United States Agency for International Development
UFC	Upazila Fisheries Committee
UNDP	United Nations Development Programme
UNO	Upazila Nirbahi Officer (administrative head of an upazila)
UP	Union Parishad (elected local government, below the <i>upazila</i> level)
<i>Upazila</i>	Sub-District (formerly <i>thana</i>)
WB	World Bank

ACKNOWLEDGEMENTS

The evaluation team would like to express its appreciation to the Cognizant Technical Officer, Azharul Mazumder, to Alia Islam, and others at USAID/Bangladesh for the excellent arrangements made for its visit to Bangladesh, including the field visits to all project sites and the follow-up discussions in Bangkok. We would also like to thank Anne Williams, Office Director, Economic Growth, Food and Environment, for her wise counsel and for joining most key meetings. We are also grateful to the Mission Director, Gene V. George, Deputy Mission Director, Beth Paige and SO 11 Team Leader, Todd Sorenson for their thorough briefing and debriefing of the team.

The Project teams – Winrock/BCAS/CNRS/Caritas and IRG/CODEC/NACOM/RDRS – went to extraordinary lengths to facilitate the team’s work by the provision of documents and other information, and by arranging and participating in the field visits. The help of IRG in providing office space was especially appreciated.

Finally, we would like to acknowledge the contribution of our Team Assistant in Dhaka, Md. Shahriar Mahmud, and to Sharon Williams of Weidemann Associates, Inc. who skillfully edited and formatted this report.

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EXECUTIVE SUMMARY

USAID/ Bangladesh initiated the **Management of Aquatic Ecosystems through Community Husbandry (MACH)** activity in 1998 to help promote the conservation and sustainable management of critical floodplain and wetland habitats. In 2002, Strategic Objective for Environment (SO6) was set out as a means of building on ongoing interventions and expanding to terrestrial ecosystems, particularly the protected upland forest areas. SO6 has an overall goal of strengthening the efforts of the government of Bangladesh and the NGOs in environmental and natural resources management.

Adoption of SO6 led USAID to support a second phase of MACH and to initiate a new program, originally called Co-management of Tropical Forest Resources in Bangladesh but later changed to **Nishorgo Support Project (NSP)**¹, which began in June 2003. The overall objective of NSP is to take the pressure off targeted Protected Areas (PAs) so as to safeguard and restore their role as important habitat for tropical forest biodiversity and ensure that they continue to provide critical environmental services, in particular, watershed protection. NSP was designed to build on the experience of MACH, especially in the management area.

Objectives of the Evaluation. The Statement of Work under the Task Order authorizing the evaluation states that the *main objective* is “to conduct a thorough evaluation of the ongoing Environment Program in order to help USAID/ Bangladesh in setting the course of its program implementation under the Mission’s new strategic options. *Specific objectives* are to: evaluate the overall technical performance of the ongoing programs; suggest potential variations on interventions to improve the ongoing programs; and, recommend realistic strategic as well as programmatic options to help realign the programs to meet the requirements of the new Mission strategy as well as new developments in the environment sector in Bangladesh.”

Methodology. The evaluation had the following phases: document review and interviews with key USAID and contractor representatives in the Washington D.C. area; field work in Bangladesh, including interviews with USAID staff, other donor representatives, and contractor staff, visits to all project sites and report drafting; follow-up meetings with the USAID/ Regional Development Mission and others in Bangkok; and, finalization of the report and final de-briefing with USAID in Dhaka and Washington. During the field work, particular emphasis was placed on meetings with project beneficiaries at the village level – several hundred people - to verify reported project achievements, discuss unresolved problems, understand the capabilities of the co-management organizations, and assess the sustainability of project innovations.

The team used an evaluation framework developed by the World Bank, which measures project or program outcomes along three axes:

- **Relevance** – the extent to which the project addresses key sector priorities and is consistent with USAID and government sector strategies.
- **Efficacy** - the extent to which project objectives have been achieved (or show promise of being achieved), using quantitative or qualitative measures as appropriate.
- **Efficiency** – the extent to which benefits exceeded costs (where quantitative measures are available) or resources were used cost-effectively

¹ *Nishorgo* means “beautiful nature” in Bangla.

Project outcomes or impacts were evaluated according to the following measures:

- **Co-Management** – the value added by the co-management model pioneered in MACH and adapted for NSP over processes used in the past.
- **Environmental/ Biodiversity** – the project’s impact on the conservation or restoration of targeted aquatic, riparian or forest ecosystems.
- **Economic** – the impact of project activities (including alternative income promotion) on the livelihood and income of local people
- **Social** – the impact of the project on community organizations and empowerment, the role of women and the status of ethnic minorities.
- **Infrastructure** – the relevance of project infrastructure to project objectives and the quality of work implemented.
- **Institutional** – the effectiveness of the project in strengthening institutions at the national, local government and community levels, including the role of NGOs.

Findings: MACH. Project MACH aims to maintain and recover selected natural flood plain ecosystems and associated fisheries, as well as increasing biodiversity, providing alternative sources of income for poor fishing families, testing the co-management model and extending project innovations more widely in the country.

As a pilot project, MACH has operated at three sites and has two core elements – co-management and supporting infrastructure - and three supporting components – alternative income generation (AIG), biodiversity enhancements and an outreach program. Under **co-management (CM)**, MACH has established 42 Resource Management Organizations (RMOs), with 16 directly involved in wetland management, to manage specific water bodies. Each RMO consists of a number of fishermen/ beneficiaries, as well as local leaders and women members. After the RMO is well established and has developed a management plan, it is allowed to take over the lease for the water body, previously held by private parties. Management plans typically include no fishing zones or sanctuaries, restrictions on fishing in the spawning season, bans on non-sustainable fishing gear and practices, and reintroduction of locally lost species. RMO management plans often call for **supporting infrastructure**, such as the re-excavation of floodplain lakes or channels and placement of fish aggregation devices, which provide food and shelter for fish and deter poaching.

As the management plans typically restrict fishing during the “hungry season”, the project has recognized the need for **AIG**. This is done by formation of Resource User Groups (RUGs), institution of group savings, training of RUG members in an activity of their choice, and provision of micro-credit, for economic activities. Micro-credit is channeled through Federations of Resource User Groups (FRUGs) to the RUGs. **Biodiversity enhancements** comprise two major elements: wetland and riparian reforestation; and, support for eco-tourism. In order to extend its impact to other areas of Bangladesh, MACH has developed an **outreach program** with the Fourth Fisheries Project (FFP), and has provided funding for infrastructure at nine sites where resource management was sufficiently strong. MACH has established Local Government Committees (LGCs) at the sub-district level, comprising local government officials, elected officials, and the chairs of the RMOs and FRUGs. Cooperation with FFP has allowed MACH experience to be reflected in the Inland Capture Fisheries Strategy, prepared by the Department of Fisheries (DoF) and now adopted by the government.

Relevance: MACH is highly consistent with both USAID and government policies and strategies for natural resources management. The CM model is working well and appears to have distinct advantages over previous approaches in the sector.

Efficacy: Nearly all targets have been achieved and some exceeded. Wetland productivity has been substantially enhanced – for example, fish production increased by 140% and consumption by 52% - and a good start has been made on extending project innovations to other areas, through the Inland Capture Fisheries Strategy.

Efficiency: The evaluation team made a crude but conservative estimate of economic efficiency, which gave a benefit-cost ration of 2.4. This shows clearly that the project interventions were well justified. Any follow-on project could probably be implemented at lower per ha costs and thus show even better returns.

Findings: NSP. NSP aims to collaboratively develop CM Agreements between the Forest Department (FD) and local stakeholders, leading to measurable improvements in forest and resource conservation in selected PAs and their buffer zones. Five PAs are presently covered and a sixth is to be selected. CM Councils and CM Committees have been formed (or are in process of formation) for each PA, with representation from the FD, community leaders, forest users and women. They will be expected to revise previous management plans for the PAs and later implement them, deter illegal use of PA resources (through community patrolling and cooperation with the FD), support AIG activities, and manage half of revenues collected from PA visitors for visitor facilities, interpretive materials, and habitat restoration. Government funding for NSP has recently been released and is supporting infrastructure, such as trails, signs and visitor centers.

Discussion is ongoing as to how to meet the challenge of mitigating the potential negative economic impact of NSP on the 270,000 people who depend to a greater or lesser extent on PA resources, for fuelwood, sticks, poles etc. Forest User Groups (FUGs) have been established and a Landscape Development Fund will soon be making small grants. It is proposed to link with established micro-credit NGOs to fund AIG activities. The project is also making efforts to encourage tourism to the PAs and to bring in the private sector.

Relevance: NSP is closely aligned with Government and USAID biodiversity conservation policies and strategies. With a population of 140 million in a territory of 144,000 km², Bangladesh has one of the lowest ratios of protected area per capita in the world. Conversely, the remaining remnants of natural and other forest are especially precious, particularly as they still support valuable habitats and are beginning to be appreciated by a rising middle class. At the same time, the project has recognized the necessity of shielding a very vulnerable surrounding population from the impacts of denial of access to the PAs.

Efficacy: As the project is only at mid-point, it is too early to tell definitively whether it will achieve its objectives. While there is reasonable likelihood that the CM institutions will be functioning, FUGs and other AIG mechanisms will be in place, tourism expanded and generating revenue locally and that funds for infrastructure will be spent, it is not yet clear that this will be enough to ensure that there will be “measurable improvement in forest and resource conservation” in the PAs and buffer zones.

Efficiency: While quantitative measures of economic efficiency are not generally applicable to biodiversity conservation activities, the evaluation team is satisfied that project costs are comparable to similar Global Environmental Facility (GEF) projects and that funds are being used cost-effectively.

Implications of Program Outcomes. Co-Management. The principle of CM -management of resources by the users, reinforced with local elected officials, local leaders, and women – is

working well in MACH and a similar model shows promise of working well in NSP, though several more years of project support will be needed before the CM bodies become self-sustaining. The CM approach appears to have increased the ability of the user groups to withstand pressure from previous leaseholders and other powerful people to appropriate the benefits of the program. The evaluation team found no examples of elite benefit capture in the main MACH program².

The NSP PAs are larger than the MACH wetlands and their resource management issues tend to be more complex. The MACH resources users are also the beneficiaries of project interventions, whereas NSP faces a particular challenge in mitigating impacts on the surrounding population of denied access to PA resources.

Biodiversity Impacts. MACH has clearly demonstrated the value of sanctuaries and associated infrastructure in conserving fish stocks during the dry season and in maintaining a richer diversity of species. The riparian plantations have been locally important in providing bird and animal habitats but their impact on siltation of water bodies is likely to be quite limited. Biodiversity and economic benefits at the Kaliakoir site are threatened by uncontrolled effluent discharges from numerous dyeing works nearby, resulting in fish kills. It is still too early to see biodiversity benefits in NSP. The NSP project team has understandably put further development of the biodiversity management plans on hold until the CM Councils and Committees are more firmly established, various means of AIG have been tested and funding is in place for habitat restoration.

Economic Impacts. Fish production in the MACH pilot sites is already 140% above the 1999 baseline. AIG has also been effective in raising incomes of RUG members by about 46%. Credit recovery rates are a very satisfactory 96%. With hindsight, the evaluation team questions whether it was necessary to build a project micro-credit system rather than to contract with existing NGOs to extend their programs. For NSP, the first economic benefits are beginning to be seen, as AIG activities get started. While these can potentially be scaled up, especially through agreements with established NGOs, the team doubts whether micro-credit alone can compensate for the economic costs of denying access to the protected areas. The landscape development fund will be a useful supplement but a more strategic and quantified approach is needed. The team suggests that strategies be developed for replacing resources like fuelwood. NSP has appropriately placed considerable emphasis on stimulating eco-tourism by preparing publicity materials and, in the near future, providing visitor facilities. The recent decision to allow fees to be charged to visitors and for half of such fees to be retained by the CM Councils is a very positive development. NSP's efforts to engage the support of the private sector are beginning to pay off.

Social Impacts. There is clear evidence that the benefits of MACH are reaching the poorest and that CM has equipped the poor to resist pressure from the powerful. However, this is more problematical for riparian plantations where landowners typically get a large share of the timber production benefits. An outstanding achievement of the project has been the empowerment of women. The project has operated in conservative rural areas, where women have traditionally had few rights and little power over their lives or livelihoods. By insisting that a proportion of positions in RMOs and FRUGs be filled by women, and by setting up RUGs for women, the project has forced the pace of social change. Social structures in and around the NSP sites are more complex than in the floodplains. In these hilly, border areas, ethnic and religious minorities are significant. Some of the forest villages are now inside the PAs. Other villages have illegally encroached on forest land. At one site, refugees from Myanmar are a further complication.

² However, riparian plantations could be criticized on this score.

Although NSP has done good preliminary work on surveying and mapping the various groups, much more needs to be done, to understand fully the present situation and to develop strategies for each site.

Institutional Impacts. The success of both projects in building CM institutions has been described. MACH staff played a key role in the development of the Inland Capture Fisheries Strategy – a keystone document for the future development of the sub-sector. The overall impact of MACH on the DoF, however, has been less than would have been desirable, as a result of a decision at the outset to manage all project funds through the contractor team. NSP could have similar success in CM, provided project support can be continued for a sufficient number of years and can overcome the hurdles of size and social complexity. NSP has a greater focus than MACH on effecting change in a government agency, by supporting the initiatives in the FD to place PA management in the hands of a specialized subdivision. A particular challenge is that FD staff do not have specialized training in PA and biodiversity management nor is there any obvious source within Bangladesh where they can get it.

Effectiveness of Monitoring and Evaluation. MACH has developed a powerful system of monitoring and evaluation (M&E), based on key performance indicators related to the project objectives. However, more work will be needed to boil down the database into simpler formats for other users, at the local level. The evaluation team's major concern is the sustainability of the M&E system after the project closes. It will be essential to develop a simplified system that can be continued at the local level. The NSP M&E system is much less well advanced and data on use of PA resources by local people is particularly scant. Project and FD staff need more training in M&E.

Sustainability of Program Outcomes. MACH. Assuming completion of planned project activities before the project closing date of October 2006, the view of the evaluation team is that MACH's considerable achievements will be **largely sustainable**, provided the Government remains committed to CM and to other elements of the Inland Capture Fisheries Strategy. Having said that, it is important to note that, without further support, some RMOs, RUGs and FRUGs might not survive but most of these could probably be brought to self-sufficiency with continued week-to-week project support. Secondly, the team notes that considerable works remain to be completed with the 416b funds (approximately \$1.3 million equivalent). While the project will continue to show substantial benefits even if these works are deferred, it would clearly be in the interest of all parties to find a mechanism to allow them to be completed. Thirdly, the design of MACH was such that capacity building of the DoF was limited and it would be highly desirable to find a way to sensitize and orient the local fisheries officers to the co-management model and to their role in supporting the fishers.

For these reasons, the evaluation team proposes that USAID consider a short extension of MACH II by 8 to 12 months – to ensure greater sustainability of MACH achievements and to allow remaining 416b works to be completed. During the proposed extension, the focus would be on: new initiatives to strengthen the DoF; continued support to the Local Government Committees; intensive support to the lagging RMOs and FRUGs, with the objective of bringing these groups to a self-sufficient stage at project's end; completion of all outstanding civil works; continued outreach to FFP and other sites; carrying out an action plan for pollution reduction at Kaliakoir; initiation of a simplified monitoring and evaluation system; and, identification of priority areas for a possible expansion phase. It appears that the remaining project funds would be sufficient to carry out this program.

NSP. NSP has resulted in many significant positive changes in its first three years but there are concerns regarding the ability of the project to ensure these changes become sustainable within the remaining two years of the project. Sustainability may be assessed in terms of achieving long-term protection of biodiversity within PAs and a long-term improvement in the livelihoods of the population within the landscape zone. Four factors have been considered: the time required to establish a positive and effective working relationship between the FD and the local population in the CM of PAs; resource use within the PAs must change to enhance biodiversity conservation but without negatively impacting the local population; Forest Reserves have a complex pattern of encroachment and clear boundaries must be set; and, the newly formed CM Committees require a significant amount of capacity building to become effective managers of the PAs.

There is also the question of the sustainability of AIG activities. NSP has found that there is a strong dependency of a large poor and ultra poor population on resources from PAs. Under the NSP, a very small proportion of the population within the landscape zone of PAs will be reached by AIG, there will remain many people that require AIG training and support for this project to be considered sustainable.

The evaluation team considers the co-management approach to PA management sound and, given sufficient time and resources, the issues noted above can be addressed. **It is the opinion of the evaluation team that a second project will be needed to complete the work that the NSP has started and to establish PAs that are self-sustaining.**

Possible Follow-up Actions. MACH. Given the very positive experience of MACH and the continuing importance of wetlands conservation from biodiversity and poverty alleviation points of view, the case for a follow-up project or program seems quite clear. The team suggests that any expansion phase follow the model of MACH, with the following adaptations: emphasis on replication rather than demonstration; a strong element of capacity building for DoF; close integration of the CM and civil works elements of the project; biodiversity enhancements split off as a separate project; and, AIG activities still a necessary part of the package but achieved through agreements with suitable major NGOs. Because of its demonstration nature, MACH has been relatively cost and staff intensive and consideration should be given to streamlining the model to see if costs can be reduced without significant loss of project quality. The evaluation team recommends strongly against an immediate replication of MACH to the whole of Bangladesh, given the high rate of failure in the past for similar rapid expansions. Many options are available for geographic expansion but the team suggests the following: in-filling of gaps in the three pilot areas; stepping out to areas adjacent to the pilot sites; and, adopting one or more new regions. An alternative would be to focus on a complete watershed, through a watershed management approach.

NSP. The chance of achieving full sustainability after the present project is completed in 2008 appears slim. A clear lesson from MACH is that building CM institutions takes considerable time – 4 to 6 years in the opinion of the evaluation team. NSP co-management must establish a working relationship between the FD and local stakeholders and address the varied issues of PA management such as illegal felling, encroachment, current resource use, restoration, wildlife management, and tourism.

An additional challenge for NSP is the necessity for finding viable compensatory mechanisms (AIG) for the many people whose livelihoods will be adversely affected by restricting access to resources from PAs. Although that process has started, a lot of learning by doing is still needed, including mechanisms like providing alternative sources of fuelwood and other forest products for the local poor; initiatives that are not yet in the project. Both these challenges argue for a

second project to complete the work that has started and to establish PAs that are self-sustaining. Such a project could also be the vehicle for extending the CM model to other protected areas, including non-forest areas.

Recommendations for Future Environmental Strategy. Pressure on natural resources in Bangladesh remains intense. Almost every square meter of the country's territory is used for one human purpose or another and areas of undisturbed nature are very few. In its 2002 "Strategic Plan for Improved Management of Open Water and Tropical Forest Resources, FY2002 –2008", USAID/ Bangladesh argued for a reinforced USAID role in natural resources management, with special emphasis on floodplain wetlands and protected forest areas. It noted that other donors were addressing other natural resource and environmental issues. The team's review of available documents, observations of conditions in the field and interviews with knowledgeable informants suggest that the two priorities selected in 2002 – *floodplain wetlands and forest protected areas* - should remain USAID's top environmental priorities for the immediate future. Suggestions for follow-up actions to the two ongoing projects are given above.

The CM model has been shown convincingly to work in the floodplain fisheries sector and shows promise of achieving the same result in forest PAs, provided in the latter case that well-targeted support can be continued beyond 2008. The time may now be ripe for Bangladesh to generalize this experience into a *Protected Areas System Strategy*. Given USAID's lead role in this subject over the past several years, it would be logical for the agency to support the government in developing such a strategy, some elements of which are already in place. Additional work, however, is needed to articulate the roles of the FD, DoF and Department of the Environment in future biodiversity protection and to lay out the steps needed to ensure consistent approaches for forest and wetland protected areas, and possible future additions such as coastal and marine sanctuaries. A possible outcome would be a single government agency to manage protected areas; the framework most commonly seen in other countries is a national parks agency.

By supporting the development of a protected areas system strategy, USAID would be able to identify the critical challenges that call for its support at the project level over the medium term. While it would be premature to forecast the scope of future projects resulting from adoption of a Protected Areas System Strategy, one might envisage further support of the NSP type for some or all of the remaining 14 forest protected areas, plus possibly new protected areas for wetlands, coasts and/or marine sanctuaries. However, this approach would entail a massive capacity building effort. This is all the more reason to stay the course on NSP, to provide a firm basis for future expansion.

Another project type that may fit USAID strategic objectives could be a program for carbon sequestration through plantations of various kinds, including riparian. Such a project would present excellent prospects for a public-private partnership, in which US corporations may see advantages in leasing land for tree planting from the FD or private owners in return for carbon credits or offsetting carbon footprints.

SUMMARY OF KEY FINDINGS AND RECOMMENDATIONS

Findings	USAID/Bangladesh Environment Project	
	MACH	NSP
Principle Findings:		
Relevance	Highly satisfactory	Highly satisfactory
Efficacy	Very satisfactory	Some good early indications, but some changes needed to ensure full success
Efficiency	Very satisfactory – B/C ratio of 2.4	No quantitative measure available; cost-effectiveness satisfactory
Detailed Findings:		
Co-Management	Very satisfactory	Promising but continued efforts needed beyond end of project
Biodiversity	Very satisfactory	Too early to tell but expected benefits remain feasible
Economic	Very satisfactory	Promising start in alternative income generation, eco-tourism and private sector support but a lot remains to be done
Social	Highly satisfactory	Strategic approach needed to avoid negative impacts
Institutional	Satisfactory at the local level but impact on Department of Fisheries less than desirable	Satisfactory initial work to build capacity of Forest Department but much remains to be done, especially training in protected area management
Monitoring and Evaluation	Highly satisfactory but system now needs to be simplified	Attention needed to system design and staff training
Sustainability	Largely sustainable as it stands but additional support to weaker co-management bodies and to Department of Fisheries strengthening could improve sustainability even further	Time is needed to build effective co-management bodies and to resolve other issues like alternatives for resource users, sustainability at project end in 2008 appears unlikely
Recommended Follow-up Actions	<ol style="list-style-type: none"> 1. Extension of MACH II by 8 to 12 months 2. Design of a replication phase, in cooperation with other donors 3. USAID funding of priority areas within replication phase 	<ol style="list-style-type: none"> 1. In remaining project period, continued attention to co-management and strengthening the Forest Department and greater attention to alternative income generation, alternatives for resource users, and park boundaries 2. Design a follow-up project to ensure sustainability of NSP innovations and possibly extend them to other areas
Recommendations for USAID's Future Environmental Strategy	<ol style="list-style-type: none"> 1. Continue to give priority to floodplain wetlands and forest protected areas 2. Support development by the Bangladesh Government of a Protected Areas System Strategy 3. Based on the results of 2., select priority activities for future USAID support 4. Consider the potential of a carbon sequestration project through public- private partnerships 	

EVALUATION OVERVIEW

1. Background

Given its geographic setting at the confluence of three major rivers – the Ganges, Brahmaputra and Meghna – Bangladesh is rich in natural resources, especially soils and water. Historically, this has led to “agricultural involution” – more and more intensive use of the very productive delta land to support a steadily growing population, now 140 million people in a country of only 144,000 km². This process has put extreme pressure on other resources, such as wetlands and fisheries, forests and wildlife. The 50% of the population classified as poor rely heavily on the use of natural resources and are the first to be affected when those resources are diminished or degraded.

Wetlands cover about half the country and are a major source of fish protein. However, their productivity has declined markedly and consequently, per capita fish consumption is declining and prices are rising. Reasons include: the leaseholder system, which encourages short-term over-exploitation; siltation of nursery and breeding areas; obstructions to fish migration from roads and other development; expansion of cropland into wetlands and more intensive use of dry season water for irrigation; water pollution; and, overfishing and use of destructive fishing practices.

Forest cover has declined by more than 50% since 1970 and, outside the Sundarbans, “natural” forests (mostly altered to some degree) cover less than 300 km². Bangladesh has less than 0.02 ha of forest land per person, the lowest ratio in the world. The remaining forest remnants are under intense pressure for timber production, gathering of fuelwood, land clearing for agriculture, and encroachment by settlements. Nevertheless, some valuable habitats remain (supporting tigers, elephants, gibbons and many other species) and the government has established 19 forest protected areas (PAs)³ to date. However, relatively little has been done yet to safeguard these areas, to educate the public on their biological richness, or to provide alternative livelihoods to approximately one million people who presently use resources within the PAs.

2. USAID Strategy and Program History⁴

Building on earlier experience in disaster relief and the Flood Action Plan, USAID/ Bangladesh initiated the **Management of Aquatic Ecosystems through Community Husbandry (MACH)** activity in 1998 to help promote the conservation and sustainable management of critical floodplain and wetland habitats aimed at improving the food security of the natural resources dependent population. This was followed in 2000 by the use of debt for nature funds under the U.S. Tropical Forest Conservation Act (1998) to establish the Arannayk Foundation (Bangladesh Tropical Forest Conservation Foundation), which awards grants on a competitive basis for smaller-scale forest conservation activities.

These initiatives were given a policy framework as a Strategic Objective for Environment (SO6), as a means of building on ongoing interventions and expanding to terrestrial ecosystems,

³ Known variously as National Parks, Wildlife Sanctuaries, Game Reserves etc.

⁴ See USAID/ Bangladesh, “Strategic Plan for Improved Management of Open Water and Tropical Forest Resources – FY 2002-2008”, 2002, for full details.

particularly the protected upland forest areas. SO6 has an overall goal of strengthening the efforts of the Government of Bangladesh and the NGOs in environmental and natural resources management. The five themes of SO6 include:

- Implementation of effective community based resources management mechanisms
- Restoration of selected habitats and ecosystems
- Implementation of selected policies
- Increased public awareness of key issues
- Improved institutional capacity

Adoption of SO6 led USAID to support a second phase of MACH and to initiate a new program, originally called Co-management of Tropical Forest Resources in Bangladesh but later changed to **Nishorgo Support Project (NSP)**⁵, which began in June 2003. The overall objective of NSP is to take the pressure off targeted PAs so as to safeguard and restore their role as important habitat for tropical forest biodiversity and ensure that they continue to provide critical environmental services, in particular, watershed protection. NSP was designed to build on the experience of MACH, especially in the management area.

3. Objectives of the Evaluation

The Statement of Work under the Task Order authorizing the evaluation is shown in Attachment D. It states that the *main objective* is “to conduct a thorough evaluation of the ongoing Environment Program in order to help USAID/ Bangladesh in setting the course of its program implementation under the Mission’s new strategic options. *Specific objectives* are to:

1. Evaluate the overall technical performance of the ongoing programs.
2. Suggest potential variations on interventions to improve the ongoing programs.
3. Recommend realistic strategic as well as programmatic options to help realign the programs to meet the requirements of the new Mission strategy as well as new developments in the environment sector in Bangladesh.”

4. Methodology

In accordance with its *Statement of Work* and the *Final Work Plan* approved by USAID, the evaluation had the following phases:

1. Document review and interviews with key USAID and contractor representatives in the Washington, D.C. area.
2. Field work in Bangladesh, including interviews with USAID staff, other donor representatives, and contractor staff, visits to all project sites and report drafting.
3. Follow-up meetings with the USAID/ Regional Development Mission and with relevant Non-Government Organizations (NGOs) in Bangkok potentially able to offer training in biodiversity management.
4. Finalization of the report and final de-briefing with USAID/Bangladesh and USAID in Washington.

During the field work, particular emphasis was placed on meetings with project beneficiaries at the village level, to verify reported project achievements, discuss unresolved problems, understand the capabilities of the co-management organizations, and assess the sustainability of

⁵ *Nishorgo* means “beautiful nature” in Bangla.

project innovations. In all, several hundred project beneficiaries and other rural people were met, including members of co-management organizations and resource user groups, as well as local elected and government officials and NGO field staff.

Meetings with donor representatives aimed to elucidate their overall interest in natural resources management, their views on MACH and NSP, and their plans for future assistance.

Key documents consulted are listed in Appendix E, key persons met in Appendix F, a full list of places visited in Appendix G and key maps in Appendix I. The Powerpoint presentation used in phases 3 and 4 is reproduced in Appendix I.

4.1 Evaluation Framework

The team used an evaluation framework developed by the Independent Evaluation Group of the World Bank and increasingly adopted by the European Union and others, which measures project or program outcomes along three axes:

- **Relevance** – the extent to which the project as designed, and as implemented, addresses key sector priorities and is consistent with USAID and government sector strategies.
- **Efficacy** – the extent to which project objectives have been achieved (or show promise of being achieved), using quantitative or qualitative measures as appropriate.
- **Efficiency** – the extent to which benefits exceeded costs (where quantitative measures are available) or resources were used cost-effectively

4.2 Evaluation of Project Outcomes

Project outcomes or impacts were evaluated according to the following measures:

- **Co-Management** – the value added by the co-management model pioneered in MACH and adapted for NSP over processes used in the past
- **Environmental/ Biodiversity** – the project’s impact on the conservation or restoration of targeted aquatic, riparian or forest ecosystems, including any negative or unintended impacts.
- **Economic** – the impact of project activities (including alternative income promotion) on the livelihood and income of local people and other economic actors, including any negative or unintended impacts.
- **Social** – the impact of the project on community organizations and empowerment, the role of women and the status of ethnic minorities, including any negative or unintended impacts.
- **Infrastructure** – the relevance of project infrastructure to project objectives and the quality of work implemented
- **Institutional** – the effectiveness of the project in strengthening institutions at the national, local government and community levels, including the roles of NGOs.

Sections 5 and 6 below summarize the principal findings of the evaluation with respect to MACH and NSP respectively. Detailed findings can be found in Appendices A and B. [Section 7](#) then presents the expected outcomes of the projects according to the measures just listed, in a way that facilitates comparison of the two project experiences. The likely sustainability of the achievements of the two projects after external support is completed is assessed in [Section 8](#), followed by some recommendations on ways to expand the impact of project innovations to a

wider area – replication. Recommendations on appropriate follow-on activities in wetlands and protected areas are made in [Section 9](#), while the [final section](#) responds to the third objective of the evaluation and explores possible options for future USAID strategy in the environment sector in Bangladesh.

5. Findings: MACH

5.1 Project Objectives

Project MACH aims to maintain and recover selected natural flood plain ecosystems and associated fisheries, as well as increasing biodiversity, providing alternative sources of income for poor fishing families, testing the co-management model and extending project innovations more widely in the country.

5.2 Project Description

As a pilot project, MACH has operated at three sites representing differing physical and social conditions (see map in Appendix I). The MACH model has two core elements – co-management and supporting infrastructure - and three supporting components – alternative income generation (AIG), biodiversity enhancements and an outreach program. Under **co-management**, MACH has established 42 Resource Management Organizations (RMOs), including 16 directly involved in wetland management, to manage specific water bodies in the pilot project areas. Each RMO consists of a number of fishermen/beneficiaries, as well as local leaders and women members. After the RMO is well established and has developed a management plan, it is allowed to take over the lease for the water body, previously held by private parties. Management plans typically include no harvesting zones or sanctuaries, restrictions on fishing in the spawning season and bans on non-sustainable fishing gear and practices, and, in some cases, reintroduction of locally lost species.

RMO management plans often call for **supporting infrastructure**, such as the re-excavation of floodplain lakes or channels, usually by manual labor, as well as meeting sheds. The project has found that the effectiveness of sanctuaries can be increased at low cost with fish aggregation devices, such as concrete pipes and hexapods, which provide food and shelter for fish and deter poaching.

As the management plans typically restrict fishing during the “hungry season”, the project has recognized the need for **AIG**. This is done with techniques pioneered in Bangladesh – formation of Resource User Groups (RUGs), institution of group savings, training of RUG members in an activity of their choice, and provision of micro-credit, for activities ranging from livestock raising, and tree nurseries to purchase of land and irrigation equipment. Micro-credit is now channeled through recently formed Federations of Resource User Groups (FRUGs) to the RUGs.

Biodiversity enhancements comprise two major elements: wetland and riparian reforestation and, a recently added activity, support for eco-tourism. At one site (Hail Haor), a major sanctuary has been established and equipped with an observation tower, as well as nesting boxes and platforms, to attract bird life. The project has also attempted to reduce the siltation problem by riparian reforestation along some of the streams, which feed the wetland areas. The mixture of species used also provides habitat for birds and mammals.

In order to extend its impact to other areas of Bangladesh, MACH has developed an **outreach program** with the Fourth Fisheries Project (FFP) (funded by the World Bank, DFID and GEF), to identify sites where resource management was sufficiently strong⁶ but where funding for infrastructure was lacking. In nine such cases, MACH has provided funding for re-excavation, fish aggregation devices, and meeting sheds.

Cooperation with FFP has allowed MACH experience to be reflected in the Inland Capture Fisheries Strategy, prepared under FFP and now adopted by the government. An action plan is being developed to disseminate the Strategy into all Department of Fisheries (DoF) programs.

At the national level, the project is guided by a National Steering Committee, which meets annually, and a Results Package Team/ Project Management Unit, which meets monthly. MACH has established Local Government Committees at the sub-district (*upazila*) level, comprising representatives of the DoF and other government agencies, elected officials, and the chairs of the RMOs and FRUGs.

5.3 Project Phasing and Costs

The project has had two phases: MACH I, from October 1998 to December 2001, and MACH II, from November 2003 to October 2006. The total cost of MACH I was \$ 6.5 million, which was fully expended, while the budget for MACH II is \$3.1 million, to which should be added the ISMP⁷ total of Tk. 346 million (currently equivalent to \$4.9 million) for both phases I and II, totaling the project budget of about \$15.0 million over 8 years. Unspent funds at the closing date are expected to total about \$0.4 million plus Tk. 90 million (about \$1.3 million), for a total \$1.7 million.

5.4 Relevance

In its objectives, MACH was highly consistent with both USAID and government policies and strategies for natural resources management. The project, in turn, has greatly influenced the government's Inland Capture Fisheries Strategy. The co-management model is working well and appears to have distinct advantages over previous approaches in the sector. With hindsight, however, it appears that MACH may have gone too far in limiting DoF's role in project execution, for example, in managing the local currency activities, and has thus limited capacity building for DoF replication of MACH achievements.

The solution of reinforcing fishing family beneficiary groups (RMOs, FRUGs) with local elected officials and local opinion leaders appears to have increased the ability of the groups to withstand pressure from previous leaseholders and other powerful people to appropriate the benefits of the program. The evaluation team found no examples of elite benefit capture in the main MACH program⁸.

⁶ The FFP uses a management model of Fisheries Sub-Committees at the village level, combined to form Fishery Management Committees at the wetland level. These groups lack the reinforcement with local leaders, which characterizes the MACH co-management model.

⁷ *Investment Support to the MACH Project*, government local currency funds, derived from the US PL 416(b) program.

⁸ However, riparian plantations could be criticized on this score.

The implementation approach adopted was appropriate for the pilot project nature of MACH but the intensity of financial and staff resource use does raise some questions for replicability. Nevertheless, the project correctly recognized that creation and sustaining of beneficiary organizations would require frequent face-to-face contact from project staff with considerable training in rural development and social awareness. Thus the combination of a major consulting firm, with considerable experience in the technical aspects of the project, with three prominent NGOs, with excellent organizational skills, has proved very effective.

5.5 Efficacy

Table A.1 in Appendix A compares project targets with actual achievements and shows that MACH has essentially achieved its objectives. Nearly all targets have been achieved and some exceeded. Wetland productivity has been substantially increased with biodiversity enhanced and a good start has been made on extending project innovations to other areas, most notably through the Inland Capture Fisheries Strategy. Elite capture of benefits has been avoided and women have been empowered. More details on impacts are provided in the following Section.

In the 25,000 ha (wet season area) covered by the project, fish production has increased by 140% as a result of the project. Fish consumption in the project areas (the major source of protein) has increased by 52%, compared to a national average that has been declining. That also translates to a significant impact on rural poverty. Since project inception, 28 fish species and 47 plant species have become re-established in the pilot project areas. However, it should be kept in mind that the project covers less than 1% of the total floodplains of the country and the total number of direct project beneficiaries is only 5,500. A major challenge remains to expand the MACH model to a much larger area (see Section 9.2).

5.6 Efficiency

As MACH has been a demonstration project, with testing of innovations and learning by doing as integral elements, it was not subjected to any tests of economic efficiency (benefit-cost analysis) at the outset, though some analysis is planned by the project team prior to project closure. In the limited time available, the evaluation team has made a very crude estimate which simply takes the total project cost of \$14.5 million over the total wetland area of 25,000 ha (\$580/ha) and compares it with a stream of benefits – incremental fish production - which rises to an average between the three sites of 232 kg/ha in year 8 and is evaluated at an average price of \$1/kg. Because AIG costs are included and no account is taken of AIG benefits, nor of the substantial biodiversity enhancement benefits, this should be quite conservative. Nevertheless, it leads to a Benefit-Cost ratio of 2.4 or a Net Present Value of \$592/ha at an opportunity cost of capital of 12%. This shows clearly that the project interventions were well justified from an economic efficiency point of view. Any follow-on project could probably be implemented at lower per ha costs and thus show even better returns.

6. Findings: NSP

6.1 Project Objectives

The NSP aims to collaboratively develop Co-Management (CM) Agreements between the Forest

Department (FD) and local stakeholders leading to measurable improvements in forest and resource conservation in selected Protected Areas (PAs) and within the surrounding “landscape” (watersheds, parks, forested buffer zones, wetlands, agricultural areas and plantations).

Project duration for the NSP is June 2003 to May 2008. A complete description of project activities organized under the following five components, with cross-reference to USAID Strategic Objective 6.0 Intermediate Results is provided in Appendix B.

- Component No. 1: Development of a Co-Management Planning and Implementation Model
- Component No. 2: Interventions and Investments for Improved Ecosystem Management
- Component No. 3: The Enabling Policy Environment for Co-Management Enhanced
- Component No. 4: Laying the Foundation for a Conservation Constituency in Bangladesh
- Component No. 5: Ensuring Institutionalization of Co-Management

6.2 Project Description

Recognizing the perilous situation of natural forests in the country, the Forest Department (FD) has established a series of protected forest areas (distinct from gazetted forest reserves). As of 2004, the total area of Bangladesh’s Protected Area (PA) system (including relatively small proposed areas) is approximately 243,723 ha. Approximately 84,000 hectares of the total PA system are relatively intact upland forests in the northeast and along the ridges of the eastern hills (the Chittagong Hill Tracts, or CHT). The remainder of the PA system is found in the lowland coastal areas, primarily within the internationally-recognized Sundarbans.

Bangladesh now has among the smallest areas of protected and intact forest in the world and Bangladesh's forests continue to come under relentless human pressure as its population grows. And yet, the citizens of Bangladesh clamor more than ever for places of natural beauty to which they can escape. The result is an ever increasing number of species threatened with local extinctions; in 2002 Earth Trends Country Profiles listed 68 threatened species. The PA system, if well designed and managed, is intended to provide long-term protection of the majority of the country’s biodiversity.

The NSP has been introduced to develop a co-management model for improved management of forest resources at six pilot PAs. According to the contract, the selection of the fifth and sixth PAs was scheduled for the beginning of the fourth year. However, the NSP selected a fifth site at the beginning of contract implementation and intends to select a sixth site in the fourth year. The five pilot PA sites (see map in Appendix I) currently being implemented are:

1. Lawachara National Park;
2. Rema-Kalenga Wildlife Sanctuary;
3. Satchari National Park;
4. Teknaf Game Reserve; and
5. Chunati Wildlife Sanctuary.

For each PA or major portion thereof, a CM Council is to be established. This is a large body of 50 to 60 persons broadly representing the local community – local officials, local elites, resource owners, FD representatives, law enforcement agencies, ethnic communities, NGOs, and civil society. Chaired by the District Forest Officer, the Council is expected to meet six-monthly, to review overall progress, support awareness building, coordinate the actions of stakeholders and resolve disputes (if needed). A smaller body of 15 to 20 members, the CM Committee, is elected from the membership of the Council in a structured way that ensures representation of all the major stakeholder groups, including women. The Council is chaired by an Assistant Conservator of Forests, to be attached to the new FD Nature Conservation and Wildlife Circle (though this is still in transition), who is effectively the manager of the PA. The Committee meets bi-monthly and approves action plans, undertakes public awareness and tourism promotion, takes action on encroachments and illegal felling and promotes alternative income generation.

A Steering Committee was formed with the Secretary, Ministry of Environment and Forests in the chair, to oversee all activities of the NSP. A Project Concept Paper was prepared following a decision of the Steering Committee and approved by the Executive Committee of the National Economic Council (ECNEC), the competent authority of the Government of Bangladesh, on 28th April 2005. A Development Project Proposal (DPP) was then prepared, which led to the preparation of a Project Pro-forma (PP) and that was finalized only on 18th October 2005. According to the PP, the government's support to NSP through the FD runs from July 2004 to June 2009.

The following six objectives are identified in the PP:

1. Develop a functional model for formalized collaboration in the management of PAs.
2. Create alternative income generation opportunities for key local stakeholders associated with pilot co-managed PAs.
3. Develop policies conducive to improved PA management and build constituencies to further these policy goals.
4. Strengthen the institutional systems and capacity of the FD and key stakeholders so that improvements in co-management under the Project can be made permanent.
5. Build or reinforce the infrastructure within PAs that will enable better management and provision of visitor services at co-managed sites.
6. Design and implement a program of habitat management and restoration for pilot PAs.

As the USAID Contractor, since June 2003, the International Resources Group (IRG) has been providing technical support in designing a co-management model acceptable to FD and other stakeholders, and testing its reliability in field situations in partnership with the FD. Two sub-contractors, namely Community Development Center (CODEC) and Rangpur Dinajpur Rural Services (RDRS), assist IRG in the field. Nature Conservation Management (NACOM), a third sub-contractor to IRG, collects data, conducts surveys and performs evaluation and monitoring.

It should be noted that the release of government budget funds for use by the FD under NSP occurred only in April 2006 and that the PP runs until June 2009, whereas IRG's contract ends more than one year earlier in May 2008. The delayed release of budget funds will make it difficult to complete all project components as outlined in the PP.

During the first three years of the project, considerable progress has been made, and the evaluation team would like to recognize IRG's success in instituting the co-management model within the FD and within the communities of the five PAs. Notable is the early success of having

the FD declare its own protected area program “Nishorgo”, the name under which the USAID project now operates. To date, much of the project work has focused on sensitizing stakeholders, including the FD, to the concepts of biodiversity conservation, co-management, and eco-tourism through a variety of training exercises, workshops, study tours and meetings. The results of these efforts is evidenced in the FD “Vision 2010” paper, the formation of multi-stakeholder CM Councils and Committees, working hand-in-hand with FD staff and the formation of forest user groups. The evaluation team also recognizes the NSP work completed “on the ground”, including the erection of PA signage, the identification of trails, NSP site office construction, public information materials, baseline monitoring, AIG demonstration activities and forest patrols that have reduced the occurrence of illegal felling.

With the recent formation of CM Committees⁹ (March/April 2006) the NSP’s co-management of PAs appears to be making a transition from what may be characterized as an “establishment phase” to an “implementation phase”. The concepts of co-management have been conveyed, the institutional structures are in place and the actual work of managing PAs under a co-management model is beginning.

6.3 Project Costs

The total contract amount is US\$ 6.525 million from USAID, US\$1.0 million GoB (Government of Bangladesh contribution in cash and kind) and local currency funds of US\$ 2.5M RPA (Reimbursable Project Aid, from USAID through the PL-416(b) generated local currency) is available as project funds. The contractor IRG oversees the USAID funds, and the FD is responsible for the GoB and RPA funds¹⁰. For the US\$ funds, a satisfactory 53% had been obligated and 44% spent by March 31, 2006. However, owing to late approval of the PP, only 6% of the taka funds had been spent by January 31, 2006, and it is unlikely that all of these funds will be disbursed before the end of contract for NSP, leaving the work for which these funds were intended incomplete.

6.4 Relevance

The present management of tropical forests in Bangladesh has led to their *de facto* treatment as "open access" resources with a consequent degradation of the resource base, a loss of biodiversity and declining productivity of needed forest resources. Currently Bangladesh has one of the lowest ratios of PA (ha) versus population. The NSP is resulting in a renewed recognition of the value of protecting tropical forests. At a national level the NSP is protecting areas valued by the general population of Bangladesh (and globally) for their inherent biological heritage. At the local level, the development of CM Councils and Committees is creating greater trust between the government and local stakeholders in their ability to achieve sustainable management of important natural resources in ways that benefit everyone.

A large poor and ultra poor population is present in areas around the NSP pilot sites. The goal of improving the livelihoods of this population through AIG activities, wise management of forest resources within buffer zones and the potential direct and indirect benefits that may be derived from increased tourism if realized will be an achievement on a par with the protection of biodiversity within PAs.

⁹ Most of the CM Councils were established some months earlier but the Committees are the real working arm of the system.

¹⁰ This is a major departure from MACH, where the contractor handles all funds.

6.5 Efficacy

During the three years since its inception, the NSP has been able to initiate remarkable social change by involving the FD and a variety of stakeholders in co-management of PAs, in distinct contrast to the adversarial (even violent) confrontations of the past. The formation of CM Councils and Committees has empowered the local people and established important social-environmental linkages. This has developed a sense of ownership of the resources by community members and created social awareness among a wider cross-section of people in Bangladesh through a variety of promotion mechanisms utilized by the NSP (e.g. competition to select the “Nishorgo” name, architectural competition for Lawachara visitor center, and private sector contributions for publishing brochures).

Empowerment and sense of ownership have encouraged community members to organize community patrolling which, in turn, has resulted in a dramatic reduction of illegal logging in some areas. Visits of stakeholders and FD staff to PAs in West Bengal have created greater understanding of the potential success of co-management and fostered the greater communication, respect and friendship between the FD and local stakeholders necessary for the co-management model to work.

The NSP has formed Forest User Groups (FUGs) among the local poor/ultra poor population living within the landscape zone to convey an understanding of the co-management model. AIG training and grants are also provided to key local stakeholders of low-income households in FUGs. To date, 90 FUGs have been formed around five sites, each group with 15-20 members, and more than half of the members are women. Inputs such as nursery seedlings and livestock have been provided to some of the groups¹¹. The inclusion of women in FUGs and a variety of AIG activities may be viewed as providing a degree of empowerment, leading to greater gender equalization in the project area. The involvement of women within areas that are predominantly Muslim is a breakthrough, given the traditional conservative nature of these communities.

CM Councils and Committees with a cross-section of people, including landless poor, local elites, former illegal loggers, timber traders, FD staff, Union Parishad members, and Upazila staff, etc. in a common forum have been formed and are now beginning to focus their attention both on the protection of biodiversity within PAs and on the needs of the poor/ultra poor populations living within the landscape zone. The NSP has also made a special effort to engage young members of the local population (youth groups, scouts) in NRM activities such as the monitoring of birds as indicator species. The NSP has also formed links to ethnic minorities living inside the PAs to ensure these traditional forest villagers have a voice in co-management.

The government has agreed that half of the revenue generated from visitors to PAs will be retained locally, shared among the community members and re-invested in PA management, according to priorities determined through co-management.

All of these accomplishments suggest the NSP is effective in its efforts to protect biodiversity and improve the livelihoods of the people of Bangladesh within the co-management framework for PAs and associated landscapes. There remain, however, questions in regard to sustainability as discussed in [Section 8](#).

¹¹ However, in contrast to MACH, NSP has not to date provided micro-credit to the FUGs.

6.6 Efficiency

To date, no assessment of cost-effectiveness has been made by NSP. While it is too early in the project to measure economic benefits, an effort should be made to obtain the necessary baseline information that will permit an assessment of cost-effectiveness when information on positive benefits is available. This will require an assessment of past and future benefits derived from PAs, income levels of the population within the landscape zone, AIG activities, tourism, PA revenue sharing, etc.

7. Implications of Program Outcomes

In this section, the expected positive and negative impacts of both projects at their respective times of closing are assessed, using the following dimensions:

- Impact of Co-Management
- Biodiversity Impacts
- Economic Impacts
- Social Impacts
- Infrastructure Impacts
- Institutional Impacts
- Effectiveness of Monitoring and Evaluation

This section is also used to draw out similarities and important differences between the projects.

7.1 Impact of Co-Management

The principle of co-management – management of resources by the users, reinforced with local elected officials, local leaders, and women – is working well in MACH and a similar model shows promise of working well in NSP, though several more years of project support will be needed for the latter before the CM Councils and Committees become self-sustaining (the same can be said for the MACH RMOs created in the last two years). However, there are important differences between the projects that will affect how the co-management strategy is implemented. In the first place, NSP protected areas are much larger than the individual MACH wetlands and their resource management issues tend to be more complex. For this reason, some NSP sites have more than one CM Council. Second, the MACH resource users – the fishers – are also the beneficiaries of project interventions, through the management plans, and those benefits may be substantial and received rather quickly, within a year or two, though some negative impacts need to be compensated through AIG. In NSP, the present resource users will lose their access to the resources of the PAs and may not benefit directly from biodiversity conservation, though the project planners expect them to benefit indirectly from eco-tourism development, AIG activities already started, and additional efforts recommended below. Such benefits will grow more slowly than in MACH, for example, five to ten years for fuelwood plantations in the buffer or sustainable use zones of the landscape using social forestry models. Third, the MACH co-management model excludes, to a large extent, the DoF at the RMO level (though it does play an important role at the LGC level), while the NSP CM Councils include FD representatives, as chairs. This was nearly inevitable, given the FD role as “owner” of the PA but, in the view of the evaluation team, also represents a step forward in trying to include all the key stakeholders in the co-management bodies, thus facilitating the institutionalization of co-management within FD.

The well established RUGs under MACH appear able to withstand pressures from powerful interest groups and thus capture of benefits by the elite, though some rearguard battles with

former leaseholders are still going on. The MACH outreach program has focused on infrastructure, rather than extending the full co-management model to additional sites.

7.2 Biodiversity Impacts

MACH has clearly demonstrated the value of sanctuaries and associated infrastructure in conserving fish stocks during the dry season and in maintaining a richer diversity of species. The 83 ha sanctuary at Hail Haor has been notably successful in attracting waterfowl, eagles and other wildlife and now has considerable potential from an eco-tourism point of view. The riparian plantations have been locally important in providing bird and animal habitats but their impact on siltation of water bodies is likely to be quite limited. A more comprehensive approach to watershed management was understandably beyond the scope of MACH and would have required the cooperation of the FD and the tea estates, which control much of the upland areas.

Biodiversity and economic benefits at the Kaliakoir site in Turag-Bangshi ([see Box](#)) are threatened by uncontrolled effluent discharges from 166 dyeing works in that vicinity, resulting in low values of dissolved oxygen and high values of alkalinity and consequently fish kills. Few factories have any type of treatment plant and these are only partly functional. Although MACH has been working with the plants to demonstrate and document no cost/low cost methods of improving effluent quality, this has not been accompanied by vigorous enforcement action by the Department of Environment.

It is still too early to expect to see significant biodiversity benefits in NSP; in some sites there is data to suggest illegal logging has decreased, contributing to biodiversity protection, while in at least one other site there has been ecological damage, as illegal loggers rushed to remove valuable timber before the co-management system became effective. The NSP project team has understandably put further development of the PA management plans on hold until the CM Councils and Committees are more firmly established, various means of AIG have been tested and funding is in place for things like habitat restoration. Clearly, a large task remains, given the highly degraded state of most of the sites, and full biodiversity benefits will only be seen in 50 years or more. However, it does appear that, for most areas, strict protection will be sufficient to allow the natural forest to regenerate¹².

7.3 Economic Benefits

As a result of the resource management plans described above, fish production in the MACH pilot sites is already 140% above the 1999 baseline. AIG has also been effective in raising incomes of RUG members by about 46%. Credit recovery rates are very satisfactory (96%). With hindsight, the evaluation team questions whether it was necessary to build a micro-credit system within the project, rather than to contract with existing NGOs to extend their programs in the pilot areas.

For NSP, the first economic benefits are beginning to be seen, as AIG activities get started. While these can potentially be scaled up, especially through agreements with established NGOs, some doubt remains as to whether micro-credit alone can compensate for the economic costs of denying access to the protected areas. The landscape development fund will be a useful supplement but a more strategic and quantified approach is needed. The evaluation team suggests that explicit strategies be developed for replacing resources like fuelwood and sticks for betel leaf

¹² The exception may be areas where woody plants have been replaced by sun grass (*Imperata cylindrica*).

plantations that are of particular importance to the poor. Social forestry of the type well understood in Bangladesh may also have an important role.

The NSP team has appropriately placed considerable emphasis on stimulating eco-tourism by preparing publicity materials and, in the near future, providing visitor facilities. The government's recent move towards the decision to allow fees to be charged to visitors and for half of such fees to be retained by the CM Councils is a very positive development. The team's efforts to engage the support of the private sector are beginning to pay off; such partnerships could eventually be very powerful. The current architectural competition for the design of a Visitor Center at Lawachara National Park is important, not only to achieve a state-of-the-art design but also to inform several hundred members of the urban elite about the park and its conservation. These are the kind of people whose support and activism will be vital if Bangladesh's PAs are to have any chance of survival.

7.4 Social Impacts

There is clear evidence that the benefits of MACH are reaching the poorest and that co-management has equipped the poor to resist pressure from the powerful¹³. However, this is more problematical for riparian plantations where landowners typically get a large share (in one case, almost all) of the timber production benefits. The AIG activities have understandably gone beyond fishers to include other poor villagers, although the extent of this is not clear.

The empowerment of women has been an outstanding achievement of the project. The project has operated in conservative rural areas, where women have traditionally had few rights and little power over their lives or livelihoods. By insisting that a proportion of positions in RMOs and FRUGs be filled by women, and by setting up RUGs for women, the project has forced the pace of social change. At several sites, the team encountered women members who were willing to speak forthrightly about their concerns and their role in the project – even interrupting the men.

MACH appears to have provided equal access to Hindus and Muslims in areas where both live.

Social structures in and around the NSP sites are more complex than in the floodplains. In these hilly, border areas, ethnic and religious minorities are significant. Some of these people live in “forest villages”, established decades ago by the FD; villagers were given land in exchange for their labor on FD activities. Some of the forest villages are now inside the PAs. Other villages have illegally encroached on FD land or are practicing slash and burn agriculture within PAs. At the Teknaf site, refugees from Myanmar are a further complication. Although NSP has done good preliminary work on surveying and mapping the various groups, much more needs to be done, to understand fully the present situation and to develop strategies for each set of circumstances, in order that the project does not have a detrimental impact on any ethnic group.

While the CM model should provide sufficient safeguards against elite capture of benefits, as it has in MACH, there may be a greater challenge in NSP because of the larger populations and more complex social structures involved.

¹³ As one proud beneficiary told the evaluation team: “Before, we were nothing but now our dignity has increased so that we can shake hands with all kinds of people. This could not have happened without MACH”.

7.5 Infrastructure Impacts

The supporting infrastructure in MACH has proven to be essential in achieving full project benefits. It is therefore of great concern that government approval of the modest ISMP took two years and, consequently, about 40% of the re-excavation works will not be completed by the closing date.

As the infrastructure parts of NSP are only just beginning, it is too early to comment on their impact. NSP is also suffering from the glacial speed of government approval processes.

7.6 Institutional Impacts

The success of the project in building co-management institutions has been described earlier. Project staff played a key role in the development of the Inland Capture Fisheries Strategy under the FFP – a keystone document for the future development of the sub-sector, which is now being followed up by an action plan.

The overall impact of MACH on the DoF, however, has been less than would have been desirable, as a result of a decision at the outset to manage all project funds, including those for infrastructure, outreach etc. through the MACH contractor team. While the project has certainly influenced DoF officers at the sub-district level to move beyond the traditional role of enforcing government regulations to a more pro-active stance concerned with assisting fishermen's groups to increase production, this process needs to be carried much further, through training programs, exchange of experience between sites and the like, which MACH has done to a certain extent.

NSP appears likely to have similar success in co-management, provided project support can be continued for a sufficient number of years and can overcome the hurdles of size and social complexity just discussed. NSP has a greater focus than MACH on effecting change in a government agency - the FD. NSP is supporting the initiatives in the FD to place PA management in the hands of a specialized subdivision – the Nature Conservation and Wildlife Circle – and has carried out a detailed assessment to that end. However, institutional changes of this magnitude will take considerable time to become effective. A particular challenge is that FD staff do not have specialized training in PA and biodiversity management nor is there any obvious source within Bangladesh where they can get it.

7.7 Effectiveness of Monitoring and Evaluation

MACH I and II have developed a powerful system of monitoring and evaluation (M&E), based on key performance indicators related to the project objectives (Table A.1 in Appendix A). Good time series data on these indicators are available in electronic and printed forms and these should be of considerable value to project planners and researchers. However, more work will be needed to boil down the project results into simpler formats for other users, at the local level. The evaluation has noted a few problem areas with the M&E system, such as incompatible data from income surveys and the lack of evaluation of training programs.

The evaluation team's major concern is the sustainability of the M&E system after the project closes. It will be essential to develop a simplified system that can be continued at the local level.

The NSP M&E program provides a limited amount of information on social, economic and ecological measures related to co-management of PAs. The most meaningful data collected to date is on structural diversity of forests using indicator bird species. It appears that little or no

information is available on forest users living within NSP's "landscape zone" and their changing patterns of resource use (e.g. fuelwood, poles, wildlife, timber, bamboo, rattan, and other products coming out of PAs) or their socio-economic well-being.

In addition, the success of the NSP relies on an understanding, acceptance and support of PA management, biodiversity conservation, and co-management concepts. Given the complexity and, in some cases, the novelty of these concepts, a good deal of training is required for NSP staff, FD and other government staff and for the public at large, particularly local forest users. Currently, the M&E program for the NSP does not endeavor to test the effectiveness of NSP in achieving an understanding and acceptance of co-management of PAs.

8. Sustainability of Program Outcomes

8.1 MACH

Assuming completion of the project activities now planned before the project closing date of October 2006, the view of the evaluation team is that MACH's considerable achievements will be **largely sustainable** for the immediate future. Those RMOs and FRUGs which have been established for a reasonably long period appear capable of managing the fishery resources and AIG activities respectively and able to resist pressure from powerful interest groups. With continued vigilance on loan repayment, the FRUGs (and their constituent RUGs) should be able to sustain themselves financially for the indefinite future. With the LGCs (in future, UFCs) becoming increasingly active and able to administer the endowment funds¹⁴, there will be continuing support to the RMOs and FRUGs, thus enhancing their sustainability. All of this presupposes that the Government remains committed to the principle of co-management and to other elements of the Inland Capture Fisheries Strategy.

Having said that, it is important to note that, without further support, *some* elements of the MACH program might not survive more than a year or so beyond the closing date. Approximately 25% of the RMOs, RUGs and FRUGs, especially those more recently established, are institutionally and financially more fragile than the majority but most of these could probably be brought to self-sufficiency with intensive week-to-week support that the project has been providing.

Secondly, the team also notes that considerable re-excavation and other works remain to be completed with the 416b funds (approximately \$1.3 million equivalent). While the project will continue to show substantial benefits even if these works are deferred, it would clearly be in the interest of all parties, especially the poor fishing communities, to find a mechanism to allow these works to be completed.

Thirdly, the evaluation has already discussed how the design of MACH was such that capacity building of the DoF, particularly at the sub-district level, was limited. DoF clearly has a major role to play in ensuring that RMOs and FRUGs are supported and sustained and it would be highly desirable to find a way to sensitize and orient the UFOs to the co-management model and to their role in supporting the fishers. Moreover, it is essential that the DoF develop internal co-management capacities to ensure effective implementation of the Inland Capture Fisheries Strategy (ICFS).

¹⁴ By limiting UFC access to the interest on such endowment funds, the project is creating a valuable tool to assure sustainability.

For these reasons, the evaluation team proposes that USAID consider a short extension of MACH II by 8 to 12 months – to ensure greater sustainability of MACH achievements and to allow remaining ISMP/ 416b works to be completed. For the latter to be effective, the extended closing date should be at least June 2007, the end of the construction season. During the proposed extension, the focus would be on:

- New initiatives to strengthen the DoF, through policy development, manpower planning, training, study tours, and technical support to the ICFS action plan process
- Continued support to the LGCs/UFCs, including completion of the network and guidance on the use of endowment funds
- Intensive support to the lagging RMOs and FRUGs in the following way: the RMOs and FRUGs would be divided into two roughly equal groups according to an assessment of their present capacity; for the stronger group, the project would withdraw all week-to-week support but would monitor performance twice during the extension period¹⁵ (project staff would also be able to respond to any emergency needs from the stronger group); for the weaker group, the project would continue to provide intensive hands-on support, as well as monitoring, with the objective of bringing these groups to a self-sufficient stage at project's end
- Completion of all outstanding civil works
- Continued outreach to FFP and other sites, as funding permits
- Carrying out an action plan for pollution reduction at Kaliakoir
- Completing the *jatka* fisher livelihood support program
- Initiation of a simplified monitoring and evaluation system and training of UFOs and others in its use
- Identification of priority areas for a possible expansion phase

It appears that the remaining funds in the MACH budget and the ISMP would be sufficient for the above program, once appropriate reallocations are made.

8.2 NSP

Sustainable development projects are those that result in positive change that continues to provide benefits long after the development project is completed; for NSP, this means beyond May 2008.

The NSP has resulted in many significant positive changes within its first three years, however there are concerns regarding the ability of the project to ensure these and other ongoing changes become sustainable within the remaining two years of the project. In the context of the NSP, sustainability may be assessed in terms of achieving long-term protection of biodiversity within PAs and a sustained increase in the livelihoods of the population within the landscape zone.

Four factors have been considered in assessing the sustainability of the NSP's co-management model for PAs (these are described in more detail in Appendix B):

1. Based on the time required to establish sustainable co-management organizations in MACH (more than 5 years) and given the history of an adversarial relationship between the FD and local populations, it is anticipated the NSP will require several more years beyond the end of contract (May 2008) to establish positive and effective working

¹⁵ This would provide a powerful test of the statement above that these RMOs and FRUGs have reached self-sufficiency.

relationships between the FD and the local population that may be considered sustainable in the co-management of PAs.

2. There is long and complicated history of the use of resources from Forest Reserves, including the NSP PAs and buffer zones. In order for the NSP to be considered sustainable, traditional forest resource use must change to protect biodiversity and it must change in ways that does not negatively impact the local population. It is clear that solving the complex issues associated with traditional resource use within PAs will extend many years beyond the NSP. Nonetheless the NSP has not yet planned or demonstrated a sustainable mechanism to ensure alternative sources for forest resources (outside PAs) will be made available to traditional users.
3. Forest Reserves have a complex problem of encroachment and unclear boundaries” that must be addressed to clearly delineate the Forest Reserve, the PA and the Buffer Zone boundaries from forest villages, surrounding villages, commercial development, and agricultural lands that have developed within Forest Reserves over time. Sustainable protection of biodiversity within PAs will require the issues of encroachment be resolved, albeit over a number of years. The NSP has not yet addressed encroachment in any substantial manner (wisely so, as it is a sensitive issue requiring good communication between all stakeholders and innovative solutions that do not create hardship for the poor). It is not likely that many issues of encroachment will be resolved within the remaining two years of the project. Sustainability cannot therefore be determined until there is good evidence that an effective mechanism is in place dealing with issues of encroachment.
4. The newly formed CM Councils and Committees require a significant amount of capacity building based on the many challenging tasks before them and the variety of skills required to effectively manage PAs in a manner that will both protect biodiversity while also providing benefits for the local population. What is at issue in regard to sustainability is a concern that the CM Councils and Committees will not have received sufficient training and support over the life of the NSP to deal effectively (*i.e.* sustainably) with the complex issues of PA management.

There is also the question of the sustainability of AIG activities. The NSP has reported that there is a strong dependency of a large poor and ultra poor population on resources from PAs. Under the NSP, a very small proportion of the population within the landscape zone of PAs will be reached by AIG, there will remain many people that require AIG training and support for this project to be considered sustainable. Of note is the fact that there is the potential for ongoing AIG activities provided by the CM Committees utilizing funds available from tourism revenues, however the capacity of the CM Committees to deliver AIG activities and the level of finances available from PA revenues remains unknown and requires therefore ongoing project support before some level of sustainability will exist.

The evaluation team considers the co-management approach to PA management sound and, given sufficient time and resources, the issues noted above can be addressed to support sustainability. **It is the opinion of the evaluation team that a second project will be needed to complete the work that the NSP has started and to establish protected areas that are self-sustaining.**

9. Possible Follow-up Actions

9.1 MACH

The evaluation team notes that, with the completion of the FFP in June 2006 and MACH in October 2006, there is presently no committed donor funding for floodplain fisheries beyond this year. Given the very positive experience of MACH and the continuing importance of wetlands from biodiversity and poverty alleviation points of view, the case for a follow-up project or program seems quite clear.

The team suggests that any expansion phase follow the model of MACH, with the following adaptations:

- Emphasis on replication rather than demonstration
- Assuming that a larger project would be managed primarily by the DoF, a strong element of capacity building for DoF
- Close integration of the co-management and civil works elements of the project in a single Project Proforma
- According to donor preferences, biodiversity enhancements might be split off as a separate, but closely coordinated, parallel project
- AIG activities should be considered as a necessary part of the package but might be achieved through agreements with suitable major NGOs, rather than a project-run activity, provided such services were closely oriented to the target groups

Because of its demonstration nature, MACH has been relatively cost and staff intensive per beneficiary or per hectare and consideration should be given to streamlining the model to see if costs can be reduced without significant loss of project quality. However, experience in Bangladesh (for example, FFP) and elsewhere shows that lower cost approaches are not as successful. Given the likely robust economic returns of even the high cost MACH model, the evaluation suggests that streamlining be approached cautiously. Specifically, it is suggested that field services through NGOs remain at the MACH level and that economies of scale be sought mainly at the project management level.

The evaluation team recommends strongly against an immediate replication of MACH to the whole of Bangladesh, given the high rate of failure in the past for similar rapid expansions. The emphasis should be on maintaining the quality and benefit level of the program. Many options are available for geographic expansion but the team suggests the following priorities:

- In-filling of gaps in the three pilot areas, for example, two or three more RMOs could be formed in Hail Haor
- Stepping out to areas adjacent to the pilot sites, for example, other *haors* in Sylhet Division
- Adopting one or more new regions, for example, building on the outreach experience in Northwest Bangladesh

An alternative approach would be to focus on a complete watershed – for example, the Upper Meghna, which could be combined with a watershed management approach, including sediment control.

The size and duration of the expansion phase will depend heavily on donor preferences and constraints. For example, there could be value in dividing the work into two steps: a transition phase of one to two years followed by a full-scale project. In the transition phase, the capacity of

the DoF could be developed, project areas selected, initial surveys and baseline data collection accomplished, some RMOs established and the detailed design of the full-scale project completed.

9.2 NSP

For NSP, as set out in Appendix B, the chance of achieving full sustainability after the present project is completed in 2008 appears slim. A clear lesson from MACH is that building co-management institutions takes considerable time – 4 to 6 years in the opinion of the evaluation team. NSP co-management must establish a working relationship between the FD and local stakeholders and, as the knowledge and experience of the CM Committee increases, address the varied issues of PA management such as illegal felling, encroachment, current resource use, restoration, wildlife management, and tourism.

An additional challenge for NSP is the necessity for finding viable compensatory mechanisms (AIG) for the many people whose livelihoods will be adversely affected by restricting access to resources from PAs on which they have come to depend. Although that process has started, a lot of learning by doing is still needed, including mechanisms like providing alternative sources of fuelwood and other forest products for the local poor; initiatives that are not yet in the project.

Both these challenges argue for a second project to complete the work that has started and to establish protected areas that are self-sustaining. Such a project could also be the vehicle for extending the co-management model to other protected areas, including those not in forest areas. While it is too early to be very definite about the size, scope or duration of a NSP II, it would likely be comparable to the current project. Every effort should be made to secure local currency funding from the outset.

10. Recommendations for Future Environmental Strategy¹⁶

Pressure on natural resources in Bangladesh remains intense. Almost every square meter of the country's territory is used for one human purpose or another and areas of undisturbed nature are very few. The 50% of the population classified as poor depend heavily on natural resources for their daily survival and are the first to be affected by the diminution or degradation of those resources.

In its 2002 "Strategic Plan for Improved Management of Open Water and Tropical Forest Resources, FY2002 – 2008", USAID/ Bangladesh argued for a reinforced USAID role in natural resources management, with special emphasis on floodplain wetlands and protected forest areas. It noted that other donors were addressing other natural resource and environmental issues.

With the short time available to the evaluation team, its review of options for future USAID involvement was necessarily limited in scope and far from exhaustive. Nevertheless, a review of available documents, observations of conditions in the field and interviews with knowledgeable informants, suggest that the two priorities selected in 2002 – *floodplain wetlands and forest protected areas* - should remain USAID's top environmental priorities for the immediate future. Suggestions for follow-up actions to the two ongoing projects are given in the previous Section. This would be consistent with USAID/Bangladesh's Strategic Statement for FY 2006 – 2010, which includes under SO 11 (More Effective and Responsive Democratic Institutions and Practices) a Program Component 7: *Improve Sustainable Management of Natural Resources and*

¹⁶ A more detailed treatment is given in Appendix C.

Biodiversity Conservation. This program component emphasizes transparency and accountability, through community-based management, with broad based local participation.

The co-management model has been shown convincingly to work in the floodplain fisheries sector and shows promise of achieving the same result in forest protected areas, provided in the latter case that well-targeted support can be continued beyond 2008. The time may now be ripe for Bangladesh to generalize this experience into a *Protected Areas System Strategy*. Given USAID's lead role in this subject over the past several years, it would be logical for the agency to support the government in developing such a strategy. The Biodiversity Strategy and Action Plan of 2005 would provide one foundation for the proposed work. Another key ingredient would be the 2004 assessment of the FD's capacity to manage protected areas prepared under NSP¹⁷. This analysis includes a detailed action plan for institutional changes and capacity building activities. Additional work, however, is needed to articulate the roles of the Forest Department, Department of Fisheries and Department of Environment in future biodiversity protection and to lay out the steps needed to ensure consistent approaches for forest and wetland protected areas, and possible future additions such as coastal and marine sanctuaries. A possible outcome would be a single government agency to manage protected areas; the framework most commonly seen in other countries is a national parks agency.

By supporting the development of a protected areas system strategy, USAID would be able to identify the critical challenges that call for its support at the project level over the medium term. While it would be premature to forecast the scope of future projects resulting from adoption of a Protected Areas System Strategy, one might envisage further support of the NSP type – combining co-management with alternative income generation – for some or all of the remaining 14 forest protected areas, plus possibly new protected areas for wetlands, coasts and/or marine sanctuaries. However, this approach would entail a massive capacity building effort, given the problems noted in Appendix B in developing a management cadre for the NSP sites alone. This is all the more reason to stay the course on NSP, to provide a firm basis for future expansion.

Another project type which may fit USAID strategic objectives could be a program for carbon sequestration through plantations of various kinds (excluding fuelwood, obviously) – long-rotation timber, wetlands, mangroves, or riparian. The last may represent a more fruitful opportunity (compared to, say, roadside plantations, which have been the target of many other projects), as relatively little appears to have been done up to now, apart from MACH. While such a project would probably involve the “mainstream” of the FD, which might be seen as a barrier, it would also present excellent prospects for a public-private partnership, in which US corporations may see advantages in leasing land for tree planting within the many degraded areas of existing Forest Reserves from the FD or from private owners in return for carbon credits or offsetting carbon footprints.

¹⁷ “Assessment of the Forest Department's Institutional Organization and Capacity to Manage the Protected Areas System of Bangladesh”, NSP, August 2004.

