CHAPTER II

Current Implementation Status of National Biodiversity Strategy and Action Plans

2.1 Introduction

Article 6 of CBD calls for an overarching framework for implementing the Convention through the development of National Biodiversity Strategy and Action Plans (NBSAP). With the development of NBSAP during 2003-2004, Bangladesh has made a big step forward fulfilling the global commitment of the country to the Convention on Biological Diversity. After finalization of NBSAP, it was essential to prioritize the actions identified and moving ahead with a comprehensive implementation programme. Despite there was no prioritization of NBSAP, some biodiversity conservation activities, essentially complementary to NBSAP, have been initiated or implemented already, overlooking NBSAP. In this context, it is clear that implementation of NBSAP has a long way to go. In this purview, this chapter analyses the actions so far undertaken towards implementation of NBSAP.

Plate 31: Fish Sanctuary at Ghotghotia River, Bishambharpur, Sunamganj.

2.2 Analysis of Current Status of NBSAP

NBSAP has identified 16 strategies under which 128 action programmes have been chalked out. The following table (Table 2.1) have synthesized the current accomplishment and implementation status of the action plan outlined in NBSAP.

Current Implementation Status of National Biodiversity Strategy and Action Plans

Table 2.1 Synthesis of Accomplishments Towards Implementation of NBSAP

Strategy	Action	Accomplishments
1. Recognize the value and importance of biodiversity for the Bangladesh people and document properly its components, distribution and value.	***Short term (0- 3 years)*** • Document existing ecosystems, species and genetic pools of Bangladesh, including their status and extension, with specific emphasis on ecosystems such as forests, coastal and marine environments, inland water, agriculture and fisheries; species including flora, fauna, microorganisms, underutilized species and insects. • Determine values in economic terms of the different goods and services provided by the different biodiversity components to the benefits of the country's economy and its people. • Support identification of the biodiversity services that contribute to reducing poverty and providing means for sustainable household economic securities. ***Medium term (4-7 years)*** • Understand the economic values of biodiversity and empower local communities to achieve economic gains by developing suitable market linkages and strategies. • Conduct village-based inventory of flora and fauna, including their traditional uses. ***Long term (8 -10 years)*** • Develop a National Biodiversity Information System that acts as the National Clearing House Mechanism on biodiversity.	• Encyclopedia of Flora and Fauna of Bangladesh published by the Asiatic Society of Bangladesh, described the current status of different taxonomic groups; • Valuation of wetland ecosystem under CWBMP has been exercised; • MACH project in Hail Haor executed by Winrock international and CNRS to conserve biodiversity of the wetland; • Scattered actions taken under various projects on livelihood/ Value Chain development in IPAC; • Co-management project of Tangua Haor, carried out by IUCN Bangladesh concentrating on ecosystem based conservation resource management; • 4th Fisheries Project (fish diversity assessment) ; • Char livelihood program to promote and conserve biodiversity in 'Charlands' funded by DFID; • Wetland management initiative under SEMP executed by CNRS, BCAS and NACOM; • CBRMP project of LGED is currently working for restoration and conservation of wetlands ecosystems; • Various other institutions such as CEGIS/ SPARSSO/CDMP/BARC are working to develop databases on natural

Strategy	Action	Accomplishments
		resources to assist conservation activities. • A total of 58 numbers of fascicles on 'Flora of Bangladesh' have been published. Those fascicles cover the taxonomic enumeration of 59 angiosperm families out of 210 angiosperm families occuring in Bangladesh. • A book entitled 'Aquatic angiosperms of Bangladesh' has been published which deals with the plant found in different aquatic habitats.
2. Conserve ecosystems, species and genetic pool of the country to ensure that the present and future well-being of the country and its people are secured.	***Short term (0- 3 years)*** • Develop action plans for protection and conservation of endangered native and endemic species of Bangladesh. • Document and map existing community reserves in the hill ecosystems along with their management modes. • Develop national systems and plans for conservation and management of Ecologically Critical Areas. • Identify the impacts of climate change, desertification, floods and other processes on the integrity of ecosystems and species and develop suitable management plans. ***Medium term (4-7 years)*** • Develop and implement actions to support management of soil biodiversity for enhancing productivity and implement options for conservation of pollinators. • Support minimum nutritional standards for the people by: promoting cultivation of nutritional crops and drought-resistant varieties; setting up community seed banks; provision of access to nutritious food; and raising awareness of addressing spells/cycles of hidden and transient hunger. ***Long term (8 -10 years)*** Support sustainable harvesting of biodiversity and management of biological resources. • Conserve the genetic pool of plants and animals, both in ex-situ and in-situ conditions, through appropriate local actions. • Promote indigenous methods of conservation and management of jhum agrobiodiversity with appropriate incentives. • Promote sustainable agriculture through diversification of crop production and introducing broader diversity in crops as well as innovative techniques such as participatory plant breeding.	• Wildlife Preservation Act of 1974 is in the process of being upgraded; • ECA Rule is underway to be finalized; • NAPA, BCCSAP, NAP have issues concerning biodiversity, but integration issues have not well taken care of in line with NBSAP; • Community conserved areas have been established in different parts of the country; • To identify impacts of climate change on Biodiversity, long term monitoring has been suggested in National Adaptation Program of Actions; • Ideas of establishing community seed banks have been initiated in grass root level. • A book on the 'Red Data Book on Vascular plants of Bangladesh' has been published. That book

Strategy	Action	Accomplishments
	• Incorporate ecosystem conservation efforts into the national disaster management plan implementation.	includes 106 species of vascular plants of the country describing their conservation status. Recently another project has been launched by BNH aiming towards publishing Red Data Book of Vascular Plants of Bangladesh vol.-2.
3. Restore ecosystems and rehabilitate endangered species.	***Short term (0- 3 years)*** • Support rehabilitation of the rare, threatened and endangered native, wild and domesticated species. • Implement plans for management of species under the rare, threatened and endangered categories. • Develop action plans for reducing levels of pollution both in rural and urban areas to support conservation efforts. • Support development of assessment, management and monitoring plans both at ecosystem and species levels. • Create and launch initiatives for restoration of degraded ecosystems. ***Medium term (4-7 years)*** Develop mechanisms to halt degradation and restore ecosystems as much as possible. Review and update Red Book lists of threatened and endangered species. ***Long term (8 -10 years)*** • Encourage afforestation and reforestation programmes with indigenous species. • Regulate shifting cultivation and introduce and extend, as appropriate, innovative farming practices developed and adopted by farmers.	• Protected Area System (In last 5 years three new national parks and one new wildlife sanctuary) have been designated; • River around Dhaka city have been declared as Ecologically Critical Area to conserve the river ecosystem; • CWBMP, IPAC and Tangua haor management plan have taken ecosystem approach to protect the habitat; • Tangua haor management plan and CBRMP have been working to restore wetland and swamp forest ecosystems.
4. Adopt national measures and standards to deal with invasive alien species and genetically modified organisms.	***Short term (0- 3 years)*** • Develop national management plans for control and eradication of invasive alien species. • Support capacity building on identification of invasive species and genetically modified organisms. • Develop a national biosafety framework. • Locally monitor and prevent the release of IAS and hybrids in aquatic ecosystems. ***Medium term (4-7 years)*** • Develop capacity building tools and methods for local	• Plant Quarantine system with limited capacity is in place to control IAS; • NBF has been developed in 2006 and biosafety rules have been drafted in compliance with Cartagena Protocol on Biosafety; • Biosafety Clearing House (BCH) has been

Strategy	Action	Accomplishments
	communities to deal with identification, management and control of invasive species and GMOs. • Build awareness of biosafety and biopiracy issues among local communities and within the Customs Service. ***Long term (8-10 years)*** • Support establishment of monitoring systems for addressing issues of regional and international trade and their impact on movement and/or introduction of invasive species and genetically modified organisms. • Support economic and social impact studies on use of genetically modified organisms and alien species. • Encourage regional dialogue on sharing of expertise and resources in management of IAS and GMOs.	established and got connected with central portal operated by SCBD; • Implementation project on NBF is underway to be initiated; • Bangaldesh is participating in regional dialogue in managing IAS and GMOs
5. Promote equitable sharing of biodiversity conservation costs and benefits among different sectors of the society.	***Short term (0- 3 years)*** • Develop and implement national access and benefit sharing regime on genetic resources. • Identify impacts of trade and IPR regimes on national policies regarding access and benefit sharing. • Develop suitable national policies on patents and IPRs, which, in addition to being responsive to local needs, will also contribute to international cooperation in the use of biological resources. • Encourage documentation and protection of traditional knowledge associated with conservation and use. ***Medium term (4-7 years)*** • Develop capacities for research and development on use of species and genetic resources. ***Long term (8 -10 years)*** • Develop mechanisms for private sector investment into sustainable use of biodiversity by revision of appropriate policies and provision of incentives for such investments. • Promote development and commercialization of under-utilized crops and species. Institute rewards and incentives for the conservation of indigenous crops, genetic materials, and best practices of resource use.	• Regulatory regime on ABS has yet to be established; • A detailed assessment on IPR is yet to be furnished; • Comprehensive documentation on indigenous and traditional knowledge is yet to be accomplished
6. Contribute to raising awareness and building capacity of biodiversity conservation among the different sectors of the society..	***Short term (0- 3 years)*** • Ensure that all sectors of the Bangladesh society, including Government at different levels, are fully aware of both the need to conserve biodiversity and their personal and institutional responsibilities involved in this task. • Build taxonomic capacity for lower groups of plants, invertebrates, microorganisms and threatened/endangered species.	• Efficiency in awarding Environmental Clearance Certificate has been enhanced by the Department of Environment through various legal and administrative measures;

Strategy	Action	Accomplishments
	• Promote understanding and awareness of the stakeholders of the importance and methods of conservation through developing appropriate communication tools, including materials in local language. ***Medium term (4-7 years)*** • Develop the capacity of different sectors, including the Government, of implementing the necessary tasks in respect of biodiversity conservation, as appropriate. • Strengthen existing capacity of Department of Environment to address the Environmental Clearance Certificate more efficiently. • Provide institutional support for conserving homestead forestry. • Build capacity in local communities, especially those that live around the PAs to serve as tour guides where market research demonstrates a viable ecotourism potential. • Curriculum development and training of the trainers (ToT) on biodiversity. ***Long term (8 -10 years)*** • Build capacity of local communities to monitor and report on the status of biodiversity, threats, and underlying causes. • Integrate conservation and sustainable use into both formal and non-formal education programmes through the provision of education opportunities that particularly target the poor and natural resource dependent communities, e.g. those living in PAs. • Establish regional herbaria and botanical gardens and the Bangladesh Museum of Natural History. • Integrate biodiversity-based curricula into the formal education system and update regularly.	• Bangladesh National Herbarium and some universities have the Taxonomic Capacity. But the capacity in this regard has to strengthened; • Environmental Curriculum on Environment has been developed by the Department of Environment for school level education awareness.
7. Promote use of traditional knowledge for conservation, use and protection of the local communities' intellectual property rights.	***Short term (0- 3 years)*** • Document and register the traditional knowledge developed over the centuries by the people. Assess extent which the *sui generis* system of Bangladesh is able to protect the intellectual property rights of local communities. ***Medium term (4-7 years)*** • Provide incentives to communities to conserve indigenous food and other economic plants ***Long term (8 -10 years)*** • Promote forestry activities with a focus sustainable harvesting and management of fuel wood and Non-Timber Forest	• No assessment done in true sense • Various NGOs have gathered data on the traditional knowledge regarding resource management and biodiversity conservation, however any national level initiative is still lacking. • A book on the 'Traditional uses of ethnomedicinal

Strategy	Action	Accomplishments
	Products (NTFPs) by supporting activities such as Joint Forest Management and development of Community Wood lots etc. (creating equitable access among gender, class and caste to forest resources) • Promote the adoption of People's Biodiversity Registers throughout the country • Integrate traditional knowledge in local level planning	plants of the Chittagong Hill Tracts' have been published. That book includes the enumeration and photographs of 700 medicinal plant used by the different indigenous tribal communities living in the CHTs area and the total pharmacology of 301 diseases treated by tribal Kabiraj/Boidhyas. • Under IPAC programme, sustainable NTFPs management programme have been outlined
8. Establish institutions for inter-sectoral implementing mechanism for the Bangladesh National Biodiversity Strategy and Action Plan	***Short term (0- 3 years)*** • Support establishment of an 'Apex Body' for biodiversity conservation for implementation of NBSAP with suitable support mechanism ***Medium term (4-7 years)*** • Develop capacities of the members of this proposed 'Apex Body' for better implementation of NBSAP ***Long term (8 -10 years)*** • Support development of monitoring and evaluation tools for assessing the implementation of NBSAP besides addressing issues of opportunities and threats • Enhance cooperation among agencies and ministries on issues of ownership of NBSAP • Support mainstreaming biodiversity conservation, issues and actions identified under NBSAP into other sectors, agencies and their action plans as well as into PRSPs and NAPA	• A National Technical Committee on Biodiversity has been formed headed by the Secretary, Ministry of Environment and Forests; This Committee is comprised of all the institutions and government agencies relevant with Biodiversity Conservation. The Committee frequently meets to make policy decisions on biodiversity conservation in Bangladesh
9. Enhance Protected Area Management, recognizing the benefits of collaboration with local communities in their management (Co-management)	***Short term (0- 3 years)*** • Identify key habitats that ensure ecosystem integrity and connectivity (corridors, migratory flyways of birds, etc) and support actions to maintain and promote such connectivity between the earmarked critical and sensitive areas ***Medium term (4-7 years)*** • Develop suitable measures to promote co-management of PAs and designate community conservation areas	• Actions are underway through various project activities to establish PA system and integrating co-management approach in Biodiversity

Strategy	Action	Accomplishments
	• Reorganize the structural pattern of the Forest Department and strengthen the capacity of personnel for PA management ***Long term (8 -10 years)*** • Identify, create and manage National Biodiversity Conservation Areas, Protected Areas (PAs) and biodiversity hot spots and suggest appropriate actions to promote environmental sustainability • Establish a well-managed and representative protected area system, which is responsive to the local needs of communities, in addition to supporting conservation of biodiversity • Establish a biosphere reserve in the hilly parts of Chittagong and the CHTs	Conservation of the Ecologically Critical Areas and Protected Areas. • Bangladesh National Herbarium has identified a number of key habitats that ensure ecosystem integrity but the management of those habitats is not under BNH. In this case BNH can provide only technical supports.
10. Ensure wise use of wetland resources.	***Short term (0- 3 years)*** • Identify key habitats that ensure ecosystem integrity and connectivity (migratory flyways of birds, fish passes, etc) and support actions to maintain and promote such connectivity between the earmarked critical and sensitive areas. • Develop community-based wetland and aquatic resources management ***Medium term (4-7 years)*** • Promote and ensure income generation activities during the fish breeding season for people those are dependent on fishing only. ***Long term (8 -10 years) 3*** • Promote conservation of biodiversity through ecosystem approach for watershed management in order to ensure adequate water supply, in terms of quality and quantity, for households by developing appropriate management plans for watersheds and their use. • Establish and manage fish sanctuaries both in fresh water and marine ecosystem including 'brush piles' in fresh water ecosystem. • Ensure the sectoral policies on fisheries, aquatic resources and water managements are in keeping with the NBSAP.	• Except a few initiatives for the conservation of wetlands, the vast area in the country still deserve a huge attention in terms of sustainable use through provisioning of alternative livelihood for local communities and other appropriate measures to minimize resource exploitation.
11. Establish participatory mechanisms to receive and utilize the inputs from private sector, civil society and local communities	***Short term (0- 3 years)*** • Ensure that appropriate participatory processes/ collaborative mechanisms are put in place in all activities related with biodiversity conservation, including the NBSAP implementation mechanisms. • Identify and establish the mechanism of cooperation between related agencies for taking forward the actions identified under the NBSAP	• Government has adopted PPP approach in various environmental and resource management programmes.

Strategy	Action	Accomplishments
about the different process leading to biodiversity conservation, use and sharing of benefits.	***Medium term (4-7 years)*** • Support development of sectoral action plans, identifying the roles and responsibilities of government agencies and departments. • Develop capacities as well as understanding on issues of conservation, management and use to relevant stakeholders Further develop the finance strategy suggested under the NBSAP to include ways of cooperating with private sector and business community. ***Long term (8 -10 years)*** • Encourage budgetary allocations to implementation of NBSAPs by different agencies, including local government bodies, private sector and NGOs.	• Department of Environment has established a partnership program to make combined effort on environment conservation in collaboration with relevant N/GOs
12. Review and develop biodiversity related legislation(s) and establish a specific branch in the Judiciary to deal with biodiversity and environmental issues.	***Short term (0- 3 years)*** • Review and strengthen the legal and policy regimes for conservation and, sustainable and equitable use of biological resources • Develop training modules for Judiciary on conservation and environment • Ensure that the proposed 'Biodiversity Act' is compatible to the NBSAP • Strengthen individual and institutional capacities on issues of trade and IPRs. WTO rules and Access and Benefit Sharing and others. • Develop a national policy to address the issue of human-animal conflicts in and around protected areas, especially trans-boundary issues ***Medium term (4-7 years)*** • Enhance the understanding of the Judiciary on importance of biodiversity, its links to local livelihoods and environment, emerging international trends in environmental law • Establish a information sharing mechanism on environmental justice and related provisions	• Regulation on IPR, plant variety protection and farmer's rights have already been developed.
13. Establish an open and transparent monitoring and reporting system status and trends of implementing the principles of CBD.	***Short term (0- 3 years)*** • Develop tools and techniques for monitoring and implementation of NBSAP • Prepare biodiversity baseline report and develop reporting tools. • Identify options for participatory implementation of NBSAP ***Medium term (4-7 years)*** • Encourage public and private sector initiatives on supporting implementation and monitoring of actions through provision of appropriate incentives.	• Bangladesh Government has introduced environment conservation award to encourage public initiatives towards environment conservation.

Strategy	Action	Accomplishments
14. Develop a financial strategy that is innovative and sustainable.	***Short term (0- 3 years)*** • Identify ways of realizing the principles of the financial strategy that identifies possible sources of support for implementation of NBSAP • Assist agencies and ministries in identifying funding strategies for conservation as well as encourage resource allocations through their annual budgets • Develop a medium term and long-term investment plan for realizing the actions under NBSAP ***Medium term (4-7 years)*** • Encourage donors and partners to mainstream elements of NBSAP and the actions thereof into their plans and programmes of support ***Long term (8 -10 years)*** • Support development of innovative funding options for actions under NBSAP • Encourage private sector partnership on financing implementation with appropriate monitoring mechanisms	• There is no separate financial mechanism yet in place to support the implementation of NBSAP. Government of Bangladesh has sporadic financial arrangements through its MTBF (Mid-Term Budgetary Framework) to support project based biodiversity conservation efforts. • NSAPR (National Strategy for Accelerated Poverty Reduction) has also highlighted conservation of biodiversity with specific targets to be achieved.
15. Address issues of synergies with other Multilateral Environmental Agreements (MEAs) and process that deal with climate change, disaster management, livelihoods, food security and sustainable development.	***Short term (0- 3 years)*** • Review and revise national disaster management plans that include elements of contributions from biodiversity into implementing such plans. ***Medium term (4-7 years)*** • Develop local activities on issues of adaptation and mitigation. • Develop a portfolio of actions on 'anticipatory research' to address the future offsets of climate change ***Long term (8 -10 years)*** • Identify options for carbon markets that are linked to quality carbon sequestration • Integrate elements of conservation of biodiversity and development planning into National Adaptation Programmes of Action (NAPAs). • Support development of policies that address issues of mitigating the impacts of trade, globalization and IPRs on local livelihoods as well as conservation. • Promote sustainable use practices and market linkages by developing policies and regulations through cooperatives and other appropriate mechanisms • Promote sustainable agricultural practices by: providing	• CDMP is working on integrating biodiversity issues into disaster management programmes. • NAPA and BCCSAP have been developed by the Government of Bangladesh to address climate change risks. Both this policy document have got specific elements to address climatic impacts on Biodiversity

Strategy	Action	Accomplishments
	incentives to farmers for following sustainable practices; supporting use of modern and traditional technology blends; supporting effective Public Distribution System.	
16. Integrate biodiversity conservation into the national development making, planning and process.	***Short term (0- 3 years)*** • Develop anticipatory methods to deal with issues of managing the environment, adoption of new technologies and strengthening resource rights. • Encourage private sector involvement in development planning as well as implementing pro-poor environmental and fiscal reforms. ***Medium term (4-7 years)*** • Strengthen institutional and individual capacities at the local level to deal with issues of negotiation as well as implementation. • Make foreign direct investment pro-poor and pro-environment. Find ways to ensure Multilateral Environmental Agreements (MEAs) more explicitly contribute to poverty reduction in their implementation. • Encourage sustainable production and sustainable consumption methods. • Enhance effectiveness of development cooperation and debt relief that is not only based on the WTO principles and negotiations but also on ethics and equity aimed at sustainable development and poverty reduction. ***Long term (8 -10 years)*** • Integrate poverty-environment-development issues into national development frameworks. • Decentralize environmental management and prioritize actions on the national development agenda. • Reduce the environmental vulnerability of poor by providing appropriate coping strategies.	• NSAPR included the items of Biodiversity conservation. • PPP approach has been initiated for natural resource management under various porject activities.

2.3 The Successes and Obstacles to implement NBSAP and Lessons learnt

Bangladesh has made various initiatives towards implementing NBSAP. Developing rules on various aspects environment conservation is underway and, in some cases, existing legislative mechanisms are in the process to be updated. For instance, the Wildlife Preservation Act 1974 is currently underway for necessary upgrading. The traditional form of government owned wetland leasing out systems has already been updated in 2005. Forest Policy of 1994 have explicit aim of bringing 25% lands of the country under forest cover by 2015. In addition, species conservation issues have been taken as forefront activities by many concerned agencies and affiliated organizations of the government. The conservation efforts in some areas have been undertaken involving local stakeholders and communities, especially in the wetlands of the country.

BARGAON WILDLIFE SANCTUARY: PEOPLES' INITIATIVE FOR WILDLIFE CONSERVATION

Located in a private land, the total area of the wildlife sanctuary is 33 acres, among the area, 4.5 acres is completely protected, which is called the **core zone**; the rest 28.5 acres is partially accessible, which is called the **buffer zone**.

Almost all the terrestrial wildlife and turtles are found in the sanctuary, however the target to conserve the species of Capped Langur (*Trachypithecus pileatus*) and Rhesus Monkey (*Macaca mulatta*); and four species of turtles Brown Roofed Turtle (*Kachuga tecta*), Median Roofed Turtle (*Kachuga tentoria*), Spotted Flapshell Turtle (*Lissemys punctata*), Ganges Softshell Turtle (*Aspideretes gangeticus*) and Peacock-Marked Softshell Turtle (*Aspideretes hurum*).

The activities for establishment of the sanctuary have been taken both in buffer and core zones are:

- Langur, monkey and bird conservation
- Turtle hatchery establishment
- Conservation of complete protected zone
- Tourist facilitation

Local people are happy to see the wildlife back again to their village. Monkeys and Langurs have been visiting the sanctuary frequently, which was not seen lately. During fruiting season, one can observe Monkeys and Langurs regularly.

Government has given special priority in agricultural research during the last couple of decades. The universities and associated institutions have championed agricultural research by inventing many high yielding varieties of crops, which are suitable to various adverse conditions. Some of the organizations are conserving seeds, especially, of local rice and vegetable varieties. Government, in dealing with climate change induced threats to biodiversity, also put sufficient emphasis to uphold the principles of CBD, while developing National Adaptation Plan of Action (NAPA) and Bangladesh Climate Change Strategy and action Plan (BCCSAP). However, there are still many challenges exist in implementing NBSAP, which are mentioned as follows:

- Weak Inter-sectoral communication.
- Policy level endorsement/ backing of conservation of biodiversity are not getting momentum.
- Implementation of existing legislative mechanism or framework is not efficient enough to halt the conversion of forest lands to commercial, industrial and settlement purposes.
- Climate change induced hazards are taking heavy tolls on conservation initiatives.
- Spatial information gap regarding biodiversity and ecosystem related issues need to be fulfilled.
- Inadequate financial and technical capacity of respective organizations is a serious barrier for implementing NBSAP strategies and action plan.

There is hardly any need to say that implementing the measures, highlighted in the NBSAP, needs skilled human resources. It is well perceived that without human capacity development, understanding and assessing

the nature and dynamics of the problem, especially where biodiversity is concerned, would be challenging atask. In this regard, government has taken various initiatives and programmes to enhance human resources. Department of Environment has expanded organizational infrastructure to the 19 greater districts of Bangladesh. Human resources engaged in biodiversity research and promotion in Bangladesh could be categorized under four broad heads. These are:

- **Government organizations and their related agencies:** Human resources in these organizations include concerned agencies like the Department of Environment, Department of Forest, Department of Agriculture Extension, Department of Fisheries, Bangladesh Agriculture Research Institute, Bangladesh Rice Research Institute, Bangladesh Sugarcane Research Institute, Bangladesh Jute Research Institute, Bangladesh Fisheries Research Institute, Bangladesh Forest Research Institute, Bangladesh National Herbarium and many more of this kind may be mentioned which have got relevant knowledge base on biodiversity.
  The human resources of these organizations have specialized skills to undertake research and development activities on various areas of biodiversity.

Medicinal plant garden: an NGO initiative

Bangladesh Resource Center for Indigenous Knowledge (BARCIK) took initiative to establish local medicinal plants garden directed by traditional healer families in 10 decimal of lands at Rameshwapur village of Netrokona. About 125 types of medicinal plants are found in the garden where people use to cure themselves and their livestock. This medicinal plant garden leads the increased use and conservation of medicinal plants and people are planting various local fruit and other useful trees in their homestead gardens. The initiative taken by BARCIK has made people capable of conserving medical and other useful trees as well as local biodiversity.

- **Universities and Institutes**: Most of the public and private Universities of the country have departments with special focus on environment/ecosystems, plant/animal science and biotechnology. These Universities produce work force on biodiversity and related areas. In addition, such universities and institutes conduct research works on issues like environment status, loss of ecosystems and habitats, special and temporal changes, detection of landuse and landcover, biodiversity assessment, monitoring and conservation issues etc.
- **Research and conservation initiatives taken by local and international NGOs and donors:** A strong role have been played by local and international NGOs and donors in research and programme implementation in areas of biodiversity protection, management and conservation in Bangladesh. Their specialized knowledge and its reflection in their publications are respectfully received by different corners of the society. In addition, country offices of FAO, UNDP, World Bank foster research and development programmes in related fields of biodiversity. For instance, a recent study, carried out by Bangladesh Space Research and Remote Sensing Organization (SPARRSO) titled 'Forest and other Land Uses of Bangladesh' gives a new insight on numerical estimates on forest and other land uses using satellite remote sensing data. The project was financially supported by FAO.

Despite of having qualified human resources in some areas, the major challenges in proper utilization of the human resources in these organizations can be seen in the constraints of research funds, weak management infrastructure incapable to provide incentive to real workers and inadequate facilities in the laboratories.

CHAPTER III

Sectoral and Cross-sectoral Mainstreaming of NBSAP

3.1 Introduction

National Biodiversity Strategy and Action Plan (NBSAP) of Bangladesh build upon five pillars, such as (i) Species conservation, (ii) Ecosystem management, (iii) Legal, regulatory and policy issues, (iv) Education, training and awareness raising, and (v) Linkages and institutional issues. It was assumed that working on these issues will finally lead to ensure better protection of biological resources of the country. Mainstreaming of NBSAP requires concerted efforts and actions to achieve the common goal of biodiversity conservation. This can be achieved once the aims and spirit of the NBSAP are mainstreamed in the following areas:

- Mainstreaming NBSAP into institutional level
- Mainstreaming at individual level
- Mainstreaming in policy and legislative framework.

In this backdrop, this chapter focuses on how far the NBSAP objectives have been mainstreamed at institutional or individual levels and assessed the legislative framework in this regard as well. The challenges that need to be overcome for effective integration of NBSAP into cross-sectoral policies, plans and work porgrammes are also highlighted in this chapter.

3.2 Status of Mainstreaming NBSAP

3.2.1 Mainstreaming at Institutional Level

Mixed impression (i.e. both positive and negative) exists in the country in mainstreaming NBSAP objectives at the institutional level of the country. Ministry of Environment and Forest (MoEF) gives emphasis on better management of environmental and ecological resources. Department of Environment under MoEF is the leading organization in the country in formulating environment related policies and regulations. National Technical Committee on Biodiversity (NTCB), an apex body, headed by Secretary of the Ministry of Environemnt and Forsts has already been operational to oversee the overall activities of biodiversity. Some of the activities like (i) Completed projects under Sustainable Environmental Management Programme (SEMP), (ii) On-going Coastal and Wetland Biodiversity Management Project (CWBMP) at Cox's Bazar and Hakaluki Haor in greater Sylhet district, (iii) Completed Nishorgo Support Programs and on-going Integrated Protected

Area Co-management (IPAC) are noteworthy initiatives towards biodiversity conservation on various ecosystems of the country.

In addition, agencies like Local Government Engineering Department (LGED), Roads and Highways Department (RHD) and Bangladesh Water development Board (BWDB) have have established environment cell to assess the impacts of the projects being implemented by these organizations. In this respect, it could be mentioned that Environment Conservation Act 1995 made it mandatory to conduct Environmental Impact assessment (EIA) before implementing physical infrastructures those have potentially higher impacts on the environment. Agencies undertake EIA for their projects under this direction. The EIA of the mega project of Bangladesh, the Ganges Bridge (locally known as Padma Bridge) is currently underway that is being conducted by the Bridge Authority of the Ministry of Communication, could be an example in this regard.

On the other hand, cynical impressions also exist in implementing NBSAP at institutional level activities. It is observed that some actions in the same agency are contradictory in consideration of biodiversity conservation. For instance, Forest Department (FD) has plantation programs, which are not always supportive to ecosystem approach being fostered by the Convention on Biological Diversity. Social Forestry being undertaken by the Forest Department is looking after commercial aspects of afforestation, rather than conserving indigenous knowledge and biodiversity. In many instances, agencies are more focused in achieving their own sectoral objectives, which sometimes go against biodiversity conservation. For example, Ministry of Agriculture is aiming at increased food grain production by introducing high yielding variety (HYV) crops at the cost of local rice varieties. This sort of farming also degrades environment and biodiversity thereof due to unscrupulous use of water resources, chemical fertilizers and insecticides. Fisheries Department also wants to see fish production in terms of as many tons as possible with less focus on fish biodiversity conservation. Promotion of shrimp cultivation in coastal areas made adverse impacts on coastal ecosystems and species diversity. Water resources ministry aims at extending geographical coverage of FCD/I (Flood Control Drainage and Irrigation) schemes that caused threats to floodplain biodiversity.

The barriers of mainstreaming NBSAP at institutional levels can be summarized as follows,

- Legal and Institutional Framework not supportive to biodiversity conservation
- Policies and programmes and development projects are not optimally coordinated at the national level.
- Institutional and individual capacities are still lagging behind.
- Funding is irregular and unpredictable, which thwarts the timely implementation of planned programmes.
- Negligible efforts to enhance the policy level understanding on the importance of biodiversity conservation.

3.2.2 Mainstreaming NBSAP at Individual Levels

In broad observation, the activities of individuals aiming at biodiversity conservation are generally sporadic and discordant. The researchers and professionals are working on different components of environment and ecosystems without having explicit aims to translate the research results in achieving the objectives of NBSAP *vis-à-vis* the Convention on Biological Diversity (CBD). Although it is true that many research works are closely connected with different components of NBSAP. The individuals working on biodiversity and ecosystems may fall into three categories, e.g. (i) those who are based in academic institutions (e.g. universities), (ii) individuals based in government research agencies (e.g. Bangladesh Agricultural Research Council, Bangladesh Rice Research Institute, Bangladesh Agricultural Research Institute, Bangaldesh Fisheries Research Institute, Bangladesh Livestock Research Institute etc.), (iii) people based in non-governmental organizations (e.g. BRAC). The results of these activities are published in peer reviewed journals and books but cataloging and archival systems of these works are still poor, which made it difficult to transmute the research results in formulating efficient legislative tools and programmes for better protection of biodiversity.

On the other hand, individuals, specially living in the rural communities are motivated to act in the favor of biodiversity conservation and its promotion. For example, biodiversity conservation in the rural homesteads, groves and agro-ecosystems are specially managed by the community individuals and in most of the cases, women members of the households play the most active roles in this regard.

3.2.3 Mainstreaming NBSAP in the Policy Frameworks

NBSAP advocated that legal, regulatory and policy regimes should be attuned in line with biodiversity conservation. In this regard, it can be claimed that the strategic arrangements and legislative frameworks of the country are strong enough to safeguard habitats, ecosystems and their associated biodiversity. The environment and biodiversity related policies such as Bangladesh Environment Policy 1992, The Forest Policy 1994, The Water Policy 1999, National Landuse Policy 2001, National Fisheries Policy 1998, National Environment Management Action Plan (NEMAP) 1995 hold strong elements of biodiversity conservation.

The level of mainstreaming of NBSAP into individual policies and strategies so far achieved in Bangladesh may be said satisfactory, but the integration and harmonization among the policies to achieve the common goal in respect to biodiversity conservation is still a big gap to be filled-in. There are some of the policies, e.g. Export Policy 2006, Industrial Policy 2005) which did not explain how objectives of those policies (export promotion or industrial expansion for example) will be achieved without compromising environmental degradation or biodiversity conservation. These kinds of inter-sectoral conflicts still remain as a challenge towards mainstreaming biodiversity in the country. With this backdrop, some policies relevant to biodiversity are examined in the following sections to illustrate how environment or biodiversity concerns are accommodated in their objectives and approaches.

3.2.3.1 Environment Policy 1992

The Environment Policy 1992 built upon the spirit of Rio Conference and acknowledged that sustained development of the country is based on the well-being of the environment and ecosystems since it provides the services necessary for ensuring progress. Section 3 of the Policy focused on the biodiversity conservation. It envisioned biodiversity protection through achieving the following targets.

- Forest conservation, extension and further development was recommend for maintaining environmental balance and to fulfill the socio-economic need of the community.
- Inclusion of tree plantation in all development activities.
- Reduction of erosion in forestlands and forest resources.
- Innovation of alternative materials to wood so that pressure on wood resources is reduced.
- Wildlife and biodiversity conservation and support research activities in related fields.
- Wetland conservation and development and protection of the habitat for migratory birds.

3.2.3.2 Forest Policy 1994

The Forest Policy 1994 recognizes the importance biodiversity for environmental sustenance. The aim 3 and 8 of the policy explicitly mentioned that habitats for the wildlife and vegetation will be conserved through afforestation and by bringing forest lands under Protected Areas. It is imperative to mention here that the current Forest Policy 1994 targets to bring 20% of the total land area of the country under forest cover, and at least 10% of which under Protected Areas by 2015. It also declared that measures will be taken to improve the degraded forests so that richness of the biodiversity could be maintained. The Policy insists on harvesting and using forest products without disturbing the state of biodiversity. The Policy, at the same time, advocated for social forestry, which includes agroforestry, woodlot plantation, strip plantation in vacant public and private lands of the country. The social forestry approach is, in many ways, contradictory to biodiversity conservation; the policy, in this regard, did not clarify how to attain mutual interests (i.e. promoting social forestry and at the same time biodiversity conservation) simultaneously.

3.2.3.3 National Land Use Policy 2001

Land utilization policy have little direct focus on biodiversity conservation, but have components like reduce illegal landuse conversion, ensure facilities so that landuse activities is attuned with environmental conservation; these holds indirect linkage to biodiversity conservation. The policy advocated tree plantation in the riverine and coastal islands to increase forest cover in the country.

3.2.3.4 National Fisheries Policy 1998

Although fisheries policy of the country aims at enhancing production of fish resources from inland and marine sources and to increase the export oriented foreign currency earning, it at the same time focus on environmental balance and biodiversity conservation (mentioned in objective 5 of the policy). The policy identified different threats to fisheries resources, such as population pressure, (ii) construction of infrastructure in the floodplains, (iii) pollution by chemical fertilizers, insecticides and pesticides; and urged for reducing these threats as to improve the situation.

3.2.3.5 National Water Policy 1999

National water policy mentions that this policy is a bold step for governance in the water sector. It explicitly mentions that it will play an important role in biodiversity conservation and ensuring a sound environment in the country. Sections 4.9, 4.12 and 4.13 clearly focus on importance of water on fisheries and wildlife, water for the environment and preservation of wetlands respectively.

3.2.3.6 Coastal Zone Policy 2005

The coastal zone policy recognizes the importance of ecosystems and biodiversity conservation needs as it mentioned, “the coast contains several ecosystems that have important conservation values. Part of the Sundarbans, the world's largest stretch of mangrove ecosystem, has been declared a World Heritage Site, whereas coral ecosystems are found around St Martin's Island. The coastal zone has not only biodiversity hot spots, but also provides the ecological foundation for an important common property resource; A large portion of these resources are various types of fisheries resources available in the Bay of Bengal”.

3.2.3.7 Livestock Development Policy 1992

Livestock development policy of Bangladesh puts major emphasis to enhance livestock and poultry (meat and egg) production in order to ensure a sustained supply of animal protein for the people of the country. However, some of the objectives have relevance to biodiversity conservation. For instance, Its target to produce biogas production may contribute in reducing pressure (e.g. fuel wood collection by the rural community) on forest resources.

3.2.3.8 National Seed Policies

National Seed Policy 1993, The Seeds (Amendment) Act 1997, The Seed Rules 1998 are mainly aiming at achieving self sufficiency in food production. Thus the instruments got provisions for liberalizing of import of seed and seed processing machineries, strengthening of quality control and research system and maintaining a seed security arrangement. These instruments have little attention on conservation of indigenous or local crop diversity and to protect local ecosystems and habitats from invasion of IAS.

3.3 Challenges for Inter-sectoral Integration

Major challenges for inter-sectoral integration are as follows:

- Human resources with appropriate background and knowledge/skills are not always posted in right positions, where their expertise is deemed necessary so that they can support the agency with proper decisions leading to inter-sectoral integration.

- Policies related to forest, wetland management are still rooted in colonial systems. For instance, the forest definition exercised by Bangladesh Forest Department and its reflection in estimating forest area coverage and the leasing out approach of wetland management being exercised by district administration is contradictory to biodiversity conservation and may hamper inter-sectoral integration. However, some innovative management system has already been introduced to overcome these kinds of hurdles in Bangaldesh. For instance, piloting the community fisheries management approach in public wetlands has been found successful, which is expected to be implemented in other areas of the country as well. Co-manangement of forest ecosystem is also going to be introduced in some pilot area under IPAC project.
- Lack of human capital and financial resources sometimes turn to be barriers to take necessary steps so that inter-sectoral actions can be put forward. Institutional up-gradations and capacity building issues are the underlying aspects on which need assessment for integration, development of tools/instruments, mechanisms and protocols for sectoral integration depends. All these issues are dependent on financial resources, which is always a constraint for the agencies of Bangladesh.

3.4. Assessing the Cross-cutting issues Among climate Change action Plans and NBSAP

Among the challenges, NBSAP considers climate change as one of the major risks to uphold its targets and to implement action plans. Climate change induced threats like temperature increase, erratic behaviour of rainfall, excessive rainfalls, occurrence of cyclone, saline intrusion in the coastal areas, incidence of drought is a major cause for destruction of habitats of species and at the same time undermine production and the thriving nature of agricultural biodiversity, which might bring instability in food security of the people of Bangladesh.

In this context, National Adaptation Plan of Action (NAPA) and Bangladesh Climate Change Strategy and Action Plan (BCCSAP), developed by the Government of Bangladesh, identified areas where specific programmes could be implemented in order to reduce the climate change threats to biodiversity. The NAPA lists a number of programmes based on some criteria, among which some are attuned with CBD principles. For example, NAPA recommended promotion of coastal afforestation through community participation to reduce the threats of climate change under its intervention type measures. In addition, some of the propositions (proposed by NAPA and BCCSAP) include development of plant/crop varieties, which are tolerant to changing climatic conditions, some focused on institutional capacity building issues so that institutions become skilled and ready to act to reduce the climate change induced threats. The proposed plans (i.e. both NBSAP and BCCSAP) have common and coinciding areas. Table 3.1 shows how the elements of NBSAP coincide with different themes of BCCSAP. Sometimes, it is difficult to find explicit correlation among the elements of these two plans, although in many respects they have indirect impacts on others.

Table 3.1 did not show any direct link between T_1P_1 (institutional capacity development) with components 1,2,3,4,5 of ecosystem management (Em) options of NBSAP. However, better management of different ecosystems will be taking place if capacity building of different agencies is ensured through implementation of BCCSAP.

Current Implementation Status of National Biodiversity Strategy and Action Plans

Table 3.1 Relationship of Biodiversity Issues Embedded in BCCSAP and Thematic Areas of NBSAP

Proposed programmes included in the Bangladesh Climate Change Strategy and Action Plan (BCCSAP)		National Biodiversity Strategy and Action Plan (NBSAP)																
		Species conservation (S_c)			Ecosystem management (E_m)					Legal, regulatory and policy issues (Lrpi)				Education training and awareness raising (E_{tar})			Linkages and in stitutional issues (L_{ii})	
		1	2	3	1	2	3	4	5	1	2	3	4	1	2	3	1	2
Theme 1 (T_1)	P_1 (Institutional capacity development for climate resilient crop variety development)																	
	P_2 (Development of climate resilient cropping systems)																	
	P_8 (Livelihoods protection in ecdogically fragile areas)																	
Theme 4 (T_4)	P_4 (Monitoring of ecosystem and biodiversity changes and their impacts)																	
Theme 5 (T_5)	P_7 (Afforestation and reforestation programme)																	
Theme 6 (T_6)	P_2 (Mainstreaming climate change in national, sectoral and spatial development)																	

Activities of thematic groups and sub-groups

S_c: 1. Wild and cultivated biodiversity, 2. Invasive Species and GMOs, 3. Microorganism diversity, health and biodiversity;

E_m: 1. Terrestrial ecosystem, 2. Aquatic and coastal ecosystem, 3. Hill ecosystem and mining, 4. Cultures and community conservation, 5. *Ex-situ* and *in-situ* conservation;

L_{rpi}: 1. Policies, laws, institutions, 2. National, regional and international obligations, 3. Tourism and others, 4. Poverty reduction and national planning;

E_{tar}: 1. Capacity building and training, 2. Education, research and awareness raising, 3. Gender, advocacy and media;

L_{ii}: 1. People, economics, livelihoods and technology, 2. Institutional linkages and development cooperation.

3.5 PRSP and NBSAP: Complementariness and Conflicts

It is important to understand the linkages between the NBSAP and Poverty Reduction Strategy Paper (PRSP). Both the Poverty Strategy Papers, i.e. PRSP I (2007-2008) and the NSAPR (2009-2011) take into account aspects of environmental health, energy, agriculture, natural resources, climate change and disaster management. Especially the NSAPR explicitly asserted to protect and tackle climate change to ensure sustainable development. The strategy papers also address forestry and fisheries issues. NSAPR proposed to reverse the downward spiral of poverty and environmental degradation considering the fact that the underlying causes of biodiversity loss are linked to the causes of poverty.

However, improving ecosystem health and at the same time reducing poverty requires pooling of local knowledge and experiences and mainstreaming the biodiversity concerns into all sectoral development strategies.

3.6 Accelerating the Pace of Mainstreaming of Biodiversity

Importance of Biodiversity as a term should be well understood by the policy level to grass-root level conservation and management peoples. Government of Bangladesh should revisit all the relevant policies and action plans to take the three pillars of CBD into consideration. There should be concerted efforts, awareness campaign and advocacy for biodiversity conservation. The capacity building at the individual, institutional and systemic or policy level to handle the complex issues of biodiversity conservation will help a lot for furthering the process of mainstreaming.

CHAPTER IV

Progress Towards the 2010 Biodiversity Target and the Way Forward to Implement the Strategic Plan

4.1. Introduction

The rich biological diversity and their genetic variety of crops, livestock, fish, harvested species of trees and wildlife directly and indirectly support the life and livelihoods of people in this agrarian country by supplying different provisional, regulatory and supportive services. However, in recent times, pressures from burgeoning human population, conversion of land use pattern and overall land degradation, environmental pollution, coupled with natural hazards like cyclone, floods, drought proneness, salinity intrusion, pose threats to this richness of the species and genetic diversity of the country. Lack of awareness about the significance of their existence in securing the human well-being also contributed to unexpected human actions leading to this declination of diversity in biological richness. As a result, some floral and faunal species have already been vanished; some others remain under threats in critical conditions, which are listed in the IUCN Red Data Book.

Conceiving the fact that biodiversity of the country has been reducing rapidly; several programmes/actions have been carried out by different agencies of the government and non-governmental organizations in order to ameliorate the situation. Bangladesh government has formulated different kinds of regulatory and management instruments in the form of policies, acts, rules and guidelines in line with the spirit of the international devices that exist in this regard, especially, the Convention of Biological Diversity.

Bangladesh government has produced its National Biodiversity Strategy and Action Plan (NBSAP) along with National Capacity Self Assessment (NCSA) that underscore the need for actions to improve the fragile situation of Biodiversity. It is imperative to mention that the underlying motivation in producing these instruments was to uphold the 2010 targets of the CBD. The combined efforts and implementation of the above mentioned instruments by different sectors in Bangladesh have a collective impacts in achieving the set targets and their goals of CBD.

With the background above, an assessment of the activities undertaken by the government and non-government organizations those contributed to 2010 Biodiversity Targets has been described in the Table 4.1

Table 4.1: Progress Towards the 2010 Biodiversity Target

Goals and targets	Progress Towards the Target
Focal Area-1: Protect the components of biodiversity	
Goal 1. Promote the conservation of the biological diversity of ecosystems, habitats and biomes	
Target 1.1: At least 10% of each of the world's ecological regions effectively conserved.	• Conservation Scheme for ecologically significant wetlands (Ramsar sites) have been implemented under co-management approach. • Programs have been implemented to conserve Ecologically Critical Areas in the globally important coastal/marine ecosystem of Bangladesh (St. Martin and Sonadia Islands and Teknaf peninsula sea beach) • Middle grounds and the south patches of the Bay of Bengal, comprising 698 sq. km area have been declared to constitute a Marine Park in the year 2000
Goal 2. Promote the conservation of species diversity	
Target 2.1: Promote the conservation of species diversity	• Department of Environment (DoE) has programs to reduce threats to marine turtle and to better manage their hatching grounds. • Conservation of freshwater fish species were undertaken through different projects of Department of Fisheries, especially conservation of *jatka* (juvenile stage of *Tenualosa ilisha)* in river ecosystems.
Target 2.2: Status of threatened species improved.	• Fish sanctuaries are established in Padma-Jamuna floodplains and haor areas of the country through different community based management projects that have improved the habitat condition of fresh water fish species. • Efforts for conservation of coral reefs and sea turtles at St. Martins Island were undertaken through Conservation of Biodiversity, Marine Park Establishment & Eco-tourism Development at St. Martin's Island and Coastal and Wetland Biodiversity Management Project (CWBMP). • In the North western parts of Bangladesh, government took initiatives to protect threatened flora and fauna under the Barind Environment Action Plan. • Forest Department has taken actions to conserve Asian Elephant (*Elephus maximus*), and common Langur (*Presbytes entellus)* in Chittagong region.
Goal 3. Promote the conservation of genetic diversity	
Target 3.1: Genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species conserved, and associated indigenous and local knowledge maintained.	• Farmers are the champions in maintaining genetic diversity of plants especially cultivated crops including cereals, pulses, tuber crops, fibre, oil seeds, fruits and vegetables. The greatest genetic diversity in rice (*Oryza sativa*) takes place in Bangladesh; about ten thousand varieties of rice are known to have existed in the country. • Sponsored by the Ministry of Environment and Forests, Bangladesh Asiatic Society has recently published 28 volumes on flora and fauna of Bangladesh. • Educational institutions (universities and research institutions) are maintaining their own botanical gardens. • Bangladesh Agricultural Research Institute (BARI), Bangladesh Rice Research Institute (BRRI), Bangladesh Jute Research Institute (BJRI)

Goals and targets	Progress Towards the Target
	maintains gene banks. About 6,249 accession of rice, 5,631 accession of jute and 565 accession of wheat, 1,750 accession of pulses, 604 accession of oil seeds, 3,522 accession of vegetables, 158 accession of spices have been stored in BARI gene bank. Moreover, the Sugarcane Research Institute with about 1,342 sugarcane germplasm entries maintains a field gene bank. ● NGOs such as Policy Research for Development Alternative (UBINIG), BARCIK have been engaged with different actions for conserving native varieties especially, the paddy. It is imperative to mention that UBINIG introduced a new programme called *New Agricultural Movement* (locally called *Naya Krishi Andolon*) aiming at conserving local crop varieties, seed preservation, keeping ecosystem health from pollution, promotion of multi cropping instead of mono-crop culture.
Focal Area-2: Promote sustainable use	
Goal 4. Promote sustainable use and consumption.	
Target 4.1: Biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistent with the conservation of biodiversity.	● Moratorium imposed on clear felling of trees in the reserved forest. ● Ban imposed on fishing gears destructive for fingerlings/fish larva in production areas mainly in rivers and estuaries during breeding season. ● Sanctuaries established through different programmes, such as MACH, CBFM to support natural production of fish and sustainability of production areas. ● Ban on jatka catch (juvenile stage of *Tenualosa ilisha* fish), ban imposed on sea turtle exploitation.
Target 4.2. Unsustainable consumption, of biological resources, or that impacts upon biodiversity, reduced.	● Hunting of wildlife and migratory birds is strictly prohibited by Wildlife Preservation Act 1974 (revision of this act is currently underway).
Target 4.3: No species of wild flora or fauna endangered by international trade.	● Bangladesh ratified CITES in 1981. As per CITES, international trade of wild species cannot be done without prior permission from the Ministry of Environment and Forests (MoEF), CITES focal point for Bangladesh. Wildlife Preservation (Amendment) Act, 1974 is in place, which provides list of species to enjoy protection against any form of trading.
Focal Area-3: Address threats to biodiversity	
Goal 5. Pressures from habitat loss, land use change and degradation, and unsustainable water use, reduced.	
Target 5.1. Rate of loss and degradation of natural habitats decreased.	● NBSAP, sectoral policies, strategies (MDGs and PRSP) and action plans regarding forest, agriculture, water, fisheries, marine and coastal resources have specific components/targets to address threats to biodiversity and for restoration and rehabilitation of natural habitats. ● National Land use Policy 2001 has the provisions of restriction on converting forestland to other purposes, which may help reduce land degradation.
Goal 6. Control threats from invasive alien species	

Goals and targets	Progress Towards the Target
Target 6.1. Pathways for major potential alien invasive species controlled.	• Pathways for major potential IAS is going to be controlled through Quarantine and other regulatory measures
Target 6. 2. Management plans in place for major alien species that threaten ecosystems, habitats or species.	• The National Biodiversity Strategy and action Plan (NBSAP) of Bangladesh provides necessary guidance and framework to tackle the spread of invasive alien species. Major actions suggested by the NBSAP with regard to the alien species and include, (i) develop national management plans for control and eradiation of invasive alien species, (ii) locally monitor and prevent the release of invasive alien species. Under NAPA specific projects have been suggested for control and management of IAS.
Goal 7. Address challenges to biodiversity from climate change, and pollution	
Target 7.1. Maintain and enhance resilience of the components of biodiversity to adapt to climate change.	• Bangladesh has developed several measures/action plans, such as National Adaptation Program of Action (NAPA), Bangladesh Climate Change Strategy and Action Plan (BCCSAP) which have incorporated the ecosystems like mangroves to be protected for enhancing resilience of the components of biodiversity to adapt to climate change
Target 7.2. Reduce pollution and its impacts on biodiversity.	• To conserve Biodiversity and natural resources, Bangladesh has made EIA mandatory by enforcing Environment Conservation Rules 1997 for the large scale industrial development interventions. The industrial entrepreneurs are currently coming forward to install Effluent Treatment Plants (ETP) and emission control devices in their industrial premises. • Department of Environment (DoE) has developed National Programme of Action (NPA) for the protection of the coastal and marine environment from land-based activities.
Focal Area-4: Maintain goods and services from biodiversity to support human well-being	
Goal 8. Maintain capacity of ecosystems to deliver goods and services and support livelihoods	
Target 8.1. Capacity of ecosystems to deliver goods and services maintained.	• Government has declared areas significant to biodiversity, either as Ecologically Critical Areas or as Protected Areas.
Target 8.2. Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people maintained.	• Fisheries Conservation Efforts have been undertaken to improve the condition of ecosystems so that it can maintain sustained supply of goods and services to the communities and livelihoods groups, by re-establishing links between floodplains and rivers, conserve wetlands, improve water quality under different projects and programs such as SEMP, MACH, CWBMP and CBFM etc.
Focal Area-5: Protect traditional knowledge, innovations and practices	
Goal 9 Maintain socio-cultural diversity of indigenous and local communities	
Target 9.1. Protect traditional knowledge, innovations and practices.	• NBSAP proposes a strategy on promotion and use of traditional knowledge for conservation, use and protection of the local communities' intellectual property rights. This target is also incorporated in the Inland Capture Fisheries Strategy, Coastal Policy, Forestry Sector Policy, Water Policy, National Water Management Plan, Barind Environment Action Plan, National Conservation Strategy, NEMAP and Chittagong Hill Tracts Development plan.

Goals and targets	Progress Towards the Target
Target 9.2. Protect the rights of indigenous and local communities over their traditional knowledge, innovations and practices, including their rights to benefit-sharing.	• Bangladesh has drafted Biodiversity and Community Knowledge Protection Act in order to provide legal basis for ensuring the conservation and sustainable use of biological and genetic resources and associated indigenous and local knowledge. The draft act has explicit objective to protect and support the rights, knowledge, innovations and practices of local and indigenous communities.
Focal Area-6: Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources	
Goal 10. Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources	
Target 10.1. All access to genetic resources is in line with the Convention on Biological Diversity and its relevant provisions.	• The National Biodiversity Strategy and Action Plan (NBSAP) also provides a framework for the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources of the country.
Target 10.2. Benefits arising from the commercial and other utilization of genetic resources shared in a fair and equitable way with the countries providing such resources in line with the Convention on Biological Diversity and its relevant provisions	• Necessary legal regime going to be developed in the line with ABS international regime
Focal Area-7: Ensure provision of adequate resources	
Goal 11: Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention	
Target 11.1. New and additional financial resources are transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with Article 20.	• New and additional financial resources are requested through international mechanism and internal resources
Target 11.2. Technology is transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with its Article 20, paragraph 4.	• Bangladesh is always emphasizing on transfer of technology for biodiversity conservation from the developed nations to biodiversity rich developing nations

CHAPTER V

Biodiversity Programme of Action 2020 (BPA 2020)

5.1 Introduction

Looking at the previous chapters of the document, a detailed accounting on the status, trends of changes and on-going threats or drivers of biodiversity loss as well as the achievements so far made by Bangladesh, in terms of conservation and management of biodiversity, be visualized. Furthermore, the document examines present status of implementation of NBSAP and assessed the progresses on 2010 Biodiversity Targets.

It has been revealed that the Action Plan as identified in NBSAP has to be updated with present understanding of the problems and solutions thereof. Considering the overall failures and successes, it is now a compelling necessity to design an ambitious but result-based future program of actions on biodiversity conservation. The development of the National Report has undergone a participatory process to identify the short and long term programmes to be undertaken for nine focal areas of biodiversity conservation in Bangladesh. These focal areas of biodiversity conservation were divided into various project activities and duration of implementation has been assessed along with indicative cost involvements. The project activities covered important habitats and ecosystems distributed all over the country. The program of action indicates timeframe to act upon and finally an implementation mechanism has also been outlined. Following are the focal areas upon which biodiversity programme of actions 2020 (BPA 2020) has been built on.

Focal Area 1:	Coastal and Marine Ecosystems Conservation
Focal Area 2:	Wetlands including Riverine Ecosystems and Fisheries Biodiversity Conservation
Focal Area 3:	Agro-ecosystem and Agricultural Biodiversity Conservation
Focal Area 4:	Hilly Ecosystems and Landscapes Conservation
Focal Area 5:	Forest Biodiversity and Conservation of Wildlife
Focal Area 6:	Biodiversity Conservation in the face of Climate Change
Focal Area 7:	Poverty Reduction through Fair and Equitable Sharing of Benefits
Focal Area 8:	Impact Assessment, Management and Monitoring
Focal Area 9:	Knowledge Management, Communication, Education and Public Awareness

Biodiversity Programme of Action 2020 (BPA 2020)

Table 5.1: Biodiversity Program of Action 2020 (BPA 2020)

Program Areas and Activities	Phase of Implementation											Indicative Resource Requirement in million BDT*
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Focal Area 1: Coastal and Marine Ecosystems Conservation												
Project 1: Study on present status of coastal and marine biodiversity with taxonomic inventory and identifying hotspots, which are not under conservation schemes.												20.00
Project 2: Coastal afforestation along the embankments/polders with suitable species												2000.00
Project 3: Co-management of marine fisheries towards ensuring sustainable use of fisheries resources												20.00
Project 4: Conservation of globally threatened Irrawaddy dolphins and other cetaceans, including finless porpoises, Indo-Pacific humpback dolphins, Indo-Pacific bottlenose dolphins and Bryde's whales, through the establishment of a network of protected areas in coastal waters off the Sundarbans and in the Swatch-of-No Ground submarine canyon												500.00
Project 6: Development of Guidelines/Regulations to ensure proper treatment and disposal of ballast water and sediments from marine ships in order to control IAS												10.00
Project 7: Strategic Environmental Assessment (SEA) of development activities and potential interventions in coastal and marine ecosystems												100.00
Project 8: Controlling land based pollution involving industrial proponents and local government agencies (under PPP mechanism).												100.00
Project 9: Provisioning of the alternative livelihoods for the communities living surrounding Sunderbans World Heritage Site												2000.00
Project 10: Updated study on the vegetation status and mapping of Sunderbans ecosystems												100.00
Project 11: Declaring Estuarine Ecologically Critical Area in river Baleshwar (from Sharonkhola to the mouth of Bay of Bengal) and conserve the area as estuarine sanctuary												200.00
Project 12: Augmentation of rivers and creeks of the Sundarbans												10000.00
Project 13: Establishment of geospatial database of coastal and marine biodiversity to address information gap in NRM												100.00
Focal Area 2:Wetlands including Riverine Ecosystems and Fisheries Biodiversity Conservation												
Project 1: Updated survey/study on the wetlands towards declaration and conservation of areas important to Biodiversity												100.00
Project 2: Development of Guidelines, Manuals and Rules-regulations for River and Wetlands Ecosystem management in participatory approach												50.00
Project 3: Community based wetland management with provisioning of livelihoods in all the declared wetlands.												500.00
Project 4: Identification and Controlling Point Sources of River Pollution for Conservation of Hilsha Fish Habitats in River ecosystems												500.00
Project 5: Conservation and sustainable management of Halda natural Fish Breeding ground												200.00
Project 6: Conservation of crocodiles in Brahmaputra and Madhumati floodplain												100.00
Project 7: Community based conservation and management of riverine habitats for Cetaceans like globally threatened Gangetic River dolphins and Irrawaddy dolphins												200.00

Program Areas and Activities	Phase of Implementation											Indicative Resource Requirement in million BDT*
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Focal Area 3: Agro-ecosystem and Agricultural Biodiversity Conservation												
Project 1: In-situ conservation of local varieties in the hot spots of rice growing areas by involving communities												100.00
Project 2: Community Based Conservation of hot-spots of mango, litchi and date palm enriched ecosystems in Meherpur, Jessore and Natore district by controlling unwarranted interventions (like brick burning).												100.00
Project 3: Community based management and in-situ conservation of medicinal plants in tea estates, hilly districts and other hot-spots												200.00
Project 4: Strengthening Gene Banks at BRRI and BARI and collection of all traditional germplasm into the Gene Banks.												200.00
Project 5: Development of marketing facilities of local varieties of crops, vegetables and pulses												500.00
Project 6: Development of genetic fingerprinting facilities and accomplish the finger printing of crop and medicinal plants												500.00
Project 7: Development of appropriate legal regime on biodiversity conservation, ITK ABS and IPR												15.00
Project 8: Development of biosafety infrastructures and implementation of NBF												100.00
Project 9: Conservation of pollinators and soil microorganisms (pilot project) in agri-potential areas												50.00
Project 10: Establishment of National Plant Genetic Resources Institute												500.00
Project 11: Collection and Conservation of under-utilized Crops/Plants												50.00
Project 12: Conservation of Chittagong Red Cow												200.00
Project 13: Conservation of Scavenging Poultry (Deshi Chicken)												100.00
Project 14: Conservation of Black Bengal Goat												200.00
Project 15: Community based Conservation of Khas land as nature reserve at Mouza level with appropriate legal mechanism to be established												300.00
Project 16: Community base Conservation of Riparian Vegetation: declaring buffer space along the river for no physical intervention except needed by the government												300.00
Project 17: Distribution of Appropriate Saplings and Raising Awareness Campaign for enrichment of homestead biodiveristy												200.00
Focal Area 4: Hilly Ecosystems and Landscape Conservation												
Project 1: Resource inventory and Strategic Environmental Assessment of development projects in the Chittagong Hill Tracts												50.00
Project 2: Community based management and in-situ conservation of medicinal plants in Chittagong Hill Tracts.												100.00
Project 3: Conservation of Indigenous Traditional Knowledge (ITK), cultural integrity and language involving local communities												100.00
Project 4: Plantation program in Chittagong Hill Tracts in denuded Hills involving communities												500.00
Project 5: Development of land use planning and protection of hilly terrain through appropriate measures (by constructing re tention wall, plantation, and drainage augmentation)												500.00

Program Areas and Activities	Phase of Implementation											Indicative Resource Requirement in million BDT*
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Project 6: Conser vation of bamboo and cane in hilly ecosystems of Bangladesh												600.00
Project 7: Establishment of Community based Gene Bank												50.00
Project 8: Conservation and Development of Goyal at CHT region												200.00
Project 9: Conservatio n and Development of Chittagong Asil Chicken												100.00
Focal Area 5: Forest Biodiversity and Conservation of Wildlife												
Project 1: Development of Guidelines and Monitoring Indicators in order to apply ecosystem approach towards forest biodiversity conservation												20.00
Project 2: Development of Guidelines for access and benefit sharing of forest genetic resources												15.00
Project 3: Updated inventory of forest resources and demarcation of forested areas all over the country												100.00
Project 4: REDD+ project involving communities in suitable forest areas												100.00
Project 5: Prevention of illegal hunting in the forest areas involving local communities												100.00
Project 6: Development of conservation based forest management system and mainstreaming conservation in all forest activities from grassroots to national level												100.00
Project 7: Development of Forest Management System with application of modern information technology for divisional offices to central level												200.00
Project 8: Restoration and management of lands in the coastal belts through plantation of suitable species												200.00
Project 9: Conduct detailed study to identify the biodiversity rich forest ec osystems to be declared and managed as protected areas												50.00
Project 10: Conduct a comprehensive inventory on genetic diversity for determining the status, distribution pattern, habitat, association and biology of the wildlives in Bangladesh												100.00
Project 11: Monitoring impacts of invasive alien species on forest ecosystems and develop regulatory measures to control their further spread												40.00
Focal Area 6: Biodiversity Conservation in the face of Climate Change												
Project 1: Identification of species threatened due to climate change, adoption of conservation strategies and implementation of long -term management plan for their survival												100.00
Project 2: Plantation of wind resistant tree species in th e coastal districts												200.00
Project 3: Integration of Climate Change consideration in Protected Area Management and other conservation efforts												15.00
Project 4: Introduction of climate resilient species suitable to conserve agricultural biodiversity												200.00
Project 5: Development of regulatory guidelines for adoption of ecosystem approach and biodiverisity conservation issues in implementing climate change mitigation and adaptation projects												30.00
Project 6: Deve lopment of a monitoring system to assess the long-term impacts of climate change on various ecosystems and species diversity												200.00

Program Areas and Activities	Phase of Implementation											Indicative Resource Requirement in million BDT*
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Focal Area 7: Poverty Reduction through Fair and Equitable Sharing of Benefits												
Project 1: Developing better cultivation and marketing facilities of medicinal plants												100.00
Project 2: Valuation of common property resources on family nutrition and livelihoods security												10.00
Focal Area 8:Impact Assessment, Impact Management and Monitoring												
Project 1: Study the impacts of habitat fragmentation on biodiversity and documentation for public awareness												10.00
Project 2: Assessment of impacts of river pollution on biodiversity in major rivers, such as Buriganga, Sitalakhya, Balu, Turag, Banshi, Padma, Meghna, Karnafuli, Bhairab -Rupsha-Pasur and development of a monitoring system at the institutional level												300.00
Project 3: Development and application of environmental management system for the industries which discharge wastes into the wetlands and rivers												50.00
Focal Area 9:Knowledge Management, Communication, Public Education, Awareness and Regulations												
Project 1: Development and Enactment of Biodiversity Conservation Act/Rules and Biosafety related Rules - regulations												20.00
Project 2: District -wise inventory of habitats, ecosystems and biological resources leading to develop national database and maps using GIS and Remote Sensing techniques												200.00
Project 3: Review the impact of Plant and Animal IAS and development of regulatory measu res to control their further spread												20.00
Project 4: Develop a handbook(s) on best practices in management of ecosystems/habitats in relation to wildlife, cultural heritage and landscape conservation												20.00
Project 5: Development of ethical code of conduct (Sui Generis System) for conservation of innovations, knowledge and practices												50.00
Project 6: National advocacy campaign to promote biodiversity conservation												50.00
Project 7: Develop a bio-matrix (information on biological components) of a river ecosystem as baseline for restoration of degraded river ecosystems												20.00
Total Resource Requirement for Implementation of BPA 2020 as estimated												**25235.00**

5.2 Implementation of BPA 2020

Bangladesh's economic stability, flourishment, in a word, its existence is heavily dependent on maintaining her life supporting ecosystems and biodiversity thereof. In this context, Biodiversity conservation demands to be the priority development agenda of the country. Designing the BPA 2020 addressed the most burning conservation issues of the country; those once fully implemented may yield substantial difference in terms of establishing a prosperous nation with its enriched natural resource base within 2020. Government of Bangladesh should incorporate BPA 2020 into its development planning systems. The relevant departments or agencies like the Department of Environment, Forest Department, Department of Fisheries, Department of Animal Resources have to incorporate relevant activities of BPA 2020 into the Sixth Five Year Plan as well as in the Annual Development Budgets of upcoming years.

A consultative process involving not only scientists or policy makers but also the community peoples conserving biodiversity at the grassroots should be followed in the development and implementation phases of the project items under BPA. Existence of a glorious country without having enough biological diversity is unimaginable. Government policy and planning has to provide special attention on sufficient resource allocation for conservation and sustainable management of biodiversity.

Global Environment Facility and all other development partners have to extend their hand for comprehensive implementation of the projects under BPA 2020. With the accelerated support of the government and development partners BPA 2020 will become a great success for Bangladesh.

Appendix 1

Status and Distribution of Threatened Animals of Bangladesh (Modified after IUCN Bangladesh 2000)

Status code: CR Critically Endangered, EN - Endangered, VU - Vulnerable
Distribution code: W-Wide, N- North; NE- North East; SE- South East; SW-Southwest, MEF-Mixed Evergreen Deciduous Forest, SB-Sundarbanss Mangrove Forest

Class: Amphibian (Total Number of Threatened Species: 8)

Sl. No.	Order	Family	Scientific Name	English Name	Local Name	Local Status	Global Status	Distribution
1.	Anura	Microhylidae	*Kaloula pulchra*	Painted Bull Frog	Venpu Bang	VU		SW, MEF
2.			*Microhyla ornata*	Ornate Microhylid	Cheena Bang	VU		W
3.			*Microhyla rubra*	Red Microhylid	Lal Cheena Bang	VU		W
4.			*Uperodon globulosus*	Balloon Frog	Potka Bang	EN		DF, MEF
5.		Ranidae	*Euphlyctis hexadactylus*	Green Frog	Sabuj Bang	EN		SB
6.			*Rana alticola*	Boulenger's Frog	Pana Bang	VU		W
7.			*Rana taipehensis*	Taipeh Frog	Gach Bang	EN		W
8.		Rhacophoridae	*Rhacophorus maximus*	Large Tree Frog	Baro Gecho Bang	VU		W

Class: Reptilia (Total number of Threatened Species:58)

Sl. No.	Order	Family	Scientific Name	English Name	Local Name	Local Status	Global Status	Distribution
I.	Crocodylia	Crocodylidae	*Croeovlus porosus*	Estuarine Crocodile	Lonapanir Kumir	CR		SB
2.		Gavialidae	*Gavialis gangetieus*	Gangetic G harial	Gharial	CR	EN	Padma
3.	Testudines	Bataguridae	*Batagur baska*	River Terrapin	Baro Kaitta	CR	EN	SB
4.			*Cuora amboinensis*	Malayan Box Turtle	Deeba Kasim	EN	LR	SE
5.			*Geoclemys hamiltonii*	Black Pond Turtle	Kalo Kasim	EN	DD	W
6.			*Hardella thurjii*	Brahminy River Turtle	Kali Kaitta	EN	LR	W
7.			*Kaehugo dhongoka*	Three -striped Roofed Turtle	Dhoor Kasim	EN	LR	Padma, Jamuna
8.			*Koehugo koehugo*	Painted Roofed Turtle	Kasim	CR	EN	Padma
9.			*Kaehugo smithii*	Brown Roofed Turtle	Baro Kori Kaitta	EN		Padma
10.			*Koehuga sylhetensis*	Assam Roofed Turtle	Sylhet Kachuga	EN	DD	Garo, Khasia Hills
11.			*Kachuga tentoria*	Median Roofed Turtle	Majhari Kaina	EN		W
12.			*Melanochelys tricarinata*	Three -keeled Land	Kasim	EN	VU	Dinajpur, Mymensingh
13.			*Melanochelys trijuga*	Indian Black Turtle	Kasim	EN	DD	W
14.			*Morenia petersi*	Yellow Turtle	Haldey Kaina	VU	LR	W

Appendices

Sl. No.	Order	Family	Scientific Name	English Name	Local Name	Local Status	Global Status	Distribution
15.		Testudinidae	*Indotestudo elongata*	Yellow -headed Tortoise	Halud Pahari Kasim	CR	VU	MEF
16.			*Manouria emys*	Asian Giant Tortoise	Pahari Kasim	CR	VU	MEF
17.		Trionychidae	*Aspideretes gangeticus*	Ganges Soft -shell Turtle	Khalua Kasim	EN		W
18.			*Aspideretes hurum*	Peacock -marked Softshell Turtle	Dhum Kasim	EN		W
19.			*Aspideretes nigricans*	Bostami Turtle	Bostami Kasim	CR	CR	Bostami pond in Chittagong
20.			*Chitra indica*	Asiatic Softshell Turtle	Sim Kasim	CR	VU	Padma, Jamuna
21.			*Lissemys punctata*	Spooned Flapshell Turtle	Shundhi Kasim	VU		W
22.		Cantorii	*Pelochelys bibroni*	Bibron's Softshell Turtle	Jata Kasim	CR	VU	SW (Estuaries)
23.	Lacertilia	Gekk onidae	*Gekko gecko*	Gecko	Tokkhak / Shanda	VU		W
24.			*Hemidaetylus bowringii*	House Lizard	Tiktiki	VU		East of Jamuna
25.		Agamidae	*Calotes rouxii*	Garden Lizard	Rokto chosha	VU		MEF
26.			*Draco blanfordii*	Flying Lizard/Draco	Uranta Tiktiki	CR		MEF
27.		Scincidae	*Mabuya dissimilis*	Stripped Skink	Anjon	VU		MEF
28.		Varanidae	*Varanus bengalensis*	Bengal Monitor	Gui Shap	VU		W
29.			*Varanus flaveseens*	Common Lizard	Sona Guil	EN		W
30.			*Varannus salvator*	Ring Lizard	Kalo Gui	EN		Coast
31.		Boidae	*Python molurus*	Rock Python	Ajagar	EN	LR	MEF, SB
32.			*Python reticulata*	Reticulated Python	Golbahar Ajagar	CR		MEF
33.		Colubridae	*Ahaetulla nasutus*	Common Vine Snake	Laodoga Shap	VU		W
34.			*Boiga cyanea*	Green Cat Snake	Sabuj Phonimonosha	VU		NE
35 .			*Cerberus rhynchops*	Dog-faced Water Snake	Jalbora Shap	VU		-
36.			*Chrysopelea ornata*	Ornate flying Snake	Kalnagini Shap	EN		W
37.			*Coluber mucosus*	Rat Snak Dhaman	Daraj / Dhaman	VU		W
38.			*Coluber nigromarginatus*	Green Rat Snake	Daraj	VU		W
39.			*Dendre!aphis pictus*	Painted Bronzeback Tree Snake	Geho Shap	VU		MEF
40.			*Dendrelaphis tristis*	Common Bronzeback Snake	Gecho Shap	VU		Forests, Woods

Appendices

Sl. No.	Order	Family	Scientific Name	English Name	Local Name	Local Status	Global Status	Distribution
41.	Serpentes		*Elaphe helena*	Common Trinket Snake	Dudhraj	EN		W
42.			*Elaphe rudiala*	Copper Had Trinket Snake	Dudhraj	EN		-
43.			*Lycodon aulicus*	Common Wolf Snake	Gharginni Shap Kaurialla	VU		W
44.		Dipsadidae	*Lycodon fasciatus*	Banded Wolf Snak	Gharginni Shap	VU		W
45.			*Lycodon jara*	Yellow speckled Wolf Snake	Gharginni Shap	VU		W
46.		Natrieida	*Mucropisthodon plumbicolor*	Green Keelback Snake	Sabuj Ohara	EN		MEF
47.		Dipsadida	*Oligodon cyclurus*	Cantor's Kukri Snake	Kukri / Bankaraj	VU		NW
48.			*Oligodon dorsalis*	Spot -tailed Kukri Snake	Kukri Bankaraj	VU		MEF
49.		Natricidae	*Rhabdophis subminiatus*	Red -necked Keelback	Laldhora Shap	VU		MEF
50.			*Xeiochrophis cerasogasler*	Dark -bellied Marsh Snake	Kalo Mete Dhora Shap	VU		Marshes
51.		Elapidae	*Bungarus caeruleus*	Common Krait	Kal Keotey	EN		W
52.			*Bungarus fasciatus*	Banded Krait	Shakini Shap	EN		W
53.			*Naja* kaouthia	Monocellate Cobra	Gokhra Shap	VU		W
54.			*Naja naja*	Binocellate Cobra	Khoia Gokhra	EN		W
55.			*Ophiophagus hannah*	King Cobra	Raj Gokhra	EN		SB, MEF
56.		Viperidae*	*Trimeresurus erythrurus*	Spot -tailed Pit Viper	Viper Shap	EN		MEF, SB
57.			*Trim* eresurus *gramineus*	Bamboo Pit Viper	Viper Shap	EN		MEF
58.			*Vipera russellii*	Russel's Viper	Chandrobora	CR		W

Class: Aves (Total number of Threatened species: 41)

Sl. No.	Order	Family	Scientific Name	English Name	Local Name	Local Status	Global Status	Distribution
1.	Galliformes	Phasianidae	*Francolinus francolinus*	Black Francolin	Kalo Titir	CR		NE, SE, NW
2.			*Francolinus gularis*	Swamp Francolin	Kea	CR	VU	Noakhali, SE
3.			*Lophura leucomelanos*	Kalij Pheasant	Kalo Mayor/ Mothura	EN	-	MEF
4.			*Perdicula manipurensis*	Manipur Bush Quail	Kalo Gundri	EN	VU	N, SE
5.			*Polypleclron bicalcaratum*	Grey Peacock Pheasant	Kat-Mayor	CR	-	MEF
6,	Anseriformes	Dendrocygnidae	*Cairina scumiala*	White-winged Duck	Bhadi Hans	CR	EN	Pablakhali (SE)
7.		Anatidae	*Sarkidiorn*is *melanolos*	Comb Duck	Buncha Hans	CR		W

Appendices

Class: Aves (Total number of Threatened species: 41)

Sl. No.	Order	Family	Scientific Name	English Name	Local Name	Local Status	Global Status	Distribution
8.	Piciformes	Picidae	*Dendrocopos hyperythrus*	Rufous-bellied Woodpecker	Kaththokra	VU		SE
9.	Bucerotiformes	Bucerotidae	*Anthracoceros albirostris*	Oriental Pied Hornbill	Kao Dhanesh	EN		MEF
10.			*Buceros bieornis*	Great Hornbill	Raj Dhanesh	CR		MEF
11.			*Ocyceros birostris*	Indian Grey Hornbill	Putial Dhanesh	EN		N
12.	Trogoniformes	Trogonidae	*Harpactes erythrocephalus*	Red-headed Trogon	Lal Trogon/Kuchkuchia	EN		MEF
13.	Coraciiformes	Coraciidae	*Eurystomus orientalis*	Dollarbird	Pahari Nilkantha	CR		MEF, Jamalpur
14.		Alcedinidae	*Alcedo hercules*	Blyth's Kingfisher	Maachranga	EN	VU	SB, MEF
I5.		Halcyonidae	*Halcyon eoromandra*	Ruddy Kingfisher	Lal Maachranga	VU		SB
16.	Cuculiformes	Centropodidae	*Phaenicophaeus leschenaultii*	Sirkeer Malkoha	Kokil	EN		NW, Chittagong
17.	Psittaciformes	Psittacidae	*Psittacula eupatria*	Alexandrine Parakeet	Chondonal Baro ria	CR		MEF
18.	Strigiformes	Strigidae	*Bubo nipalensis*	Spot-bellied Eagle Owl	Pencha	EN	LR	MEF
19			*Ketupa flavipes*	Tawny Fish Owl	Pencha	EN	VU	Coastal islands, St, M
20.			*Ketupa zeylonensis*	Brown Fish Owl	Bhutum Pencha	VU		W
21.	Caprimulgiformes	Caprimulgidae	*Caprimulgus indicus*	Grey Nightgar	Dinkana/Ratchara	EN		W
22.	Columbiformes	Columbidae	*Columba punicea*	Pale-capped Pigeon	Pahari Ghughu	CR	VU	MEF
23.			*Treron apicauda*	Pin-tailed Green Pigeon	Horial / Harikol	CR		MEF (Srimangal, Rema-Kalenga)
24.	Gruiformes	Heliornithidae	*Heliopais personata*	Masked Finfoot	Goilo Hansh	EN	VU	SB
25.	Ciconiiformes	Charadriidae	*Vanellus duvaucelii*	River Lapwing	Hot-titi	EN		Padma, coast
26.		Laridae	*Rynchops albicollis*	Indian Skimmer	Panikatal Jolkhor	EN	VU	Coast, large Rivers
27.			*Sterna acuticauda*	Black-bellied Tern	Gangchil	EN	VU	W
31.		Anhingidae	*Anhinga melanogaster*	Darter	Shap -pakhi	VU	LR	W
32.		Ardeidae	*Gorsachius melanoplus*	Malayan Night Heron	Bagha Bok	CR		W
33.		Threskiornithidae	*Platalea leucorodia*	Eurasian Spoonbill	Kodali Bok	CR		Coast, Padma

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Sl. No.	Order	Family	Scientific Name	English Name	Local Name	Local Status	Global Status	Distribution
34.			*Leptoptilos dubious*	Greater Adjutant	Hargila	CR	EN	Wetlands
35.		Ciconiidae	*Leptopti los javanicus*	Lesser Adjutant	Modontak	EN	VU	W
36.			*Mycteria leucocephala*	Painted stork	Rangila Bok	CR	LR	Coast,SB
37.		Muscicapidae	*Cochoa perpurea*	Purple Cochoa	--	EN		SE
38.	Passeriformes	Sylviidae	*Garrulax galbanus*	Yellow - throated Laughingthrush	Pa nga	CR	LR	MEF
39.			*Paradoxornis flavirostris*	Black -breasted Parrotbill	--	CR	VU	MEF
40.			*Pellorneum albiventre*	Spot -throated Babbler	Shatbhaila	CR		MEF
41.		Nectariniidae	*Arachnothera magna*	Streaked Spiderhnnter	--	EN		Hill forests

Threatened Birds of Bangladesh in Picture

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Black Francolin, male

© WTB/Enam Ul Haque

Swamp Francolin

© Ronald Halder

Kalij Pheasent male

© WTB/Enam Ul Haque

Grey Peacock Pheasant (male)

© WTB / Gawsia Wahidunnessa Chowdhury

White-winged Duck

© Nikhil Devasar

Knob-billed Duck

© Nikhil Devasar

Rufous-bellied Woodpecker

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Great Hornbill

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Indian Grey Hornbill

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Red-headed Trogon

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Oriental Dollarbird

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Blyth's Kingfisher

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Sirkeer Malkoha

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Alexandrine Parakeet

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Spot-bellied Eagle-Owl

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Tawny Fish Owl

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Pale-capped Pigeon

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Pin-tailed Green Pigeon

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Masked Finfoot

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River Lapwing

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Indian Skimmer

Appendices

© Rich Andrews

Black-bellied Tern

© WTB/Enam Ul Haque

White-bellied Sea Eagle

© WTB/Enam Ul Haque

Pallas's Fish Eagle (adult)

© Mike Prince

Red-Headed Vulture

© WTB/Enam Ul Haque

Darter

© WTB/Enam Ul Haque

Black-crowned Night Heron

© WTB/Enam Ul Haque

Eurasian Spoonbill

© Sirajul Hosain

Greater Adjutant

© Zahangir Alom

Lesser Adjutant

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Painted Stork

© Jiangtian Dong

Purple Cochoa

© Bjorn Anderson

Yellow-throated Laughingthrush

Black-breasted Parrotbill

Spot-breasted Parrotbill

Streaked Spiderhunter

Class: **Mammalia** (Total number of Threatened species: 40)

Sl. No.	Order	Family	Scientific Name	English Name	Local Name	Local Status	Global Status	Distribution
1.	Primates	Loridae	*Nycticebus coucang*	Slow Loris	Lajuk Banor	CR		MEF
2.		Cercopithecidae	*Macaca fascicularis*	Crab-eating Macaque	Lombaleji Banor	CR	LR	Cox's Bazar
3.			*Macaca mulatta*	Rhesus Macaque	Banor	VU	LR	W
4.			*Macaca nemestrina*	Pig-tailed Macaque	Kulu Bandor	CR	VU	NE
5.		Colobidae	*Semnopithecus entellus*	Common Langur	Hanuman	CR	LR	Greater Jessore and Kushtia
6.			*Trachypithecus phayrei*	Phayre's Langur	Kalo Hanuman	CR	DD	NE
7.			*Trachypithecus pileatus*	Capped Langur	Mukhpora Hanuman	EN	VU	DF, MEF
8.		Hylobatidae	*Hylobates hoolock*	Hoolock Gibbon	Ulluk	CR	DD	MEF
9.	Carnivora	Canidae	*Canis aureus*	Asiatic Jackal	Pati Shial/Shial	VU		W
10.			*Cuon alpinus*	Asiatic Wild Dog	Ram Kuttal Dhole	CR	VU	SE
11.			*Vulpes bengalensis*	Bengal Fox	Khek Shial	VU	DD	W
12.		Felidae	*Felis chaus*	Jungle Cat	Ban Biral	EN		W
13.			*Catopuma temmincki*	Asiatic Golden Cat	Sonali Biral	CR	LR	SE
14.			*Neofelis nebulosa*	Clouded Leopard	Gecho Bagh	CR	VU	MEF
15.			*Panthera pardus*	Leopard/Panther	Chita Bagh	CR		MEF
16.			*Panthera tigris*	Royal Bengal Tiger	Bagh	CR	EN	SB
17.			*Prionailurus viverrinus*	Fishing Cat	Mecho Bagh	EN	LR	W
18.		Herpestidae	*Herpestes edwardsi*	Common Mongoose	Bara Benji	VU		W
19.			*Herpestes urva*	Crab-eating Mongoose	Kakrabhuk Benji	EN		SE

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Sl. No.	Order	Family	Scientific Name	English Name	Local Name	Local Status	Global Status	Distribution
20.		Mustelidae	*Aonyx cinerea*	Oriental Small - clawed Otter	Ud Biral	EN	LR	Coasts, Khagrachari
21.			*Lutra lutra*	Common Otter	Ud Biral	CR		Greater Sylhet & Mymensingh
22.			*Lutra perspicllata*	Smooth - coated Otter	Ud Biral	EN	VU	W
23.		Ursidae	*Ursus malayanus*	Sun Bear	Bhalluk	CR	DD	MEF
24.			*Melursus ursinus*	Sloth Bear	Bhalluk	CR	VU	MEF
25.			*Ursus thibetanus*	Asiatic Black Bear	Kalo Bhalluk	EN	VU	MEF
26.		Viverridae	*Arctictis binturong*	Bear Cat	Gecho Bhalluk	CR		MEF
27.			*Paradoxurus hermaphroditus*	Common Palm Civet	Gandho Gokul	VU		W
28.			*Vivera zibetha*	Large Indian Civet	Bagdash	EN		W
29.			*Viverricula indica*	Small Indian Civet	Khatash	VU		W
30.	Cetacea	Delphinidae	*Orcaella brevirostris*	Irrawaddy River Dolphin	Shishu / Shushuk	CR		SB
31.			*Peponocephala electra*	Melon - headed Dolphin	Shishu / Shushuk	CR		Coastal islands, SB
32.		Phocoenidae	*Neophocaena phocaenoides*	Finless Porpoise	Shishu / Shushuk	EN	DD	SB
33.		Platanistidae	*Platanista gangetica*	Ganges River Dolphin	Shishu / Shushuk	EN	EN	W
34.	Proboscidea	Elephantidae	*Elephas maximus*	Asian Elephant	Hati	CR	EN	MEF
35.	Artiadactyla	Cervidae	*Cervus unicolor*	Indian Sambar	Sarnbar	CR		MEF
36.			*Muntiacus munljak*	Barking Deer	Maya Harin	EN		DF, MEF, SB
37.		Bovidae	*Capricornis sumatraensis*	Mainland Serow	Ban Chagal	CR	VU	MEF, Garo Hills
			Bos frontal is	Mithun	Gayal	EN	EN	SE
38.	Pholidota	Manidae	*Manis crassicaudata*	Indian Pangolin	Banruil Pipilikabhuk	CR	LR	SE
39.	Rodentia	Hystricidae	*Hystrix indica*	Indian Crested Porcupine	Shojaru	EN		W
40.	Lagomorpha	Leporidae	*Lepus nigricollis*	Rufous-tailed Hare	Khargosh/ Shashak	EN		W

Appendices

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Slow Loris

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Phayre's Langur

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Rhesus Macaque

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Pig-tailed Macaque

© WTB/Samiul Mohsanin

Capped Langur

© WTB/Samiul Mohsanin

Hoolock Gibbon

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Asiatic Jackal

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Tiger

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Asian Elephant

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Crab-eating Mongoose

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Asiatic Black Bear

Appendix-2

Status and Distribution of Threatened Inland Fishes of Bangladesh ((Modified after IUCN Bangladesh, 2000)

Status code: CR - Critically Endangered, EN - Endangered, VU - Vulnerable3
Distribution code: W-Wide; N-North; NE-Northeast; SE-Southeast; B-Beels, Haors, Baors, Ponds, Ditches (closed water bodies of different sizes); R-Rivers, Streams, Canals; Et-Estuaries, Tidal Rivers, Creeks; FP-Floodplains

Total Number of Threatened Species: 54

Class: Osteichthyes

Sl. No.	Order	Family	Scientific Name	English Name	Local Name	Local Status	Global Status	Distribution
I.	Osteoglossi-formes [Clupei-formes]	Notopteri-dae	*Notopterus chitala* (Hamilton-Buchanan, 1822)	Humped Featherback	Chital	EN	--	
2.			*Notopterus notopterus* (Pallas, 1769)	Grey Featherback	Foli/Pholoi	VU	--	W
3.	Anguilli-formes	Anguillidae	*Anguilla bengalensis* (Gray, 1831)	Indian Long fin Eel	Bamosh/ Baneharal /Bao Baim/Telkoma	VU	--	Et,R
4.	Cyprini-formes	Cyprinidae	*Bari/iusbendelisis* (Hamilton-Buchanan, 1822)	Hamilton's Barila	Joial Hiralul Koksi Tilai Chedra	EN	--	R(N)
5.			*Barilius vagra* (Hamilton-Buchanan, 1822)	Vagra Baril	Koksai Khoksa	EN	--	R (Dinajpur)
6.			*Bengala elanga* (Hamilton-Buchanan, 1822) [Rasbora elanga (Hamilton-Buchanan, 1822)]	Bengal Barb	Along Sephatia	EN	--	R
7.			*Chela laubuca* (Hamilton-Buchanan, 1822)	Indian Glass-barb! Indian Hatchet Fish! Winged Danio	Laubucal Kash Khaira	EN	--	W
8.			*Cirrhinus reba* (Hamilton-Buchanan, 1822) [Cirrhinareba Day, 1877]	Reba Carp	Raikffatk inil BataiLaachol Bhagna	VU	--	W
9.			*Crossocheilus latius* (Hamilton-Buchanan, 1822)	Gangetic Latia	Kalabata	EN	--	ER
10.			*Labeo bata* (Hamilton-Buchanan, 1822)	Bata Labeo	Bhangon Bata/Bata	Status EN	Status --	R
11.			*Labeo boga* (Hamilton-Buchanan, 1822)	Boga Labeo	Bhanganl Bhangan Bata	CR	--	R

Appendices

Sl. No.	Order	Family	Scientific Name	English Name	Local Name	Local Status	Global Status	Distribution
12.			*Labeo calbasu* (Hamilton-Buchanan, 1822)	Black RohuJ Kalbasu	Kalibaus/Bausl Kalia	EN	--	W
13.			*Labeo gonius* (Hamilton-Buchanan, 1822)	Kuria Labeo	Goni/Kurchii GhannyaiGhonia/ Ghainna	EN	--	W
14.			*Labeo nandina* (Hamilton-Buchanan, 1822)	Nandi Labeo	NandinalNandill Nandi	CR	--	UP
15.			*Labeo pangusia* (Hamilton-Buchanan, 1822)	Pangusia Labeo	Ghora Muikha/ Ghora Maach/ Longu Rui	CR	--	R
16.			*OSleobrama cotio* (Hamilton-Buchanan, 1822) [Rohlee colio (Hamilton-Buchanan, 1822)]	Cotio	Dhela/Dhipalil Ketil Mauwa/Lohasura	EN	--	W
17.			*Puntius sarana* (Hamilton-Buchanan, 1822)	Olive Barb	Sarpuntil Sarnapuntil Saralpunti/Kurti	CR	--	W
18.			*Puntius ficlo* (Hamilton-Buchanan, 1822)	Firefin Barbl Two-spot Barbl Tictо Barb	Tit Punti	VU	--	W
19.			*Raiamas bola* (Hamilton-Buchanan, 1822) [Bari/ius bola (Hamilton-Buchanan, 1822)]	Indian Trout	Bhol/Bol	EN	--	R
20.			*Rasbora rasbora* (Hamilton-Buchanan, 1822)	Gangetic Scissortail Rasbora	Darkina/Leuzza Darkina	EN	--	W
21.			*Tor tor* (Hamilton-Buchanan, 1822)	Tor Mahseer	Tor Mahaseer/MahasholIMohal/ Mashol Maach	CR	--	N.SE
22.		Cobitidae	*Botia dario* (Hamilton-Buchanan, 1822)	Necktie Loach	Rani/Beti/Botya	EN	--	W
23.			*Bofia /ohachata* Chaudhuri, 1912	Y-Ioach	Rani/Putul/Beti	EN	--	R
24.	Siluriformes [Cyprini-formes]	Bagridae	*Aorichthys aor* (Hamilton-Buchanan, 1822) [Myslus aor (Hamilton-Buchanan, 1822)]	Long-whiskered Catfish -	Ayer/Aor	VU	--	W

Appendices

Sl. No.	Order	Family	Scientific Name	English Name	Local Name	Local Status	Global Status	Distribution
25.			*Aorichthys seenghala* (Sykes, 1841) [Mystus seenghala (Sykes, 1841)]	Giant River - catfish Tengaral Seenghari	Guizzal Guizza Ayer	EN	--	W
26.			*Batasio tengana* (Hamilton - Buchanan, 1822)	Assamese Batasio	Tengra	EN	--	R
27.			*Mystus cavasius* (Hamilton - Buchanan, 1822)	Gangetic Mystus	Kahashi - tengra Goishal Goisha - tengra	VU	-	W
28.			*Rita rita* (Hamilton - Buchanan, 1822)	Rita	Rita	CR	-	Et, R
29.		Siluridae	*Ompok* bimaculatus (Bloch, 1797)	Indian Butter Catfish	Kani Pabda Boali Pabda	EN	-	W
30.			*Ompok pobda* (Hamilton - Buchanan, 1822)	Pabdah Catfish	Modhu Pabda! Pabda	EN	_	W
31.			*Ompok pabo* (Hamilton - Buchanan, 1822)	Pabo Catfish	Pabda	EN	-	R, B
32.		Schilbeidae	*Ailia punctata* (Day, 1871)[Ailiichthys punctata Day, 1871	Jamuna Ailia	Kajulil Baspata	VU	-	R
33.			*Clupisoma garua* (Hamilton - Buchanan, 1822)	Garua Bachal Guarchcha	Ghaura	CR	-	W
34.			*Eutropiichthys vacha* (Hamilton - Buchanan, 1822)	Batchwa Bacha	Bacha	CR	-	W
35.			*Silonia silondia* (Hamilton - Buchanan, 1822)	Silondia Vacha	Shillong	EN	--	Et, R
36.		Pangasiidae [Schilbeidae]	*Pangasius pangasius* (Hamilton - Buchanan, 182 2)	Pungas	Pungus	CR	-	Et, R
37.		Sisoridae	*Bagarius yarrellii Sykes, 1841* [Previously referred as Bagarius bagarius (Hamilton - Buchanan, 1822)]	Gangetic Goonch	Baghair	CR	-	W
38.			*Sisor rhabdopharus* Hamilton - Buchanan, 1822	Sisor Catfish	Sisor/Chenua	CR	-	R (N)

Appendices

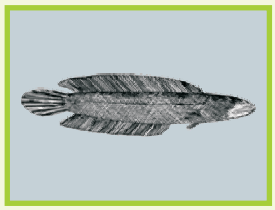
Sl. No.	Order	Family	Scientific Name	English Name	Local Name	Local Status	Global Status	Distribution
39.		Chacidae	*Chaca chaca* (Hamilton-Buchanan, 1822)	Indian Chaca	ChekaiChaga	EN	--	W
40.		Plotosidae	*Plotosus canius* Hamilton-Buchanan, 1822	Canine Catfish-eel	Gang Magurl Kan Magur	VU	-	Et, B
41.	Cyprinodon-tiformes [Beloni-formes]	Hemiram-phidae	*Dermogenys* pusillus van Hassell, 1823	Wrestling Halfbeak	Ek Thota	EN	--	R (Karnaph uli)
42.	Syngnathi-formes	Syngnathi-dae	*Microphis deocata* (Hamilton-Buchanan, 1822)	Deocata Pipetish	Kota Kumirer Khil/ Kumirer Khil	EN	--	R (N)
43.	Synbranc-hiformes	Synbranc-hidae	*Monopterus cuchia* (Hamilton-Buchanan, 1822)	Gangetic Mudeel/Cuchia	KuichalKuchiai Kunche	VU	--	W
44.	Perciformes	Ambassid ae [Centropo m-idae]	*Chanda nama* Hamilton-Buchanan, 1822	Elongate Glass-perchlet	Chandal Nama Chanda	VU	--	W
45.			*Pseudambassis ranga* (Hamilton-Buchanan, 1822) [Chanda ranga Hamilton-Buchanan, 1822]	Indian Glassy Fish	Chandal Ranga-chandal Lal Chanda	VU	--	W
46.		Scatopha gi-dae	*Scatophagus argus* (Linnaeus, 1766)	Spotted Scat	Bishtara	EN	--	Et
47.		Nandidae	*Nandus nandus* (Hamilton-Buchanan, 1822)	Mottled Nandusi Mud Perch	Meni/Bhedal Bhedary	VU	--	W
48.		Nandidae [Pristole-pidae]	*Badis badis* (Hamilton-Buchanan, 1822)	BadisiDwarf Chameleontish	Napit Koi/ Koi Bandi	EN	--	W
49.		Belontiidae [Anaban-tidae]	*Ctenops nobilis* McClelland,1845	Indian Paradisetish	Neftani	EN	--	W
50.		Channidae	*Channa barca* (Hamilton-Buchanan, 1822)	Barca Snakehead	Pipla Sholl Tila Shol/Tila	CR	--	B
51.			*Channa marulius* (Hamilton-Buchanan, 1822)	Giant Snakehead	Gajar/Gajal	EN	--	B (Mymen-singh, Sylhet)
52.			*Channa orientalis* Bloch & Schneider, 1801	Asiatic Snakehead	TeloTaki/ Gachual Ragai Cheng	VU	--	B
53.		Mastacem-belidae	*Macrognathus aral* (Bloch and Schneider, 1801) (Not *Macrognathius aculeatus* (Day, 1876)	One-stripe Spinyeel	Tara Baim	VU	DO	W
54.			*Mastacembalus armatus* (Lacepede, 1800)	Tire-track Spinyeel	Baimi Sal Baim/ Bam	EN	--	W

N. B. Previous names are given in square brackets Classifications are given in brackets

Appendices

Some Threatened Freshwater Fishes of Bangladesh (IUCN 2000)


Clown Knife Fish *(Chitala chitala)*

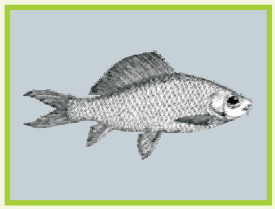


Barca Snakehead *(Channa barca)*

Garua Bacha *(Clupisoma garua)*

Batchwa Vacha *(Eutropiichthys vacha)*


Boga Labeo *(Labeo boga)*



Nandi Labeo *(Labeo nandina)*


Pangusia Labeo *(Labeo pangusia)*

Pungas *(Pangasius pangasius)*


Badis *(Badis badis)*

Hamilton's Barila
(Barilius bendelisis)

Hill Trout *(Barilius vagra)*

Draft Catfish *(Batasio tengana)*


Olive Barb *(Puntius sarana)*

Rita *(Rita rita)*

Sisor Catfish
(Sisor rhabdophorus)

Tor Mahseer *(Tor tor)*


Bengala Barb *(Bengala elanga)*

Queen Loach *(Botia dario)*

Y-loach *(Botia lohachata)*

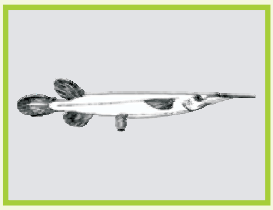
Squarehead Catfish *(Chaca chaca)*


Giant Snakehead
(Channa marulius)

Indian Grass Barb
(Chela laubuca)

Gangetic Latia
(Crossocheilus latius)

Indian Paradisefish
(Ctenops nobilis)



Wrestling Halfbeak
(Dermogenys pusillus)

© AKA Rahman

Bata Labeo *(Labeo bata)*

© WTB/M Anwarul Islam

Black Rohu *(Labeo calbasu)*

© AKA Rahman

Kuria Labeo *(Labeo gonius)*

© WTB/M Anwarul Islam

Tire-track Spiny Eel
(Mastacembelus armatus)

© WTB/M Anwarul Islam

Deocata Pipefish
(Microphis deocata)

© AKA Rahman

Butter Catfish
(Ompok bimaculatus)

© WTB/Gawsia W Chowdhury

Pabdah Catfish
(Ompok pabda)

© WTB/M Anwarul Islam

Pabo Catfish *(Ompok pabo)*

© AKA Rahman

Cotio *(Osteobrama cotio)*

© WTB/M Anwarul Islam

Indian Trout *(Raiamas bola)*

© AKA Rahman

Gangetic Scissortail Rasbora
(Rasbora rasbora)

© AKA Rahman

Spotted Butterfish
(Scatophagus argus)

© WTB/M Anwarul Islam

Silond Catfish
(Silonia silondia)

© AKA Rahman

Giant river catfish
(Sperata seenghala)

Appendix-3
List of Exotic Fish species Introduced in Bangladesh

Scientific Name	Common English Name	Country of Origin
Aristichthys nobilis	Bighead Carp	China
Barbonymus gonionotus	Java Barb	Thailand
Ctenopharyngodon idella	Grass Carp	China, Russia
Cyprinus carpio	Common Carp	China
Hypophthalmichthys molitrix	Silver Carp	China
Mylopharyngodon piceus	Black Carp	China, Russia
Pangasius hypophthalmus	Sutchi Catfish	Thailand, Laos
Oreochromis mossambicus	Tilapia	Africa
Oreochromis niloticus	Nile Tilapia	Africa
Pygocentrus nattereri	Red Piranha	South America
Piaractus brachypomus	Red bellied Pacu	South America
Clarias gariepinus	North African Catfish	Africa
Trichogaster pectoralis	Siamese Gourami	Thailand

Source: IUCN Bangladesh (2000e)