Fourth National Report to the Convention on Biological Diversity

Maldives

Ministry of Housing and Environment

2010

FOURTH NATIONAL REPORT TO THE CONVENTION ON BIOLOGICAL DIVERSITY MALDIVES

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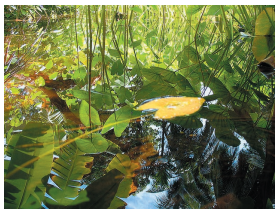
Acronyms

AEC Atoll Ecosystem Conservation Project
CBD Convention on Biodiversity
DNP Department of National Planning, Maldives
EIA Environmental Impact Assessment
FAO Food and Agriculture Organisation
GCRMN Global Coral Reef Monitoring Network
GDP Gross Domestic Product
ICAO International Civil Aviation Organisation
IFAD International Fund for Agricultural Development
IPCC Intergovernmental Panel on Climate Change
IRRM Integrated Reef Resources Management
IUCN International Union for Conservation of Nature
LUP Land Use Plans
MCS Monitoring, Control and Surveillance
MEEW Ministry of Environment Energy and Water
MEMP Maldives Environmental Management Project
MHAHE Ministry of Home Affairs Housing and Environment
MNDF Maldives National Defence Force
MRC Marine Research Centre
MoE Ministry of Education
MoFA Ministry of Fisheries and Agriculture
MoHE Ministry of Housing and Environment
MoFAMR Ministry of Fisheries Agriculture and Marine Resources
MRf Maldivian Rufiyaa
MSY Maximum Sustainable Yield
NAPA National Adaptation Program of Action
NBSAP National Biodiversity Strategy and Action Plan
NCIT National Centre for Information Technology
NPC National Planning Council
UCSUSA Union of Concerned Scientists (USA) (Citizens and Scientists for Environmental Solutions)
VMS Vessel Monitoring System

EXECUTIVE SUMMARY



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Introduction

Maldives has a rich marine biodiversity. The biological diversity of the large demersal fish and plankton in the deep blue ocean gives way to atolls with coastal reefs built of live coral and its associated reef fish and marine fauna. The atolls consist of lagoons with faros and patch reefs and different corals including branching corals. The islands are made up of coral sand. Due to the small size of the islands, terrestrial biodiversity is limited, even though it is varied.

Status, Trends and Threats to Biodiversity

The pristine marine ecosystems of Maldives are being threatened by natural factors like climate change and related factors like coral bleaching. It is also threatened by anthropogenic activity like tourism and over-exploitation without consideration to biodiversity. The ecological zones in Maldives include the ocean and deep sea, coastal and reef systems, the mangroves, the wetlands and the terrestrial (island) systems.

A clear record of the status of, trends in and threats to biological diversity of life in the Maldives is not available. The present records indicate that Maldives has a total of 1,100 species of demersal and epipelagic fish including sharks, 5 types of marine turtles, 21 species of whales and dolphins, 187 species of corals and 400 species of mollusks. There are 120 species of copepods, 15 species of amphipods, over 145 species of crabs and 48 species of shrimps. There are also 13 species of mangroves and 583 species of vascular plants. Additionally, two species of fruit bats (mammals) which are endemic have been found. The bird species number 170 of which most are sea birds: seventy of these birds are protected.

The major trends in the systems include the threats as well. The major threats include climate change, coral bleaching, habitat modification and over-exploitation. Pollution from uncontrolled waste disposal and untreated sewage are major threats to the biodiversity of the Maldives. However, turtle and shark fishing have been banned, and so has coral mining.

National Biodiversity Strategy and Action Plan

Maldives prepared a National Biodiversity Strategy and Action Plan (NBSAP) in 2002. Since its compilation, NBSAP has guided the planning and policy-making process in terms of biodiversity. Government agencies like the Environmental Protection Agency (EPA) (formerly Environmental Research Centre, ERC) and the Marine Research Centre (MRC) have done a considerable amount of work in biodiversity-related areas including protection (by EPA). However, lack of resources and human capacity has limited the extent to which NBSAP has been implemented. NBSAP needs revising to take into account changes that have occurred since its inception.

Mainstreaming Biodiversity

Biodiversity issues have been incorporated into national and sector plans and policies. There is a greater awareness among the policy makers and the public on biodiversity issues. All major projects require an EIA which has a list of biodiversity components and concerns that need to be addressed by the proponent. Turtle and shark fishing has been banned. Felling of large trees older than 50 years is prohibited. Ministry of Education has incorporated environmental and biodiversity issues into the Environmental Studies subject taught in primary schools. MoHE and EPA have been involved in habitat conservation measures, establishing protected areas and developing management systems and regimes. EPA has also drawn up a list of sensitive areas and species for eventual protection.

Progress towards the 2010 Targets

Maldives adopted the global framework of 2010 biodiversity targets and did not set any national targets, although progress has been made towards these targets. However, due to the absence of a biodiversity database, it was difficult to report on the status, trends and progress in the thematic areas. Protected areas and species have included marine, coastal, reef, island and mangrove areas. A lot more needs to be done to record, conserve and protect the biodiversity of the Maldives.

GEF has provided grants for environmental protection and biodiversity conservation. Conservation measures are being carried out in Baa atoll through the Atoll Ecosystem Conservation Project funded by GEF: many biodiversity conservation measures including protecting marine areas and islands in Baa Atoll and preparing reports on valuing biodiversity have been carried out through this project.

Maldives is threatened by climate change. The National Adaptation Plan of Action, the National Sustainable Development Strategy and the policy on achieving Carbon neutrality by 2020 are measures to mitigate its impact and to maintain and enhance the resilience of the environmental and biodiversity components to climate change.

To facilitate implementation of the Cartagena Protocol, the Maldives National Biosafety Framework was developed in 2006. A quarantine centre which also supports in this work has been established, although poor capacity has hampered implementation of NBSF

Conclusions

Impact of the implementation of the Convention on improving conservation and sustainable use of biodiversity

The implementation of the goals and objectives of the Convention on Biodiversity in Maldives have been achieved through the implementation of the National Biodiversity Strategy and Action Plan (NBSAP). The overall assessment of the impact indicates that NBSAP has effectively contributed to the protection,

conservation and sustainable use of biodiversity in the Maldives. It has contributed to:

- incorporation of biodiversity conservation measures into plans and policies at national and sector levels;
- providing a basis for and a direction to biodiversity conservation discussions, measures and implementation; and
- raising awareness of biodiversity issues.

The genetic resources available in the Maldives are not known. Therefore, the question on fair and equitable sharing of the benefits arising out of the utilization of genetic resources in Maldives cannot be answered properly.

Lessons learned regarding implementation

Implementation of the National Biodiversity Strategy and Action Plan has inculcated an awareness of the urgency to address biodiversity issues in the Maldives. Examples of successful actions taken include:

- incorporation of biodiversity conservation issues into national and sectoral plans, policies and strategies;
- increase in the protection of species, habitats and areas;
- banning of activities detrimental to biodiversity conservation (e.g. coral mining, shark fishing, etc);

Examples of less successful actions taken include:

- monitoring and evaluation aspects of the plans and policies;
- institutional capacity building, which includes weakness in development of, and uncertainty in, sustainability and stability of institutions, especially in technical wings including the research and development branches which are necessary if a scientific and technical convention such as CBD is to be implemented properly; and
- Attempts to coordinate and implement some biodiversity conservation and protection actions.

Future priorities and capacity-building needs

As a future priority for further national-level implementation of the Convention, the following actions need to be considered for biodiversity conservation across the nation.

- A greater focus on key priorities. Priority action needs to be attended to first.
- Making the objectives and actions time-bound: currently there are no time limits for the achievement of the objectives or implementation of the actions.
- Identifying who is responsible to implement the action or at least the lead person or agency

responsible so that it becomes part of their mandate. When multiple agencies are responsible then there is no specific agency to initiate or lead and if one of the agencies initiates then others may leave the organization and management of all the activities to that agency, which may not be so convenient.

- Human resource development needs to focus on specific professions including but not limited to environmental scientists, ecologists, taxonomists, molecular biologists, agronomists, environmental monitoring and evaluation specialists, environmental lawyers, etc.
- Better understanding of the climate change and biodiversity inter-linkages at national level.
- Climate change adaptation and mitigation with a view to avoiding potential threats to biodiversity from climate change.

In general, as mentioned earlier, Maldives has made progress in implementing the goals and targets in the Convention on Biodiversity. More can be done with better human and institutional capacity and financial resources. There is a will in the environmental and related sectors. Maldives needs the way and the means to conserve and protect its rich and unique biodiversity.



Photo: Ahmed Zahid | www.ahmedzahid.com

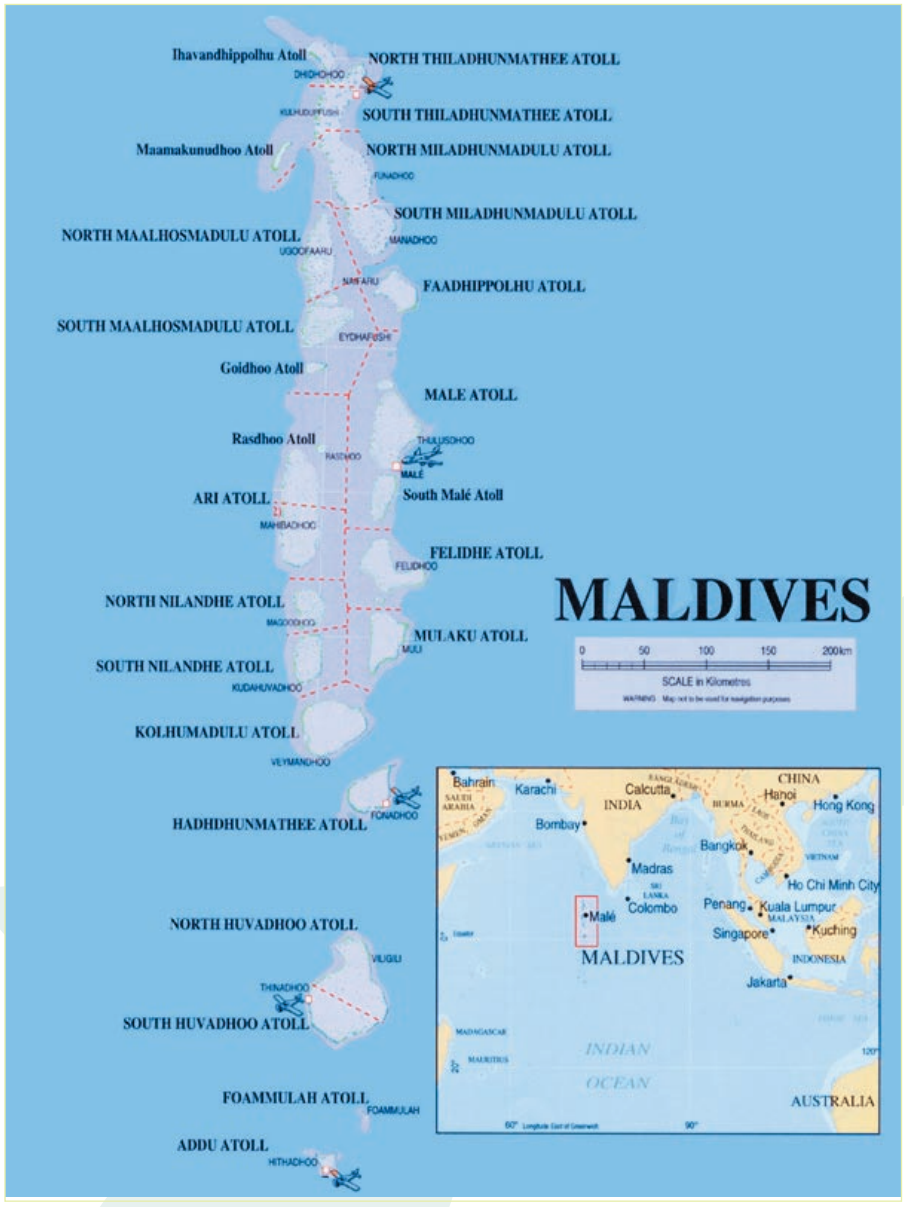

Figure 1.1: Map of the Maldives

CHAPTER ONE:
STATUS, TRENDS AND THREATS TO BIODIVERSITY

1.1 Introduction

The Republic of Maldives consists of 1192 tiny islands spread from north to south over the 73-degree East longitude across the equator (Please see Figure 1.1: Map of the Maldives). Maldives has a rich biodiversity related mainly to the marine environment.

This chapter presents the status, trends and threats to the biodiversity of the Maldives. It provides information on the current status of biodiversity in the Maldives, changes and trends in the main ecosystems and some implications of changes in biodiversity for national economic development, local livelihood and human well-being.

In this report, information on implementation is given primarily in narrative form as directed by the guidelines to prepare the 4th National Report. Tables and Figures are also included where appropriate.

1.2 Country Biodiversity Facts

This section presents information on the main ecosystems and species. No specific studies have been found on genetic diversity.

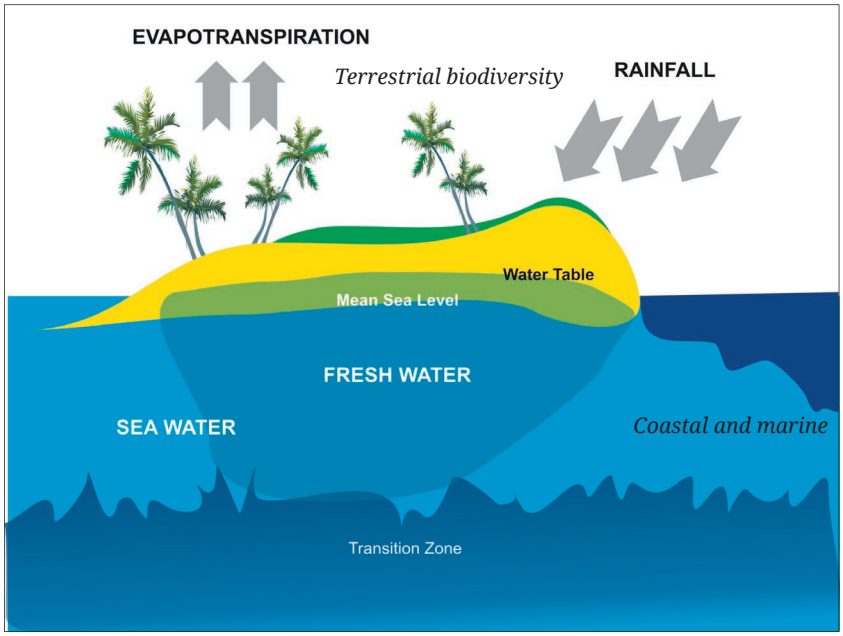

FIGURE 1.2: ISLAND GEOMORPHIC STRUCTURE AND BIODIVERSITY
(GEOMORPHIC STRUCTURE SOURCE: UNICEF AND MWSA 2001)

The geomorphic structure of the tiny islands of the Maldives characterizes the biodiversity and ecosystems of the country as shown in Figure 1.2. The size, shape, height above sea-level, north-south

location and environmental factors all affect the biodiversity and ecosystems related to the islands. As shown in Figure 2, the coastal and marine ecosystems including the coastal reefs form the main biome. Other ecosystems include mangroves, swamps, sea grass and open ocean ecosystems. Ecosystems such as sea grass beds, mangroves and swamps are small in terms of area covered but important in terms of the diversity of life and their contribution to the island ecosystem. The tiny islands support a limited terrestrial biodiversity. Birds are mainly migratory and mostly of sea bird varieties. Mangroves and swamps are mainly found in the southern atolls.

The environment

Photo: Ahmed Zahid www.ahmedzahid.com

The southern parts of the Maldives cross the equator. It experiences a sunny, warm, humid, tropical monsoonal climate. Sunshine is plentiful with an average of 2784.51 hours of sunshine per year in the central areas. There are two seasons. The northeast monsoon (dry season) extends from January to March, while the southwest monsoon (wet season) runs from mid-May to November. In the wet season Maldives receives torrential rain with average rainfall over the Maldives at 1996.3mm. Throughout the year, the sea temperature remains almost the same. Daily temperature ranges from around 31 (°C) during daytime to 23 (°C) during the night time (MMS 2010).

Main ecosystems and species

Although it is rich and diverse, comprehensive studies of marine and terrestrial biological diversity of the Maldives have not been made. A survey of the biodiversity of the whole archipelago is an urgent need to document the status of marine and terrestrial biodiversity of these islands, although small-scale projects like the Fishes of the Maldives (MRC 1997) have provided some basic data.

Since the islands are surrounded by the ocean, the greatest diversity occurs in marine life. The 1190 tiny, low-lying coral islands form 25 natural atolls. An atoll is formed of a lagoon surrounded by a coral reef. Coral reefs are the dominant ecosystems found in the islands of Maldives. The coral reef systems of the Maldives are the eighth largest in the world and cover an area of approximately 4513 sq km (MRC 2010a) which is approximately 5% of the world's reef areas (Spalding et al. 2001). Life on the coral reefs is highly diverse but low in abundance. On a healthy reef, the reef slope is covered with lush coral and vegetation. The outer reef slope has a series of reef terraces at depths of 3-6m, 13-30m, and a deeper one at 50m. The newer, recent coral growth is veneer over older reef rock. Reef building is by zooxanthellate corals. In deeper zones, reef building is sometimes by azooxanthellate branching coral (MHAHE 2002). The lagoons in the atolls contain micro-atolls, faros, patch reefs and knolls, and vary from 40m to 60m in depth.

The islands are built of bioclastic sediments and are of different sizes and shapes. Terrestrial biodiversity of Maldives is limited due to the small size of the islands. Fauna and flora mostly associated with the tropical climate, coral soil and coastal regions are found on the islands. Native plants of the islands can be ecologically grouped into five categories of vegetation (Adams 1988). They are beach pioneers,

littoral hedge, sublittoral thicket, climax forest and mangrove and swamp forest. Many islets provide a number of natural sanctuaries for birds.
Due to the absence of large fresh water bodies to support the system, there are only a few mangroves and swamps in some islands but these are not well-developed. Nearly three quarters of available land area is less than 1 m above mean high tide.

Though the climate of the Maldives provides ideal conditions for luxuriant growth of tropical trees and shrubs, other factors such as high salinity, the highly calcareous nature of soils and the salt-laden winds create harsh environmental conditions. These are some of the reasons why the number of species in the Maldives, either native or naturalized, is limited. (Selvam 2007).

However, being in the middle of the Indian Ocean, Maldives provides a fertile ground for the transfer of planktonic larvae of reef organisms and other marine life across the Indian Ocean, providing for the possibility of a rich endemic marine biodiversity.

Source: www.biodiversity.mv/aec/

1.3 Status of main biodiversity systems

Coastal and marine species diversity

Coral reefs

In Maldives, the living coral reefs are an ecosystem on its own right and are among the richest in the world in terms of species diversity. Thirty-seven different species of coral have been found in the Maldives *(Zahir and Naeem 1997).* It has two of the largest natural atolls in the world: Thiladhunmathi Atoll with a total surface area of 3,788km and Huvadhoo Atoll with a total surface area of 3,278km (MEEW 2007).

Fishes

Due to socio-economic importance, fishes are the most well-documented group of marine fauna in the Maldives. A total of 1,100 species of demersal and epipelagic fish fauna including sharks have been recorded and the number is likely to exceed 1500 species (MRC 2003). The mesopelagic fishes of the Maldives have not been reviewed comprehensively and bathypelagic fishes are completely unstudied (MHAHE 2002).

Although only a few endemic species of fish have been recorded so far, studies of larval movements suggest that there is a possibility that Maldives might enjoy a more unique fish fauna than currently observed and further research is required to record the endemic species. For instance, the Maldive Blenny, *Ecsenius minutes*, has so far been identified only in the Maldives, and the Maldive anemonefish, *Amphiprion nigripes*, is found only in the Maldives, Laccadives and Sri Lanka (MRC 2003).

Freshwater fish fauna in the Maldives is very scarce, possibly due to lack of suitable habitat, and appear to have been recently introduced species (MHAHE 2002). Most freshwater fish are imported aquarium fish.

Turtles

Studies on the status of the turtle populations in the Maldives by Frazier et al (2000) showed that there were five different species of turtles. These species and their suggested status are given in Table 1.1 below.

Table 1.1: Status of marine turtles in the Maldives

English name	Maldivian name	Scientific name	Status
Green turtle	Velaa	*Chelonia mydas*	Common
Hawksbill turtle	Kahan'bu	*Eretmochelys imbricata*	Common
Loggerhead turtle	Boa bodu velaa	*Caretta caretta*	Rare
Olive Ridley turtle	Va woshi velaa	*Lepidochelys olivacea*	Rare
Leatherback turtle	Musimbi	*Dermochelys coriacea*	Rare

Source: Frazier et al. 2000

Turtles are protected by Law in the Maldives. A 10-year moratorium on catching turtles was declared in 1995 and has been extended since then. Collection of turtle eggs is allowed as a source of protein for the population. However, this has also been banned from the thirteen islands which studies showed to be popular for turtle nests. A number of NGOs and private organizations and tourist resorts are supporting the effort through their own conservation programs.

Marine mammals

Not much research has been done into the rich cetacean fauna of the Maldives. Approximately 21 species of whales and dolphins have been recorded (MHAHE 2002). Since 1993, whales and dolphins have been protected in the Maldives, and capture of cetaceans is prohibited by a Government directive under the Fisheries Law (Government directive of 15 May 1993), while the export of cetacean products is prohibited under the Export-Import Act of the Republic of Maldives (Law No. 31/79). In general, cetaceans are not exploited commercially in the Maldives and there is no cetacean by-catch from the fisheries.

A number of species of marine fauna including those which are endemic to the Maldives have been protected by the Maldivian Environment Law (Law no. 4/93) and regulations emanating from it (See Table 1.2).

Table 1.2: Marine species protected under Maldivian Law

Common name
Napolean Wrasse
Lobsters
Conch (Triton) Shell
Black Coral
Giant Clam
Dolphins
Whales
Whale Shark

Source: MHTE 2010

Photo: Ahmed Zahid
www.ahmedzahid.com

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www.ahmedzahid.com

Marine algae, sea grass and marine fungi

In Maldives 285 species of marine algae including 21 species of bluegreen algae, 163 red algae, 83 species of green algae and 18 of brown algae have been found (Hackett et al. 1977). Five species of 4 genera of sea grass namely, *Syringodium isoetifolium, Thalassia hemprichii, Thallassodendron ciliatum, Cymnodoea rotundata, Cymnodocea sp*. were reported to be found, with the most common being *Thalassia hemprichii* (Ahmed and Saleem 1999, cited in MHAHE 2002)

Marine invertebrates

Very few studies of the marine invertebrate species diversity in the Maldives have been done. Among the marine invertebrates found in the Maldives are sponges, coelenterates, mollusks, arthropods and other marine species. However, very little primary data on the relative abundance and distribution of these identified species is found.

Corals, mollusks and crustaceans

Records have shown that there are 187 species of corals, over 400 species of mollusks, over 145 species of crabs, 48 species of shrimps and 83 species of echinoderms (MHAHE 2002). However, the current status of these is not known, except perhaps the sea cucumber.

Photo: Ahmed Zahid |www.ahmedzahid.com

Terrestrial species diversity

Vegetation

Adams (1984, cited in MHAHE 2002) reported 583 vascular plant species in the Maldives (see Table 1.3 below). Out of these, 323 are cultivated, and 260 are native or naturalized plants, which include 214 flowering plants and 5 ferns. Of the plants found in the Maldives, over 300 species may be used in traditional medicine.

Table 1.3: Details of hierarchies of plants found in the Maldives

Plant Group	Numbers
Families	107
Genera	374
Species	583
Native or Naturalized	260

Source: Adams 1984

Photo: Ahmed Zahid |www.ahmedzahid.com

Terrestrial mammalian fauna of the Maldives is limited. Holmes (1993) has recorded two endemic subspecies of fruit bats, *Pteropus gigantus arie*l and *Pteropus hypomelanus maris*, with the latter only in the southern-most atoll. Very little of the local terrestrial invertebrate fauna are documented, and a comprehensive survey of the amphibian and reptile fauna of the Maldives needs to be carried out.

Thirteen species of mangroves belonging to nine genera have been identified in the Maldives. Table 1.4 shows the mangrove species identified in the Maldives and their status. The most common are *Bruguiera cylindrical, Ceriops tagal and Lumnitzera racemosa*. There are 6 species of plants and 37 species of fungi associated with mangroves (Untawale and Jagtap 1991, cited in MHAHE 2002).

Table 1.4: Mangrove species identified in the Maldives and their status

	Scientific Name	Common Name	Local Name	Status
1	Avicennia marina	Grey mangrove	Baru	Occasional; restricted to northern islands. Only a very few seedlings are noticed
2	Bruguiera cylindrica	Small-leafed orange mangroves	Kan'doo	Common; found either as a dominant or co-dominant species in many of the mangrove ecosystem of the Maldives. It also found in the form of pure stands. A large number of young seedlings are found growing in the areas.
3	Bruguiera gymnorrhiza	Large-leafed mangroves, oriental mangroves	Bodu Kandoo, Boda vaki	Common; found growing as a dominant or co-dominant species in many of the mangrove ecosystems of the Maldives. In some areas it is found in the form of pure stands.
4	Bruguiera sexangula		Boda vaki	Rare; observed only in Fuvamulah island, where 10-12 trees are found growing on the landward portion of brackish water lagoon (kulhi). These are found growing among taro (cocoyam-colocasia esculenta) crops where a few wild trees of pond apple (annona glabra) are also present. A few healthy seedlings are also found in this area.
5	Ceriops tagal	Yellow mangrove	Karamana	Rare; found only in Furukolhu Funadhoo island in the northern group of islands. It is present in two to three rows along the border of a large lagoon, which is still connected to the sea by a channel. Only a few seedlings are noticed, indicating poor natural regeneration.

6	Excoecaria agallocha	Blinding tree, river poison tree	Thela	Occasional; found on the landward side of the mangroves in some of the northern islands. No seedling is noticed in the areas where the trees are found, indicating poor rate of natural regeneration.
7	Heritiera littoralis	Looking-glass mangrove	Kaharuvah gas	Rare; a single tree is observed in Male'.
8	Lumnitzera racemosa	Black mangrove	Burevi	Common; found along the border of closed and open lagoons both in the northern and southern islands. Natural regeneration is very high.
9	Pemphis acidula	Iron wood	Kuredhi,	Abundant; grows along the beaches of almost all islands and forms contiguous stands in many places.
10	Rizophora apiculata		Thakafathi	Rare; a few individuals are found in the northern islands.
11	Rhizophora mucronata		Ran'doo	Occasional; found growing as pure stands or mixed with Bruguiera both in the northern and southern islands. Natural regeneration is found to be moderate.
12	Sonneratia caseolaris	Crabapple mangrove apple	Kulhavah	Occasional; found growing as pure stands as well as a few individuals both in the northern and southern islands.
13	Xylocarpus rumphii	Ceder mangrove	Maru gas	Rare; a few trees are found in some of the northern islands. Natural regeneration is very poor and no seedling is noticed.

Most bird species resident in the Maldives are seabirds. Over 170 bird species, including 36 seabirds, 91 shorebirds and 63 land birds have been recorded in the Maldives (MHAHE 2002). The resident status of some of these birds is presented in Table 1.5 below. Birds other than sea birds are seasonal, migrants, vagrants, introduced species or imported species. A comprehensive ornithological study of the Maldives is needed to understand the biodiversity of bird species in the Maldives.

Table 1.5: Some sea bird species identified in the Maldives and their status

English name	Maldivian name	Scientific name	Status (tentative)
Audubon's Shearwater	Dhivehi Hoagulhaa	*Puffinus therminieri*	Resident
Lesser Frigatebird	Hoara	*Fregata ariel*	Resident
White-tailed Tropicbird	Dhandifulhu dhooni	*Phaethon lepturus*	Resident
Lesser Crested Tern	Gaa Dhooni	*Sterna bengalensis*	Resident
Great Crested Tern	Bodu Gaa Dhooni	*Sterna bergii*	Resident
Roseate Tern	Valla	*Sterna dougallii*	Resident
Bridled Tern	Vaali	*Sterna anaethetus*	Resident
Sooty Tern	Beyndu	*Sterna fuscata*	Resident
Lesser Noddy	Kurangi	*Anous tenuirostris*	Resident
Brown Noddy	Maaranga	*Anous stolidus*	Common resident
Bulwer's Petrel	Hoagulhaa	*Bulweria bulwerii*	Uncommon visitors, SW season
Flesh-footed Shearwater	Maa Hoagulhaa	*Puffinus carneipus*	Visitor, southern winter
Wedge-tailed Shearwater	Bodu Hoagulhaa	*Puffinus pacificus*	Possibly resident
White-faced Storm-petrel	Raalhu Kotti	*Pelagodroma marina*	Uncommon visitor, southern winter
Wilson's Storm-petrel	Raalhu Kotti	*Oceanitis oceanicus*	Visitor, southern winter
White-bellied Storm-petrel	Raalhu Kotti	*Fregetta grallaria*	Uncommon visitor, southern winter
Masked Booby	Hudhu Maadhooni	*Sula dactylatra*	Uncommon visitor
Brown Booby	Kalhu Maadhooni	*Sula leocogaster*	Uncommon visitor
Red-footed Booby	Maadhooni	*Sula sula*	Uncommon visitor
Great Frigatebird	Maa Hoara	*Fregata minor*	Visitor
Skuas	Kukulhu Maadhooni	*Catharacta spp.*	Uncommon visitor
Seagulls	Boyah guirey	*Fam. Laridae*	Uncommon visitor
White-winged Black Tern	Valla	*Chilidonias leucopterus*	Uncommon visitor, northern winter
Gull-billed Tern	Kanifulhu Dhooni	*Sterna nilotica*	Possibly resident
Caspian Tern	Miyaremu Dhooni	*Sterna caspia*	Uncommon visitor, northern winter
Common Tern	Valla	*Sterna hirundo*	Visitor, northern winter
Saunders' Little Tern	Bondhu Dhooni	*Sterna saundersi*	Common resident
White-cheeked Tern	Valla	*Sterna repressa*	Uncommon visitor, northern winter
Black-naped Tern	Kiru Dhooni	*Sterna sumatrana*	Common resident
White Tern	Dhon Dheeni	*Gygis alba*	Resident, in south only

Source: Anderson 1996a

So far only five subspecies of birds have been identified as endemic to the Maldives (Table 1.6). A more comprehensive study may identify others.

Table 1.6: Bird subspecies endemic to the Maldives

English name	Maldivian name	Scientific name
Maldivian Water Hen	Dhivehi Kan'bili	*Amouronis phoenicurus maldivus*
Maldivian Pond Heron	Huvadhoo Raabondhi	*Ardeola graii phillipsi*
Maldivian Little Heron	Dhivehi Raabondhi	*Butorides striatus albidulus*
Central Maldivian Little Heron	Medhu Raajjetherey Raabondhi	*Butorides striatus didii phillipsii*
Asian Koel	Dhivehi Koveli	*Eudynamys scolopacea scolpacea*

Source: MHAHE 2002

Already 70 species of birds, including those which are endemic to the Maldives and those found to be visitors, have been protected by Maldivian Environment Law (Law no. 4/93) and regulations emanating from it. Information on these species is provided in Chapter Three.

Ornamental plant varieties, various bird species, vegetable plant species and various pests have been introduced but very little information is available on these due to the weakness and lack of regulations, and capacity to control and monitor the plants that are being imported.

Photo: Ahmed Zahid |www.ahmedzahid.com

Photo: muha |source: www.bluepeacemaldives.org

1.4 Trends in main biodiversity components and ecosystems

This section highlights key changes in the status and trends of biodiversity components observed in recent years.

Trends in marine biodiversity

Maldives is built on biologically diverse corals. The greatest diversity in growth and diversity of coral was found to a depth of about 5-25m. Coral cover in some areas in Maldives range from 100% to average values of 40% to 60%.

In response to the severe coral bleaching event of 1998, Marine Research Centre started a National Coral Reef Monitoring Program. This program monitored 15 sites across northern, central and southern Maldives annually. The aim was to study the recovery of the coral cover of the reefs and other benthic communities. The monitoring showed that the coral bleaching in 1998 caused high mortality to live coral cover and led to ecological changes to the reef system. Live coral cover was reduced from 40-60% to less than 2% at sites where pre-bleaching data is available. Additionally, 90% or more of the live coral cover at the 15 monitoring sites died because of the 1998 bleaching event. This was the highest coral mortality reported across the areas where bleaching was reported in 1998.

Recovery of the reefs from the bleaching has been monitored over the past 12 years, which is variable both at site, atoll and regional level. Male' atoll sites and Haa Alif atoll sites showed the slowest recovery (less than 2% in 1998 to 15-25% in 2009) while Addu and Ari atoll showed high recovery (5% in 1998 to over 50% in 2009) (Zahir, H 2010). Coral cover recovery trends showed that reefs in Maldives could reach pre-bleaching levels within 10-15 years (Zahir, H 2006). The records from the monitoring program also showed that the impact of the December 2004 tsunami on the coral reefs was minimal (Zahir, H 2010).

This recovery was possibly interrupted by the bleaching event in 2010 which is comparable to the temperature anomaly recorded in 1998. However, other factors such as cloud cover, sea state and sea currents that may have influenced or triggered bleaching were different in 1998 compared to 2010. This year (2010) although the temperature anomaly was the same, weather conditions were more severe with much rain and wind, leading to rough seas and ocean surface mixing. A preliminary survey of monitoring sites in Male' atoll showed substantial bleaching (over 70%). However, the severity of bleaching appears to be low (the percentage of the totally bleached coral community is less than 15%), lending to the recovery of less bleached coral if the severe conditions are not continued.

The key issues that emerge from the bleaching events that Maldives is experiencing are:

- Recurrent bleaching events would lead to large and wide scale mortality of coral community and hence reef ecosystem at large
- Global warning linked bleaching to coral reefs are predicted on the increase by the coral reef scientists
- SST increase and its consequences to coral reef are a serious concern.

Maldivian fishermen practice dolphin-friendly, pole-and-line tuna fishery. The most important marine species are the skipjack tuna *(Katsuwonus pelamis),* juveniles of yellowfin tuna *(Thunnus albacares),* and to a lesser extent bigeye tuna *(Thunnus obesus),* which are the mainstay of Maldivian fishermen.

Reef fishery has concentrated mainly on groupers, sea cucumber and aquarium fish. However, as these have been over-fished, regulations are being put in place to control the amount of fish harvested. The over-fishing of these species has become a potential threat to biological diversity as illustrated later in the chapter.

Thirty seven species of sharks have been recorded in the Maldives. In 2008 shark fishing was carried out in 13 islands in 8 atolls and the average monthly income to shark fishermen during 2008 was about Maldivian Rufiyaa 5,000 per month. Export of shark products contributed only 0.24% of the total marine export value in 2008. Shark fishing has now been banned with effect from 1 July 2010. This issue will be referred to in Chapter Three.

Maldivian fishermen depend on the availability of livebait. Thus live bait fishery is key to the Maldivian fishing industry. The most commonly used species are sprats (*Spratelloides gracilis* and *S. delicatulus), fusiliers (Gymnocaesio gymnopterus* and *Pterocaesio pisang), anchovies (Encrasicholina heteroloba* and *Stolephorus indicus),* and *cardinal fishes (Archamia leneolata* and *A. buruensis).* Availability of live bait fish is seasonal, and the volume and species used vary from atoll to atoll. Fishermen have been reporting a decline on the availability of the baitfish, and the status of stocks of live bait fish species in Maldivian waters need to be determined urgently. The export of all types of baitfish used in the pole and line fishery has been banned since June 1995.

A fishery in groupers started in 1993. Assessments made in 2004 indicated that groupers were heavily fished. Catch rates declined dramatically and nearly half of the catch was immature. There was a real threat that 'if the fishery continued without strong management intervention the groupers may become "extinct" from the Maldives' (MRC 2008). The Marine Research Centre started conducting experiments to culture groupers in floating cage systems in the Maldives (MRC 2008). However, lack of technology has restricted the success of these experiments.

In 1985, a sea cucumber fishery began in the Maldives. Maldives was reported to be having a rich community of commercially valuable sea cucumbers. Sixteen species of commercial value were observed, including many of the most commercially valuable species like the white teatfish, *Holothuria fuscogilva,* and the prickly redfish, *Thelenota ananas.* (Reichenbach 1997). The most valuable of these species, *Thelonata ananas,* was rapidly overfished, followed by other medium value species. The catch of high value species decreased rapidly (Joseph 1992). Table 1.7 and Figure 1.3 show the export of sea-cucumber from Maldives from 1985 to 2009. To restrict over-fishing, the government introduced a ban on the use of SCUBA diving gear to collect sea cucumber and a limit on the depth at which sea cucumber may be harvested. However, violations of this regulation appear to be common. In addition to regulations, the Marine Research Centre in association with other research bodies started a mariculture project for sea cucumbers (Reichenbach 1997). Due to the high commercial value of the fish, private parties also started such projects. One party has been successful in culturing and producing sea cucumbers commercially (Nalanadhoo sea cucumber project).

Table 1.7: Export of sea-cucumber from Maldives (1995-2009)

Year	Quantity (Mt)	Vale (MRf)	Value (US$)	FoB ($/kg)
1995	93.81	8,316,827	706,612	7.53
1996	145.33	7,600,524	645,754	4.44
1997	318.03	8,559,723	727,249	2.29
1998	85.0113	4,067,649	345,595	4.07
1999	53.841	4,795,478	407,432	7.57
2000	205.245	28,524,834	2,423,520	11.81
2001	225.852	34,330,925	2,682,104	11.88
2002	190.795	38,044,294	2,972,210	15.58
2003	293.335	43,147,093	3,370,867	11.49
2004	182.057	31,049,007	2,425,704	13.32
2005	117.397	23,223,586	1,814,343	15.45
2006	87.874	12707459	988907	11.25
2007	113.002	10946290	851851	7.54
2008	84.015	7891327	614111	7.31
2009	62.78	3870819.7	301231.1	4.80

(Source: MoFA 2010)

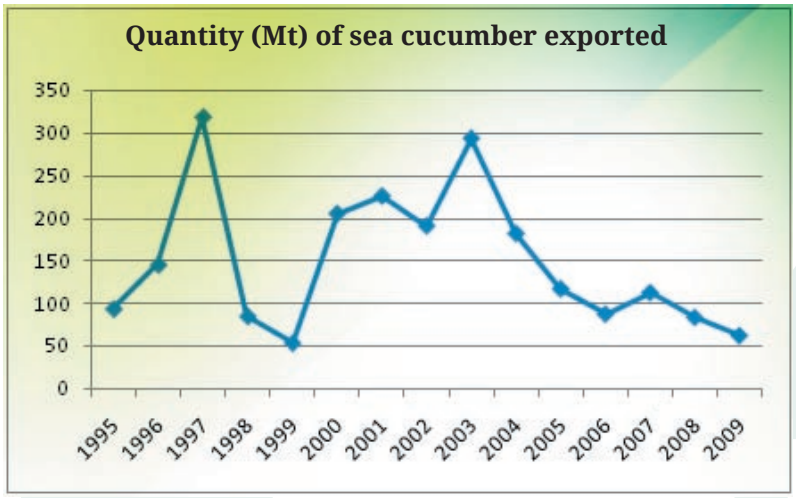

Figure 1.3: Quantity of sea cucumber (in metric tons) exported (1995-2009)

Ahmed et al, (1997) have reported five species of spiny lobster in the Maldives. These are Panulirus longipes, Panulirus penicillatus, Panulirus ornatus, Panulirus versicolor, and Panulirus polyphagus. All these are harvested for the local tourist industry. To prevent over-fishing, the government passed a regulation to control the lobster fishery in 1987. According to this regulation, harvesting of berried lobsters and small lobsters with carapace lengths less than 25cm is prohibited. However, monitoring of the implementation of this regulation has proved difficult (Adam 2006).

In 1995, the government banned the export of rays, eels, pufferfish and parrotfish, and it banned the export of ray skins in 1996 (Ahmed and Saleem 1999).

Export of live tropical fish for the aquarium trade is believed to have begun in 1979. Over 100 species of

live ornamental fish are exported, with about 75% of the trade comprising of 20 species including some rare fish in the Maldives (Adam, 1997) which are therefore vulnerable to over-exploitation. In 1988 and 1989, the government set an export quota of 100,000 fish with a supporting measure of species-based quota for species identified as over-exploited or with exploitation levels close to MSY. However, these measures have not been properly implemented due to lack of capacity. Figure 1.4 shows the numbers of aquarium fish exported and their export value .

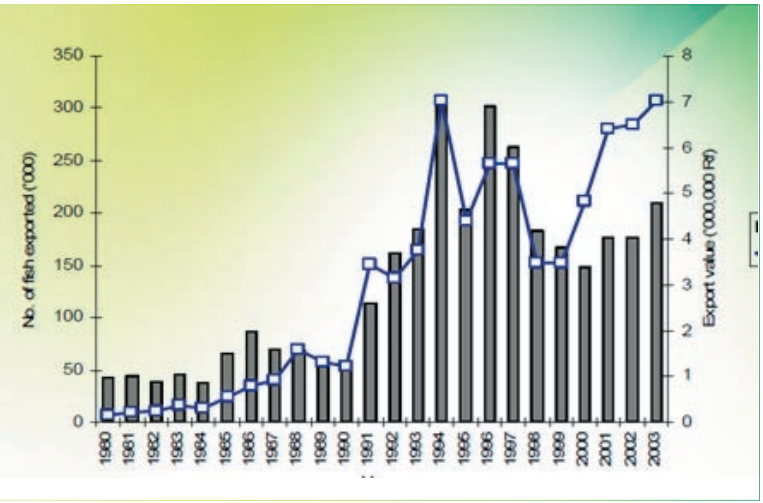

FIGURE 1.4: NUMBERS OF AQUARIUM FISH EXPORTED AND THEIR EXPORT VALUE

(Source: Saleem and Adam 2004)

As mentioned earlier, the harvesting of sea turtles has been banned in the Maldives. Initially a 10-year moratorium was set on the catch or killing of any turtle species under the Fisheries Law of 1995. However, the harvesting of turtle eggs is still allowed, except in the 13 islands where turtles have been sighted most.

Terrestrial biodiversity

According to Selvam (2007), 'vegetation in the Maldives has changed both quantitatively and qualitatively over time and have made the islands of the Maldives, their ecosystems and human populations more vulnerable to natural calamities such as cyclones, tidal waves and tsunami and man-made calamities such as rising sea levels.' The total forest area of the Maldives is estimated to be around 2817 hectares (draft forest sector review of Maldives, 2006). There is general agreement that the littoral forests and bushes play an important role in coastal protection of the islands of the Maldives (Salmi 2007).

The Law on Uninhabited island of Maldives (Law no.20/98) states that MoFA is the government agency that is responsible to assign uninhabited islands on varuvaa lease, which is the traditional non-commercial form of lease. The Law stipulated rights and responsibilities of the lessee. Under this Law, wood can only be harvested from the island with a written permission from MoFA, and harvesting can only be conducted in the presence of an atoll officer and representative of the lessee. Clause 11-14 of the said Law defines the conditions of commercial lease. Another Law, regulating forest or trees of

inhabited islands is Law no.21/98, the Law regulating coconut palms and trees of inhabited islands.

"Assistance in the drafting of Agricultural legislation (2009-20011)" is a project granted by FAO to assist the government in preparing legislation in four key areas in order to lay a firm basis for an institutional framework designed to support sound management of the agricultural sector. The legislative framework includes:

- A draft Agriculture Act
- A draft Plant Protection Act
- A draft Pesticides Act
- A draft Agricultural Land act.

Photo: Ahmed Zahid
www.ahmedzahid.com

These Acts will enable the Ministry of Fisheries and Agriculture to play its mandatory role, and thereby contribute to National food security, and social and economic development. To enhance the legal drafting capacity within the Ministry of Fisheries and Agricultural for future drafting of regulations and other legal instruments and technical capacity of Ministry staff for a sound implementation of the legal framework, on-the-job training workshops and seminars are being offered. The timeline of this project is 2 years from 2008.

Mangrove and swamp areas

The mangroves of the Maldives belong to the carbonate setting type. Within this broad category, the mangroves of the Maldives are found in five different environmental conditions:

i) in the fringe area of some of the islands, where wave energy and wind speed is less, and brackish water is present due to mixing of seawater with the margin of the freshwater lens,
ii) in the deposits of sediments,
iii) along the borders of lagoons that are connected to the sea,
iv) along the borders of lagoons that have lost connections to the sea but receive seawater periodically through seepage, and
v) in the shallow depressions where rain water accumulate.

According to Shazra et al (2008), mangrove ecosystems are important coastal ecosystems in the Maldives which may 'vanish' due to dumping of wastes, cutting down trees, logging and poor management practices. Waste material being dumped currently into mangroves and swamps include household organic waste as well as plastic and other types of non-biodegradable packaging and dredge material from harbour dredging.

According to Choudhury (1993) it was observed that the islanders throw all their garbage either under the mangroves (as in Landhoo), or on the fringe of the depression harbouring mangroves (as in Kelaa and Kaashidhoo). These wastes adversely affect the habitat by clogging the network of connections beneath the coral stone which brings the sea water into the system. The effects of adjoining ecosystems is likely to affect the depression adjoining mangrove ecosystems in two ways: (a) bring in higher quantities of silt

and clay from these agricultural fields into the depression with runoff water, causing quicker siltation of the depression, and (b) the insecticides and fungicides that are used in the agricultural fields will reach the mangrove ecosystems in the depression. The cumulative effects of these may induce toxicity which may affect the microbes and other living organisms, thus jeopardizing the whole ecosystem.

Coastal ecosystems

Problems due to the current degradation of coastal ecosystems include loss of biodiversity, reduced ecosystem functions, and costs to coastal human societies (Gladstone, 2009). In Maldives, beach erosion is widespread (Khaleel and Saeed, 1996). Beach erosion is exacerbated on some islands due to human-induced beach modifications and coastal 'protection' devices to arrest erosion, such as groynes, jetties, and breakwaters (Hameed and Ali, 2001).

Islands

It has been claimed that from a biodiversity point of view, it is very important to protect all islands of the Maldives from the effects of climate change and sea level rise (MHAHE 2001).

1.5 Threat analysis

The main threats or pressures to conservation of biological diversity relate to the pressures on the marine biodiversity and those on terrestrial biodiversity (MEC 2004). The threats or pressures on marine biodiversity include:

- climate change and climate variabilities,
- demand for coral, sand and branched coral,
- over-consumption of marine resources,
- waste disposal of non-biodegradable imported products on the reefs,
- pollution and intensive use of reefs through scuba diving and snorkelling,
- loss of coastal habitats (e.g. sea grass beds), mangroves and coral reefs through such activities as dredging of harbours, land reclamation and grounding of vessels, and
- coral bleaching.

Threats or pressures on terrestrial biodiversity include:

- invasive pests and diseases,
- invasive plant species,
- damage due to unsustainable agricultural practices such as over-use of agricultural fertilizers and pesticides,
- removal of vegetation, and
- developmental practices.

In addition to the threats mentioned above, population growth and improved living standards cause

Table 1.8: Impacts of threats on different types of biodiversity in the Maldives

	Over-population	Habitat Change	Climate Change	Invasive species	Over-exploitation	Pollution	Diseases	Pests/ pesticides
Marine biodiversity	High Around inhabited islands	High Around inhabited islands	Potentially very high	Not known	In some species	High, especially by non-biodegradable materials	Not known	Not known
Corals and reef ecosystems	High Around inhabited islands	High Around inhabited islands	Potentially very high, coral bleaching	Not known	In some areas, e.g. by tourists	High, especially by non-biodegradable materials,	Coral bleaching becoming more frequent	Possibly high near agricultural areas/ islands
Mangrove Biodiversity	In inhabited islands	In inhabited islands	Potentially very high	Not known	Possibly in inhabited islands	High, especially by non-biodegradable materials	Not known	Possibly high near agricultural areas/ islands
Sea grass and Sea Algae	No change	No change	Potentially very high	Not known, some sea grass, algae may be invasive	Not known	Not known	Not known	Not known
Birds	Some bird roosting areas affected	Some bird roosting areas affected	Potentially very high	Not known	Not known	Not known	Not known	Not known
Terrestrial Biodiversity	High in inhabited islands	High in inhabited islands	Potentially very high	Not known; possibly v high	High in some inhabited islands	By inorganic fertilizers high in some areas	High in some agricultural areas	High in some agricultural areas

additional demand for land. Coral and sand mining for urbanization and house construction were also reported as causes of coastal beach erosion (Ravishankar 2005). This is disturbing the littoral vegetation and its associated terrestrial biodiversity as well. Table 1.8 lists some impacts of threats on different types of biodiversity in the Maldives.

Analysis of direct threats

Threats to marine biodiversity

The main direct threats to marine biodiversity relate to the negative impact of climate change. The threat that is most pronounced is the coral bleaching event. The major coral bleaching event of 1998 reduced live coral cover to a mean of 2.1% compared to the pre-bleaching level of 30-45% live cover (MRC 1999). Although the overall mean coral cover increased from 2% to 28% between 1998 and 2004, the recovery was variable amongst the different areas of Maldives (Zahir 2010a). Coral bleaching and temperatures similar to 1998 were again reported in 2010. According to Zahid (2010b) the preliminary survey of monitoring sites in Male' atoll showed substantial bleaching (over 70% of bleaching in coral cover). However, the severity of bleaching appears to be low, i.e. the percent of totally bleached coral community is less than 15%. This could lead to early recovery of less bleached coral if the severe conditions do not continue.

Reef fish is another species that is directly under threat. Reef fishing trials made for a year (1986-87) in the reefs of North Male' Atoll indicated that there were 'considerable' reef fish resources inside and outside the atoll (Van der Knaap et al 1991). The second phase of the same study conducted in Shaviyani, Alifu and Laamu Atolls during 1989-91 indicated a maximum potential yield of commercial reef fish (i.e. medium to large snapper, grouper, emperor and reef associated jack) of around 30,000mt a year (Anderson et al 1992), and the atoll basins were reported to have relatively large reef fish resources. In 2000, scientists raised concern about the threatened status of groupers (Morris et al 2000). In 2004, it appeared that there were clear signs of over-harvesting of fish and other reef resources such as sea cucumbers, chanks and spiny lobsters (Rajasuriya 2004). In 1997, a catch of over 1 million groupers was reported in Maldives. In 2005, that figure was less than quarter of a million indicating a very sharp declining trend (Sattar and Adam 2005). In 2008, researchers at MRC observed that certain species of reef fish caught were decreasing in size and raised the alarm of 'intense over exploitation' (Sattar 2008).

Import of materials such as raw, untreated cow dung as fertilizers and import of ornamental plants to cater for the demand from the resorts have increased the exposure of local plants to pests and plant diseases. Such practices have to be controlled to preserve the biodiversity of the nation.

The dumping of waste and reclamation of mangroves and swamps is threatening their rich biodiversity and their very existence.

Using powerful halogen lamps to collect live baitfish is reported to attract a large number of small fish and other organisms towards the light and these die or are weakened during the process before enough baitfish is collected (according to a report from an experienced 'keyolhu' (fishing boat captain) from Naifaru (a famous fishing town adjacent to the fish processing factory in the north)).

Habitat modification and change due development needs is another serious threat to biodiversity. Land is being cleared and some large trees are being felled to cater to the demand for housing. Additionally,

construction of harbours and reclamation of land for developmental purposes destroy the habitats of many species, both terrestrial and marine.

Analysis of indirect threats

The coral reefs of the Maldives support biologically rich and diverse but fragile marine coastal ecosystems. That biological diversity is constantly under threat due to the small size, insularity and fragility of the small Maldivian island ecosystem and increasing demands on the natural resources due to increasing anthropological activities, leading to environmental degradation and loss of biological diversity on the coral reefs and terrestrial habitats.

Hameed and Ali (2001) have reported that some storm events induce gross morphological short- and long-term changes to islands and their beaches. They observed that most islands are extremely vulnerable to storm events and encroachment of the sea and this vulnerability is expected to be exacerbated by climate change and sea level rise.

1.6 Implications of changes in biodiversity

This section refers to the implications of changes in biodiversity for national economic development, local livelihood, and human well-being.

In spite of the increasing size of the fishing boats and the use of better technology, the total catch of fish has been decreasing over the years as illustrated in Table 1.9 and Figure 1.5 below.

Table 1.9 and Figure 1.5 show the changes in fish catch over the last 10 years. The figures suggest that the total amount of fish caught increased until 2006 and then started to decline, perhaps due to the reduced amount of fish available and also reduction in the bait fish, and other natural causes such as climate change.

Table 1.9: Changes in fish catch over the last 10 years (Source: MoFA 2010)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Total fish catch ('000 mt)	118.96	127.1	163.4	155.4	158.6	186.0	184.2	144.2	133.1	116.7
Change in fish catch		7%	29%	-5%	2%	17%	-1%	-22%	-8%	-12%
Total Coll. ('000 mt)	27.69	31.38	53.62	61	64	84	98.01	67.23	62.10	31.85
Fish Exports ('000 MTs)	57.28	64.8	79.3	112.0	122.2	129.6	148.4	97.6	88.4	65.6

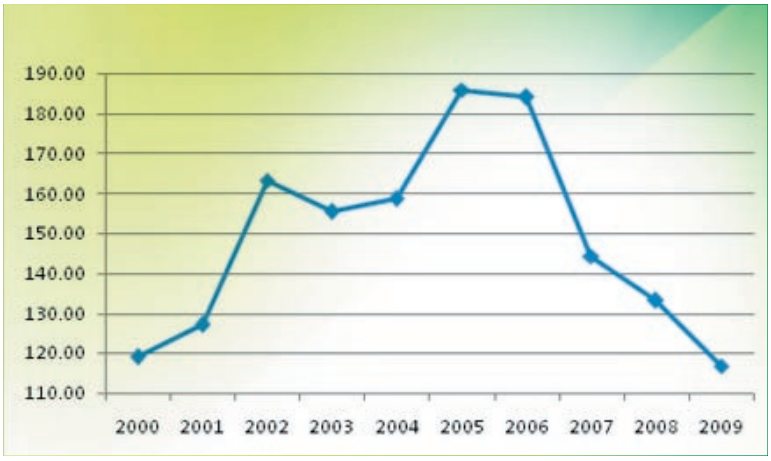

FIGURE 1.5: CHANGES IN THE FISH CATCH OVER THE LAST 10 YEARS

Thus the main implication of possible loss of biodiversity and changes due to natural causes such as climate change is the direct loss of the livelihood of the people. Two areas of major implications on livelihood due to loss in biodiversity include the impact on those depending on the tourism industry and those depending on agriculture.

The tourism industry in the Maldives depends on coastal and marine biodiversity. The coral and the associated fish are major attractions for snorkelers and the divers. Bleached and dead coral reefs do not support any of the rich life forms associated with live, thriving coral reefs. Thus the loss of biodiversity could kill off the tourism industry which provides up to 90% of government revenue, including both direct and indirect revenue (IUCN 2007). In 2008, total government revenue was MRf 7,054.43, out of which MRf 1,969.72 (27.9% of the total government revenue) came directly from tourism (MTAC 2009).

Pests, invasive species and pesticides are major threats to terrestrial biodiversity, especially agriculture. There are reports from farmers, of pests, especially those arriving with fertilizer like raw cow dung, destroying fields of agricultural produce, e.g. brinjal. The impact of the invasive species and pesticides is not known. What is known is that there are new species coming in and more and more pesticides are required.

SOURCE : UNICEF / PIROZZI

CHAPTER TWO:
STATUS OF NBSAPS

Source : AEC project

2.1 Introduction

This chapter provides an overview of the implementation of the Maldives National Biodiversity Strategy and Action Plan of the Maldives (MHAHE 2002). It contains a brief description of the NBSAP, identifying the goals, objectives, actions and strategies therein, and information on the extent to which these actions have been implemented.

The chapter assesses the effectiveness of the implementation of the strategy and identifies some difficulties encountered in the implementation of NBSAP. The issues raised can assist Maldives to plan for a more conscious and effective implementation of the national biodiversity strategy and action plan in the future. The chapter ends with a case study on banning shark fishing, offered as an example of the provision of incentives to conserve biodiversity.

2.2 Overview of Maldives NBSAP

This section presents an overview of NBSAP, identifying the goals, objectives, actions and strategies.

National Biodiversity Strategy and Action Plan (NBSAP) of the Maldives was prepared in 2002. It evolved through extensive stakeholder consultation and contributions.

Section 3.8 of the NBSAP defines the vision and guiding principles of the environment sector. The elements of the vision can be interpreted as an expression of the policies and plans of other sectors (e.g. forestry policy of the agricultural sector).

The vision of NBSAP is that Maldives is:

"A nation which appreciates the true value of the natural environment, utilizes its natural resources in a sustainable manner for national development, conserves its biological diversity, shares equitably the benefits from its biological resources, has built the capacity to learn about its natural environment and leaves a healthy natural environment for future generations."

National biodiversity strategy and action plan of the Maldives

The guiding principles of NBSAP are ecological sustainability, individual responsibility for biodiversity conservation, equitable sharing of benefits, accountability and transparency of decision makers to the public, and community participation. The guiding principles realize the dependence of the people on the nation's biological resources and the need to conserve them; the necessity to share the benefits

equitably; economic cost-benefit assessment; the need to integrate environmental considerations as cross-cutting issues in the economic development policies and plans; and appreciation of community participation, and accountability and transparency in plan implementation. Further, the principles state that ecological sustainability should be a fundamental principle, that an integrated ecological approach is needed and that the action plan will be part of an interactive process to be monitored and reviewed regularly.

NBSAP is developed on three fundamental goals, 15 objectives including an objective on implementation, and associated strategies or measures. The three goals and their respective objectives are given in Table 2.1.

Table 2.1: Goals and objectives of NBSAP

Goal one **Conserve biological diversity and sustainably utilize biological resources**
Integration of biodiversity conservation into the national development process **Objective 1** Integrate biodiversity conservation into the national development policy-making and planning process (through Development Planning; Land Use Plans; and Environment Impact Assessment - EIA).
Adoption of policies and management measures for sustainable use **Objective 2** Adopt appropriate national and sectoral policies and management systems for the sustainable utilization of natural resources.
Development and establishment of measures for in-situ and ex-situ conservation **Objective 3** Develop and establish effective management measures for conservation of biodiversity to ensure ecological processes and systems are maintained.
Objective 4 : Management of threatening process Ensure that threatening processes are managed at the national level to minimize adverse impacts on biological diversity, and strengthen efforts to influence the international community to control threatening processes at global level.
Objective 5: Adoption of economic incentives for conservation Develop and adopt suitable economic instruments to ensure that the value of biodiversity is adequately reflected in national development activities and to promote sustainable utilization of biological resources and equitable distribution of benefits from the use of biological resources.
Objective 6: International co-operation Support and participate in international efforts to conserve local and global biodiversity.

Goal two: Capacity building **Build capacity for biodiversity conservation through a strong governance framework and improved knowledge and understanding**	
	Objective 1 Improve knowledge and understanding of biological diversity and resource management to promote conservation and sustainable use of biodiversity.
	Objective 2: Increasing awareness Create awareness to change attitudes and practices that harm biological diversity, develop behaviour that promote biodiversity conservation, and create public support for biodiversity conservation.
	Objective 3: Legal framework Establish and strengthen legal framework for biodiversity conservation.
	Objective 4: Institutional capacity building Provide a facilitative and capable institutional environment to ensure that biodiversity conservation and sustainable resource management goals and objectives are achieved.
	Objective 5: Human resource development Develop and increase human resources to plan and implement biodiversity conservation measures and assess conservation needs.
	Objective 6: Financial capacity Ensure that funds essential to achieve biodiversity conservation objectives are secured and allocated in a manner that maximises benefits.
Goal three: Community participation **Foster community participation, ownership and support for biodiversity conservation**	
	Objective 1: Co-management Establish an institutional framework in which property rights are devolved to a defined user group, with concomitant responsibilities and obligations for biodiversity conservation and natural resource management.
	Objective 2: Community Mobilization Mobilize communities to actively become involved in biodiversity conservation.
	Objective 3: Implementation, monitoring and review Ensure that the activities in the NBSAP are implemented according to priority and within specified time frames by the concerned agencies, and establish regular monitoring and review mechanisms for it.

Inclusion of global and/or national targets in NBSAP

Due to socio-economic and capacity limitations, Maldives has not been able to prepare a complete status report of the NBSAP until now. Therefore, national biodiversity target setting has been limited. However, the very existence of a NBSAP is a reflection of the importance that Maldives gives to the conservation and sustainable use of biodiversity resources. NBSAP has incorporated into it global issues and targets as set out in the Convention on Biodiversity. The Seventh National Development Plan and relevant Sectoral Plans also are integrated as appropriate, as well as the conservation and sustainable use of biological diversity in accordance with Article 6 of CBD 2002. NBSAP has also embraced in-situ and ex-situ conservation measures and public education and awareness raising programs which have guided or contributed to biodiversity activities since the inception of NBSAP.

Contribution of NBSAP to the implementation of the articles of the Convention on Biodiversity

The goals, objectives, actions and strategies have been developed to contribute to and support the implementation of the articles of the Convention on Biodiversity and the thematic programmes and cross-cutting issues adopted under the Convention. A few examples are given in Table 2.2 below.

A case in point is the attempts to increase public awareness of biodiversity issues. In Maldives, biodiversity is taught through the subject of Environmental Science which is in the curriculum of all primary schools of Maldives. Additionally, environment-related issues are incorporated into primary teacher education programs and information on biodiversity issues is provided through discussions and contributions to the media including TV, radio and the internet. The Environment Department of MoHE has started awareness programmes on all aspects of the environment in 2010, which is expected to be continued over the years and is mainly targeted at students all over the country.

Table 2.2 Examples of the contribution of NBSAP to the implementation of CBD

Article in CBD	Item in NBSAP
Article 6 (a) Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity	Goal 1: Conserve biological diversity and sustainably utilize biological resources.
Article 6 (b) Integrate the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies	Objective 1.1: Integrate biodiversity conservation into the national development policy-making and planning process.
Article 8 (a) Establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity	Objective 3, Action 13, Protected Areas: Develop and implement a national representative system of effectively managed protected areas to ensure biodiversity conservation in the natural environment.
Article 13. Public Education and Awareness. (a) Promote and encourage understanding of the importance of, and the measures required for, the conservation of biological diversity, as well as its propagation through media, and the inclusion of these topics in educational programmes	Objective 2: Increasing awareness. Create awareness to change attitudes and practices that harm biological diversity, develop behaviour that promote biodiversity conservation, and create public support for biodiversity conservation.

2.3 Progress in implementation and effectiveness of NBSAP

According to the COP 8 Decision VIII/14 on National reporting on CBD, 'the fourth and subsequent national reports should be outcome oriented and focus on the national status and trends of biodiversity, national actions and outcomes with respect to the achievement of the 2010 target and the goals of the Strategic Plan of the Convention, and progress in the implementation of national biodiversity strategies and action plans.'

To fulfil the said reporting need, this section will assess the progress made in the implementation and effectiveness of NBSAP by analysing the achievement level of each of the components (goals, objectives, actions and strategies) of NBSAP. The results will indicate the current status of NBSAP and its effectiveness. It will provide an overview of progress made in implementation of NBSAP including priority actions, focusing on concrete results achieved, including success stories. Table 2.3 shows the current status in implementation and the achievement of each component of NBSAP.

The analysis in Table 2.3 indicates that many of the strategies or measures contained in NBSAP have been achieved or are in some stage of being achieved. Given the lack of human, financial and institutional

capacity for conserving biodiversity in the Maldives, the progress in implementing and the effectiveness of NBSAP is considerable.

Issues raised in the goals and objectives of NBSAP can be observed at the national and sector level plans and programs. For example, one of the objectives of NBSAP was integrating biodiversity conservation into the national development planning and policy-making process. This objective and its associated actions were incorporated into the following seventh National Development Plan. An example of this incorporation is given in Chapter Three on incorporation of biodiversity issues into national and sector plans.

2.4 Funding and incentives to biodiversity conservation

According to IUCN (2007), "Marine and coastal tourism is the largest industry in the Maldives, for instance, directly accounting for 20% of GDP and 40% of employment. Its wider effects produce 74% of national income, 60% of foreign exchange earnings, and 90% of government revenues. National economic indicators and development statistics rarely reflect these broader values." The report 'Valuing Biodiversity: the economic case for biodiversity conservation in the Maldives' indicates that the biodiversity-based sectors contribute to 71% of national employment (78,500 jobs), 49% of public revenue (MRf 2.5 billion), 62% of foreign exchange (US$ 435 million), 98% of exports (MRf 1.7 billion), and 89% of GDP (MRf 135 billion). The economic case for funding biodiversity conservation measures cannot be made more strongly than this.

A case study on 'Valuing biodiversity – The economic case for biodiversity conservation in the Maldives' is provided at the end of this chapter. It gives an indication of the level of funding from domestic and international sources dedicated to environmental and biodiversity conservation. It also gives a view into the activities that can be successful.

The Case Study contains sections on:

- financing biodiversity conservation in the Maldives,
- tools for improving the financial sustainability of marine and coastal biodiversity conservation,
- economic incentives to conserve biodiversity in the Maldives, and
- economic instruments that can act as incentives for biodiversity conservation.

These are some of the issues that need to be addressed through NBSAP that have been achieved through a project on biodiversity conservation, namely the Atoll Ecosystem Conservation (AEC) Project.

Table 2.3: Current status in implementation and the achievement of each component of NBSAP

GOAL – ONE
CONSERVE BIOLOGICAL DIVERSITY AND SUSTAINABLY UTILISE BIOLOGICAL RESOURCES.

Objectives	Actions	Measures/ Strategies	Status/Achievement
Objective 1 Integrate biodiversity conservation into the national development policy-making, planning and process.			
Development Planning: 1. Develop and adopt planning procedures and processes that take into account biodiversity conservation.		1. Develop and adopt biodiversity conservation principles in prospective plans and strategic planning.	Achieved
		2. Undertake strategic environmental assessment of the national development plan and sectoral master plans.	In initial stage
		3. Ensure that initial environmental impact evaluation is carried out before endorsement of projects in the public sector investment programme (PSIP).	Achieved through EIA
		4. Ensure effective participation of development planners and town planners in the selection and designation of protected areas.	Achieved through participation in Committees
		5. Designate focal points for biodiversity conservation from planning agencies and regional development management offices.	In progress (guideline prepared)
		6. Conduct training programmes on biodiversity conservation for planners, economists and strategists.	Environment awareness programs held, but rarely directly on CBD
		7. Establish ecological valuation processes in development planning.	In initial stages, not whole country yet
		8. Adopt multi-species approach in resource management planning	MRC, LME project, being attempted

Land Use Plans 2. Formulate and adopt integrated national and regional land use plans that would ensure appropriate use of natural resources, development of infrastructure, conservation of the natural environment and serve as a guideline for the utilization of national resources.	1. Develop land use plans for all the regional growth centres and development focus islands, giving due consideration to the protection and preservation of important habitats and species in such islands.	On-going
	2. Review and revise development plans and existing land use plans as well as regulations and guidelines, giving priority to human well-being and protecting the natural environment.	Regulations reviewed and published; NPC process, cabinet papers also consider the protection of the environment
	3. Review and revise the regional development plans for projects which may have adverse impacts on biological resources, such as creation of ports, harbour facilities, land reclamation and waste disposal sites, to incorporate biodiversity conservation concerns.	Achieved through EIA
	4. Seek public and private sector involvement in formulating urban and rural development plans.	Being attempted
	5. Identify and allocate suitable areas for waste disposal and industrial development to reduce the impacts of pollution from these activities.	Waste disposal sites identified in most islands, WMCs constructed in 60% of the islands. Waste management work is being carried out through the MEM Project - MEMP is expected to establish a fully functional waste management facility in the North Province by the end of the project; work of regulating waste management is on-going. Problem: lack of permanent disposal sites

	6. Integrate biodiversity conservation principles into existing resettlement plans.	Incorporated into EIA process to some extent
	7. Give importance to the creation/ preservation of green belts around every island that would help to protect the island from storms and other severe natural events.	Being attempted through establishment of Environment Protection Zone (EPZ) i.e. 20m buffer zone, added to Land Use Plans regulations since 2008.
	8. Allocate zones and areas for different commercial activities, areas of natural beauty, sites of special scientific interest and conservation areas to preserve the nations' natural heritage.	Being attempted through Land Use Plans
3. Review and strengthen national EIA process to provide for mitigating the possible adverse environmental impacts of policies, programmes, and projects.	1. Ensure that all projects, including public and private sector ones, undergo the EIA process.	New EIA regulations provided in 2007, EIA process being strengthened: made mandatory for all development projects
	2. Provide for public participation from the early stages of the EIA process and allow public concerns and objections to be raised before final decisions are made including project site selection.	Public participation sought, but some communities do not, or are not aware of how to, participate
	3. Develop and provide project-specific guidelines focused on key issues and incorporate biodiversity conservation concerns.	In every project
	4. Develop and incorporate biodiversity conservation criteria in the EIA process, incorporating concepts such as endangered species, keystone species and critical habitats.	Incorporated into EIA process
	5. Use economic valuation of ecosystems in EIA processes as a determinant in justification of projects.	Incorporated into project approval process
	6. Strengthen the monitoring process of environmental impacts stated in EIAs to improve environmental management	sometimes; improving; facing enforcement difficulties

Objective 2 Adopt appropriate national and sectoral policies and management systems for sustainable utilization of natural resources.		
4. Establish a macro policy environment, guided by principles of biodiversity conservation of and sustainable use of natural resources that will ensure appropriate allocation between various types (or sectors) of resource use while ensuring the sustainability of single- and multiple-use resources.	1. Review existing (sectoral) policies on natural resource utilization and identify areas of policy and management failure that lead to biodiversity loss, and natural resource loss and degradation.	Goal being attempted. Achievement level 3/10 E.g. Work on groupers and reef fisheries
	2. Implement a macro strategy for biodiversity conservation and sustainable management of natural resources that optimises environmental, social and economic objectives, while harmonizing sectoral objectives and strategies.	Achieved through Constitution; Laws (Environment, Fisheries, etc)
	3. Establish and adopt mechanisms to absorb this macro strategy into sectoral policies and plans with a view to integrated natural resource use conservation and management.	Mechanisms established – NEAP 1,2,3
	4. Implement a mechanism for regular performance reviews that utilizes participatory monitoring and evaluation processes in order to ensure the effectiveness of sectoral policies and strategies to implement the macro strategy, and to ensure their responsiveness to biodiversity conservation needs.	Ad hoc

5. Develop national resource management plans and assess economically important biological resources to contribute to sustainable utilisation of biological resources.	1. Implement resource use mapping and establish biological reference points for commercially-exploited species.	To some extent (MRC-baitfish, grouper, shark); the third component of the current MEMP is to expand the knowledge base regarding critical natural resources on which the Maldives ecosystem and economy depend.
	2. Assess threatening processes to develop alternatives.	On-going (e.g. coral and sand mining, alternative livelihood options offered to shark fishers), Achievement level 4/10
	3. Adopt an ecosystem management approach in national resource management planning.	MoHE is attempting to achieve this through the AEC Project and National plans.
Marine Policy 6. Formulate and adopt an integrated marine policy which would facilitate and catalyze actions for effective management of marine resources while strengthening inter-sectoral relationships and ensuring consistency in policies and strategies formulated by various government institutions regarding the marine environment.	1.Conduct a review of existing policies and strategies on marine environment with a view to changing policies to accommodate sustainable management of marine resources, if needed.	New Fisheries bill
	2. Develop consistent legislation to define and apply the principles of sustainable management of marine environment.	Addressed in the new Constitution in Articles relating to the environment; Fisheries Bill, some regulations developed, other Laws and regulations in draft stage
	3. Strengthen communication among various government institutions to minimize overlapping of strategies and programmes formulated towards the management of marine biodiversity.	On-going, needs strengthening, improving slowly

	4. Seek stakeholder participation in the policy process and harmonize conflicting objectives, strategies and capacities.	Conflicts between some sectors according to their interests. However, the current NPC process attempts to address such differences and conflicts
Fisheries Sector 7. Adopt ecologically sustainable fisheries management measures based on best scientific evidence available, to ensure the attainment of maximum economic and social benefit from the sector while conserving resources for future generations.	1. Formulate and implement Code of Conduct for responsible fisheries to ensure effective conservation, management and development of fishery resources, with due respect for ecosystem and biodiversity.	(International) Code of conduct agreed/ adopted
	2. Establish an effective technology-based system for Monitoring, Control and Surveillance (MCS) to ensure that all fishing activities are carried out in a manner consistent with national legislation and in conformity with international Laws.	MCS being worked on through MCS-IFAD project, Vessel Monitoring System (VMS);surveillance work carried out by MNDF: a number of illegal fishing vessels have been caught in the past few years
	3. *Promote devolution of management* responsibilities to community level with the aim of government institutions and communities working together to develop conservation and management strategies for the fisheries sector.	*Decentralisation Bill* has been enacted. MoFA has an officer in each Province Office to attend to Fisheries sector issues at the community level
	4. Integrate socio-economic impact assessment (SEIA) into management processes in order to ensure sustainable management of fisheries and to enable the achievement of social and economic objectives.	Incorporated into stock and other assessments/ reviews

	5. Promote the introduction of bio-economic management tools to prevent over-fishing and excess capacity and to ensure that fishing effort is commensurate with the productive capacity of the resources and their sustainable utilization.	Vessel design; boat building code; MRC - resource management plans (e.g. bait fishery, grouper, shark, turtle management plans) are under development. (e.g. MRC is developing a bait fish management plan through MEMP)
	6. Minimise waste, discards, incidental and by catch through adoption of ecologically friendly fishing practices and technologies that are specific to target species.	Being attempted
	7. Work to regulate fisheries in a manner that minimizes multiple-use conflicts and conflicts between fishers using different vessels, gear, fishing methods and fishing for different species.	Being attempted through Fisheries bill.
	8. Ensure that appropriate research is conducted into all aspects of fisheries including ecology, technology, economics and socio-economics.	Lack of capacity; MRC is attempting this.
	9. Increase human and research capacity in the relevant institutions for assessing impacts on fishery resources and the environment from fisheries activities.	Lack of capacity – main hurdle. However, MEMP has a component on Capacity Building for Environmental Management, Faculty of Education (MCHE) has started a BSc Degree and Diploma in Environmental Management in collaboration with MEMP.
Tourism Sector 8. Adopt a policy of ecologically sustainable tourism.	1.Review and revise existing regulations, and adopt guidelines to strive towards minimum disturbance and alterations to the environment in construction of resorts, infrastructure development and other activities in the tourism sector.	Being attempted through Tourism Regulations, EIA.

	2. Incorporate biodiversity conservation principles into tourism regulations and standards.	Environment, Tourism etc regulations;EIA; Green Resort Award given to resorts for environmentally friendly practices; resorts work towards international environmental awards and standards
	3. Integrate broad-based natural resource stakeholder consultation processes into tourism development and planning to minimise multi-use conflicts.	Stakeholder consultation through EIA process

	4. Review and strengthen EIA processes within the tourism sector to avoid ecologically unsustainable developments and protect ecologically important and sensitive areas when planning tourist facilities.	MEMP has a component on Regional Strategic Environmental Assessment which is aimed at expanding the knowledge base regarding critical natural resources on which the Maldives ecosystem and economy depend. It selectively targets issues and information gaps where assistance is most urgently needed and promotes activities designed to stimulate discussions and policy deliberations that would lead to greater community awareness and better decision-making including the tourism sector
	5.Integrate SEIA in tourism planning and development.	Being attempted
	6. Implement planning controls to establish ecotourism and specialist tourism instead of mass tourism.	Specialized, ecologically sustainable tourism being practiced through tourism regulations

9. Promote biodiversity conservation while maintaining high standards of quality and delivery in providing tourist experiences through sustainable utilization of natural resources and strengthening management practices in the sector to ensure tourism development is not detrimental to the ecological integrity of the area.	1. Improve capacity to assess ecological impacts of tourism developments and operational practices through institutional strengthening and human resource development.	Being attempted through training
	2. Resolve multiuse conflicts related to tourism activities including utilisation of uninhabited islands and protected sites.	Being attempted; MPAs; dive sites; fishing zones; shark fish ban
	3. Conduct research to monitor environmental impacts and stresses on natural resources from tourism developments and evaluate trends in the tourism industry.	Limited research carried out (e.g. through EIA process and dive schools). Government is considering outsourcing of management of MPAs to strengthen this aspect
	4. Develop limits of acceptable change to tourist areas. Review and determine ecological carrying capacity limits on tourist facilities and visiting areas.	Incorporated in resort development activities. MoTC is working on this
	5. Formulate and implement a code of conduct for responsible tourism incorporating biodiversity conservation principles for tourist facility operations.	Some regulations in place, others including Laws being developed
	6. Establish minimum standards, guidelines for wise use and reduce demand for biological resources to prevent waste and degradation, and encourage implementation of environment friendly technologies and materials.	Incorporated into guidelines in giving permission for resort development
	7. Promote development of ecotourism as a vehicle for providing environmental, socio-economic and cultural benefits at both local and national levels through implementation of eco-tourism projects and product marketing.	Tourism in protected areas being attempted with local community participation
	8. Develop and implement a programme to increase awareness of tourists on the vulnerability of the natural environment of the Maldives.	Information being provided to tourists

	1. Restrict coastal development projects such as ports and harbours only to islands that have been identified in the national/regional development plans.	According to national needs and government policy
	2. Discourage dredging/excavating of small harbour basins for every inhabited island by encouraging the use of natural harbours (vilu) and by seeking alternative means, such as jetties, to access the islands.	Not successfully implemented mostly due to the demands by residents of islands
	3. Strengthen institutional and human resource capacities of regional and local government bodies that are essential to enforce land use regulations and guidelines.	On-going
Housing and Physical Development 10. Ensure biodiversity conservation is integrated into housing, physical development activities and other land use practices.	4. Set standard policies and written guidelines on allocation of housing plots and urban development areas in all inhabited islands which: (a) Ensures minimum disruption to densely vegetated areas when allocating land for new housing zones or plots and other physical development activities by protecting such areas, (b) Ensures retention of shoreline vegetation buffer zone (Heylhi) when allocating land for housing plots and other physical development activities in inhabited islands.	On-going Land use plans being developed; in some islands priority had to be given to housing as a Constitutional right rather than protection of sites. However, significant trees and areas including wetlands being protected in making land use plans. Implemented through LUP regulations
	5. Defines and optimises the area of land to be allocated for housing plots and other physical development activities in a way that is most appropriate for conservation of the biological diversity of each island or atoll.	Through land use plans;sensitive areas being identified and zone-based conservation process and community advocacy attempted
	6. Review and revise existing guidelines on management of newly allocated housing plots and encourage retention of vegetation within allocated housing plots whenever plots are allocated within densely vegetated areas.	Designated community green spaces and parks provided in all LUPs; plots given now are very small, so this is attempted through community advocacy

	7. Support use of perimeter hedges instead of perimeter walls by providing detailed layout plans of housing plots for each island.	MHE supports this and attempts to achieve it through identifying plots in the Land Registry and establishing corner pegs. Safety and security concerns may restrict use of hedges in the current context
	8.Review and enforce regulations on non- occupation of housing plots to fully utilize housing zones of islands.	Being attempted
Timber Resources 11. Strengthen and implement national policies and regulations for ecologically sustainable use of timber resources.	1. Review the appropriateness of existing policies, legislation and current management practices on timber resources.	Permits for logging temporarily suspended, no further permits given; forestry policy formulated, not yet finalized; monitoring mechanisms being established
	2. Develop policy and legislative frameworks for the utilization of timber resources taking into account conservation of biological diversity.	Regulations in place (Law on uninhabited islands);forestry master plan being drawn up
	3. Undertake assessments of resource status on uninhabited islands and community land on inhabited islands to identify their value for the conservation of biological diversity.	Not directly; some work done through other projects and programs
	4. Develop and adopt codes of practice to promote efficient management, sustainable utilization and effective monitoring of timber resources.	Provincial assessments being attempted;better working relationships/ coordination between stakeholders needed
	5. Develop and implement rehabilitation programmes to conserve terrestrial biodiversity, including agro-forestry and reforestation programmes.	Forestry policy formulated, not yet adopted; forest rehabilitation needed

Agriculture 12. Formulate and adopt ecologically sustainable agriculture development and management practices.	1. Develop institutional and legal work frame incorporating biological diversity conservation measures for the agriculture sector.	Draft bills on:Agriculture Law, Land Law, Pesticides Law, Plant Protection Law, Animal Health Law (expected to be in place by July 2011)
	2. Introduce and support adoption of technologies and methodologies for cultivation that are appropriate for the conservation and sustainable use of land and trees.	On-going; salt tolerant varieties being introduced; better growing practices advocated, e.g. drip irrigation, etc
	3. Promote participatory approaches that enable local people to be involved in the planning and management of agricultural activities, including land allocation for cultivation and crop varieties to be grown, in order to encourage them to work towards enhancing the local environmental.	Attempts being made through Community-based Producer Organisations (CBPOs), Co-ops, NGOs, - CBPOs trained in 25 islands
	4. Enhance partnerships and collaboration with all the current and potential stakeholders in adopting ecologically sustainable agriculture management practices.	Being attempted through CBPOs, Co-ops, NGOs
	5. Minimise use of chemical fertilizers by promoting use of organic fertilizers and green manure application for conservation of soil and soil organisms.	Included in draft bill of Pesticide Law; Male' nursery to offer organic products, bio pesticides, organic composting, etc
	6. Collaborate with international agriculture research institutions to strengthen national research systems and to link conservation with national agricultural management practices.	Collaborations with IFAD, ICRAF; seeking support for research and training through Asia-Pacific Forest Invasive Species Network (APFISN)
	7. Implement Integrated Pest Management (IPM) practices for the control of pest and diseases of plants.	Bio controls being attempted; booklet on bio controls prepared for distribution

	8. Develop programmes for proactive management of insects and insect ecology in wild lands and agricultural lands in order to diminish the loss of essential ecosystem services such as pollination and decomposition.	Guidance given to islands to control pests, insects, etc, e.g. using soap water to clean the leaves and branches and trimming rather than fogging
	9. Develop a code of conduct to be used as a set of principles for the distribution, handling and effective use of pesticides and herbicides and create awareness on safe use of pesticides.	Pesticide Bill in process
	10. Introduce and adopt appropriate low-cost technologies for irrigation to enable efficient harvesting of ground water and thereby minimize salination, salt-water intrusion and other adverse effects on biological diversity.	To some extent; drip irrigation promoted; infiltration galleries in pilot stage; micro-irrigation systems being offered; government is encouraging and providing assistance to communities to increase rainwater harvesting
Objective 3 Develop and establish effective management measures for conservation of biodiversity to ensure ecological processes and systems are maintained.		
Protected Areas 13. Develop and implement a national representative system of effectively-managed protected areas to ensure biodiversity conservation in the natural environment.	1.Identify and map bio-regions for establishing adequate protected areas, and categorise these areas for management.	Sensitive areas identified; MoHE is strengthening its GIS capacity through MEMP
	2. Identify keystone species and study their interactions to protect those elements of the ecological systems that are crucial for conservation.	Sensitive species identified, list made
	3. Establish a Protected Areas Management Unit comprising of technical experts, government and other stakeholders to strengthen institutional capacity to design and manage a system of protected areas.	Supported through PoWPA, AEC project; Technical work underway to establish this unit
	4. Develop and introduce operational guidelines for protected area systems management.	Work to address this issue is on-going

	5. Identify training needs for the community and institutions and train national coordinators, local monitors and wardens for management and monitoring of protected areas.	Work to address this issue is on-going
	6. Prepare a framework for financing and implement a financial mechanism for the long-term management of protected areas.	Management Outsourcing documents prepared
	7. Strengthen protected areas management through community participation and increased awareness.	On-going; being practiced in AEC project in Baa atoll.
14. Identify and develop guidelines for conservation of unique species and biologically unique features of natural landscapes and seascapes.	1. Identify, categorise and map unique habitats and species for conservation and protection.	Sensitive list made
	2. Identify and protect significant populations of seabird species and their habitats to facilitate conservation.	Birds protected;Environmental Liability Regulations drafted to strengthen enforcement
	3. Implement measures to preserve nesting vegetation and roosting grounds of bird species including shoreline buffer vegetation.	List of sensitive areas being compiled
	4. Strengthen and implement measures for protection of turtles, including extending protection to turtle eggs and breeding areas.	Turtles protected; collecting eggs prohibited from 16 islands, protection of breeding areas

Coral Reefs 15. Strengthen conservation and management measures for coral reef ecosystems.	1. Improve knowledge and understanding of the important ecological and biological processes of coral reef ecosystems by reviewing existing global information.	Member of CBD, member of International Coral Reef Initiative (ICRI) developed through CBD; party to and contribute to Global Coral Reef Monitoring Network (GCRMN); National coral reef status reports published in Status of Coral reefs of the World; widely participate in regional and international forums to discuss and share information on the ecological, biological and economic importance of coral reefs and the threats reefs are exposed to (natural and anthropogenic), especially threats linked to global warming
	2. Study human-coral reef interactions and improve knowledge of natural and anthropogenic threats to coral reefs of Maldives to support management measures.	National coral reef monitoring program by MRC

	3. Strengthen monitoring procedures of biophysical and socio-economic aspects of coral reefs.	Review of national coral reef monitoring program to adapt an ecosystem (indicator) based approach to coral reef monitoring with climate change focus to understand the linkages between the goods and services provided to the Maldivian society by the coral reefs; basic principles outlined by CBD for ecosystem based monitoring are being followed
	4. Declare and manage protected areas within coral reefs, including no-take zones for coral reef flora and fauna at threat of overexploitation.	33 areas declared as protected; management is weak due to weak legal framework for natural resource conservation and management; however, draft Environment Act and outsourcing of the management will strengthen this aspect
	5. Develop an economic valuation system for coral reefs that can be used in the EIA process.	On-going; contributions made by AEC project.
	6. Disseminate information on the importance and threats to coral reef ecosystems through public awareness programmes.	On-going through audio-visual, printed and voice media using relevant agencies
	7. Implement management plans for coral reef-associated species that are at threat of overexploitation, e.g.: bêche-de-mer, groupers etc.	No management plans developed; some regulations in place for sharks, beche-de- mer, and giant clams; export and exploitation bans on several species such as napoleon wrasse, lobsters, parrotfishes, etc.

16. Phase out coral mining to support conservation of the reef ecosystem.	1. Conduct awareness programmes and educate the public on the importance of coral reefs to the Maldives and the threat that coral mining imposes on them.	Coral mining banned; regulations in place; limited sand mining
	2. Initiate the phasing out process by identifying and selecting one reef in each atoll where coral mining will be allowed and ban mining from other areas within the atoll.	Coral mining banned; the policy is no longer promoted
	3. Prohibit the use of coral for building coastal protection such as seawalls and promote use of alternative materials.	Coral mining and use of live coral stones for construction is banned
	4. Hold public exhibitions to disseminate information on alternative sources of construction material.	Information disseminated, private parties active
	5. Assist companies to extend distribution of alternative construction materials to more remote islands by providing incentives such as soft loans.	Soft loans not available yet
	6. Support and encourage use of alternative sources of construction materials through appropriate techniques, research and economic incentives such as reduced import tax on alternative construction material to reduce their cost.	Construction materials imported and distributed by private and public companies
Conservation of Plants and Mangroves 17. Ensure indigenous plant genetic resources are preserved through an economically efficient and sustainable system.	1. Identify, inventory and assess threats to endemic plant species.	Inventory being made
	2. Develop cooperation with regional and international centres of gene banks for the ex-situ conservation of plant genetic resources, recognizing that states have sovereign rights over their own plant genetic resources.	Not yet achieved

	3. Establish botanical gardens and national parks to conserve vegetatively propagated plants and threatened species.	Plans for botanical garden and conservation of plants drawn up
	4. Conduct research to develop improved methods of conservation of plant genetic resources, in particular low-cost techniques appropriate to local operating conditions.	Not yet achieved
	5.Encourage and support farmers to grow distinct local varieties of food crops, to ensure biodiversity conservation through traditional practices.	Attempted through agriculture master plan
	6. Educate the public of the value of plant genetic resources for their livelihood and thereby importance of conservation of this resource.	Awareness programmes arranged and continued since 2010 by Environment Department include these aspects
	7. Encourage the public to grow indigenous plant species in home gardens and public areas such as mosques, schools, graveyards etc.	"Return of the flowers" campaign was held in 2006 where such plants were reintroduced
	8. Promote development of traditional medicinal practices and assist the public to grow traditional medicinal plants.	Being attempted
	9. Build a comprehensive data base on traditional medicinal plants.	Completed
18. Implement management measures to conserve wetlands and mangrove ecosystems.	1. Identify wetlands and mangrove ecosystems important for conservation.	EPA prepared a list
	2. Develop economic valuation system for wetlands and mangrove ecosystems.	Not yet achieved
	3. Set aside representative areas of wetlands and mangrove ecosystems for biodiversity conservation.	Being attempted; sensitive list made
	4. Undertake EIA before commencement of projects that involve wetlands, mangroves and seagrass areas.	Through EIA regulations
	5. Undertake restoration programmes for ecologically important wetlands and mangrove ecosystems that are endangered.	EU grant being sought for restoration program

	6. Protect and conserve mangroves, other wetlands and seagrass areas wherever possible from being used as landfill, or being developed without taking conservation into consideration.	Regulation through land use plans
	7. Study the role of seagrass ecosystems in the Maldives and investigate the importance of these ecosystems to the Maldivian environment.	Not yet achieved
Introduction of Exotic Species and Pests 19. Establish sanitary and phyto-sanitary measures necessary for conservation of biological diversity, animal and plant life, and health.	1.Formulate quarantine Laws and other regulations to control the importation of alien species, pests and diseases.	Quarantine regulations incorporated as a component of the Plant Protection bill
	2. Adopt risk assessment techniques developed by international organizations for identification of potentially harmful species, their entry, establishment and control.	Quarantine Unit established at Hulhule'; training being given to staff; expert working now to establish systems
	3. Establish suitable quarantine facilities at entry points.	Quarantine Unit established at Hulhule'; three labs to be developed
	4. Establish appropriate measures for conservation of local biological diversity when transferring species from one locality to another within the country.	Not yet achieved
Migratory Species 20. Establish management systems for transboundary straddling stocks and highly migratory species.	1. Identify migratory species and undertake international data sharing for stock assessments of migratory species.	Limited tuna stock assessment made by MRC
	2. Identify and manage nursery areas and habitats that hold significant numbers of migratory species.	Being attempted by EPA and MRC
	3. Identify migratory species that are threatened and develop mechanism for their protection, including establishment of links with international funding agencies and interest groups, and adoption of appropriate regulations	Sensitive list made; mechanism not yet established

Protection and Rehabilitation of Threatened Species 21. Develop and adopt mechanisms for the protection and rehabilitation of threatened components of biological diversity.	1. Establish abundance indices for the identification of vulnerable and endangered species.	Not yet achieved
	2. Implement and monitor moratoriums on utilization of endangered species.	Moratorium on turtle protection implemented; not monitored appropriately
	3. Formulate and implement rehabilitation programmes and recovery plans for endangered species and their habitats.	Turtle recovery programs run by private parties with permission from MoFA
	4. Establish incentives for utilization of sustainable alternatives for biological components that are threatened.	Alternative livelihood incentives provided for shark fishers
Objective 4: Management of threatening process Ensure that threatening processes are managed at the national level to minimise their adverse impacts on biological diversity and strengthen efforts to influence the international community to control threatening processes at global level.		
Pollution 22. Ensure that adverse impacts of pollution are minimised.	1. Adopt a policy of "polluter pays" in cases of significant pollution of the environment.	Waste policy and regulations being developed
	2. Develop a national integrated solid waste management system which incorporates solid waste minimization and reuse methods which are practical for small islands and proper disposal of solid waste with minimal environmental impact.	Waste disposal mechanisms in Male' and some islands; feasibility study made for 2 islands
	3. Improve current septic tank designs by taking into consideration socio-economic factors such as large households, geophysical conditions such as shallowness of the water lens, and climatic conditions such as the high rainfall for the country.	Government no-longer promotes septic tanks
	4. Develop a safe disposal method for hazardous waste, which is currently disposed with solid waste in open landfills.	Poorly developed

	5. Implement the Addressing Air Pollution – National Strategy for Action.	No national strategy yet. Ground level air pollution monitoring will begin this year under Male' Declaration, CFCs phased out, HCFC to be phased out by 2020,(HFCF Phase out Management Plan) ICAO Regulations followed
	6.Formulate and implement a Marine Pollution Action Plan aimed at combating and reducing marine pollution and dealing with disasters.	IMO Regulations on pollution control followed
Climate Change 23. Develop and implement measures at national level to deal with the effects of climate change and increase efforts internationally to support mitigation of green house gases.	1. Make execution of activities proposed in the National Implementation Strategy for Addressing Climate Change a priority.	NAPA, NSDS, SAP prepared; Carbon neutrality by 2020
	2. Intensify efforts to raise the concerns of the Maldives in international forums regarding the effects of climate change and sea level rise, and the threats to the Maldives from the same.	Maldives is an active member in several different international discussions and negotiations (e.g. IPCC, UNFCCC, IRENA etc);Maldives actively contributes to these fora through position papers, especially on climate change adaptation and mitigation
Objective 5: Adoption of economic incentives for conservation Develop and adopt suitable economic instruments to ensure that the value of biodiversity is adequately reflected in national development activities and to promote sustainable utilization of biological resources and equitable distribution of benefits from the use of biological resources.		
Economic Valuation 24. Develop valuation systems for ecologically and socially important components of biodiversity through appropriate monetary valuation methods.	1. Utilize biodiversity valuation within feasibility studies, including cost benefit analyses, for all infrastructure and development projects and economic activities.	Attempts being made; study carried out through AEC project in Baa and Male'; joint program by EPA and SANDEE; needs integration into EIA process

25. Develop a natural resources account incorporating biodiversity values that complements standard national income accounts, to reflect costs of ecosystem degradation, loss of species and genetic diversity, and resource depletion.		Information to develop an account being made available, e.g. through AEC project; potential for developing an account; some projects have this information; valuation of marine resources project undertaken by EPA-SANDEE
26. Adopt suitable economic incentives according to conservation needs of the component of biological diversity being utilised.	1. Introduce the concept of 'user pays' principle for biological resource utilization.	Consultative process completed; policy level willingness to implement, e.g. Baa atoll (AEC project)
	2. Introduce tradable permits to promote economically efficient and sustainable utilization of resources.	Not yet achieved
	3. Introduce export quotas to promote sustainable utilization of those components of biodiversity, the exploitation of which are mainly for export.	Quotas established for marine ornamental fish and yellowfin tuna
	4. Obtain optimal economic benefit of biological resources through improved processing and efficient marketing.	Being attempted
	5. Ensure that economic instruments (e.g., licenses, quotas, taxes, etc.) utilized in biological resource use promote equitable distribution of benefits from the use of biological resources and do not favour other nationalities over Maldivians.	Fishing regulations made to favour locals; IUU regulations followed; traceability factor included; competitive market being established
27. Integrate sustainable income generation into conservation efforts to ensure long-term conservation.		Not yet achieved

28. Make available access to adequate financial resources to help start new and innovative projects for conservation and to include conservation components into existing projects.		A grant facility established and currently being announced, through GEF-UNDP
Objective 6 International co-operation Support and participate in international efforts to conserve local and global biodiversity.		
29. Joining international conventions that promote biodiversity conservation and ensure that every effort is made to meet the objectives of these conventions.		A number of conventions and protocols entered into.
30. Utilize the opportunities offered through the Convention on Biological Diversity and other such initiatives to obtain technical, financial, research and other assistance from international agencies.		Assistance being sought
31. Contribute to regional bodies that are related to the conservation of biological resources through data sharing and resource management programmes.		Some associations and reports made
32. Collaborate with the international community to utilize genetic resources of the Maldives that have potential medicinal or other value in a manner that is sustainable and beneficial to all.		MRC: pearl-oyster culture project implemented but no tangible outcome for the Maldives

GOAL – TWO

CAPACIY BUILDING

BUILD CAPACITY FOR BIODIVERSITY CONSERVATION THROUGH A STRONG GOVERNANCE FRAMEWORK AND IMPROVED KNOWLEDGE AND UNDERSTANDING

Objectives	Actions	Measures/ Strategies	Achievement
Objective 1 Improve knowledge and understanding of biological diversity and resource management to promote conservation and sustainable use of biodiversity.			
33. Strengthen the system for assessing, monitoring and forecasting the status of biological diversity.	1. Strengthen the existing system of collecting fisheries, agricultural and environmental data from resource users, such as fishing vessel owners, dive schools, farmers and uninhabited island leaseholders by making data collection regular, timely and reliable.		Being strengthened through EIA and MEMP (comprehensive terrestrial and marine environmental database for monitoring the quality of environmental assets and to guide sustainable development)
	2. Establish a data collection system specific for biodiversity so that data from this system combined with resource use data will give a better picture of biodiversity status.		Being developed through EIA and MEMP (comprehensive terrestrial and marine environmental database for monitoring the quality of environmental assets and to guide sustainable development)
	3. Analyse and interpret data from present fisheries, agricultural and environmental data collection systems in order to assess the level of resource utilization and status of biodiversity.		Assessments made mostly by MRC, MEMP, GIS
	4. Establish a biodiversity database for continued storage and analysis of biodiversity-related data.		Being developed through the AEC Project

	5. Undertake regular analysis and forecasting of biodiversity status in light of available stock assessment, resource use, environmental and meteorological data so that if future remedial measures are required they can be taken with minimum negative socio-economic impact.	Not regularly; ad hoc
	6. Establish and maintain a GIS database of national biological diversity to enable scenario generation on biodiversity status, support decision-making and promote wide dissemination and sharing of information.	GIS system has been installed at NCIT and data is being uploaded on to it now
	7. Establish monitoring systems for threatening operations and processes such as land reclamation, dredging, deforestation and pollution, with the aim of assessing the status, and taking timely and appropriate mitigation measures.	Somewhat; monitored through EIA process
Research 34. Conduct research and develop appropriate technology to facilitate biodiversity conservation.	1. Formulate and implement a comprehensive research strategy with the participation of relevant agencies to facilitate and support biodiversity conservation, taking into account available resources and explicitly stated realistic time frames.	At policy level, not yet at strategy and practice level
	2. Establish a suitable set of indicators to use in biodiversity conservation and natural resources management such as ecological indicators, human development indicators, environmental indicators and performance indicators. In doing so, utilize indicators which have already been developed in other countries and modify them to fit local conditions.	Under consideration
	3. Expand research and development capacity through human resource and infrastructure development.	Some training done; environment management degree course under MEMP; short and long term courses being attempted; agricultural training was given in HDh Hanimaadhoo, and L Mendhoo (now to be transferred to L. Gan)

	4. Initiate collaborative research with regional and international research bodies, and expand and strengthen current collaborative research activities.	MRC, some research done by EPA; efforts made to affiliate with World Agroforestry Centre, ICRAF (agriculture)
	5. Assess the biological diversity of the Maldives at genetic, species and ecosystem levels as a phase out activity.	On-going at species and ecosystem level,
	6. Utilize rapid assessment methods to assess the status of biological diversity.	EPA, MRC, EIA
	7. Undertake a species inventory of the Maldives taking into account species abundance and distribution, initially by reviewing and revising the taxonomy of known species to conform to current systems and then by identifying new ones through collaboration with international organisations and/or experts.	On-going; Catalogue of Plants and Trees and Shrubs catalogue made
	8. Undertake surveys of intensively-exploited biological resources by assessing the stocks of exploited species, and environmental and socio-economic impacts of activities.	Reports on sharks, groupers; Baa atoll assessment baseline report
	9. Assess the vulnerability of Maldivian biodiversity, most of which is characterised by low abundance and low tolerance to environmental changes, in the face of increasing resource exploitation, environmental degradation and habitat modification.	Status of the coral reefs in the Maldives; post-coral bleaching event; impact of tsunami on live bait fish
	10. Collect, document, and disseminate ethno-biological and traditional knowledge, and develop appropriate models and tools for biodiversity conservation in current conditions through the use of ethno-biological knowledge and indigenous resource management practices.	Some work done
	11. Undertake a programme to screen flora and fauna for medically active substances by utilizing traditional knowledge and through collaboration with international institutions.	Being attempted by EPA (traditional knowledge); cancer research carried out by University of Texas on marine fauna, sponges, algae, MRC
	12. Improve knowledge on coastal ecological systems to help in formulating coastal development plans where coastal modifications are necessary.	MEMP, Kench report

35. Strengthen and expand existing information dissemination systems to facilitate easy public access to information related to biodiversity.	1.Collect literature related to biodiversity conservation and make it easily accessible to the public.	EPA, MRC,AEC being tried: http://www.biodiversity.mv/aec/
	2. Establish and develop a national library system easily accessible for local communities through the use of mobile libraries, community libraries and school libraries.	Not yet achieved
	3. Provide technical, financial and infrastructure support to local communities for the adoption of information technology in natural resource management and biodiversity conservation.	Not yet achieved
	4. Undertake a programme of information dissemination through the use of all media (radio, TV, internet), public information sessions, public information centres and direct contact in order to mobilize community involvement.	Through Fehivina and Kandu falhu programs and other TV and radio programs and websites (EPA, MHE, MRC, MoFA)
	5. Undertake a programme to translate existing resource and status studies into Dhivehi to support community learning and self-development for biodiversity conservation and resource management.	Currently being worked on

Objective 2: Increasing awareness Create awareness to change attitudes and practices that harm biological diversity, develop behaviour that promote biodiversity conservation, and create public support for biodiversity conservation.		
36. Spread awareness of biodiversity conservation principles, issues and methods at all levels of society including grassroots level, through formal, non-formal and adult education systems.	1. Introduce biodiversity conservation topics into staff development programmes at educational institutions to increase their appreciation of the issues and thereby enable them to enhance student awareness.	Introduced into teacher education programs
	2. Introduce biodiversity conservation principles and issues into the school curriculum in relevant subject areas at a standard suitable to each grade, incorporating local environmental issues as examples.	Environmental science is a subject in primary school

	3. Create a sense of ownership for biodiversity conservation by concentrating on local issues when planning and conducting awareness programmes.	Being tried
	4. Employ methods such as participatory learning models that encourage critical consciousness in order to spread awareness at grassroots level.	Through environment clubs
	5. Establish ways and means of continuous learning about biodiversity conservation within the non-formal and adult education systems.	Not yet achieved
37. Utilize popular culture to heighten awareness of biodiversity conservation.	1. Develop and broadcast/telecast public service announcements and special programmes on biodiversity conservation.	Being attempted through participation in media programs
	2. Incorporate biodiversity conservation programmes (including relevant programmes or documentaries in other languages which have been translated into Dhivehi) into current environment awareness programmes broadcast/ telecast through popular media.	Limited translations
38. Conduct regular awareness programmes for policy makers and management level officials of both public and private sectors to update them on current issues and promote integration of biodiversity conservation principles into relevant programmes.		Not yet achieved
Objective 3: Legal framework Establish and strengthen legal framework for biodiversity conservation.		
Strengthening Legal Framework		Draft Environmental Law
39. Review and revise existing Laws and regulations relating to conservation of biological diversity and formulate regulations with provisions for implementing them.	1. Identify loopholes and shortcomings of existing Laws and regulations relating to biological diversity and strengthen these to support biodiversity conservation effectively.	Loopholes and shortcomings identified
	2. Formulate and periodically review regulations on the conservation of biological diversity.	Not yet achieved

	3. Ensure that existing and/or new regulations are transparent and unambiguous.	Attempting, on-going
	4. Involve stakeholders in reviewing existing regulations and formulating new regulations.	On-going
40. Ensure Laws and regulations relating to biodiversity conservation reflect the value of biological diversity.	1. Ensure that Laws and regulations are formulated in such a way that they effectively deter persons from engaging in conduct that harms biological diversity.	Regulations, Laws made; level of implementation needs to be monitored
	2. Ensure that penalties for non-compliance adequately reflect the cost to biological diversity.	Being worked on
	3. Make it an offence not to disclose information regarding or report a breach of a Law/regulation relating to biodiversity conservation.	In regulations
41. Strengthen Law enforcement capability while undertaking management systems designed to promote voluntary compliance.	1. Increase awareness of the general public regarding the existence, substance and rationale of Laws and regulations relating to biological diversity by publicity through the media.	Attempts being made to publicize through media
	2. Strengthen coordination and cooperation between parties responsible for regulating and monitoring compliance.	On-going
	3. Strengthen Law enforcement by encouraging parties responsible for regulating and monitoring to take initiative in enforcing Laws/ regulations established for conservation of biological diversity.	Enforcement officers, police, customs being trained
42. Ensure legal recognition for conservation of all living things in relevant Laws and regulations.		On-going
43. Expand the role of island and atoll offices in the implementation of regulations related to biological resource conservation.	1. Strengthen institutional framework at atoll and island level by building capacity that is required to implement Laws/regulations designed to conserve biological diversity.	Not yet achieved

	2. Ensure greater consultation with atoll and island offices in formulation of the regulatory framework for conservation of biological diversity.	Consultations made
	3. Ensure atoll and island offices, under the supervision of relevant government offices, are made responsible and accountable for enforcing Laws/regulations relating to the conservation of biological diversity at atoll and island level.	No enforcement power or delegation yet
Intellectual Property Rights and Use of Genetic Resources		
44. Protect intellectual property rights.	1. Ensure that local/indigenous knowledge about living organisms and their use is protected by establishing other more appropriate forms of IPR protection.	In process
	2. Ensure such IP knowledge is not inequitably taken out of Maldives by screening research proposals made by foreign companies or private parties, and entering into contract with parties whose research proposals are accepted in a manner that protects IPR.	IPR Law in process
45. Ensure that the benefits derived from the use and development of the genetic resources of the country serve national interests and are shared fairly and equitably.	1. Introduce appropriate legislation setting out terms of access to genetic materials of/in Maldives to control access to genetic resources and ensure that Maldivians get their fair share of any benefits derived from the utilization of these resources.	Being attempted through formulation of Laws and regulations
	2. Establish a system of screening all research activities that are to be conducted in the Maldives and monitoring these activities.	
Objective 4: Institutional capacity building Provide a facilitative and capable institutional environment to ensure that biodiversity conservation and sustainable resource management goals and objectives are achieved.		
46. Establish institutional arrangements that are facilitative, responsive and support biodiversity conservation and sustainable management of natural resources		Not yet achieved

	1. Conduct an institutional capacity analysis of existing institutions and organizations in order to identify their strengths, weaknesses, synergies, conflicts and gaps in relation to biodiversity conservation and sustainable management of natural resources. In doing so, assess institutional capacity gaps in:	Not yet achieved
	a. national or sectoral policy, Laws and regulations;	A number of Laws and regulations made that support biodiversity conservation, others being made
	b. institutional mandates and inter-institutional relationships;	Not yet achieved
	c. internal organization (distribution of functions, organization and management framework physical and financial capacity);	Being attempted
	d. skills, expertise and information in relation to mandate;	Environmental Management Degree programme at MCHE contributes to developing skills
	e. financial resources and mechanisms available to the respective institutions; and	Not yet achieved
	f. the quality of their response to issues related to biodiversity conservation and sustainable management of natural resources.	Not yet achieved
	2. Review and restructure overall institutional framework for resource management, use and conservation in a manner that:	
	a.takes into account identified institutional capacity gaps;	Not yet achieved, to be done
	b. provides clear institutional mandates that complement each other;	Not yet achieved, to be done
	c. ensures inter-agency co-ordination and collaborative partnerships; and	Not yet achieved, to be done
	d. optimises use of available institutional, financial and human resource capacities.	Not yet achieved, to be done

	3. Establish effective channels of communication and co-ordination between institutions to:	
	a. ensure information sharing and transfer;	Not yet achieved, to be done
	b. joint education and training (where appropriate);	Not yet achieved, to be done
	c.learning from policy experience; and	Not yet achieved, to be done
	d. joint project and policy monitoring and evaluation.	Not yet achieved, to be done
47. Undertake institutional strengthening and capacity building to facilitate, provide timely response, and support biodiversity conservation and sustainable management of natural resources.	1. Formulate an institutional development strategy for each line institution aimed at overcoming any identified deficiencies and institutional capacity gaps in the distribution of functions, internal organization and management, and physical and financial capacity of the institution with respect to biodiversity conservation.	Not yet achieved
	2. Adopt an equitable and efficient decision-making process that is informed by stakeholder input and utilizes best available knowledge.	Ad hoc
	3. Provide education and training to build skills and expertise on participatory management and regulation, integrated natural resource management, conflict resolution, institutional supervision, and ability to implement economic policy instruments strategically.	From different institutions; not specifically for biodiversity
	4. Establish financing mechanisms to fulfil institutional functions and build capacity for revenue management.	Currently being attempted through GEF
	5. Implement public sector investments that support biodiversity conservation and sustainable management of natural resources.	Not yet achieved

Objective 4.5 Human resource development Develop and increase human resources to plan and implement biodiversity conservation measures and assess conservation needs.		
	Action 48: Assess national human resources development needs for biodiversity conservation in relevant areas of public as well as private sectors.	Training needs identified at environment ministry and MRC
	Action 49: Train biodiversity professionals to develop manpower in a variety of relevant fields including natural resource planning, conservation biology, natural resource economics, bioregional management, community organisation, and marine and terrestrial ecology and taxonomy.	Training on-going
	Action 50: Train and appoint people at atoll and island level through short-term training programmes to evaluate biodiversity conservation needs and assist in implementing conservation measures.	Short term training given
	Action 51: Build indigenous capacity in communities through participatory techniques that create conditions for the exchange of knowledge, and through assistance to develop managerial and organisational skills adapted to current practice.	Training workshops held in atolls; information shared
	Action 52: Create suitable positions for biodiversity professionals both nationally and locally, with incentives to work in difficult conditions.	Not achieved
Objective 4.6 Financial capacity Ensure that funds essential to achieve biodiversity conservation objectives are secured and allocated in a manner that maximises benefits.		
53. Allocate funds explicitly for biodiversity conservation and sustainable use from the annual budget of concerned government offices and ensure that these funds are utilized fully for that purpose		Only in local budget

54. Establish a national Environment Conservation Fund (ECF) with the support and participation from all levels and sectors of the government.	1. Determine the most suitable structure for the ECF, taking into consideration the various options available such as endowment funds, sinking funds, revolving funds or a combination of these.	Currently being discussed and attempted
	2. Manage the ECF through a Board of Trustees represented by relevant government offices, private sector, NGOs and donor agencies	Currently being discussed and attempted
	3. Establish systems of banking, auditing and contracting including appropriate legislation and oversight.	Currently being discussed and attempted
	4. Establish guidelines for managing the fund including acceptable funding sources, criteria for project proposals and allocation of funds.	Currently being discussed and attempted
	5. Ensure a large continual funding base through assistance from international donors as well as financing mechanisms at national level.	Currently being discussed and attempted
	6. Market the ECF to publicize the fund and give recognition to sponsors through websites, popular media and awards.	Currently being discussed and attempted
	7. Establish precedents for a governance structure to ensure transparency between ECF donors and beneficiaries.	Currently being discussed and attempted
55. Seek financial assistance from relevant international organisations by pursuing conservation goals that they support.		To some extent

GOAL – THREE
COMMUNITY PARTICIPATION

FOSTER COMMUNITY PARTICIPATION, OWNERSHIP AND SUPPORT FOR BIODIVERSITY CONSERVATION.

Objective 1: Co-management Establish an institutional framework in which property rights are devolved to a defined user group, with concomitant responsibilities and obligations for biodiversity conservation and natural resource management.		
	56. Develop and implement integrated processes and mechanisms for continuous and sustained co-management partnerships through stakeholder consultation, collaboration, and devolved management.	Through CBPOs in agricultural sector; community consultation in other sectors
	57. Establish a network (or management group) that has stakeholder support and trust, consisting of relevant line agencies of the government and resource use groups.	Not yet
	58. Develop appropriate skills and disciplines amongst co-management partners and adopt sound management principles, rules and regulations, and best practices.	Through training and use of local NGOs
	59. Empower local communities through community organization, environmental education and institutionalization.	CBPOs
	60. Provide extension services, training, scientific and technical advice and information to co-management partners.	Training and support provided to local individuals and groups
	61. Integrate conflict resolution techniques (facilitation, conciliation, negotiation, mediation and arbitration) into the management process to minimize infringements of rules and regulations.	No legal basis or framework in place
Objective 5.2 Community Mobilization Mobilize communities to actively become involved in biodiversity conservation.		
	62. Develop and adopt tools and participatory techniques to enhance public involvement and strengthen user group teamwork.	CBPOs

	63. Undertake programmes of social communication and information dissemination through the use of all media, public information sessions, public information centres and direct contact in order to mobilize community involvement.	TV, radio, internet used to provide and disseminate information and messages
	64. Introduce rapid rural appraisal systems at community level to improve assessment of the status of biodiversity.	Not yet

Objective: Implementation, monitoring and review Ensure that the activities in the National Biodiversity Strategy and Action Plan are implemented according to priority and within specified time frames by the concerned agencies, and establish regular monitoring and review mechanisms for the National Biodiversity Strategy and Action Plan	No coordination system; stakeholders do not know which components they are supposed to implement and when; little effort to implement NBSAP per se; most strategies and measures achieved through sectoral efforts, projects and programs
Prioritising and Sequencing of Activities	
Administration, Coordination and Review	

2.5 Key challenges and obstacles in implementing NBSAP

The challenges and obstacles to the implementation of NBSAP are related mainly to the following areas according to stakeholder perspectives. These issues may not be limited to the implementation of NBSAP; rather many of them may be common to the implementation of other plans and policies. Many issues can be addressed through capacity building.

Lack of capacity

A number of staff have been recruited and trained in environmental and related sectors but the numbers are not enough to cater to the need to implement the biodiversity-related activities. Many are still abroad completing their studies. Others who returned have been drawn into other sectors of the government or the more lucrative private sector. Thus, to implement the actions contained in the Action Plan, more trained staff are needed.

Lack of resources or funding

Government and some international agencies can offer only limited funds to this sector. More and alternative sources of funding and innovative mechanisms for funding have to be sought to address the urgent need to save the rich biodiversity of the Maldives.

Issues with stakeholder participation

Some stakeholders do not know whether they can participate in the process. Others do not know how to contribute. Still others are not able to participate, due to socio-economic circumstances. More public awareness programs and support for participation were suggested as the way forward.

Difficulties of coordination between multiple sectors and agencies

Biodiversity issues involve many sectors and agencies. Coordinating between them pose significant challenges and obstacles. Many officers have multiple duties and assignments, and attending to all of them can be difficult. Differences in perspective between the different sectors can also lead to coordination issues.

Competing interests between sectors

Fisherman will go to the sites where they can have the best catch. It is their livelihood. The divers and tourists want to be in sites where they can see most varieties, types and sizes of fish and other beautiful life forms in abundance. They come to the Maldives to see that biological diversity. Both of these groups end up in the same site. This local competition has repercussions in the management and policy levels between fisheries and tourism sectors and the environment sector is sandwiched in-between. This is one example where competing interests arise.

Unclear and overlapping mandates

The environmental sector has the mandate to protect. The areas may be under the jurisdiction of fisheries, agriculture or tourism sectors. The latter may find difficulties in rolling out the pertinent regulations. There might also be the difficulty of saying ‘no’ to the public, especially when suitable alternatives may not be available.

Lack of regularity or follow up

NBSAP has a number of actions that have to be performed regularly. However, the general agreement among stakeholders seem to be that within the circumstances, things often get done ad hoc, rather than regularly. With better capacity and resources this challenge could be addressed.

Weakness or lack of Laws and regulations

Existing regulations need to be amended and upgraded. New regulations need to be made for sustainable conservation of biodiversity.

2.6 Contributions of NBSAP to CBD thematic work programmes

A biological diversity thematic assessment of the status of implementation of the NBSAP was made in July 2006 jointly by the AEC project and ICCS project implemented by MEEW. The results of this review are presented briefly in Table 2.4 to show concrete contributions of national actions to the implementation of the CBD thematic work programmes and cross-cutting issues.

The status in Table 2.4 can be compared with the status presented in Table 2.3 for an update of the achievement of that strategy. Comparison of the status in 2006 and 2010 show that considerable progress has been made in integrating conservation and sustainable use into sectoral plans, programmes and policies. The impact of this integration may take longer to be realized. However, the status of a few issues has stayed almost the same. For example, in identification and monitoring, no comprehensive assessment of the biodiversity in the Maldives has been undertaken to date.

Table 2.4: Contributions of national actions to implementation of the CBD thematic work programmes and cross-cutting issues

Article in CBD/ NBSAP	Status
Article 6 (b) Integrate conservation and sustainable use into sectoral plans, programmes and policies.	Biodiversity issues integrated into 7th National Development Plan. (More on integration in Chapter 3 of this document)
Article 7 Identification and Monitoring	No comprehensive assessment of the biodiversity in the Maldives has been undertaken; studies undertaken are limited to commercially important species and to marine flora and fauna
	Under the GCRMN programme the MRC continues to monitor 14 transects of different reefs; activities planned for 4-5 pilot sites for comprehensive socio-economic and biophysical monitoring; GIS introduced to facilitate data analysis; national system of coral reef monitoring program has been established
	MOFAMR and MRC have developed a full listing of the fish species in Maldivian waters
	MEEW has developed a listing of the biological diversity of bird species of the country; 5 endemic sub-species and 18 bird species under threat were identified

	The Maldives has a total enumeration system of reporting to the MOFAMR on marine species utilized commercially; the MOFAMR also has a monitoring system established for monitoring of reef species utilization, especially grouper species
Article 8 In-Situ Conservation	Article 4 of Act 4/93 gives powers to the Environment Ministry to declare protected areas. A Maldives Protected Areas System project was implemented from 2000 to 2004 to develop guidelines and build the capacity for protected areas management in the Maldives. The Integrated Reef Resources Management (IRRM) programme of the MRC also provides methodologies and systems for the sustainable use of marine biodiversity in the Maldives; species based management measures for conservation of marine biodiversity implemented through the Fisheries Law (5/97); terrestrial biodiversity is protected under Law on Uninhabited Islands. A regulation on removal of vegetation and transfer of trees from one island to the other was issued by the MEEW on 15 January 2006. Result: a number of species and areas are protected (see Chapter 3 of this document for details)
Article 9: Ex-situ conservation	There are no programmes of ex-situ conservation.
Article 10: Sustainable Use	(no comment in review)
Article 11: Incentive Measures	Quota system on catch and export Mandatory EIA requirement for all major development projects ensure that environmental costs are included in project costs and operations
Article 12 Research and Training	Marine Research Centre is lead research agency on marine research; Agriculture Section of the MOFAMR conducts research on plant and terrestrial species; the few trained and technical staff available are not adequately deployed nor their skills made best use of due to the shortage of general staff and their resulting employment in administrative and technical jobs;

	research and training in biodiversity conservation is regarded as a function of state agencies. Hence, in addition to low funding and other demands on staff time, relatively low wages means that the turnover of trained staff is high. Research programmes tend to suffer and lack sustainability as there is a continual need for new staff to be adequately trained in scientific research methods and techniques. Training institutes in the country are primarily geared towards sectors such as health, education, tourism maritime and engineering. Technical training for biodiversity research and conservation is unavailable in the country, leading to a dependence on government-funded opportunities overseas. Various in-house training in research methods and skills are carried out within research- and conservation-oriented programmes and projects. However, the sustainability of such programmes is greatly diminished by the inability to develop and build on these skills once a particular programme is over. (Although not mentioned in the review, Environmental Research Centre (ERC) made significant contributions to research, training and practice in conservation of biodiversity.)
Article 13: Public Education and Awareness	MoHE, MEEW, MOFAMR, MRC, ERC and NGOs have conducted a number of public education and awareness programmes on biodiversity conservation. Print and electronic media is used to promote awareness on a regular basis while community mobilization is conducted through workshops conducted by mobile teams. MoE has resource materials for use in schools. Environmental Studies has been a compulsory primary school subject since 1984. Environmental conservation and sustainable use concepts and activities are incorporated into the Practical Arts subject. At secondary school level, Fisheries Science is offered as an optional subject. MoFA has two dedicated units to run extension programmes to promote sustainable development of fisheries and agriculture.

Article 14: Impact Assessment and Minimising Adverse Impacts	Clause 5 of the Environment Act 4/93 makes EIA mandatory for all development projects that will have a significant impact on the environment. EIA guidelines and procedures were first established in the Maldives in 1994. New EIA regulations were issued in May 2007.The EIA requirement is enforced for all development projects and economic sector investments by both private and public sectors. The key issues in the EIA system include EIA auditing, monitoring of mitigation measures and ensuring community participation in all stages of the EIA process.

2.7 Further Implementation and updating of NBSAP

The review of the status of each of the actions in NBSAP indicate that an update of NBSAP is necessary to cater to the present and expected future circumstances of biodiversity and to make its implementation realistic and current.

2.8 Case study: Banning shark fishing - an example of the provision of incentives to conserve biodiversity

Case study:

Banning shark fishing

One example of the provision of incentives to protect biodiversity is the recent case of the ban on shark fisheries. The government consulted with the representatives of shark fishermen. The ban was announced one year ahead of the effective date. Time was given for the fisherman to sell off their previous catch.

As incentives to the shark fishermen to leave that activity, the government offered

1. to buy-back the gear that they were using for shark fishing so that they can receive a return on their investment;
2. to support the fishermen to obtain alternative livelihoods in fishing, agriculture or any other employment that they had skills in; and
3. to support shark fishermen and other fishermen with large fishing boats to go for off-shore long-line fishing which is a sector that is believed to be underutilized.

In addition, the Ministry of Fisheries and Agriculture (MoFA) is considering the establishing a Trust Fund to support people in the process of leaving such activities as shark fishing and seeking alternative employment.

The whole process has enabled MoFA to make a complete shark ban effective.

Offering incentives such as alternative employment and support to make the transition to such employment appear to be one of the most successful paths to biodiversity protection and conservation by preventing human-induced biodiversity degradation and over-use.

CHAPTER THREE
MAINSTREAMING BIODIVERSITY

http://www.biodiversity.mv/aec/

3.1 Introduction

Biodiversity concerns are gradually being addressed in the policies and programs of various sectors. The progress so far has been slow mainly because of lack of adequate capacity and partly because of the fact that many of the concepts are new.

This chapter offers a brief description, with concrete examples, of the extent to which biodiversity conservation and related issues have been integrated into sectoral and cross-sectoral plans, policies and strategies. The results show that NBSAP has helped to inculcate consciousness in biodiversity conservation at least at the policy and planning level. Biodiversity conservation has been addressed in plans and policies both at the national and sectoral levels. When these plans and policies take effect, biodiversity and its conservation will have a more central role in the life of Maldivians.

The chapter also presents some examples of measures taken by various sectoral and cross-sectoral departments in support of mainstreaming biodiversity conservation, including mechanisms established and incentives adopted to make such measures effective and sustainable. An example of the attempts to adopt an ecosystem approach in conserving biodiversity is also presented. A case study on valuing biodiversity which provides the economic case for mainstreaming biodiversity conservation in the Maldives has been included to help convince relevant stakeholders to take action to protect biodiversity.

In this chapter, we will

- Go beyond a list of sectors and sectoral and cross-sectoral strategies and plans where biodiversity has been integrated (elaborating more on relevant mechanisms established and outcomes resulting from integration).
- Highlight cases and success stories of integration.
- Increase synergies among relevant conventions.
- Involve as many stakeholders as possible.

3.2 Integration of biodiversity into national, sectoral and cross-sectoral plans, policies and strategies

This section offers a brief description, with concrete examples, of the extent to which biodiversity conservation and related issues have been integrated into sectoral and cross-sectoral plans, policies and strategies.

The Maldives is committed to biological diversity conservation at the highest policy and planning level as stated in Article 6(b) of the Convention on Biodiversity. Article 6(b) requires the parties to 'Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies.'

Protection of the environment and biodiversity as a fundamental right of every citizen of the Maldives is enshrined in the Constitution of the Maldives ratified in August 2008. Clause 22 of the Constitution of the Maldives states that 'The State has a fundamental duty to protect and preserve the natural environment, biodiversity, resources and beauty of the country for the benefit of present and future generations. The State shall undertake and promote desirable economic and social goals through ecologically balanced sustainable development and shall take measures necessary to foster conservation, prevent pollution, the extinction of any species and ecological degradation from any such goals.'

By Constitution, the State is required to undertake ecologically balanced sustainable development, conserve the environment including biodiversity and prevent the extinction of any species and ecological degradation. This is the highest Law of the Maldives which guides all policies, plans and programs.

In addition to being a right of every citizen, protection and conservation of the environment is a Constitutional responsibility and duty of every citizen as well. Article 67 of the Constitution states that, 'The exercise and enjoyment of fundamental rights and freedoms is inseparable from the performance of responsibilities and duties, and it is the responsibility of every citizen: ... (h) to preserve and protect the natural environment, biodiversity, resources and beauty of the country and to abstain from all forms of pollution and ecological degradation.' Thus every citizen of the Maldives and even visitors have an obligation to respect, protect and conserve the biodiversity of the Maldives. Few countries would have such a strong commitment to the protection and conservation of biodiversity and a commitment to the ideals of the Convention on Biodiversity, both as a government and as a people.

Biodiversity-related goals and strategies have been incorporated into national and sector level plans and strategies. For example, one of the objectives of NBSAP was integrating biodiversity conservation into the national development planning and policy-making process. This objective and its associated actions were incorporated into the Seventh National Development Plan (2006 – 2010) as illustrated in Table 3.1 below. The plan includes specific policies and strategies to conserve biological diversity and mainstream biodiversity conservation. For example, one of the strategic policy directions is to 'implement obligations under the Convention of Biological Diversity (CBD).' Another is to 'mainstream Biodiversity Conservation into all national development and sectoral policies.' This shows the commitment of the government and people of the Maldives to conserve and mainstream biodiversity.

TABLE 3.1: EXAMPLES OF BIODIVERSITY CONSERVATION POLICIES AND STRATEGIES IN THE 7TH NDP

Action in NBSAP (2002)	Policy and strategies in the 7th National Development Plan
Development Planning 1. Develop and adopt planning procedures and processes that take into account biodiversity conservation.	Policy: Conserve biological diversity for natural, traditional, cultural and economic needs of the people.
	Strategies proposed to achieve this policy: 1.Establish a strong information base for biodiversity conservation and to create public awareness. 2.Develop policies, Laws, regulations, guidelines and standards for biodiversity conservation. 3.Designate protected areas and species, and develop conservation management plans. 4.Support and participate in international efforts to conserve local and global biodiversity. 5.Review the National Biodiversity Strategy and Action Plan. 6.Mainstream Biodiversity Conservation into all national development and sectoral policies. 7.Implement obligations under the Convention of Biological Diversity (CBD). 8.Participate in other biodiversity related international conventions and bodies.
2. Review and strengthen national EIA process to provide for mitigating the possible adverse environmental impacts of policies, programmes, and projects.	Policy: Strengthen EIA process to ensure environmental and socio-economic impacts associated with new developments are accounted for in decision-making.
	Strategies proposed to achieve this policy: 1. Provide infrastructure, equipment and support for the safe handling, collection, storage and transfer of hazardous wastes at national, regional and island level. 2. Develop industry-based guidelines and standard operating procedures that support the safe handling, collection, storage and transfer of hazardous wastes. 3. Establish a contaminated land investigation and cleanup program on inhabited islands. 4. Monitor import and usage of chemicals and other toxic products into the Maldives. 5. Implement obligations under the Vienna Convention and Montreal Protocol.

Following on from the Constitution, the Strategic Action Plan (SAP) of the current government contains policies and strategies to protect the environment and conserve biodiversity. Two of the key policies in SAP that directly support the conservation and mainstreaming of biodiversity issues are given in Table 3.2.

Table 3.2: Examples of policy level commitment to biodiversity in SAP

Policy Conserve and sustainably use biological diversity and ensure maximum ecosystem benefits.	
	Strategies 1. Mainstream Biodiversity Conservation into all national development and sectoral policies. 2. Define national government, province/atoll office and community responsibilities for biodiversity conservation. 3. Ensure biodiversity conservation as a core component in all provincial development strategies, atoll development plans and island land use plans. 4. Introduce formal agreements and market-based instruments for biodiversity conservation. 5. Establish a fully functional Protected Areas system in the Maldives that provides adequate protection for terrestrial, marine, and mangrove ecosystems' threatened species.
	Other related directives Environment Protection and Preservation Act (4/93) Maldives National Strategy for Sustainable Development NBSAP Third National Environment Action Plan
Policy Strengthen EIA process with an emphasis on EIA monitoring.	
	1.Undertake a resources assessment to determine the level of staffing, training and other support required to implement an efficient and effective EIA monitoring and surveillance program. 2. Increase EIA awareness and capacity building. 3. Publish an annual national report that provides both quantitative and qualitative insights into the outcomes of the EIA processes. 4. Strengthen EIA monitoring and implementation. 5. Develop environmental guidelines for selection of sites for development purposes. 6. Increase skills of EPA/ EIA unit staff for monitoring. 7.Strengthen public participation in EIA evaluation and monitoring. 8. Decentralise EIA monitoring and compliance to atoll councils.

	Third National Environment Action Plan Environment Protection and Preservation Act (4/93) Environmental Impact Assessment regulations 2007 Maldives National Strategy for Sustainable Development

Biodiversity considerations appear in the plans, policies and activities of the Environmental sector. The Maldives National Adaptation Program of Action (NAPA 2007) contains specific adaptation needs and measures to protect the biodiversity of the coral reefs. These adaptations needs include:

1. Providing alternatives to coral and sand as construction materials and enforce the ban on coral mining.
2. Enhancing the capacity for waste management to prevent pollution of the marine environment.
3. Formulating and implementing an oil pollution contingency plan.
4. Acquiring appropriate sewage treatment technologies.
5. Establishing marine protected areas.
6. Establishing an information base on coral reefs and climate change.
7. Undertaking monitoring and research to prevent coral diseases and rehabilitate coral reefs.
8. Developing measures to protect coral reefs from development activities.

When adaptation measures were prioritized, the stakeholders placed the highest priority on 'build capacity for coastal protection, coastal zone management and flood control' with a score of 76.14. Biodiversity-related issues like 'Provide alternatives to coral and sand as construction materials and enforce the ban on coral mining' and 'Integrated reef fishery management' came 13th and 14th respectively in the priority listing of adaptation measures.

The variety of needs and measures and the different sectors they represent reflect the complex synergy needed to address biodiversity issues and the adaptation measures necessary.

The Maldives National Strategy for Sustainable Development (NSDS 2009) also identifies a goal with operational objectives, corresponding targets, and proposed actions on protecting coral reefs. Three targets are identified to achieve this goal. They are:

1. Giving protected status to five percent of the coral reef areas.
2. Banning reclamation of reef areas and fish breeding grounds.
3. Banning export of reef fish.

If achieved, these targets can contribute immensely to the protection and conservation of reef and associated coastal biodiversity. The achievement of these targets is to be monitored using 6 indicators which include:

- Percentage of reef area under protected status
- Number of reef reclamation projects undertaken
- Area of reef reclaimed
- Quantity of reef fish catch
- Quantity of reef fish exported
- Value of reef fish exported

In 2009, Maldives also published its Third National Environment Action Plan 2009-2013 (NEAP3). One of the results expected from NEAP3 is Rich Ecosystems. To achieve this result, NEAP3 contained 6 goals, with associated objectives and targets. These goals included the following:

Goal 8: Improve scientific knowledge and access to information for biodiversity conservation
Goal 9: Bring institutional and legislative reforms to enable biodiversity conservation
Goal 10: Protect and restore coral reefs
Goal 11: Protect and restore vegetation, terrestrial ecosystems and islands
Goal 12: Protect and restore wetlands and mangrove ecosystems
Goal 13: Control invasive species

The goals, objectives and targets in Expected Result 2 of NEAP3 (2009) in effect appear to update many of the issues referred to in NBSAP (2002). The difference is that there was a timeframe attached to the actions in the latter.

Another example of the sector policies and plans where biodiversity issues have been incorporated include the new Forestry Policy of the Maldives. Some of the policies and related strategies to conserve the terrestrial biodiversity of the Maldives are given in Table 3.3.

Table 3.3: Policies and strategies for biodiversity conservation in the forestry policy

Policies

Protection of coastline: The inherently unstable shores of the low-lying coralline islands of the Maldives, threatened by raising sea level due to the global climate change, are protected by well-stocked and sustainably managed buffer zones of 30 meters width, wherever possible, composed of multi-purpose salt tolerant trees and bushes.

Biodiversity conservation: The fragile terrestrial ecosystems of the Maldives, threatened by population pressure, economic development, invasion of exotic plant and animal species and the mere small size of the islands, are protected through sustainable multi-purpose management of the remaining forest areas, re-introduction of rare and threatened tree and other plant species, and conservation of an adequate sample of terrestrial ecosystems by establishing a network of conservation islands.

Photo: Ahmed Zahid www.ahmedzahid.com

Strategies for the conservation of biodiversity

Inhabited Islands

Protection of coastline: Buffer zones are to be maintained and / or planted using multiple-use, salt tolerant, easily growing tree and bush species by the local authorities. The policy encourages the use of economically valuable and useful species so that some income can be obtained from the buffer zones through sustainable management and rotational harvesting of timber and / non-timber forest products. The local authorities may also delegate the task of the establishment and maintenance (management) of the buffer zones to local NGOs/CBOs through agreement / contract which also specify the right to possible income from sustainable use of the buffer zone trees and bushes. (Medium Term)

Biodiversity conservation: There is normally little space for true conservation in inhabited islands in the Maldives. Nevertheless, reintroduction of rare and threatened tree species to the forest, agricultural and urban areas of even densely-populated islands is possible and encouraged. Suitable / required species must be defined at island level in a consultative manner. The ministry in charge of technical support to forestry will facilitate the procurement of seedlings. (Long Term)

In uninhabited islands

Protection of coastline: Buffer zones are to be maintained and / or planted using multiple-use, salt tolerant, easily growing tree and bush species by the manager / lessee of the island. Similarly to the inhabited islands the policy encourages the use of economically valuable and useful species for income generation from buffer zones. (Long Term)

Biodiversity conservation: Carefully selected uninhabited islands will be declared as conservation islands. [Ideally there should be at least one conservation island in each administrative atoll] OR [X% of land area of each administrative atoll should be declared as conservation areas.]. The conservation islands should be identified and selected based on their present and potential biodiversity value. Economic and social realities must be duly addressed in the conservation process; this means that small uninhabited islands would be more likely candidates for conservation than economically more important larger islands. Privately-managed conservation islands (e.g. under the management of tourist resorts) can be taken into consideration when assessing the compliance with this policy, provided the conservation area under private management has similar legal status with other conservation areas in terms of permanence of the conservation. Any existing investments by local communities, individuals or companies on islands to be conserved should be fully compensated. (Long Term)

In other uninhabited islands that are managed for agricultural purposes, the biodiversity conservation will focus on securing sustainable management and maintenance of adequate amount of woody vegetation. On agricultural islands no less than 50% of the land area should be under forest and tree cover (regulation: Medium Term). The coastal buffer zone, if under forest cover, can be included in the forest and tree cover area.

In tourist islands/resorts

Protection of coastline: Buffer zones are to be maintained and / or planted using multiple-use, salt tolerant, easily growing tree and bush species by the manager / lessee of the island. (Medium Term)

Biodiversity conservation: Biodiversity conservation on tourist islands will focus on securing sustainable management and maintenance of adequate amount of woody vegetation. On tourist resort islands no less than 80% of the land area should be under forest and tree cover. The coastal buffer zone, if under forest cover, can be included in the forest and tree cover area. (Long Term)

Further examples of the incorporation of environment and biodiversity in policies and regulations include:

- EIA Regulations 2007
- The Tourism Act of Maldives 1999
- The Environmental Protection and Preservation Act 1993
- The Fisheries Act of Maldives 1987
- Regulation on Protection and Conservation of Environment in Tourism Industry
- Maritime Law of the Maldives
- Multilateral Environmental Treaties that Maldives have entered

Thus biodiversity has taken root in national and sectoral plans, policies and strategies. When they come into effect biodiversity conservation will be a mainstream, national feature.

3.3 Measures taken, mechanisms established and incentives adopted to conserve biodiversity

This section presents some examples of measures taken by various sectoral and cross-sectoral departments, including mechanisms established and incentives adopted in support of biodiversity conservation.

Protected areas

The best example of the measures taken to conserve biodiversity can be seen in giving legal protection status to different areas and species of the Maldives. This is also an example of cross-sectoral cooperation and coordination to conserve and preserve biodiversity. Maldives has given protected status to 9 species, 5 areas, 25 dive sites, 3 islands and 70 species of birds. (see Tables 3.4, 3.5, 3.6, 3.7, 3.8).

In the Maldives, a protected areas system needs to focus on the atoll ecosystems because they are the centres of biodiversity. Here, the greatest diversity of life occurs in the coral reefs that surround the atolls. At least 1090 species of fish and 187 coral species have been recorded in the Maldives. The reefs are literally the basis of the country's life-support system, providing services such as shoreline protection and goods upon which the economy entirely depends, such as fisheries and tourism. Wetlands and mangrove areas also form an important component of the atoll ecosystem.

Very little of the Maldives' biodiversity is currently protected, with areas designated for nature conservation. Policies and action plans regarding the management and integration of protected areas exist in all key national policy documents, such as National Biodiversity Strategy and Action Plan (NBSAP), National Environment Action Plan (NEAP) and National Development Plans (NDPs). Most existing measures and policies on protected areas in the NBSAP are being implemented through the NDP. The Maldives does not have any specific legislation for protected areas but it is anticipated that the existing Environment Protection and Preservation Act (Law no.4/93) can be amended to incorporate a regulation on protected areas. This Act provides for the designation of protected areas, as reflected by the existing network.

The Environmental Protection Agency of the Maldives has developed a 'sensitive list' of different species and areas which needs protection or conservation due to their biodiversity and endangered status (EPA 2010, pers comm.). EPA needs considerable urgent and immediate support in terms of resources, human capacity and policy implementation in its endeavour, if these species and areas are to be preserved for future generations.

Table 3.4: Protected species of the Maldives

Common name	Scientific Name
Napolean Wrasse	Cheilinus undulatus
Lobsters	
Conch (Triton) Shell	
Black Coral	Antipatharia
Giant Clam	Tridacna gigas
Dolphins	
Whales	
Whale Shark	Rhincodon typus
Turtles	

Table 3.5: Protected areas

Protected Areas	
Name	**Island/Location**
Eidhigalhi Kilhi	S. Hithadhoo
Huraa Kulhi	K. Huraa
Hanifaru	B. Atoll
Agafaru	B. Atoll
Rangali falhu Hulhagu uthuru	ADh. Atoll

Table 3.6: Protected dive sites of the Maldives

Protected Dive Sites	Location	Atoll
Banana Reef (Gaathugiri)	73° 32' E 04°14'.5 N	North Male' Atoll
Dhigali Haa	73° 02' E 05°08' N	Baa Atoll
Emboodhoo Kandu	73° 31' E 04°05' N	South Male' Atoll
Filitheyo Kandu	73° 02' E 03°13' N	Faafu Atoll
Fish Head (Mushimasmigili Thila)	72° 55' E 03°56' N	North Ari Atoll
Fushi Kandu	72° 56' E 03°00' N	Dhaalu Atoll
Fushifaru Kandu (Fusheevaru Thila)	73° 31' E 05°29' N	Lhaviyani Atoll
Giraavaru Kuda Haa	73° 24.5' E 04°12' N	North Male' Atoll
Guraidhoo Kandu	73° 27' E 03°53.5' N	South Male' Atoll
Hakuraa Thila (Lhazikuraadi)	73° 33' E 02°57' N	Meemu Atoll
Hans Hass Place (Gulhi Falhu)	73° 28' E 04°10.5' N	North Male' Atoll
HP Reef (Thaburudhoo Thila)	73° 34.5' E 04°19' N	North Male' Atoll
Karibeyru Thila	72° 57' E 04°06' N	North Ari Atoll
Kudarah Thila	72° 55' E 03°34' N	South Ari Atoll
Kuredu Express	73° 28' E 05°33' N	Lhaviyani Atoll
Lions Head (Falhuge Miyaruvani)	73° 25.5' E 04°11' N	North Male' Atoll
Maayaa Thila	72° 51.5' E 04°05' N	North Ari Atoll

Madivaru (Faruhuruvalhi Beyru)	72° 43' E 03°36' N	South Ari Atoll
Makunudhoo Kandu	73° 23' E 04°34' N	North Male' Atoll
Miyaru Kandu (Dhevana Kandu)	73° 30' E 03°34.5' N	Vaavu Atoll
Nassimo Thila (Lankan Thila)	73° 32' E 04°17' N	North Male' Atoll
Orimas Thila	72° 57' E 03°59' N	North Ari Atoll
Rasfari	73° 21' E 04°24' N	North Male' Atoll
Vattaru Kandu	73° 26' E 03°13' N	Vaavu Atoll
Villigilee Thila	72° 58.4' E 05°00' N	Raa Atoll

Table 3.7: Protected islands of the Maldives

Protected Islands	
Name	**Atoll**
Olhugiri	Baa Atoll
Hithaadhoo	Gaafu Alifu Atoll
Hurasdhoo	South Ari Atoll

Table 3.8: Protected birds of the Maldives

Common Name	Scientific Name
Ruddy Turnstone	Arenaria interpres
Lesser Golden Plover	Pluvialis dominica
Gray Plover	Pluvialis sqatarola
Lesser Sand Plover	Charadrius mongolus
Great Sand Plover	Charadrius leschenaultii
Common Ringed Plover	Charadrius hiaticula
Glossy lbis	Plegadis falcinellus
Whimbrel	Numenius phaeopus
Red-throated Pipit	Anthus cervinus
Tree Pipit	Anthus trivialis
Black Bittern	Dupetor flavicollis
Yellow Bittern	Ixobrychus sinensis sinensis
Black-crowned Night Heron	Nycticorax nycticorax
Crab Plover	Dromas ardeola
Curlew Sandpiper	Calidris ferrunginea
Common Greenshank	Tringa nebularia
Black-tailed Godwit	Limosa Limosa
Marsh Sandpiper	Tringa stagnatilis
Black-headed Gull	Larus ridibundus
Pallas's Gull	Larus ichthyaetus
Ferruginous Pochard	Anthya nyroca

Kentish Plover	Charadrius alexandrinus
Garganey	Anas querquedula
Yellow Wagtail	Motacilla flava
Northern Shoveler	Anas clypeata
Brown Booby	Sula leucogaster
Red-footed Booby	Sula sula
Western Reef Egret	Egretta gularis
Maldivian Little Heron	Butorides striatus albidulusi
Maldivian Pond Heron	Ardeola grayii phillipsi
Greater Flamingo	Phoenicopterus ruber
Purple Heron	Ardea purpurea
Black Headed Heron	Ardea melanocephala
Eurasian Spoonbill	Platalea leucorodia
Cattle Egret	Bubulcus ibis
Masked Booby	Sula dactylatra
Central Maldivian Heron	Butorides striatus didii phillipsi
Black-winged Stilt	Humantopus himantopus
Jack Snipe	Lymnocryptes Minimus
Pacific Golden Plover	pluvialis fulva
Audubon's Shearwater	Puffinus iherminieri
Lesser Crested Tern	Sterna bengalensis
Great Crested Tern	Sterna bergii
Northern House Martin	Delichon urbica
Maldivian Water Hen	Amaurornis Phoenicurus maldivus
Common Moorhen	Gallinula chloropus indics
Caspain Tern	Sterna caspia
House Sparrow	Passer domesticus
Wilson's Storm-petrel	Oceanites oceanicus
Watercock	Gallicrex cinerea
White Tern	Gygis alba monte
Black-naped Tern	Sterna sumatrana
Gull-billed Tern	Gelochelidon nilotica
Great Lesser Frigatebird	Fregata ariel
Lesser Frigatebird	Fregata minor
Whiskered Tern	Chlidonias hybridus
Sooty Tern	Sterna fuscata
Saunder's Tern	Sterna saundersi
White-tailed Tropicbird	Phaethin lepturus
Flesh-footed Shearwater	Puffinus carneipes
Common Tern	Sterna hirundo
Roseate Tern	Sterna dougallii
Brown Noddy	Anous stolidus
Spot-billed Pelican	Pelecanus phillippensis
Great Egret	Casmerodius albus

Common coot	Fulica atra
Wedged-tailed Shearwater	Puffinus pacificus
Asian Koel	Eudynamys scolopacea scolopacea
Bridled Tern	Sterna anaethatus
Lesser Noddy	Anous tenuirostris

Tables 3.4 to 3.8 indicate that a considerable number of species and areas have been protected in the Maldives. These include birds, fishes and other marine and life forms. The process is continuing. This is a considerable achievement for a tiny country with limited resources. For the process to be effective, the Maldives needs to do a comprehensive study of the marine and terrestrial fauna and flora to know exactly what is there in this unique marine-terrestrial symbiotic bio-system with its rich biodiversity of life forms.

3.4 Adopting an ecosystem approach in mainstreaming biodiversity

In general, some stakeholders described attempts to adopt an ecosystem approach in mainstreaming biodiversity. For example, the fisheries sector considers the reef system, the fishes and other coastal and marine biodiversity in its programs and activities. Since the Marine Research Centre is its executive wing, the projects that emerge have a more holistic perspective of the reef, fish and other marine life forms and their protection and conservation. The close working relationship between the Marine Research Centre and the Environmental Protection Agency (formerly Environmental Research Centre) helps in developing the ecosystem approach. An Agricultural and Land Resources Centre could perhaps help to adopt a more ecosystem-based approach to terrestrial biodiversity including terrestrial fauna and flora and the mangroves.

3.5 Biodiversity issues in the Environmental Impact Assessment (EIA) process

Biodiversity considerations are central to the Maldives Environmental Impact Assessment (EIA) Regulations of 2007. Every major developmental project has to complete an EIA.

The regulations stipulate that:
‘3 (2) An Environmental Impact Assessment or Initial Environmental Examination shall be conducted in accordance with the provisions of these Regulations, and considering the effects of a Development Proposal on the following factors:

(a) Fauna and flora, and living components of the environment;
(b) Soil, water, air, climate, the landscape, and the non-living components of the environment;
(c) The interaction between the factors mentioned in paragraphs (a) and (b) of this sub-regulation;
(d) Material assets and cultural heritage;
(e) Impacts on the project from the environment; and
(f) human interactions and their interactions with the factors mentioned in paragraphs (a) to (e) of this sub-regulation.’

The EIA process requires the applicant to study the potential impacts on a number of biodiversity-related issues (see Table 3.9). Permission is granted upon satisfaction of the addressing of the issues related to biodiversity.

Table 3.9: List of environmental components including biodiversity aspects that are assessed during the EIA process

Will the project impact the following key environmental components? Please indicate whether the impact will be beneficial or adverse and provide additional comments as necessary:			
Environmental Components	No impact	Beneficial impact	Adverse impact
Seabed			
(Sea) water quality			
Fish stocks			
Coral reefs			
Sea grass beds			
Beaches			
Mangroves and wetlands			
Protected area			
Terrestrial vegetation			
Introduction of exotic species (density)			
Habitat change			
Air quality			
Groundwater quality			
Groundwater availability			
Noise levels			
Public wellbeing			
Public health			
Public safety			
Public transport			
Employment opportunities			
Economic Status			
Public views			

The list in Table 3.9 requires information on condition of the existing environment relative to the development project, the potential impacts of the project on many biodiversity components and related issues including (but not limited to) fish stocks, coral reefs, sea grass beds, beaches, mangroves and wetlands, protected area, terrestrial vegetation, introduction of exotic species (density) and habitat change. In addition, the EIA process requires the developer to identify ways to mitigate these impacts, implement these mitigation measures and monitor the changes to areas affected by the development project. Thus the EIA process helps to identify the current status of these biodiversity features through

the project description and the study of the impacts as in Table 3.9. It supports biodiversity conservation by making it a requirement in gaining permission for the project.

3.6 An example of an outcome as a result of integration of biodiversity measures

There are a number of examples of outcomes resulting from the integration of biodiversity measures or considerations. One example is the banning of turtle fishing and removal of turtle eggs. A government moratorium in 1995 prohibited the fishing of turtles for a period of 10 years and the ban is still being continued. Harvesting of turtle eggs from 10 islands where studies showed the turtles to frequent most were prohibited from 1st January 2006. Three more islands were added to the list from 1st January 2007. In addition, private parties have also been hatching and releasing turtles into the sea. Reports indicate that turtle sightings have increased after these measures were taken.

Due to the inclusion of biodiversity measures into the EIA process, more resorts and large developments have become more conscious of biodiversity issues and are taking their own conservation measures.

3.7 Case study: Valuing biodiversity – the economic case for biodiversity conservation in the Maldives (Ministry of Housing Transport and Environment 2009)

The case study presented here is a very good study carried out by the Atoll Ecosystem Conservation (AEC) Project team on valuing and financing biodiversity conservation in the Maldives. The components from 'Financing biodiversity conservation in the Maldives' are included here as an example of a proactive attempt at financing biodiversity conservation. The sample came from Baa atoll (one of the atolls in the northern part of Maldives) and Male' (the capital). The study is related to and addresses some of the aspects and issues raised in NBSAP.

6. Financing biodiversity conservation in the Maldives

The current status of biodiversity funding

Central government financial support and overseas donor assistance provide the main funding resources for biodiversity conservation in the Maldives, with a very limited amount of private sector funding support (much of which is provided indirectly or in kind, via resorts making efforts to ensure that the islands and coral reef dive areas used by their clients are kept in good condition).

Pre-tsunami statistics show that an average of MRf 29 million a year was being spent on environmental protection by the central government; more than 80% of this figure was accounted for by current expenditure, and under 20% was capital spending. The environment has accounted for a similar proportion of total government expenditures over the last 3 years, although overall budgets have risen substantially in the post-tsunami period. This amount is very small as compared to other sectors: in terms of overall government expenditures, environmental protection has consistently accounted for less

than 1% of the total for the last 6 years. Although the funding situation of the Ministry of Environment, Energy and Water has improved slightly over recent years, the 2007 budget breakdown shows that in terms of budget allocations it was ranked sixteenth out of 26 government agencies.

Overseas Development Assistance (ODA) is a significant part of the Maldivian government's revenue, accounting for over 40% of total government revenue in 2007 (and around 20% in the years preceding the tsunami). ODA primarily supports capital budget investments, but a small proportion is also used to fund recurrent expenditures. As of the last quarter of 2007, donors had committed a total of just over US$ 1 billion in development assistance for on-going activities in the Maldives, around 90% of it for post-tsunami activities. Environment and natural resources accounted for 1.6% of ODA for activities under the National Recovery & Reconstruction Plan and 15.6% of funding under non-tsunami development activities, together worth US$ 30.65 million (MRf 390 million). In total, environmental spending comprises just 3% of all donor support to the Maldives.

A major problem is that these financial resources are not adequate to cover the costs of biodiversity conservation in the Maldives. The various government agencies responsible for conservation (most notably the Environment Ministry, Ministry of Fisheries, Agriculture and Marine Resources, and Ministry of Atolls Development and Atoll/Island Authorities) state that they face persistent shortfalls in funding, and are unable to carry out activities of the types and to the levels which they deem necessary for effective biodiversity conservation.

As is the case in many other countries, a variety of other financial constraints also beset marine and coastal biodiversity conservation in the Maldives, in addition to the inadequate amount of funding available. Financial sustainability extends beyond considerations of the absolute quantity of funds: it can be defined as the ability to secure sufficient, stable and long-term financial resources and to allocate them in a timely manner and in an appropriate form, so as to ensure that the full costs are covered and biodiversity is conserved effectively and efficiently. Five additional financial sustainability issues that arise in the context of marine and coastal biodiversity in the Maldives and Baa Atoll relate to the breadth of the funding base, the allocation of financial resources to the agencies mandated to conserve biodiversity, the composition of conservation expenditures, financial planning processes and procedures, and the distribution of conservation funding and benefits.

- Biodiversity conservation budgets in the Maldives rely almost entirely on just two sources – central government and overseas donors. This is not only inadequate to fulfil conservation needs, it constitutes an extremely narrow, and risky, financial base. Should one or both of these sources diminish or fail, this would have a devastating effect on conservation budgets – which would then have no other funds to fall back on. Without a more diverse portfolio, composed of a number of sources which can substitute for any shortfalls, where necessary, the funding base for marine and coastal biodiversity conservation will remain insecure in the long-run.

Value of tourist accommodation	MRf 32.6 million in 2004 (pre-tsunami), or 0.9% of all central government expenditure; MRf 94.95 million in 2007 (post-tsunami), or 0.7% of all government expenditure.
Overseas Development Assistance	US$ 14.35 million (MRf 182 million) commitments under tsunami assistance or 1.6% of total US$16.30 million (MRf 208 million) commitments under general development assistance or 15.6% of total. In total, environmental spending is just 3% of all donor support to the Maldives.

- The level of self-generated revenue from the sustainable use of biodiversity and from non-extractive uses remains extremely low in the Maldives. This is the case even where these goods and services (such as diving, snorkelling, fisheries productivity, etc.) generate extremely high economic values for their users and beneficiaries, and are subject to high levels of demand. Even where charges are levied on biodiversity-dependent products, services and activities (for example in the tourism and fisheries sectors), none of the revenue raised goes to the government agencies mandated with biodiversity conservation – even though biodiversity and ecosystem services play a key role in enabling the activities concerned. The funds flow either to the central Treasury or to other line agencies. Few attempts have been made to identify cases where charges and fees could (and should) be levied for biodiversity goods and services, and captured as funding for conservation. There are limited possibilities for government conservation agencies, individual conservation areas or Atolls to retain the revenue raised from biodiversity and to invest them in biodiversity conservation.

- The pattern of budget allocations and expenditures made does not necessarily ensure effective conservation. Of particular concern is the balance between capital and recurrent expenditures in conservation budgets in the Maldives. A review of government budgets for environmental protection over the last 3 years indicates that recurrent expenditures accounted for between 76% and 86% of the total, leaving just 14%-24% for essential capital investments. Biodiversity conservation is hampered by a lack of funding for key capital and infrastructure, as well as by low budgets for the non-staff recurrent expenditures such as equipment, maintenance, monitoring, patrolling and outreach activities that are key to effective conservation.

- There is a short-term and inflexible financial planning horizon. Budgets are prepared on an annual basis in the Maldives, with little consideration of future funding streams or funding security. There are often delays in the actual release of funds, and annual budget plans remain relatively rigid in terms of allowing for changes in expenditures or interchange between budget lines. These factors put conservation managers in a situation where they are unable to engage in forward financial and conservation management planning, or to be certain of what budgets will be received over the medium or long-term. It also means that funds cannot always be made available at the exact time that they are needed for (often urgent) conservation activities.

- The definition of costs and funding needs is narrow and excludes an important element – the indirect and opportunity costs of biodiversity conservation. Opportunity costs can be defined as the benefits or economic opportunities that are diminished or lost by choosing to conserve biodiversity, and include both the value of foregone output from prohibited resource uses and from potential conversion of the area to an alternative use, as well as possible congestion effects on other sites and stocks that remain available for extractive uses and alternative developments. They accrue mainly at the atoll and household level. With conservation funding focusing primarily on covering the direct costs of the government agencies mandated to manage biodiversity, there has been little effort to balance or offset indirect and opportunity costs. This is not only inequitable, but also undermines effective conservation. As long as local users and managers perceive there to be net costs to them from conservation, they are unlikely to support it.

Tools for improving the financial sustainability of marine and coastal biodiversity conservation

A core element of any strategy to improve the financial situation and sustainability of marine and coastal biodiversity conservation is to look towards increasing existing sources of funding. As described in the paragraphs above, environmental protection currently accounts for an extremely low share of both government and overseas donor budgets. This is somewhat paradoxical given its demonstrable economic and development importance. Major efforts should be made to increase the priority and budgets, accorded to marine and coastal biodiversity conservation by government and donors. Here it should be noted that the 2002 National Biodiversity Strategy and Action Plan explicitly mentions the objective of building financial capacity for biodiversity conservation through increasing and augmenting annual government budget allocations. A first step would be to clearly articulate and communicate to the Ministries of Finance and Treasury, Planning and National Development, Trade and Industries and other sectoral line agencies the high dependence of the Maldives economy, livelihoods and human well-being on biodiversity and ecosystem conservation.

It is clear that additional financing mechanisms need to be identified that cannot just increase the amount of funding for marine and coastal conservation in the Maldives generally, and in Baa Atoll specifically, but also act to improve financial diversity, security and retention. A number of clear opportunities exist for generating these financial resources, and for ensuring that they are used to support more effective biodiversity conservation. These are described in the following paragraphs. Voluntary contributions from overseas tourists: 85% of overseas visitors to Baa Atoll are willing to each contribute US$ 35 (MRf 446) per visit towards marine and coastal conservation.

The tourist willingness to pay survey mentioned before found that more than three quarters of tourists from overseas to Baa Atoll resorts are in favour of making financial contributions to conservation via support to Dhigali Haa MPA. In principle, they are willing to pay either a one-off conservation fee (applicable to tourists visiting Baa Atoll) of an average of US$ 35±5 (MRf 446 – 510) (85% of respondents), or a user fee solely for divers was US$ 15±5 (MRf 191 – 255) (74% of respondents), with the former preferred as a mechanism for revenue collection.

In total, such a conservation fee could, if implemented, generate around US$ 1.57 (MRf 20.02) million in payments each year, based on current rates of just under 45,000 tourist visits a year for Baa Atoll.

As mentioned earlier, surveys were carried out on the willingness of Maldivian residents in Male' and Baa Atoll to pay for marine and coastal biodiversity conservation.

The surveys found that more than half of Maldivian residents in Male' and almost three quarters in Baa Atoll considered marine and biodiversity to be very important to them (and very few in either location considered it to be of no importance), particularly for the supporting and regulating services it provides to human production and settlements and due to its cultural value. The majority of respondents also believe that marine and coastal biodiversity is threatened, in particular, due to human influences and inadequate waste management.

This concern with the environment is reflected in a very high willingness to provide material support to marine and coastal biodiversity conservation. Almost three quarters of survey respondents in Male' and more than 90% in Baa Atoll declared that they would be prepared to contribute cash to conservation (on average MRf 120-130), with most preferring to make this payment as an annual donation to a biodiversity conservation fund. Most respondents (a similar proportion in Baa Atoll and a higher proportion in Male') were, in addition to this, willing to contribute their time to assisting with biodiversity conservation activities such as awareness campaigns, tree planting, and beach and reef clean ups.

If these sources of voluntary funding could be realised, they would constitute a significant contribution to the financial resources available for biodiversity conservation in the Maldives (additional funds of MRf 0.15 million a year from Male' respondents) and for Baa Atoll (MRf 20.26 million, which includes both Baa residents and tourists willing to pay). It is worth noting that even though the data generated by this study refer only to two sites (Baa Atoll and Male' Island) the stated individual voluntary contributions already equate to an amount of additional funding that is at MRf 20.41 million a year (Table 5) equivalent to 20% of the current annual government budget for environmental protection. Potential funding for Baa Atoll is worth some two and a half times more than current government budget allocations through the Ministry of Atolls Development. If the rest of the Maldivian population were willing to make donations at a similar level, this figure would rise to almost MRf 6 million a year from domestic sources alone. Capturing overseas willingness to pay via a conservation fee levied on all tourists could, if findings from Baa Atoll are more broadly extrapolated, generate conservation revenue of almost MRf 230 million a year. Combined, these potential sources of funding of some MRf 234 million or US$ 18 million a year is more than two and a half times the amount of the budget currently allocated to all environmental protection activities in the Maldives. If even a part of this funding is realised it could still be potentially significant.

Maldivian citizens' willingness to support biodiversity conservation	74% of Male' residents and 91% of Baa Atoll residents are willing to each contribute between MRf 123 and MRf 130 per year towards marine and coastal conservation
	Slightly higher percentages are also willing to donate their time to supporting conservation activities
Voluntary funding to conservation in Male' and Baa Atoll	Survey findings indicate that revenues of MRf 20.41 million a year could be raised for conservation from voluntary contributions from Maldivian citizens in Male' and Baa Atoll
Untapped biodiversity funding	If the willingness to pay findings of this study are more broadly extrapolated to all Maldivians and foreign tourists, voluntary contributions could generate additional conservation funding of MRf 234 million or US$ 18 million a year – more than two and a half times the 2007 government budget allocated for this

TABLE 5: POTENTIAL FUNDING FOR BIODIVERSITY CONSERVATION FROM VOLUNTARY CONTRIBUTIONS (MRF MILLION/YEAR)

	From Male' and Baa Atoll only	Extrapolated to all tourists and Maldivians	
	Baa Atoll	Male'	
International tourists	20.02	---	228.32
Maldivians	0.24	0.15	5.91

A variety of mechanisms could be used to capture such willingness to pay. If cash was to be given on a voluntary basis, some form of biodiversity conservation fund could be constituted with which to absorb and administer these – and other – revenue. This would respond to the intention of establishing a national environmental conservation fund, as stated in the 2002 National Biodiversity Strategy and Action Plan for the Maldives (see next section). It is however unclear whether current Laws and financial regulations in the Maldives permit funds to be raised and then earmarked for conservation, or whether such funds are permitted to be allocated through normal annual budgets. It should also be noted that survey respondents' willingness to donate money is in many cases contingent on their being assured that such funds would really be used for on-the-ground conservation measures. Another option would be to institute mechanisms to collect these fees as mandatory payments – for example as a conservation levy on tourists or Maldivian citizens, paid directly or as a surcharge to existing charges and fees (similar considerations to those mentioned above also hold).

A number of additional conservation finance mechanisms should also be mentioned, which have potential for use in the Maldives, and which warrant further investigation. These are dealt with only briefly and selectively in the bullet points below, as a proper scoping and feasibility exercise on sustainable financing for marine and coastal biodiversity conservation would be required to investigate these in detail.

- A wide range of uses are made of marine and coastal biological resource and ecosystem services, but – even where charges and fees are levied for these activities – payments do not accrue to the government agencies that are responsible for biodiversity conservation. Significant funding could be raised through instituting or sharing user fees (for example from divers and snorkelers), or as some form of cross-sectoral transfer of revenue from the tourism and fisheries sectors to the environment sector as payment for ecosystem services provided.

- To date, little attempt has been made to solicit funds from the private sector for conservation – despite their dependence on biodiversity for business profits. A range of opportunities exist for raising funds, ranging from advertising and corporate sponsorship, through cost-sharing and in-kind contributions for conservation equipment and activities, to direct payments for goods and services used or consumed.

- Currently there is little capacity or requirement for sustainable finance planning among conservation managers. Although the concept of management planning for specific sites or areas of high conservation importance is gaining currency in the Maldives, such efforts are rarely accompanied by the development of a financial plan. In other parts of the world, business planning is increasingly seen as a routine component of conservation management and Marine Protected Area planning. The development of capacity among conservation managers in the Maldives to develop medium-term financial plans or business plans, alongside conservation plans, could provide a valuable tool for enhancing the financial sustainability of marine and coastal biodiversity conservation.

As mentioned above, distributional concerns are also key to the financial sustainability of biodiversity conservation. Mechanisms for ensuring that sufficient benefits accrue at the atoll and household level, and that the indirect and opportunity costs of conservation are covered, have been dealt with in the next section of this report.

7. Economic incentives to conserve biodiversity in the Maldives

How existing economic and environmental policies influence biodiversity.

There is a strong stated aim to mainstream biodiversity into economic policy and planning in the Maldives. The government of Maldives has ensured that environmental protection and sustainable development are key elements of Vision 2020. Recognising the economic significance of the country's natural assets, successive national development plans have emphasised the need for sound environmental practices. The current Seventh National Development (NDP) Plan 2006 – 2010 acknowledges the dependence of

the economy on coastal and marine resources. One of the twelve goals laid out in the Plan relates specifically to conservation ("protect the natural environment and make people and property safer"), and contains targets concerned with conserving the environment, improving solid waste management and protecting coral reefs. The plan also recognises the reliance on tourism alone as one of the challenges faced by the country and outlines the policy of expanding into other areas. Most importantly, the NDP points to the importance of the marine and coastal environment and has set a series of targets to ensure conservation of the country's natural resources, including having solid waste management facilities in 75% of the islands, giving protected status to 5% of coral reef areas, and access to safe drinking water for all.

The overriding focus of the plan remains, however, on achieving economic growth and equitable income distribution, and few references are made to the ways in which economic and environmental policies and policy instruments can be harmonised in order to promote sustainability, and provide incentives for producers, consumers and investors to conserve biodiversity in the course of their economic activities.

The population of the country is dispersed over many islands, which poses a challenge to development. The cost of providing and maintaining services and infrastructure thus becomes very high, compounded by a poorly developed transportation system. The government is thus pursuing the Population and Development Consolidation Programme, whereby populations living on environmentally vulnerable islands or islands with fewer than 1000 people, will be provided incentives to resettle in other islands.

Although a wide range of instruments has been developed to promote production, investment and trade in priority sectors of the Maldives economy, there are no specific environmental investment incentives:

- For example the Foreign Services Investment Bureau currently emphasises that a priority will be given to promoting investment activities that, among other criteria, are environmentally-friendly. However, the investment incentives offered (such as exemption or relief on taxes and other facilities, lack of restrictions on the repatriation of earnings and profits, and waiving or reductions in certain import tariffs) do not differentiate between environmentally sustainable activities and other investments.

The following are notable in relation to trade incentives.

- The current import tariff regime does contain some – albeit very limited – provisions for products which are considered to be potentially harmful to the environment: higher rates (200%) are set for plastic bags and packaging and there is a prohibition on the import of used vehicles over 3 years old, both justified on environmental grounds.

- However, in most other areas, import duties make no distinction between goods and technologies on environmental grounds: for example the import duty levied on diesel-based and wind-based electricity generation equipment is identical at 20%, while a higher tariff (of

25%) is imposed on the import of solar panels.

- The categories of goods for which duty-free entry is permitted or duty reductions are allowed focus heavily on those required for construction and expansion of the tourism, fisheries and garment manufacture sectors, and make no explicit efforts to encourage the import of energy-efficient, waste-minimising or environmentally friendly products and technologies.

- There are currently no direct duties imposed on goods intended for export, with the exception of indirect taxes on tourism and a duty of 50% on ambergris. On conservation grounds, there is however a complete ban on the export of certain marine products.

The Maldivian economy is relatively liberalised, and many of the subsidies formerly made to key sectors and industries have been dismantled over recent years. The few subsidies that remain are focused primarily on social sectors such as food, medicines and water (the estimated budget for these subsidies in 2008 is MRf 535.3 million. Temporary subsidies are also allowed for establishing and operating regional sea ports. Energy remains a subsidised sector of the economy, with price interventions on oil imports and energy subsidies to consumers. Although there are plans for a subsidy regime for renewable energy projects, this has not yet been implemented.

With regard to environmental policies, the Environment Protection and Preservation Act (EPPA) was adopted in 1993, aiming to preserve land and water resources, flora and fauna, as well as beaches, lagoons, reefs and all natural habitats. A total of 26 marine sites are protected and only diving and bait fishing are allowed in these sites, although monitoring and enforcement is lacking (MRC). Another 5 areas have also been declared as protected areas under the EPPA. The napoleon wrasse, dolphins, turtles, whales, sharks, tritons, and black coral are all protected. An EIA guideline was enacted in 1994, which has been instrumental in over-viewing development projects and undertaking EIAs for them. According to UNEP (2005) 93 development projects have been subjected to EIA's since 2000. However, there is a lack of implementation due to weaknesses in the legal and regulatory framework; for example, contrary to the EIA Act 1994 and since 2001, 74 coastal modification projects have been undertaken without formal EIAs. There is also a lack of EIA expertise and Ministry of Environment staff themselves at times act as consultants and prepare the EIAs, reflecting a conflict of interest.

Freshwater is the one of the scarcest resources in the country. There is almost no surface water and the traditional sources of water are shallow groundwater aquifers. While almost all islands have groundwater aquifers, the availability of water depends on net rainfall recharge, size of the island, vegetative cover, etc. Since these factors differ from island to island the quality of water also differs. Additionally, there are issues of contamination and many islands are faced with polluted groundwater. Rainwater use was initiated in the 1930s and subsequently desalination was introduced in 1980s. According to the Agriculture Master Plan 2006 (information taken from Island Fact Sheets 2004):

- No. of islands with water suitable for drinking: 39
- No. of islands with water not suitable for drinking: 162
- Islands where groundwater is not suitable due to salt water intrusion: 54%
- Islands where groundwater is not suitable due to pollution: 46%

To address the issue of safe water provision to the populace and to provide adequate sanitation facilities, the Water and Sanitation Authority has issued a Water and Sanitation Policy. The Policy identifies the provision of safe drinking water as equally important as any other economic activity and outlines many challenges that must be overcome to meet the targets. Interestingly, some tourist resorts still do not have a sewerage treatment plant. However, all new resort facilities are required to have one.

The Environment Ministry (now the Ministry of Housing and Environment) has also issued a Solid Waste Management Strategy, which recognises the lack of a national approach to solid waste management. The Strategy estimates that solid waste generated in the country will increase by 30% from 248,000 tonnes in 2007 to 324,000 tonnes in 2012. The primary target of the strategy is thus to reduce the amount of waste generated by 25% through recycling, reuse, and influencing consumer preferences. The Strategy also aims to develop an awareness programme, promote the development of island waste management plans, construct island waste management centres and provide equipment. However, currently the system of waste management relies on collecting waste from tourist and a few inhabited islands and depositing them at a designated island. In many other inhabited islands solid waste is not collected at all. This shows that while there is sufficient recognition and acknowledgement of environmental conservation in government policy, more efforts are required towards implementation.

Land is another precious resource for the Maldives and the demand for land increases with a rising population and need to expand economic activity. Clearing of forest areas has increased to make room for housing and/or to get timber. This is compounded with beach erosion being faced by many islands (including tourist resorts). MEEW issued a regulation banning the cutting of trees. Furthermore, migration to Male' for better job prospects has also added to the problem. While the Government's Population and Development Consolidation Policy is one step to address this, there is still a need for integrated land use policies, and development of conservation plans.

The Fisheries Law is in place and aims to ensure that the Ministry of Fisheries and Agriculture conserves and manages marine and fisheries resources. It has developed a Law on Fisheries which allows for comprehensive and integrated marine resources management. However, the main objective of the Ministry is to promote fisheries and develop the fishing industry, since this forms a major source of livelihood for the people. As a result conservation of marine resources tends to get sidelined. Supplementary to regulations for fisheries, economic tools need to be assessed to promote sustainable fishing by providing economic incentives and alternative livelihoods to the fishing-based populations.

The Maldives Tourism Act provides for the determination of zones and islands for the development of tourism in the Maldives: the leasing of islands for development as tourist resorts, the leasing of land for development as tourist hotels and tourist guesthouses, the leasing of places for development as marinas, the management of all such facilities; and the operation of tourist vessels, diving centres and

travel agencies, and the regulation of persons providing such services. According to this Law an island is leased to a private party for a certain period of time (maximum 25 years or 35 years for investment of US$ 10 M or more), after which the lease can either be extended or the island returned to government control. In cases where the agreement is not terminated prematurely by the lessee, the government pays a monetary value for the infrastructure on the island after depreciation. The Act also outlines procedures for the registering and licensing of tourist hotels, guesthouses and tourist vessels. Marinas and diving centres are also subject to leasing and registration respectively. The Ministry of Tourism leases and releases islands for resort development and where the government is not the lessee, leasing is done through a bidding process. Recently 35 new islands have been released for development as tourist resorts.

The Third Tourism Master Plan is now in place and like the previous plans recognizes the inextricable links between tourism and coastal and marine biodiversity. As such it stresses the sustainable development of tourism. It emphasizes the importance of developing tourism in harmony with nature; facilitating private sector investment; developing human resources; increasing employment opportunities; diversifying markets and products; and spreading the economic benefits of tourism across the entire archipelago more equitably. The Tourism Law (1979 and 1999) introduces more extensive environmental controls on resorts and coastal development including mandatory EIAs, to be implanted by the Ministry of Environment with support from the Tourism Advisory Board. The government's stated commitment towards biodiversity conservation can thus be seen in its policies. However, once again effective implementation and management of these policies and incorporation of economic tools (such as payment for ecosystem services) and incentives is required to ensure a much more sustainable tourism sector.

The first National Environment Action Plan was formulated in 1989 and aimed to establish a comprehensive environmental strategy. NEAP II (1994) reflects this need even further and establishes a comprehensive framework for sustainable development and natural resource management. The Sustainable Tourism Master Plan, Agenda for Integrated Reef Resource Use and Integrated Atoll Development Plan incorporated environmental resource management into their programmes. However, one of the MDGs that the country is lacking in is to ensure environmental sustainability. The National Environment Action Plan (NEAP) provides the overarching policy framework for environmental protection in the Maldives. Although economic tools are not explicitly mentioned in the actions, policies and measures it contains, the NEAP has an overarching focus on promoting sustainable economic development.

The National Biodiversity Strategy and Action Plan (NBSAP) was produced in 2002 and one of its main objectives is to build capacity through governance strengthening. The NBSAP highlights the need for incorporating biodiversity conservation into the national development processes. In addition, it also recommends strengthening legal and policy frameworks, improving in-situ conservation and establishing long term financing mechanisms. One of the eleven objectives and set of actions of the 2002 National Biodiversity Strategy and Action Plan is the adoption of economic incentives including the use of economic valuation and natural resource accounting, as well as economic instruments such as the user pays principle, tradable permits and export quotas. Another relates to building financial

capacity for biodiversity conservation through contributions from the annual government budget, the establishment of an environment conservation fund, and international funding sought from relevant donor agencies. A third states the intention to achieve better integration of biodiversity conservation into the national development process, including the development and adoption of suitable economic instruments to ensure that the value of biodiversity is adequately reflected in national development activities.

There is no specific agriculture policy. According to the Agriculture Master Plan, agriculture potential is concentrated in 36 islands, only 33 of these have land areas in excess of 1 sq. km, and 3 islands have an area larger than 3 sq km. Only about 10 percent of the total land area is suitable for farming. The Master Plan also highlights that recently watermelon, cucumber and papaya were introduced for the domestic market and tourist resorts. On some other islands breadfruit, banana, taro, cassava and sweet potato are grown and they are significant food sources for the people. Other crops such as mango, papaya, water melon, melon, pumpkin, cucumber, eggplant, chilli pepper, leaf cabbage, and small red onion are commercially produced on some inhabited islands and on uninhabited islands leased for agriculture. However, coconut is the dominant crop which is produced and consumed throughout the country. Agriculture's contribution to the national GDP declined from around 7% in 1984 to 3.6% in 1995 and then to 2.7% in 2003. About 3% of the labour force is employed in the agriculture sector. According to the Master Plan, land is leased for commercial purposes and the rights and responsibilities of tenures differ for different activities. However, there are no written Laws regarding the assignment of agricultural land on inhabited islands.

From the above paragraphs it is evident that there is an Environmental Protection Act and many comprehensive sectoral policies; however there is little implementation especially in areas such as solid waste management, water and sanitation and land use. Ministries often apply varying policies and directives for land allocation, which results in lack of coordination and consistency. It is clear that while these policies target the host of environmental problems being faced by the country, their implementation is not clear since any changes that should have occurred have not been measured. As mentioned above, monitoring of projects with regards to EIA is weak and as a result non-compliance is rarely addressed. Additionally, because there is a lack of benchmarking, monitoring and compliance measurement, penalties are rarely imposed. There is no capacity at island or atoll level for monitoring and conservation activities and there is little awareness. Government departments have limited staff and expertise due to which there is a lack of field offices. Licenses are issued for various purposes such as tourism (by the Ministry of Tourism), construction and land reclamation (by the Department of National Planning), and natural resource use (by the Ministry of Fisheries). Natural resource use licenses include those for sand and coral mining, tree cutting and marine resource use. However, according to UNEP (2005) there are no licensing criteria and licenses are issued on a case-by-case basis for natural resource use.

Despite the emphasis given to the development of economic incentives in the NBSAP, economic and environmental policies, instruments and regulations in the Maldives tend to focus on command and control measures of penalties and enforcement rather than on providing positive economic incentives and enabling economic instruments for biodiversity conservation.

- Thus the 1993 Environmental Protection and Preservation Act of the Maldives establishes fines for environmental non-compliance and breaches of the Law, ranging from MRf 500,000 for minor offences to MRf 100 million for serious transgressions; it also enables the government to claim compensation from the perpetrators of activities which potentially or actually cause environmental damage. The 2007 Environmental Impact Regulations associated with this Act do not, however, specifically mention requirements for environmental compensation or the funding of ecosystem restoration.

- Likewise, fisheries sector regulations are focused primarily on stimulating production and make little or no mention of environmental concerns. The exception seems to be provisions in the 1987 Fisheries Act of the Maldives which allow the Ministry of Fisheries to prohibit fishing for a specified period or to establish special sanctuaries in instances where there is a special need for the conservation of marine species. Fisheries regulations also ban, on environmental grounds, the use of fishing nets in Maldivian waters.

- The 2002 Maldivian Land Act allows for the allocation of land for various purposes and uses, including for environmental protection. However, although it specifies the various taxes and charges that must be paid on the sale of land and property, there is no differentiation of this tax on environmental grounds, and no provisions for environmental fines or penalties.

- The 1999 Maldives Tourism Act introduces extensive environmental controls on resort development and operations (including the development of environmental management plans for islands used for tourism), and sets general fines for non-compliance with the Law. It does not however distinguish environmental fines and penalties, and contains only limited mention of biodiversity conservation aside from highlighting the requirement to obtain government permission and to abide by regulations when activities involve felling trees, dredging lagoons, reclaiming land or causing any other permanent change to the natural environment of islands.

- The 1999 Maldives Recreational Diving Regulations are concerned primarily with the certification and safety of divers, equipment and boats, but contain some mention of environmental protection. They underline the need for divers to take reasonable care to protect the marine environment, its associated living organisms and their habitats, and ban activities which are stated in the Environment Protection and Preservation Act to be detrimental to marine protected areas and protected species and their habitats. No specific mention is made of fines or penalties for damage caused to the marine environment from diving activities.

The review of economic and environmental policies and instruments provided above makes it clear that, currently, economic instruments for biodiversity conservation remain extremely rudimentary in the Maldives – despite this being a stated objective of the NBSAP. In particular, it highlights three incentive gaps in relation to biodiversity conservation which are provided by the current economic and environmental policy framework:

- Despite the dependence of the economy and its growth on biological resources and natural ecosystems, biodiversity conservation goals are not mainstreamed into development policies, strategies and plans at national, sectoral or Atoll levels.

- Although economic disincentives to degrading or depleting biodiversity exist via the punitive measures that are created through general environmental penalties and fines, there is a notable lack of positive incentives to balance these which would act to encourage or reward for the conservation (rather than degradation) of biodiversity in the course of economic activities.

- Although there are few or no environmentally-damaging subsidies in the Maldives, in some cases the incentive systems which are offered in order to stimulate economic activity and expand production (for example in the tourism, fisheries and industrial sectors) may serve as perverse incentives with respect to conservation – because they encourage investors and producers to carry out activities in ways and at levels which harm biological resources and ecosystems.

8. Economic instruments that can act as incentives for biodiversity conservation

Clearly there is a need to investigate thoroughly the ways in which existing economic and environmental instruments can be reformed so as to support biodiversity goals, and to look into the possibility of introducing new economic incentives for conservation. Such economic instruments could, if properly designed, serve three purposes:

- Raise revenue that can be invested in biodiversity conservation by government.

- Internalise biodiversity costs and benefits into private economic decisions by encouraging producers, consumers and investors to engage in environmentally-friendly behaviour (by making it more profitable for them to do so) and discouraging them from carrying out activities that lead to biodiversity degradation or loss (by making it less profitable, or more costly, to do so). It is worth mentioning that this is something that the AEC project is attempting to pilot in Baa Atoll.

- Act as redistributive mechanisms which would ensure that a sufficient level of economic value from conservation accrues locally, to the primary harvesters, users and managers of biological resources and ecosystems. As well as providing economic incentives for conservation, this could have the additional benefit of creating more sustainable livelihoods and development opportunities at the household, island and atoll level.

Unlike in other countries (where differential tax and subsidy rates are often used to promote environmentally-friendly products, practices and consumption patterns, and to discourage environmentally damaging ones), there is very limited potential under existing conditions to use fiscal incentives for biodiversity conservation in the Maldives. This is because taxes and tax revenue are

currently a relatively insignificant part of government economic policy and budgetary revenue (there are no personal income, property, capital gains, business profit, sales or land taxes, and tax revenue excluding import duties account for only a very small proportion of government revenue). As there are currently also few price interventions in the Maldives economy, and limited public financial resources, it is unlikely that conservation subsidies would be acceptable to government.

The main opportunity to use economic instruments in support of biodiversity conservation in the Maldives would seem to lie in reforming existing (and where appropriate introducing new) charges, fees and duties to reward environmentally-friendly behaviour and penalise activities that lead to biodiversity loss or degradation. There are at least two types of market-based and trade instruments which could be used in the Maldives – focusing on the sectors and industries that use and impact on biodiversity, and based around the principles of user-pays or polluter-pays.

- Fees and charges for the use of biological resources (for example for fisheries and tourism activities) or payments for ecosystem services (for example support to fisheries productivity, tourism landscapes or the protection of settlements), have been discussed in the section above. As well as serving to raise revenue for conservation, these instruments also provide a way of regulating or managing the demand for biological resources, and encourage users to reduce pressures on particular species, stocks or sites.

- Import tariffs are a special type of economic instrument which are particularly important in the Maldivian context – both because they are already an important tool for economic management and public revenue generation, and also because of the unusually high dependence of Maldivian industries and businesses on imports. A key goal would be to differentiate duty rates based on environmental criteria, allowing exemption or relatively lower tariffs on some items, and relatively higher duties on others. Reform of the existing import tariff regime could thus act to discourage the import and use of products, technologies and equipment that pose a potential threat to biodiversity, as well as encourage those which avoid or minimise negative biodiversity impacts.

As mentioned above, being cognisant of local opportunity costs and making it a priority to ensure that economic benefits arising from the conservation and sustainable use of biodiversity are distributed equitably is key to both conservation and economic development goals. A range of economic incentives which are targeted specifically at the local-level users and managers of biological resources and ecosystems have great potential for application in the Maldives. In addition to instruments which aim to ensure compliance with environmental rules and regulations, these include:

- Allocation of a portion of any funding raised to the atoll, island or household level to be used to directly finance local initiatives, on either a grant or credit basis.

- The establishment of enterprise funds to enable the development of value-added or sustainable biodiversity business, and to support investments in environmentally-friendly

technologies, equipment and products.

- The establishment of targeted incentive and payment systems, which directly reward the provision of environmental goods and services through conservation at the local level, including direct participation and involvement in economic activities.

CHAPTER FOUR

PROGRESS TOWARDS THE 2010 TARGET AND IMPLEMENTATION OF THE STRATEGIC PLAN

Photo: Ahmed Zahid |www.ahmedzahid.com

4.1 Introduction

Information on biodiversity in the Maldives is limited. With limited resources and limited capacity in human and institutional capacity, the tiny island community has not been able know the richness of its own biodiversity. Research on biodiversity started very recently. Due to limited research and study into this area, use of such data as a basis for developing policies, preparing actions to conserve biodiversity or for reporting on progress or seeking the best options for conservation are all relatively limited.

This chapter presents a review of the progress of Maldives towards the 2010 target. It also records progress towards the Goals and Objectives of the Strategic Plan of the Convention on Biodiversity and lists some conclusions based on the results presented in the four chapters.

4.2 Assessing progress towards the 2010 biodiversity target

Table 4.1 presents a review of the progress of Maldives towards the 2010 target and the global goals and targets agreed by the CBD, using global indicators. It shows the different actions that the Maldives has engaged in to address each of the goals and targets, as in Annex II of the guidelines on preparing the 4th National Report.

The results in Table 4.1 show that, within the constraints of lack of capacity, financial resources and institutional capacity, the Maldives has made progress in achieving success in a number of global goals and targets. The results also show that much more has to be done as well.

Global Goals and Targets
Protect the components of biodiversity
GOAL – ONE **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. Target 1.2: Areas of particular importance to biodiversity protected
• Actions taken and plans made to achieve goal and targets: • So far 3% of the Maldives has been declared as protected areas (under the Environment Protection and Preservation Act 4/93). These include marine and terrestrial areas. • A list of 98 areas which are rich in biodiversity have been identified as Sensitive areas. These include possible fish breeding areas, bird sanctuaries, micro atolls, islands, mangroves and marine areas. EPA is working on protecting these areas which will help the Maldives to reach the target of 10% of ecoregions.

- Atoll Environment Conservation (AEC) Project and Program of Work of Protected Areas are preparing plans to protect 7 more areas.
- Local communities are engaged in the process of protection by calling for local community proposals for protection and conservation so that the protection and conservation can be more effective.
- EIA process requires the protection of biodiversity components.
- Education and awareness has brought up a holistic approach to the process of protection of species as well as areas.

GOAL – TWO

PROMOTE THE CONSERVATION OF SPECIES DIVERSITY

Target 2.1: Restore, maintain, or reduce the decline of populations of species of selected taxonomic groups.

Target 2.2: Status of threatened species improved.

- Turtles have been protected by a 10 year moratorium and certain rare species that are likely to be threatened or endangered are prohibited from exploitation and export. Turtle breeding programs supported by some tourist resorts.
- Harvesting sea turtle eggs is prohibited in 10 selected parts of the country where sea turtles are under severe threat and a turtle management plan is in its final stages.
- A whale shark aggregating area was declared as a marine protected area in 2009.
- Shark fishery ban from 2010.
- No baseline study for species threatened with extinction.
- Replanting of mangrove areas which were affected by the 2004 tsunami has been carried out with the help of island NGOs and island communities.
- Species-specific conservation programs are being undertaken to reduce the decline of population of selected taxonomic groups and to improve the status of threatened species.

GOAL – THREE

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.

- Areas especially rich in local medicinal plants enlisted in sensitive list for protection

Promote sustainable use	
GOAL – FOUR **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. Target 4.2. Unsustainable consumption of biological resources, or those that impact upon biodiversity, reduced. Target 4.3: No species of wild flora or fauna endangered by international trade.	
• Various approaches are being used to conserve and use resources sustainably. • The regulation on uninhabited islands requires that a tree be planted for each tree felled. It also requires the party responsible to manage the island to look after and regenerate the natural resources on the island, especially the plant resources. • Public awareness raising and support is being enlisted to protect areas and species and maintain that protection. • Alternative sources of income are being sought for people dependent on the protected areas or species for their livelihood. • Research is being carried out to establish aquaculture and / or mariculture as an alternative to natural breeding to reduce the economic and social impacts of reduced stocks and safeguard some threatened species like sea cucumbers and groupers. • International trade in endangered species (e.g. turtles and their products) is banned	
Address threats to biodiversity	
GOAL – FIVE **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.	
• Ecosystems and habitats such as mangroves are being protected through land use plans, support provided for regeneration and maintenance.	

GOAL – SIX

CONTROL THREATS FROM INVASIVE ALIEN SPECIES

Target 6.1: Pathways for major potential alien invasive species controlled.

Target 6.2: Management plans in place for major alien species that threaten ecosystems, habitats or species.

- International trade of endangered wild species is prohibited by regulation.
- Quarantine Centre established in Hulhule.
- Maldives is working towards becoming a party to the Convention on International Trade in Endangered Species of Fauna and Flora (CITES),

GOAL-SEVEN

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.

Target 7.2: Reduce pollution and its impacts on biodiversity.

- National Adaptation Programme of Action (NAPA) developed in 2007: contains plans, policies and strategies including those which can be used to address challenges to biodiversity from climate change.
- Regulations and efforts being made to reduce pollution through waste management measures, roadworthiness requirements, applying ICAO standards for air quality and IMO standards for marine pollution control and biosafety.
- Maldives pledged to become a carbon neutral country by 2020 – helps reduce pollution and assist biodiversity conservation.
- Maldives pledged to phase-out HCFC by 2020 which also contributes to biodiversity conservation from climate change and pollution.

Maintain goods and services from biodiversity to support human well-being

GOAL-EIGHT

MAINTAIN CAPACITY OF ECOSYSTEMS TO DELIVER GOODS AND SERVICES, AND SUPPORT LIVELIHOODS

Target 8.1: Capacity of ecosystems to deliver goods and services maintained.

Target 8.2: Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people, maintained.

- Environmental Protection Agency and Marine Research Centre are leading the in-situ and other biodiversity conservation efforts, and other protection measures for biological diversity of the Maldives.
- Water resources and water quality are important current issues. Salt water intrusion has become a major issue after the 2004 tsunami and due to anthropogenic activities. Seasonal and local water shortages occur in some inhabited islands. The government has provided a 2500-liter water tank to every household for rain water harvesting but some limitations occur in agricultural use as well. Improper waste disposal and sanitation practices are making ground water unusable for human consumption.

Protect traditional knowledge, innovations and practices

GOAL-NINE
MAINTAIN SOCIO-CULTURAL DIVERSITY OF INDIGENOUS AND LOCAL COMMUNITIES

Target 9.1: Protect traditional knowledge, innovations and practices.
Target 9.2: Protect the rights of indigenous and local communities over their traditional knowledge, innovations and practices, including their rights to benefit sharing.

- All Maldivians speak the same language called Dhivehi, which is an indigenous language. In that sense there is little linguistic diversity among the Maldivians except the dialectical differences.
- Traditional knowledge of medicinal plants and trades like boat-building are widely available and practiced, although with hospitals and new materials like fibre-glass for boat building, these practices and knowledge need preservation.

Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources

GOAL-TEN
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.
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

Ensure provision of adequate resources

GOAL-ELEVEN

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.

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

- Conservation and protection programs are funded and facilitated by government budget as well as donor funds.
- One key program is the Atoll Environment Conservation (AEC) Project funded by the Global Environment Facility which has supported biodiversity-related projects, especially in Baa Atoll.
- Technology and knowledge transfer occurs through workshops, seminars, exchange visits, study tours and long-term scholarships.

4.3 Progress towards the goals and objectives of the strategic plan of the Convention on Biodiversity

This section presents the progress that has Maldives made in contributing to the relevant goals and objectives of the Strategic Plan of the Convention on Biodiversity. It reports briefly on the Maldives National Biodiversity Strategic Action Plan (NBSAP) contributes to achieving the goals and objectives of the Strategic Plan of the Convention on Biodiversity. National and sectoral biodiversity goals, objectives and strategies have been explicitly linked to the goals and objectives of the NBSAP. The goals and objectives of NBSAP and biodiversity-related policies and strategies in national plans and some sector plans have been presented in Chapter Three. NBSAP has been implemented with support from and in cooperation with other related agencies and sectors. Table 4.2 presents the Maldives' contribution to the implementation of the goals and the objectives of the Strategic Plan of the Convention on Biodiversity.

Obstacles encountered in implementing NBSAP

The major obstacles faced in implementing NBSAP relates to lack of technical expertise, financial resources and research and development facilities. These have been highlighted earlier in Chapters Two and Three.

TABLE 4.2 MALDIVES CONTRIBUTION TO THE IMPLEMENTATION OF THE GOALS AND THE OBJECTIVES OF THE STRATEGIC PLAN OF THE CONVENTION ON BIODIVERSITY

Strategic goals and objectives	Maldives' contribution
GOAL ONE: THE CONVENTION IS FULFILLING ITS LEADERSHIP ROLE IN INTERNATIONAL BIODIVERSITY ISSUES.	
	CBD provisions, COP decisions and 2010 targets are reflected in the Strategic Action Plan, 7th National Development Plan (7thNDP) and other work plans
1.4 The Cartagena Protocol on Biosafety is widely implemented.	Maldives National Biosafety Framework for the Republic of Maldives developed in 2006.
1.5 Biodiversity concerns are being integrated into relevant sectoral or cross-sectoral plans, programmes and policies at the regional and global levels.	Biodiversity conservation issues are integrated into Strategic Action Plan (SAP), National Environmental Action Plan III (NEAP3), National Sustainable Development Strategy (NSDS), National Adaptation Plan of Action (NAPA) and others. Environmental Impact Assessment process integrates biodiversity concerns into the development projects.
1.6 Parties are collaborating at the regional and sub-regional levels to implement the Convention.	SAARC Coastal Zone Management Centre is established in the Maldives.
GOAL TWO: PARTIES HAVE IMPROVED FINANCIAL, HUMAN, SCIENTIFIC, TECHNICAL, AND TECHNOLOGICAL CAPACITY TO IMPLEMENT THE CONVENTION	
2.1 All Parties have adequate capacity for implementation of priority actions in national biodiversity strategy and action plans.	Heavy investment in human resources development is improving the capacity for biodiversity conservation. However, the capacity available is at present is still grossly inadequate to carry out the work that needs to be done in implementing priority actions in national biodiversity strategy and action plans, especially those in taxonomy and research and development.

2.2 Developing country Parties, in particular the least developed and the Small Island Developing States amongst them, and other Parties with economies in transition, have sufficient resources available to implement the three objectives of the Convention.	Maldives as a Small Island Developing State is not able to fulfil the commitments stipulated under the convention due to financial constraints. Limited funds have placed constraints on human resource development, research and development, and establishment of the necessary facilities. However, there is some donor support to biodiversity as illustrated by the AEC Project.
2.3 Developing country Parties, in particular the least developed and the Small Island Developing States amongst them, and other Parties with economies in transition, have increased resources and technology transfer available to implement the Cartagena Protocol on Biosafety.	Maldives acceded to the Cartagena Protocol on Biosafety on 2nd September 2002. It developed a National Biosafety Framework for the Republic of Maldives in 2006 to fulfil its initial obligation to the Cartagena Protocol on Biosafety. Work of implementing the framework is on-going.
2.4 All Parties have adequate capacity to implement the Cartagena Protocol on Biosafety.	Maldives does not have adequate capacity to implement the protocol. It needs trained technicians as well as equipped labs to adequately fulfil its obligations.
2.5 Technical and scientific cooperation is making a significant contribution to building capacity.	There appear to be little progress in this area.

GOAL THREE: NATIONAL BIODIVERSITY STRATEGIES AND ACTION PLANS AND THE INTEGRATION OF BIODIVERSITY CONCERNS INTO RELEVANT SECTORS SERVE AS AN EFFECTIVE FRAMEWORK FOR THE IMPLEMENTATION OF THE OBJECTIVES OF THE CONVENTION.	
3.1 Every Party has effective national strategies, plans and programmes in place to provide a national framework for implementing the three objectives of the Convention and to set clear national priorities.	As indicated in Chapter Three, there are national and sectoral policies, plans, legislation and regulations in place that are relevant for the implementation of the three objectives of the convention. These include: • Strategic Action Plan (SAP) 2009 • Seventh National Development Plan 2006 • National Biodiversity Action Plan 2002 • National Environmental Action Plan III (NEAP3) • National Sustainable Development Strategy (NSDS) • National Adaptation Plan of Action (NAPA) • The National Environment Strategy (NES) called "The Middle Path" is in place • Maldives Forest Policy • Environment Impact Assessment Regulations 2007 • National Biosafety Framework, 2006 • Regulations on Uninhabited Islands
3.2 Every Party to the Cartagena Protocol on Biosafety has a regulatory framework in place and functioning to implement the Protocol.	The main regulatory framework in place to implement the Cartagena Protocol on Biosafety is the National Biosafety Framework for the Republic of Maldives, 2006.
3.3 Biodiversity concerns are being integrated into relevant national sectoral and cross-sectoral plans, programmes and policies	As can be seen in Chapter Three, biosafety concerns have been and are being integrated into relevant national, sectoral and cross-sectoral plans, programmes and policies. However, the level of implementation needs to be evaluated.

3.4 The priorities in national biodiversity strategies and action plans are being actively implemented, as a means to achieve national implementation of the Convention, and as a significant contribution towards the global biodiversity agenda.	Developmental plans, policies, strategies and actions are being implemented. Some actions are implemented by the responsible agency and the others are implemented as a collaborative activity among the concerned sectors. However, the latter appears to take longer to organise.
GOAL FOUR: THERE IS A BETTER UNDERSTANDING OF THE IMPORTANCE OF BIODIVERSITY AND OF THE CONVENTION, AND THIS HAS LED TO BROADER ENGAGEMENT ACROSS SOCIETY IN IMPLEMENTATION	
4.1 All Parties are implementing a communication, education, and public awareness strategy and promoting public participation in support of the Convention.	Issues related to the convention are covered Environmental Studies and General Science curricula in the public schools. Issues related to the convention are raised in media discussions and public awareness campaigns on the environment.
4.2 Every Party to the Cartagena Protocol on Biosafety is promoting and facilitating public awareness, education and participation in support of the Protocol.	Promoting and facilitating public awareness, education and participation in support of the Protocol is limited.
4.3 Indigenous and local communities are effectively involved in implementation and in the processes of the Convention, at national, regional and international levels.	Community participation in biodiversity conservation is encouraged. AEC Project is one example where public participation from Baa atoll community is actively sought. EIA process requires seeking public views on the project.
4.4 Key actors and stakeholders, including the private sector, are engaged in partnership to implement the Convention and are integrating biodiversity concerns into their relevant sectoral and cross-sectoral plans, programmes and policies.	Key actors and stakeholders, especially the related sectors in the government, are engaged in partnership to implement the Convention and are integrating biodiversity concerns into their relevant sectoral and cross-sectoral plans, programmes and policies. There is limited capacity and only a few NGOs specialising in this area in the private sector.

4.4 Conclusion

4.4 (a) Impact of the implementation of the Convention on improving conservation and sustainable use of biodiversity

The implementation of the goals and objectives of the Convention on Biodiversity in Maldives have been achieved through the implementation of the National Biodiversity Strategy and Action Plan (NBSAP). The overall assessment based on results in Chapters One, Two and Three indicates that NBSAP has effectively contributed to the protection, conservation and sustainable use of biodiversity in the Maldives. It has contributed to:

- incorporation of biodiversity conservation measures into plans and policies at national and sector levels;
- provide a basis for and a direction to biodiversity conservation discussions, measures and implementation; and
- raising awareness of biodiversity issues.

The genetic resources available in the Maldives are not known. Therefore, the question on fair and equitable sharing of the benefits arising out of the utilization of genetic resources in Maldives cannot be answered properly.

4.4 (b) Lessons learned regarding implementation

Implementation of the National Biodiversity Strategy and Action Plan has inculcated an awareness of the urgency to address biodiversity issues in the Maldives.

Examples of successful actions taken include:

- incorporation of biodiversity conservation issues into national and sectoral plans, policies and strategies;
- increase in the protection of species, habitats and areas;
- banning of activities detrimental to biodiversity conservation (e.g. coral mining, shark fishing, etc);

Examples of less successful actions taken include:

- monitoring and evaluation aspects of the plans and policies;
- institutional capacity building. These include weakness in development of, and uncertainty in, sustainability and stability of institutions, especially in technical wings including research and development branches, which are necessary if a scientific and technical convention such as CBD is to be implemented properly; and
- attempts to coordinate and implement some biodiversity conservation and protection actions.

4.4 (c) Future priorities and capacity-building needs

As a future priority for further national-level implementation of the Convention, the following points need to be considered for biodiversity conservation across the nation.

- Priority action needs to be attended first.
- Making the objectives and actions time-bound: currently there are no time limits for the achievement of the objectives or implementation of the actions.
- Identifying who is responsible to implement the action or at least the lead person or agency responsible so that it becomes part of their mandate. When multiple agencies are responsible then no one may take responsibility lest the whole responsibility for implementation fall on them.
- Human resource development needs to focus on specific professions including but not limited to environmental scientists, ecologists, taxonomists, molecular biologists, agronomist, environmental monitoring and evaluation specialists, environmental lawyers, etc.
- Capacity development on how to access and utilize the available resources and to effectively use them to conserve biodiversity.

In general, as mentioned earlier, Maldives has made progress in implementing the goals and targets in the Convention on Biodiversity. More can be done with better human and institutional capacity and financial resources. There is a will in the environmental and related sectors. Maldives needs a way and the means to conserve and protect the rich and unique biodiversity of the country.

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APPENDICES

Appendix I - Information concerning reporting Party and preparation of national report

Appendix II - Further sources of information

Appendix III - Progress towards targets of the Global Strategy for Plant Conservation and Programme of Work on Protected Areas

Appendix IV - National indicators used in the report (optional)

Appendix I - *Information concerning reporting Party and preparation of national report*

A. Reporting Party

Contracting Party	
NATIONAL FOCAL POINT	
Full name of the institution	Ministry of Housing and Environment
Name and title of contact officer	Dr. Mohamed Shareef, State Minister Ministry of Housing and Environment Ameenee Magu, Male' Maldives
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CONTACT OFFICER FOR NATIONAL REPORT (IF DIFFERENT FROM ABOVE)	
Full name of the institution	Ministry of Housing and Environment
Name and title of contact officer	Ms. Ilham Atho Mohamed Environment Analyst
Mailing address	Ministry of Housing and Environment Ameenee Magu Male' Maldives
Telephone	(+960) 3004 300
Fax	(+960) 3004 301
E-mail	ilham.mohamed@mhte.gov.mv
SUBMISSION	
Signature of officer responsible for submitting national report	
Date of submission	

B. Process of preparation of national report

In preparing the report, the prescribed guidelines for the preparation of the Fourth National Report provided by the Convention on Biological Diversity (CBD) were adhered to.

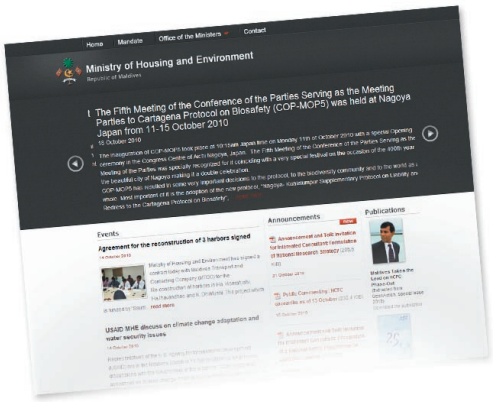
A number of reports that have been published and key national documents and previous experiences related to biodiversity were referred to in the process and their information synthesized and incorporated.

In preparing the report, Focal Points from different stakeholders like MoFA, MRC, EPA, AEC, MHE and Tourism were identified and regular meetings were held from the very beginning to make sure of their maximum contribution to the report. Consultations, both formal and informal, were made with experts in the Environmental section, the Environmental Protection Agency, the Marine Research Centre and various experts working in biodiversity and related field from various agencies. Their contributions were incorporated into the report.

The draft report was circulated among key stakeholders, and a workshop was conducted to finalize the report. Feedback from both was incorporated into the report.

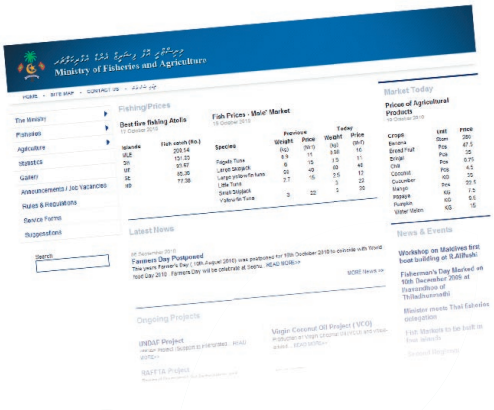
Appendix II - *Further sources of information*

The Environment and biodiversity sectors in the Maldives have been very active. A number of plans, policies, and reports have been made or contributions made to them. Various activities have also been carried out. A few sources where additional information can be obtained are given below:



Ministry of Housing and Environment
www.mhte.gov.mv

Environmental Protection Agency
www.epa.gov.mv



Ministry of Fisheries and Agriculture
www.fishagri.org

Marine Research Centre
www.mrc.gov.mv

Ministry of Tourism
www.tourism.gov.mv

Appendix III - *Progress towards targets of the Global Strategy for Plant Conservation and the Programme of Work on Protected Areas*

A. Progress towards targets of the Global Strategy for Plant Conservation

Target 1: A widely accessible working list of known plant species, as a step towards a complete world flora	A book on the plants of the Maldives has been published (see Chapter 1). However, more needs to be done on recording the indigenous fauna and flora.
Target 2: A preliminary assessment of the conservation status of all known plant species, at national, regional and international levels	Trees older than 50 years are being protected; trees in some mangroves are being conserved.
Target 3: Development of models with protocols for plant conservation and sustainable use, based on research and practical experience	
Target 4: At least 10 per cent of each of the world's ecological regions effectively conserved	3% conserved/ protected
Target 5: Protection of 50 per cent of the most important areas for plant diversity assured	Sensitive list or areas prepared and protection attempted
Target 6: At least 30 per cent of production lands managed consistent with the conservation of plant diversity	
Target 7: 60 per cent of the world's threatened species conserved in situ.	Turtles, sharks conserved,
Target 8: 60 per cent of threatened plant species in accessible ex situ collections, preferably in the country of origin, and 10 per cent of them included in recovery and restoration programmes	
Target 9: 70 per cent of the genetic diversity of crops and other major socio-economically valuable plant species conserved, and associated indigenous and local knowledge maintained	Initiated
Target 10: Management plans in place for at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems	Initiated
Target 11: No species of wild flora endangered by international trade	International trade in these banned
Target 12: 30 percent of plant-based products derived from sources that are sustainably managed	

Target 13: The decline of plant resources, and associated indigenous and local knowledge innovations and practices that support sustainable livelihoods, local food security and health care, halted.	
Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes.	Being incorporated
Target 15: The number of trained people working with appropriate facilities in plant conservation increased, according to national needs, to achieve the targets of this Strategy.	Training urgently needed
Target 16: Networks for plant conservation activities established or strengthened at national, regional and international levels	No such network established yet

B. Progress towards targets of the Programme of Work on Protected Areas

This section presents an overview of progress towards selected targets contained in the Programme of Work on Protected Areas,
National targets established (global targets adopted)
Maldives has adopted global targets in relation to biodiversity issues. These include MDGs as well.

(i) Incorporation of targets into relevant strategies, plans and programmes
The targets have been included into national development plans and policies as indicated in Chapter Three.

(ii) Actions taken to achieve the target.
Please see Table below for status and actions taken.

(iii) Obstacles encountered, including the following:

- Lack of proper mechanisms for the management of protected areas.
- Lack of capacity of the governing authority.
- Absence of resource utilization mechanisms.
- Challenges of monitoring vast network of protected areas.
- Financial constrains to manage the protected areas.
- Challenges in ownership and management of resources.

(iv) Needs and future priorities identified, and include:

- Building better capacity.
- Seeking more resources.

Future priorities include:

- Completing Management plans for 7 protected areas by end of the year 2010.
- Protecting the major sensitive areas identified before end of the year 2010.
- Develop Baa Atoll as a biosphere reserve.
- Increase the coverage of marine protected areas.
- Increase the boundaries of existing marine protected areas.
- Develop the regulatory mechanism for conservation of biodiversity.
- Undertake species-specific conservation programs to reduce the decline of the population of selected taxonomic groups and to improve the status of threatened species.

Table: Goals and targets of the Programme of Work on Protected Areas

Goals	Target	Achievement/ Progress
1.1. To establish and strengthen national and regional systems of protected areas integrated into a global network as a contribution to globally agreed goals.	By 2010, terrestrially / and 2012 in the marine area, a global network of comprehensive, representative and effectively managed national and regional protected area system is established as a contribution to (i) the goal of the Strategic Plan of the Convention and the World Summit on Sustainable Development of achieving a significant reduction in the rate of biodiversity loss by 2010; (ii) the Millennium Development Goals – particularly goal 7 on ensuring environmental sustainability; and (iii) the Global Strategy for Plant Conservation	- 3% of the Maldives has been declared as protected areas both marine and terrestrial -- More than 100 areas have been identified as Sensitive areas among them area micro atolls, islands, mangroves and marine areas. Species such as turtles and sharks are protected - Species such as turtles and sharks are protected - Certain rare species that are threatened or endangered are prohibited from exploitation and export.
1.2. To integrate protected areas into broader land- and seascapes and sectors so as to maintain ecological structure and function.	By 2015, all protected areas and protected area systems are integrated into the wider land and seascape, and relevant sectors, by applying the ecosystem approach and taking into account ecological connectivity 5/ and the concept, where appropriate, of ecological networks.	- This is being attempted in the process of making land use plans

/ Terrestrial includes inland water ecosystems.

5/ The concept of connectivity may not be applicable to all Parties.

6/ References to marine protected area networks to be consistent with the target in the WSSD plan of implementation.

1.3. To establish and strengthen regional networks, transboundary protected areas (TBPAs) and collaboration between neighbouring protected areas across national boundaries.	Establish and strengthen by 2010/2012 6/ transboundary protected areas, other forms of collaboration between neighbouring protected areas across national boundaries and regional networks, to enhance the conservation and sustainable use of biological diversity, implementing the ecosystem approach and improving international cooperation	- Being attempted through regional cooperation and participation in regional biodiversity conservation networks (e.g. protection of turtles)
1.4. To substantially improve site-based protected area planning and management. - Management Plans for 7 protected areas are currently being prepared by B. Atoll project and Program of Work of Protected area	All protected areas to have effective management in existence by 2012, using participatory and science-based site planning processes that incorporate clear biodiversity objectives,targets,management strategies and monitoring programmes, drawing upon existing methodologies and a long-term management plan with active stakeholder involvement	- Protected Areas management is being attempted - Management Plans for 7 protected areas are currently being prepared by B. Atoll project and Program of Work of Protected area
1.5. To prevent and mitigate the negative impacts of key threats to protected areas.	By 2008, effective mechanisms for identifying and preventing, and/or mitigating the negative impacts of key threats to protected areas are in place.	- mechanisms identified for some protected areas, but not effectively in place yet
2.1. To promote equity and benefit-sharing.	Establish by 2008 mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas	- Being attempted, currently significant background work is being done in this area

2.2. To enhance and secure involvement of indigenous and local communities and relevant stakeholders.	Full and effective participation by 2008, of indigenous and local communities, in full respect of their rights and recognition of their responsibilities, consistent with national Law and applicable international obligations, and the participation of relevant stakeholders, in the management of existing, and the establishment and management of new, protected areas	- Local communities lead the process of protection by coming forward with the proposals; hence locals are more aware of significance of protection
3.1. To provide an enabling policy, institutional and socio-economic environment for protected areas.	By 2008 review and revise policies as appropriate, including use of social and economic valuation and incentives, to provide a supportive enabling environment for more effective establishment and management of protected areas and protected areas systems.	- Policies reviewed, social and economic valuation and establishment of mechanisms for such evaluation being attempted through various projects
3.2. To build capacity for the planning, establishment and management of protected areas.	By 2010, comprehensive capacity building programmes and initiatives are implemented to develop knowledge and skills at individual, community and institutional levels, and raise professional standards	- Various training programmes carried out, a related degree program is being launched
3.3. To develop, apply and transfer appropriate technologies for protected areas.	By 2010 the development, validation, and transfer of appropriate technologies and innovative approaches for the effective management of protected areas is substantially improved, taking into account decisions of the Conference of the Parties on technology transfer and cooperation	- Appropriate technologies and innovative approaches sought

3.4. To ensure financial sustainability of protected areas and national and regional systems of protected areas.	By 2008, sufficient financial, technical and other resources to meet the costs to effectively implement and manage national and regional systems of protected areas are secured, including both from national and international sources, particularly to support the needs of developing countries and countries with economies in transition and Small Island Developing States	- lack of funds is one major hindrance to the process of protection
3.5. To strengthen communication, education and public awareness.	By 2008 public awareness, understanding and appreciation of the importance and benefits of protected areas is significantly increased	- Awareness of the need for and process of protection of species and areas raised through education
4.1. To develop and adopt minimum standards and best practices for national and regional protected area systems.	By 2008, standards, criteria, and best practices for planning, selecting, establishing, managing and governance of national and regional systems of protected areas are developed and adopted	- Being attempted
4.2. To evaluate and improve the effectiveness of protected areas management.	By 2010, frameworks for monitoring, evaluating and reporting protected areas management effectiveness at sites, national and regional systems, and transboundary protected area levels adopted and implemented by Parties	- A rapid assessment of a broad range of PA governance types and study the experience of neighbours, is being done to short-list “theoretically” feasible types of PA governance for the Maldives

4.3. To assess and monitor protected area status and trends.	By 2010, national and regional systems are established to enable effective monitoring of protected-area coverage, status and trends at national, regional and global scales, and to assist in evaluating progress in meeting global biodiversity targets	- Being attempted
4.4 To ensure that scientific knowledge contributes to the establishment and effectiveness of protected areas and protected area systems.	Scientific knowledge relevant to protected areas is further developed as a contribution to their establishment, effectiveness, and management	- Being attempted

Appendix IV - *National indicators used in the report (optional)*

Maldives, being a small island state with limited resources, is able to use only global indicators at this point of time. Hence, indicators given in Convention on Biodiversity Targets for 2010 and indicators given in Millennium Development Goals are used to assess progress on Biodiversity.