Fourth National Report

To The

Convention on

Biological Diversity

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Executive Summary

1. Overall status of Country's biodiversity

Cambodia is a small country in the continental South-east Asia adjacent to the Gulf of Thailand. It has an area of 181,035 km^2 between 10 and 15^o N and 102 and 108^{o}E. The country possesses 2,308 plant species belonging to 852 genera in 164 families including 7 genera and 14 species belonging to Gymnosperms; 219 genera and 488 species belonging to Monocotyledons; and 626 genera and 1,806 species belonging to Dicotyledons. As no systematic and complete study has been done, it is estimated that a full list for Cambodia is expected to exceed 3,000 species, with expectations that at least 700 additional species will be described as new to science in the country (Aswell, 1997). The World Conservation Monitoring Centre 2000 estimates 8,260 plant species in Cambodia, 10% of which will be endemic.

57 and 125 taxa of aquatic macro invertebrate were recorded in a few surveys in two provinces in 1991 and 2001 respectively including Insecta, Oligochaeta, Mollusca, Crustacea and others. 28 species of amphibian and reptile are described. A total of 874 fish species are recorded, of which 490 - freshwater fishes from 64 families, 410 - saltwater fishes from 83 families, 22 are threatened; 1 endemic; 13 introduced fish species. Over 500 birds have been recorded but it is likely that the number goes easily to over 600. A list of known species is provided below.

Taxon	Total number of known species	On IUCN Red list
Mammal species	123	39
Bird species	545	36
Reptile species	88	13
Vascular plants species	2,308	38
Fish species	874	-
Hard coral	24	-
Soft coral	14	-
Sea grass	10	-
Amphibian	63	12

Cambodia protected areas system include 7 national parks (742,250 ha), 10 wildlife sanctuaries (2,030,000 ha), 3 protected landscape (9,700 ha), 3 multiple use areas (403,950 ha), 6 protection forests (1.350,000 ha), and 8 fish sanctuaries (23,544 ha).

Cambodia's forests have decreased significantly in terms of both area and quality over the last few decades. As of late as 1969, the country's forests covered around 13.2 million hectares, or 73% of the country's total land area. However, a recent forest resource assessment by FAO (2005) indicates Cambodia to have lost more than a quarter of its remaining primary forest since 2000, and ranks the country third in the world for primary forest loss. Regardless of the differences, trend in forest changes accelerated during the period from 1997 and 2002 by approximately 5% or 1% per year (IFSR 2004) and still increased further between 2002 and 2005 at a rate of 2% (CDRI 2006) and afterward.

Of 490 freshwater fish species, at least 45 species are already to be commercially important and 22 threatened fish species are recognised for their conservation significance. There is increasing prominent that the aquatic habitat is being converted for agriculture, other land use types, and the fish migration pattern is constrained by hydrological infrastructure development, particularly in the upstream of the Mekong and irrigation scheme locally in the flood plain. The flooded forest extended over more than 1

million hectares originally, had reduced to only 614,000 hectares in the 1960s and 362,000 hectares in 1991.

Recent surveys by the International Rice Research Institute (IRRI) have identified over 2000 different strains of rice used in Cambodia. Of the total rice cropping area 2,585,905 ha (2007) in Cambodia, 86% is rainfed lowland rice, 8% is Dry season rice, 4% is floating rice and 2% is upland rice.

A number of categories of threats to the country biodiversity are listed. Genetic erosion is due to the fact that people were unable to preserve the old varieties that they used to possess earlier, changes in agricultural system, increasing use of agricultural chemicals, pesticides, and herbicides are potential cause for loss of genetic resources and the introduction of new farming systems. Habitat loss is due to demand for increased agricultural lands, fuelwood and non-timber forest products and infrastructure development. Unsustainable harvesting includes hunting, logging, burning, non-timber forest product (NTFP) collection and over-fishing. Hydropower development and urban and industrial development are putting pressure on the aquatic ecosystems through changes in hydrological regime and pollution. The presence of alien species, some of them were for farming purposes, is becoming a threat that would potentially enhanced under climate change situation.

2. Key actions taken in support of the Convention's three objectives and to achieve the 2010 target and goals and objectives of the Strategic Plan of the Convention

Biodiversity is mainstreamed into both national and sectoral plans and policies such as forestry, fisheries, agronomy, animal production, water resources.

The Government Rectangular Strategy (2009-2013), a government policy platform emphasizes good governance as its core component and one of the four strategic pillars addresses enhancement of agricultural sector through improving productivity and intensifying agricultural sector, and land, forestry and fisheries reforms. The strategy states the need to maximize agricultural production and ensure sustainable use and management of natural resources including Biodiversity. The Cambodia Millennium Development Goals (CMDGs) are the national version of the MDGs adopted by member countries to the UN and provide a diagnosis of Cambodia's major policies and programs contributing to each CMDG. The CMDGs are the cornerstones of country's development policies and strategies. The National Strategic Development Plan (NSDP 206-2013) was developed, based on a results-oriented emphasis, with extensive consultations among all stakeholders - government ministries and agencies, external development partners, civil society organisations - to agree upon overall priority goals and through a series of workshops bringing together all the parties to jointly look at the goals and constraints to be overcome to achieve them.

To support the reform process, a national committee to support decentralization and deconcentration is formed with mandates, among other things, to promote mainstreaming of natural resource and environmental management with an overall development objective to achieve sustainable management of natural resources and the environment, assure secure and equitable access to land and natural resources and create opportunity for natural resources related economic activities, thus contribute to poverty reduction. An organic law (2008) on sub-national administration provides further basis for the establishment of sub-national councils with the responsibility to oversee local development and natural resources management. The law requires the review of the functions at the national level and their delegation to the lowest most effective levels, including those related to natural resource management.

A mechanism for government and donor coordination collaboratively assisting the government to progress relevant sectoral development in Cambodia was developed, as a result a total of 19 Government-Donor Technical Working Groups (TWGs) were set up in 2004-05 and after for key sectors and thematic areas in order to provide a link between high-level policy dialogue and field implementation or project work.

National Environmental Action Plan for 1998-2002 (now being revised) and the National Biodiversity Strategy and Action Plan (NBSAP) of 2002 emphasise the need to prepare and implement management plans for biodiversity conservation and to integrate them into the government's broader policy framework for environmental management. An Environmental Impact Assessment (EIA) system, as set out in the 11 August 1999 Sub-Decree on the Environmental Impact Assessment Process, requires for an examination and evaluation of EIA reports as well as "monitoring, observing and taking action to ensure that the project owner follows the environmental management plan during the construction, operation and termination" of the project.

The National Biodiversity Strategy and Action Plan (NBSAP) have been in place for implementation for 6 years. The Plan consists of 98 priority actions covering 17 different themes. It highlights the three pillars of sustainable development (ecological integrity, economic sustainability and social equity) and also sets the stage for the country to assess the adequacy of current efforts to conserve and use biological resources in a sustainable manner and to determine how gaps will be filled and opportunities realized.

Cambodia also developed National Capacity Action Plan to address the objectives of the three UN Conventions (UNCBD, UNFCCC, and UNCCD) and identified 160 priority actions for implementation over a period of 10 years (2007-2016). A Program of Work on Protected Area developed with 103 priority actions (2008) identified.

The process of developing a National Forest Programme (NFP) has resulted in a national forest policy statement formulated in 2002, a forestry law in 2002 and a series of national plan being developed. The policy statement defines forest resources of the country as permanent forest estate to be managed by promoting conservation and sustainable forest management initiatives that directly contribute to the rehabilitation and conservation. It stipulates that "The Royal Government of Cambodia commits itself to the conservation and management of the country's unique forest resources in a sustainable manner now and for future generations".

The fishery policy defines the goal of the fisheries sector to maximize the contribution of sector to the achievement of national development objectives especially those related to improving rural livelihoods of the poor, enhancing food security and the sustainable development and equitable use of the fisheries resource base. The government's agricultural strategy promotes diversified farming systems, agro-forestry and protection, and management of critical watersheds. Those strategies, and their direct link to the maintenance of protected areas and biodiversity are key to maintaining stability in agricultural systems and therefore to food security.

The principle of Integrated Water Resource Management is identified as an effective mechanism for national water resource sector and requires coordinated multi-sectoral water use planning including the need for use to conserve of biodiversity and ecosystems. The recognition of the potential for nature based tourism, for which biodiversity is seen as an important source of attraction, is implicitly enshrined in a number of relevant instrument including the government Rectangular Strategy, NSDP, NEAP, and Organic law on Sub-national Administration.

Years of efforts have resulted in more than a quarter of the country's land is set aside for protection including the about 3 millions hectares of national protected areas system, 1.35 millions hectares of protection forest and a number of fish sanctuaries. In order to promote wildlife habitats, at least 3 corridors including coastal-central cardamom, northern plain in Preah Vihear, north-eastern plain in Mondulkiri and several projects around Tonle Sap so as to reduce threats to biodiversity. Selected species have also receiving attention through researches, conservation, and monitoring. They include Elephants, tigers, vultures, Ibis, Dolphins, and Sarus crane.

While alternative livelihood of local communities has been promoted as part of effort to include local people in resource conservation, a landscape approach to management resources has become part of an innovative intervention to encourage harmonized actions by sectoral agencies.

3. Areas where national implementation has been most effective or most lacking

Latest achievements in relevant sectors include 264 Community Forestry sites covering an area of about 179,020 hectares established. A logging moratorium has been imposed on all existing logging concessions; 2,158 cases of forest crimes have been entered into the case tracking system; 606 offenders have been arrested and sent to courts; 1,636 illegal saws, 2,776 m^3 of round and squared logs and 14,925 m^3 of sawn-wood, as well as 3,044 kg and 6,971 heads of wildlife, were confiscated; 215,521 hectares of forest land have been reclaimed from land grabbing and encroachment; several annual bidding coupes have been prepared to meet domestic timber demands; Tree planting and forestation activities have all been significantly increased and become part of on-going activities.

Community Fisheries have been established to facilitate management and use of common fisheries resources. National policies recognise the rights of fisheries communities to manage local fisheries and the importance of their involvement in protection of the resource. In total 468 Community Fisheries (CFi), 433 in the inland and 35 in the coastal area established covering 126,390 households and 49% of them are designated fish refuge. In addition to 8 inland fish sanctuaries, 1,900 ha of seagrass beds have been protected results in increase of fish catch in the surrounding areas and illegal fishing practice reduced by 75% have been reported.

System of rice intensification (SRI) has been an on-going effort to promote in the field trials and farm introduction. 70 field trails on SRI have been conducted in 2007 with 500 households in 5 provinces adopted the approach. The trend of areas for and farmers engaged in SRI.

Already in some parks tourism is bringing in significant revenue for local communities. A number of initial investments have been made in infrastructure in some parks, with NGOs assisting in establishing community based ecotourism in many sites. In 2006-07, three eco-tourism destinations have been established and two more destinations are being developed. Although assessment of tourism potential in some PAs and other sites may have been made, there are no clear guidelines on regulation carrying capacity for tourism activities.

Awareness campaigns are also undertaken on semi-regular basis under an initiative by the MoE's Department of Environmental Education and Communications. TV spots and radio shows, including music and songs dedicated to biodiversity protection are strongly promoted. Awareness is also undertaken through national days such as the National/International Environment Day, National Arbour day, National Fish day, and World Wetlands Day. While such education and awareness campaigns focus mainly on students and public at large, newsletters are also produced under project targeting decision and policy makers, and practitioners

4. Major obstacles

Despites progress made in the recent years, Cambodia is still facing substantial challenges. The number of forest crimes, despite dropped, is still a constraint to biodiversity conservation and sustainable use. Remarkably, a number of fishery crimes were dramatically dropped but there is an increasing of endangered aquatic species as seen in the proposed sub-decree in 2009. Although aquaculture has increased every year that could support the decline of natural fish stock in terms of consumption, there limited indicators on the in-captive breeding of endangered aquatic species.

The country has fallen short in achieving a target on fuelwood. In 2008, the 85% of the population still depend upon fuelwood as targeted to 61% by 2010. Within less than two years, 24% cannot be achieved unless enough electricity including transmission lines are set up in major rural areas. But encouragement of planting trees is a good culture in supporting the reduction of dependence on natural fuelwood of rural households.

There is no national plan or strategy to deal with alien invasive species but the government has recognized the troublesome cause by these species. More studies are being undertaken on alien invasive species including aquatic and terrestrial. However, there is an on-going IPM program to tackle with pests causing the decline of rice and other crop production.

The increase of commercial plantation could pose threat to the forestland both in and outside of protected areas such as from plantation of rubber, cashew nut, sugar cane, palm oil, acacia, eucalyptus, jetropha, etc. However, these plantations may play certain roles in climate change and biodiversity, and support local economy, if developed and managed appropriately.

There is insufficient information of traditional medicine practices in Cambodia, despites 586 plant species have been use in this sector. No clear system that addresses access to and benefit-sharing arising out of utilization of genetic resources.

According to the National Capacity Self-Assessment report, Cambodia faces severe lacking of financial capacity (between lacking and severely lacking). Human capacity also remains weak (between lacking and sufficient), particularly in the provincial and local levels. Similar to financial aspects, organizational and constituency capacity stands between lacking and severely lacking. In general at the national level, capacity for planning and implementing the NBSAP is much better than the provincial level. Resource mobilization is the main problem in meeting goals and objectives of the country's strategic plan to implement the Convention.

5. Future priorities

Cambodia should enhance the implementation of the Convention on Biological Diversity through improving the four dimensions of the capacity (human, financial, organizational and constituency). These capacities should be raised from lacking to sufficient so that most obligations and COP decisions under the Convention can be taken to effectively implement. The country should increase capacity for a real in-captive breeding program of endangered species for plants, aquatic life, and wildlife. The country should not allow commercial activities of wildlife species, whose status is not known. Agro-forestry practices should be encouraged among communities to contribute to agriculture and biodiversity. Since there is not regulation on access to and equitable sharing of benefits arising out utilization of genetic resources in the country, the government should regulate traditional medicine shops and proper document which and where plants, micro-organisms, fish, wildlife by-products are taken as sources of medicines.

Cambodia should also enhance cooperation with ASEAN member states, GMS countries, MRC riparian countries to implement the Convention especially in terms of capacity building and information sharing. The country should have its own goals, objectives of the strategic plan to assess targets beyond 2010. Only commitment of the government and political determination can establish the enabling environment to prevail this obligation of the UNCBD.

By and large, despite the government has undertaken some activities to improve the population of endangered species but this is not enough to ensure the population return to the satisfaction level. It is wise that the government strengthened existing PA communities, forest communities and fishery communities to address sustainable use of natural resources. In the absence or limited of fund, the government should promote communities to handle the issue.

Chapter I - Overview of Biodiversity Status, Trends and Threats

1. General overview of Cambodia's Biodiversity

1.1 Biological characteristics

Cambodia is a small country in the continental South-east Asia adjacent to the Gulf of Thailand. It has an area of 181,035 km^2 between 10 and 15^o N and 102 and 108^{o}E. The country is influenced by the monsoon climate and has two different seasons with the annual precipitation between 1,200 and 1,875 mm over most of the plains and higher annual rainfall (to over 3,000 mm) on the Cardamom and Elephant mountain ranges south west of the country, and on the slope facing the coast.

Cambodia possesses 2,308 plant species belonging to 852 genera in 164 families including 7 genera and 14 species belonging to Gymnosperms; 219 genera and 488 species belonging to Monocotyledons; and 626 genera and 1,806 species belonging to Dicotyledons. As no systematic and complete study has been done, it is estimated that a full list for Cambodia is expected to exceed 3,000 species, with expectations that at least 700 additional species will be described as new to science in the country (Aswell, 1997). The World Conservation Monitoring Centre 2000 estimates 8,260 plant species in Cambodia, 10% of which will be endemic.

57 and 125 taxa of aquatic macro invertebrate were recorded in a few surveys in two provinces in 1991 and 2001 respectively including Insecta, Oligochaeta, Mollusca, Crustacea and others. 28 species of amphibian and reptile are described. A total of 874 fish species are recorded, of which 490 - freshwater fishes from 64 families, 410 - saltwater fishes from 83 families, 22 are threatened; 1 endemic; 13 introduced fish species (FishBase 2009)[1]. Over 500 birds have been recorded but it is likely that the number goes easily to over 600.

Table 1: List of known species of Cambodia [2]

Taxon	Total number of known species	On IUCN Red list
Mammal species	123	39
Bird species	545	36
Reptile species	88	13
Vascular plants species	2,308	38
Fish species	874[1]	-
Hard coral	24	-
Soft coral	14	-
Sea grass	10[3]	-
Amphibian[4]	63	12

1.2 Pressure and threats

a. Genetic erosion

People displacement leaving behind their crops and thus unable to preserve the old varieties that they used to possess earlier, changes in agricultural system, increasing use of agricultural chemicals, pesticides, and

[1] www.fishbase.org
[2] acbsite6.aseanbiodiversity.org/bio_joomla/index.php?option=com_content&view=article&id=154&Itemid=142
[3] National Action Plan for Coral Reef and Seagrass Management in Cambodia, 2006-2015.
[4] Neang Thy, FFI, personal comm. 2009.

herbicides are potential cause for loss of genetic resources. Recent introduction of new modern varieties also cause threat to danger of replacing the remnant native landrace diversity of rice and other crops.

b. Habitat loss

The pressures causing habitat loss in both terrestrial and aquatic environments include the demand for increased agricultural lands, fuelwood and non-timber forest products. Recent road and irrigation infrastructure development and rehabilitation not only cause fragmentation to the original habitats but also open for more access to other destructive activities. The increased access to areas has subsequent spread of land claims and wildlife trade networks from the local to international level and as a result enhanced wildlife hunting.

c. Unsustainable harvesting

Whilst anthropogenic activities such as selective logging, shifting agriculture, burning, and non-timber forest product (NTFP) collection have multiple effects, hunting supersedes all these in posing the most intense and immediate threat, particularly to mammals. It is expected that overfishing is occurring in some fisheries activities, however this is very difficult to substantiate.

d. Change in hydrological regime

Change in land use and infrastructure development, particularly on the Mekong and its tributaries pose potential severe threat to the hydrological regime of the Mekong and Tonle Sap systems. Fish production is potentially under strong influence from such change and development as fish migration is particularly triggered by not only the size and duration of flood, but also the timing of pulse flood. The contentious issues now are related to the fact that a series of hydropower projects on both mainstream of the Mekong and its tributaries are planned to go ahead in the Mekong riparian countries.

e. Pollution

More and more small industries are becoming established, but without effective waste management. Cambodia's population is mostly concentrated around the lowlands and near inland freshwater where the water is becoming more polluted as the sewage is not treated and no appropriate waste management is in place. Agricultural run-off is becoming more polluted due to increasing use of agricultural chemicals such as fertilizers and pesticides.

f. Alien species

At present there does not seem to be any documented cases of detrimental effects of alien invasive species in Cambodia. However, a number of known aggressive invaders are reported to present in Cambodia. There are also many activities in agriculture, forestry, fisheries, horticulture, and rural development that involve intentional introduction of alien species. The FishBase[1] lists 13 fish species introduced into the country.

g. Climate Change

As much of Cambodia is lowlands and particularly wetlands any rise in sea level that is an effect of potential climate change would significantly affect the freshwater fishery. If sea level changes affect the salinity of the Mekong and Tonle Sap, it will also directly impact on the fish species diversity, as many freshwater fish are sensitive to salt water. The coastal zone would also be negatively impacted, as increasing water level would lead to considerable habitat loss in the short term.

2. Terrestrial biodiversity

2.1 Status

Terrestrial biodiversity in the country presents in different status under the IUCN Red list. The list of known species of the country provides the following number of species listed as under the IUCN red list of globally threatened species: reptile - 20, Birds - 39 and mammal - 34 species.

Table 2: List of terrestrial species under IUCN Redlist

Taxonomic groups	IUCN Red list status (2000)				
	CR	EN	Vul	NT	DD
Reptile	5	7	6	2	-
Bird	4	5	13	17	-
Mammal	3	4	11	9	7
Amphibian[4]	-	-	3	3	6

There is no comprehensive assessment of conservation status for floral species of the country. However, in an assessment in 2003 by a multi-disciplinary team for the Cambodian Tree Seed Project (CTSP) identified 34 priority species for tree species conservation purpose.

A variety of vegetation and land use mapping programs have recently been completed for Cambodia. A number of different perspectives of land use questions and resource management have been the basis for these efforts and thus divergent schemes of classification for images from satellite and aerial photography have been used in their construction.

Table 3: Extent of forests in Cambodia by category

Forest cover assessment of 2006 (hectares)	
Evergreen forest	3,668,902
Semi-evergreen forest	1,362,638
Deciduous forest	4,692,098
Other forests	971,341
Bamboo	35,802
Wood shrub dry	37,028
Wood shrub evergreen	96,390
Non-forest area	7,296,475
Total	18,160,674

Source: FA 2007a

Cambodia designated 23 protected areas in 1993 covering about 18% of the country under the authority of the Ministry of Environment. The Ministry of Agriculture, Forestry and Fisheries also made a series of designation of 6 additional protected areas by its Forestry Administration covering 1.35 million hectares and 8 fish sanctuaries by its Fisheries Administration. The major habitats under the current PAs is presented in table 4 below.

Table 4: Major ecosystems covered under current national protected areas systems.

Management category	Number	Main ecosystem coverage	Area (hectare)	IUCN Category
Protected areas system under the Royal Decree of Nov 1993				
National park	7	Lowland evergreen forest also coastal forest, mangroves, *Dacrydium/ Podocarpus,* swamp forest, corals reef and seagrass	742,250	II, IV
Wildlife sanctuary	10	Evergreen forest, Mangroves, Coral reef	2,030,000	II, IV
Protected landscape	3	Lowland evergreen forest	9,700	V
Multiple use area	3	Flooded forest, mangrove and coastal wetland	403,950	VI
Forest protected areas				
Protection forests	6	Lowland evergreen forest and wetlands	1.350,000	II, IV
Aquatic conservation areas				
Fish sanctuary	8	Inland wetlands	23,544	II, IV

2.2 Trends

Cambodia's forests have decreased significantly in terms of both area and quality over the last few decades. As of late as 1969, the country's forests covered around 13.2 million hectares, or 73% of the country's total land area (Thomas et al. 2000 as quoted by FA and Danida 2003). However, a recent forest resource assessment by FAO (2005, as quoted by FLD, CTSP and FA 2006) indicates Cambodia to have lost more than a quarter of its remaining primary forest since 2000, and ranks the country third in the world for primary forest loss. Recent estimates by the GTZ/MRC Forest Cover Monitoring Project based on 1996/1997 satellite imagery shows that the forest cover diminished to only 10.5 million hectares, or 58% of the total land area and much of this is degraded. Of 3.1% of the remaining forest or roughly 322,000 hectares is classified as primary forest, the most biodiverse form of forest.

Now there are three official national datasets calculating forest cover for 1993, 1997 and 2002. Comparisons of these data make it difficult to determine the true extent of deforestation and degradation as the categorization system of vegetation types change between 1997 and 2002 data using fewer categories and status such as wood and shrubland used to classified as non-forest has later been included as other forest (SCW 2006). Regardless of the differences, trend in forest changes accelerated during the period from 1997 and 2002 by approximately 5% or 1% per year (IFSR 2004) and still increased further between 2002 and 2005 at a rate of 2% (CDRI 2006) and afterward.

Table 5: Change in forest cover by assigned forest type

No	Forest type	Forest cover, (hectares and %)				Comparison: 2006/2002	
		2002		2006		ha	%
1	Evergreen	3,720,492	20.49	3,668,902	20.20	-51,591	-0.28
2	Semi-evergreen	1,455,183	8.01	1,362,638	7.50	-92,545	-0.51
3	Deciduous	4,833,887	26,62	4,692,098	25.54	-141,789	-0.78
4	Other forest types	1,094,728	6.03	1,007,143	5.55	-87,585	-0.48
	Total forest cover	**11,104,291**	**61.15**	**10,730,781**	**59.09**	**-373,510**	**-2.06**
5	Non-forest area	7,056,383	38.85	7,429,893	40.91	373,510	2.06
	Total	**18,160,674**	100	**18,160,674**	100	-	-

Source: MAFF annual report, 2008

Some of the latest status information of the key large animal species is provided through Cambodia community wildlife ranger tiger and elephant conservation program[5] that monitored tigers, elephants and other large mammals monthly in the most important regions of the country from 2000 to mid-2005. *Kouprey (Bos sauveli)* is most likely extinct since there is no confirmed sighting since 1980. Wild water buffalos are likely feral rather than truly wild stock, but their conservation importance is still quite high. Khting Vor (*Pseudonovibos spriralis*) appears never exists, but the debate will probably continue until every set of horns in every collection is tested for DNA. Numerous wildlife surveys throughout Cambodia since 2000 have uncovered no trace of Javan Rhinocerous anywhere although it was reportedly present at least until 1930s. Eld's deer populations have now been confirmed from multiple locations and its conservation potential for long term survival and expansion of its populations is high. A population of 9 tigers and 20-30 elephants estimated in patrol areas in Mondulkiri, and 10-20 tigers and 15-25 elephants in Cardamoms but for elephants informally it was speculated that something like 50 to 100 elephants may be present in each of the two regions. Nevertheless, 116 Asian elephants are reported in the Seima Biodiversity Conservation Area[6]. Tiger prey such as Wild Pig, Muntjac, Sambar, Gaur and Banteng are all commonly recorded and collectively comprise the regional prey base.

2.3 Major threats

The causes of forest degradation include commercial logging, slash and burn cultivation, land encroachment for human settlements, farming and infrastructure development and cutting wood for fuel. The loss in forest quality is significantly higher than the loss in forest area, as logging has concentrated on commercially valuable species and larger-size trees. Large-scale clearing of timber has serious environmental effects on other economic sectors. Estimates now indicate that commercial management is only feasible in less than four million hectares of the forest area. These activities have been a major threat on large mammals, particularly whose population are mostly already dwindling.

3. Freshwater biodiversity

3.1 Current status

The freshwater floodplains of Cambodia can be categorised into varieties of habitat types including marshes/swamps, shrublands, grasslands, flooded forest, and rice fields. Cambodia has one of the most productive freshwater fisheries in the world. The fish yield of Tonle Sap floodplain is 139-190 kg/hectare/year (Lieng and van Zalinge 2001) and 230 kg/hectare/year (Baran et al. 2001a). The annual inland fish catch in Cambodia is estimated between 130,000 and 682,000 tonnes.

As indicated earlier there is limited study and information on aquatic invertebrate, amphibians and reptiles and most of the study so far has more focus on fish. 490 freshwater fish species occupying various ecological niches has been reported including plankton feeders, detritus feeders, predators and opportunists. At least 45 fish species are already to be commercially important and 22 threatened fish species are recognised for their conservation significance.

3.2 Trends

Changes in the species composition and especially a decline in the abundance of larger slower growing species indicates the present exploitation rate is high and that the scope for future increases in overall annual catches from heavily exploited areas may be limited. In less heavily exploited areas, some scope for modest increases may exist.

[5] Chheang Dany, Nong Divan, Julia Chase Grey, Kristin Nowell, Prum Sovanna, Hunter Weiler. 2006. Cambodia Community Wildlife Ranger Tiger And Elephant Conservation Program. Final Report. www.felidae.org/LIBRARY/CWRP%202003-2005%20PROGRAM%20REPORT.pdf

[6] WCS. 2008. The Status and Conservation of Asian Elephants in Seima Biodiversity Conservation Area, Cambodia. Phnom Penh.

There is increasing prominent that the aquatic habitat is being converted for agriculture, other land use types, and the fish migration pattern is constrained by hydrological infrastructure development, particularly in the upstream of the Mekong and irrigation scheme locally in the flood plain. The flooded forest extended over more than 1 million hectares originally, had reduced to only 614,000 hectares in the 1960s and 362,000 hectares in 1991. Change of types of aquatic habitats which support freshwater capture fisheries in Cambodia is presented in the table 10 below.

Table 6: Change of aquatic habitats

	Area (hectare) 1985/1987	Area (hectare) 1992/1993
Permanent water	567,100	411,100
Flooded forest	795,400	370,700
Flooded secondary forest	28,200	259,800
Flooded grasslands	80,800	84,900
Receding and floating rice field	17,500	29,300
Seasonally flooded crop fields	366,800	529,900
Swamp	12,200	1,400
Total	1,868,100 hectare	1,687,100 hectare

Source: Ahmed et al. 1998 based on Cambodia land cover Atlas, Mekong Secretariat, Bangkok

3.3 Threats

It has become apparent that reptiles, especially turtles, snakes, and monitor lizards, are heavily hunted for food and especially for their value in medicinal and food trades in Vietnam and China. Illegal fishing practices may have an adverse effect on some invertebrate groups. Use of explosives in rivers and ponds for example may physically destroy habitat and increase turbidity, which can affect the plants, and algae that some macro-invertebrates rely on.

Because fish productivity is related to the extent of flood plain inundation, any developments which may lower peak flood levels will be detrimental to the fishery. The dramatic impact of dams on fisheries in Cambodia is illustrated by the Yali dam located in Vietnam on a river flowing down to Cambodia. It was estimated that the erratic flow release of this dam resulted in over USD 2.5 million in lost of income in 1999 for 3,434 households. Cutting or conversion of flooded forest to create agricultural land has a negative effect on fishery production.

Along with illegal fishing practices that are claimed to cause severe destruction to the aquatic biodiversity including electrocution, explosive, and poisoning, threats to fisheries are also chemicals that are widely used in and around the Tonle Sap lake, where sixty-seven percent of the farmers surveyed used pesticides in 2000 (EJF, 2002) with volume as high as 72 litres/hectare/ year for vegetable and 1.3 million litres of pesticides were used in the Tonle Sap catchment area (Yang et al., 2001).

Known exotic species that may cause harm to the ecosystem, particularly to aquatic ecosystem, but not well documented consist of 17 fish species including red-bellied pacu (*Piaractus brachypomus*); an apple snail (*Pomacea gigas*); and plant species including water hyacinth (*Eichornia crassipes*), giant mimosa (*momosa pigra*), *M. invisa* and *M. pudica* and two grass species including *Brachiaria mutica* and *Echinochoa stagnina*.

4. Coastal and marine biodiversity

4.1 Current status

435 fish species from 97 families were found in 1983 in the waters within Cambodia's exclusive economic zone. Four species of marine turtles have been reportedly seen. Cetacean stranding reports include the first country-record of Short-finned Pilot Whale Globicephala macrorhynchus. Dugong Dugong dugon and a large rorqual whale (either Fin Whale Balaenoptera physalus or Bryde's Whale B. edeni) are also reported. This brings the total number of marine mammals recorded in Cambodian waters to eleven. Finless Porpoise Neophocaena phoceanoides and Irrawaddy Dolphins Orcaella brevirostris, and unconfirmed local reports of Indo-Pacific Humpback Dolphins Sousa chinensis were also reported in a survey in the Cambodia's coastal waters.

Coral reefs are reported from around almost all islands in the coast of Cambodia. Around 70 coral species in 33 genera and 11 families have been identified. Coral diversity is higher in offshore reefs while inshore areas have low species diversity and dominated by massive corals. Little is know about the current distribution, composition and health of these coral reefs. Its extent is currently about 2,805 hectares.

Seagrass of the Cambodia's coastal waters can be divided into extensive seagrass meadows along the mainland and paths of seagrass intermingled with coral reef around islands. The current extent of seagrass in Cambodia's coastal water is 32,494 hectares. 10 seagrass species and some 30 species of true mangroves have been recognised have been identified so far.

4.2 Trends

Coastal and marine development is emerging. Almost all the islands in coastal waters of Cambodia are offered on concession. A few urban and tourism developments current on their start have changed some of the current coastal habitats, particularly mangroves on the mainland and the potentially coral reef on the fringe of islands.

A 4,835 hectares reduction of mangrove forest from 76,518 hectares in 1993 to 71,683 hectares in 1997 has been reported. Based on the assessment of the pressure and state indicators of biodiversity and coastal habitats, and considering the trend for biodiversity and mangrove coverage in the coastal area, there is no indication that this downward pattern has been stopped or reduced and under current trend, the mangrove cover may reduce further to only 60% of the coverage in 1993 by 2015 (MoE, 2005).

4.3 Threats

The most immediate concerns are marine mammal by-catch in various forms of monofilament gillnets, chiefly 'set-nets' and Spanish Mackerel nets, habitat degradation and over-fishing, both through industrial-scale trawling of offshore waters by foreign fishing vessels, and smaller-scale trawling and push-netting in inshore waters by a very large fleet of Cambodian boats.
Dugong populations suffer direct persecution and from the loss and destruction of their specialised seagrass habitat. Seagrass beds are vulnerable to impacts from degradation of water quality and destructive fishing practices. Logging, hydropower development upstream and mining currently taking placed in the catchment of a number of rivers, increased use of fertilizers and pesticides in the coastal agricultural land and discharge of domestic and industrial waste waters are the prime caused.

5. Agricultural biodiversity

5.1 Status

Agricultural landscape of the country is characterised by rice field particularly in the central lowland extending from northwest to southeast of the country with recent increase in large monoculture plantation on a commercial scale. Traditional rice agriculture is an important example of biodiversity as it utilizes a

diversity of rice strains and a diversity of rice ecosystem species to provide food security. Recent surveys by the International Rice Research Institute (IRRI) have identified over 2000 different strains of rice used in Cambodia.

Of the total rice cropping area in Cambodia, 86% is rainfed lowland rice, 8% is Dry season rice, 4% is floating rice and 2% is upland rice. Traditional rice agriculture in Cambodia has excellent potential for future sustainability of the agricultural sector. Typical shifting cultivation in Cambodia is the practice of clearing and utilizing a plot of land for 1 – 5 years and then clearing another plot of land. The plots are rain-fed and usually 1 –3 ha large but often include another 5 – 6 ha of fallow land. Shifting cultivation in the upland areas of Cambodia can have very rich agricultural biodiversity. Here, rice is still a major crop however the typical highlander families plot may have 60 – 100 varieties of plants being cultivated due to the strong tradition of seed exchange. As such shifting cultivation agriculture may serve as important collections of agricultural biodiversity.

Commercial field crops are on an increase particularly in the recent decades including annual plantation crops such as tobacco, cotton, sugarcane, pineapple and bananas. In Cambodia rice is the predominant crop followed by maize, and other crops include; legumes such as soybean and mungbean; oilseeds including groundnut and sesame; commercial crops of sugarcane, jute and tobacco; vegetables also occupy a large area under cultivation; and sweet potato is more common along with an increase in plantation of cassava particularly in the last few years.

High value perennial crops such as coconuts, rubber, sugar palms, oil palms, tea, citrus and other fruit trees are grown at varying scales throughout settled parts of Cambodia. Most of the perennial crops are parts of other crops systems - large-scale plantations of perennials such as rubber and oil palm, are typically undertaken as monocultures, and are more likely to use increased inputs of agro-chemicals.

5.2 Trend

In general agro-ecosystem is managed to reduce biodiversity. Attention is mainly paid to enhanced productivity of small number of target species with effort to eliminate other non desirable species. There is a growing trend towards more modern rice agriculture. Increased agricultural chemical use will directly reduce the diversity of the ecosystem. For the last five years (2002-2006), rice cultivated, harvest areas, yield and total production have increased by 3.95%, 4.25%, 0.10% and 4.64% respectively[7]. Production of rice, the major crop sustaining most of the rural people in Cambodia, after reaching a peak in 2005-06 season, has been steadily increasing thereafter, though at a lesser rate (about 6% per year). The increase in crops was 27.6% in 2005 followed by 5.3% in 2006, and 8.2% in 2007.

There is increasing use of low cost and high yield approaches like SRI (system of rice intensification), organic farming methods, and IPM (integrated pest management). Diversification into cash crops is increasing and marketing of agricultural products is improving, thanks in part to more favourable pricing conditions.

Table 7: Trend in rice production in Cambodia

Description	2003	2004	2005	2006	2007
Cultivated land	2,314,285	2,374,175	2,443,530	2,541,433	2,585,905
Harvested land	2,242,036	2,109,050	2,414,455	2,516,415	2,566,951
Yield	2.101	1.977	2.479	2.489	2.621
Production	4,710,957	4,170,284	5,986,179	6,264,123	6,727,138

Source: MAFF's annual report, 2008

[7] MAFF's annual report 2008

Major crops such as maize, cassava, mungbean and soybean showed no major changes in yield and production, roots and tubers area harvested dropped, production and yield increased, oil crop production increased, fruits and vegetables production also increased. However, cultivated land has seen increased for the last few years, particularly for rubber and cassava.

5.3 Threats

Many of the agricultural chemicals in Cambodia are not used according to safety and quantity instructions and as such may be causing environmental and health problems (Yang et al 2001). There is also an increasing availability to highly toxic agricultural chemicals that are banned in many other countries.

Just as the spread of agriculture has altered and modified natural or unmanaged ecosystems, other land uses compete for the land that agriculture now occupies. The competition for and sterilization of first class agricultural land by urban, industrial and transport developments is made more serious because of the lack of this type of land.

The largest impact of agriculture on the environment and therefore on agricultural ecosystems is accelerated soil erosion. The process has been sped up by the removal of vegetation and the tillage of soils, particularly on slope. The loss of topsoil also causes a considerable loss of organic matter and nutrients, therefore reducing the agro-ecosystems productivity.

6. Implications of changes

The country's society and economy may be affected to varying degree of impacts from loss and degradation of biodiversity of the country. Biodiversity, on the one hand, provide source of income for economy and livelihood as well as for meeting other needs and security. On the other hand it provides direct source of livelihood and protection to people live without giving direct monetary value.

The high value forest reserves and other terrestrial biological resources represent an enormous asset for Cambodia. Sustainable use could provide substantial benefit to especially local forest communities. The forests could support a large industry, while supplying domestic demands. Forests also provide for essential environmental benefits impacting the outcome of other sectors, in particular agriculture. The importance of the forests' environmental service for regulating climates, local water circulation, reducing floods and effects of droughts, is enhanced by Cambodia's low elevation and in many areas infertile soils. The forests sequester atmospheric carbon and provide for conservation of biological diversity for present and future use.

Deforestation might accelerate soil erosion and increase the occurrence of flash floods. Impacts on biodiversity from natural disasters are normal; however the increased impacts from human activities during or in the aftermath of natural disasters can exacerbate the impact. Cambodia is one of the fourteen countries in Asia considered by the UN Department of Humanitarian Affairs to be the most prone to disasters, of which floods, drought, and fire are some of the prominent issues. Floods are a very apparent natural disaster in Cambodia and the government is concerned with flood prevention and control. In 2000, for example, floods killed 800 people and caused severe human sufferings, serious damage to infrastructure, major disruption of social and economic activities, loss of agricultural land and crops.

It is estimated that over 95% of the population of Cambodia uses wood or charcoal for energy. More than 70% of Cambodians live in areas that can't sustainably provide their fuelwood needs. A wood energy flow study estimated approximately 24,000 tonnes of fuelwood arrived in Phnom Penh annually. The flow of fuelwood into urban areas places increased pressure to over log easily accessed forest areas, such as along roads and rivers. The degradation of forest as source of energy means that local people have to spend more and more time to obtain this energy source.

Timber and Non-timber forest products are also essential, particularly for the indigenous people living in the remote areas in the forest. Some of the wild plants have been domesticated for many years. The loss of non-timber forest biodiversity would have significant implications for their extensive uses as Derleth (in Ashwell, 1997) highlights that Cambodians habitually utilized at least 931 species of Cambodia's 2,304 plant species.

Research by CDRI concluded that 42% (or USD280) of the total household economic activities for the low income group and 30% (USD345) for the medium income group derive from NTFPs. As approximately 33% of the population lives within 5 km of a forest, this indicates the high absolute value of forest resource to the well being of many people.

In terms of volume, fish and other aquatic products far outweigh any one of the four main terrestrial commodity groups including beef, sheep, pig and poultry meat, e.g. in 2002 the fish production 373,933 metric tons was double of that beef, pig and poultry combined (191,208 tons). Since many rural Cambodians do not produce enough agriculture for their consumption, decline in fisheries resource means that rural people have to face even intense food insecurity. In fishing provinces of Cambodia, small scale fisheries can provide 65-75% of animal protein intake of the households whose value would be 40% that of the rice production. Even in a relatively less important fishing region, families living near water bodies catch on average 86 kg of fish per year with those living far away catch only 30 kg/year. Families that consider themselves as fishing families catch 123 kg and 56 kg per household a year for those who live near and far away from water bodies respectively. When include various forms of fish raises fish the average consumption is estimated 75.6 kg per capita per year.

In addition to production, fisheries are also important in the terms of number of people engagement. Overall, about 88% of inhabitants rely on natural fishing and fish related activities for their livelihood and income generation. 10.5% of households have fishing or fishing related activity as their primary occupation while another 34.1% are engaged on a part-time basis. Thus over one million people are either fully or partly dependent on fisheries resource harvesting and related activities for their income.

Because open access nature of aquatic resources, fisheries in particular, and because fishing does not require land ownership, it often becomes employer of the last resort, attracting people who have no other means of subsistence. 90% of the households still prefer a free and unlimited access rather than restrictions or regulations on the use of common property.

Cambodia is an agrarian country. About 90% of the population still thrives on agriculture. The
Cambodian national economy is also largely agriculture based, mostly rainfed, mono-cropped and mainly under rice based farming system. Rice is staple food for Cambodian just like potatoes in the west. The importance of rice is reflected in the way it is used to name the three meals. Under the condition that the soil become poor and the climate extreme is more prevalent, the loss of agro-biodiversity would not only means a risk to food security but also the loss of cultural practice of farming.

Chapter II: Current Status of National Biodiversity Strategies and Action Plans

1. Overview of NBSAP

The National Biodiversity Strategy and Action Plan (NBSAP), is a national policy on biodiversity conservation and sustainable use including certain cross-cutting issues, was developed by the various ministries, research institutions, local governments and NGOs in addressing international obligations as required by the CBD and its COP decisions. Royal Government of Cambodia approved the National Biodiversity and Action Plan in July 2002. The Action Plan has been in place for implementation for 6 years. The Action Plan consisted of 98 priority actions covering 17 different themes in order to use and conserve biological resources in a sustainable manner.

The NBSAP has mainstreamed all priority actions into its three objectives namely: the conservation of biodiversity, the sustainable use of biological resources, and the fair and equitable sharing of benefits resulting from the use of genetic resources. These objectives highlighted the three poles of sustainable development (ecological integrity, economic sustainability and social equity) and illustrate the nature and breadth of the Convention. As a global instrument, it sets the stage for each nation to assess the adequacy of current efforts to conserve and use biological resources in a sustainable manner and to determine how gaps will be filled and opportunities realized.

One among the required obligations for parties that have ratified the Convention on Biological Diversity is to prepare a "national strategy" as stated in article 6 of the Convention. Therefore, the National Biodiversity Strategy and Action Plan was prepared in a response to this obligation and was developed as a guide to the implementation of the Biodiversity Convention in Cambodia. All of the strategic directions contained in the Strategy are relevant from a national perspective, but some elements of the Strategy may not be relevant in some areas of the country of for some sectoral agencies.

The NBSAP recognized existing constitutional and legislative responsibilities for biodiversity conservation and sustainable use in Cambodia. It also emphasized the importance of intergovernmental cooperation to create the policy, management and research conditions necessary to advance sustainable management of natural resources. National and regional governments and sectoral ministries and departments, in cooperation with stakeholders and members of community, will pursue implementation of the directions contained in the Strategy according to their policies, plans, priorities and fiscal capabilities.

The NBSAP was developed with a clear vision on "Equitable Economic Prosperity and Improved Quality of Life through a Sustainable Use, Protection and Management of Biological Diversity". It highlights more protection beyond the minimum standard as set by the Convention. The Strategy provided a framework for action at all levels that would enhance our ability to ensure the productivity, diversity and integrity of our natural systems and, as a result, our ability as a nation to reduce poverty and improve the quality of life of all Cambodians. It promotes the conservation of biodiversity and the sustainable use of our biological resources, and describes how we will contribute to international efforts to implement the Convention.

In each theme of the NBSAP has its own strategic goals and objectives. Generally, the goals set are to embrace following concepts:

1. Maintain biological diversity and productivity of ecological systems by protecting the various species of living organisms in their natural and manmade environments, especially forests, aquatic ecosystems, wetlands and agricultural land.

2. Manage human activities and utilizing biological resources in a way that preserves for the long term the basic natural resources, which are necessary for human livelihood and development.
3. Ensure that the benefits coming from the sustainable use of biological resources contribute to poverty reduction and improve quality of life for all Cambodians.

The strategic objectives listed in each respective theme followed by priority actions constituted a reflection of the intentions of the government regarding each sector of activity. They are specific and measurable objectives that will guide the relevant ministries during the implementation phase of the strategy and action plan. Ministries will regularly document and report on the identified indicators attached to each objective.

The themes of the NBSAP addressed most of the articles under the CBD, which included Protection of Natural Resources (Protected areas, Endangered species, *Ex situ* conservation); Animal Wildlife Resources; Freshwater Fisheries and Aquaculture; Coastal and Marine Resources; Forest and Wild Plant Resources; Agriculture and Animal Production; Energy Resources; Mineral Resources; Industry, Technology and Services (Manufacturing, Biotechnology and Biosafety, Tourism); Environmental Security; Land Use Planning; Water Resources; Climate Change and Biodiversity; Community Participation; Awareness, Education, Research Coordination and Development; Legislation and Institutional Structure; and the Quality of Life and Poverty Reduction. At least 22 government agencies, research institutions and provincial authorities take part in the implementation of the NBSAP. Approximately 30 non-government organizations and international organizations assist and also take part in the implementation of the NBSAP. In total, 42 agencies throughout the country have directly and indirectly taken part in the implementation of the NBSAP.

Priority actions adopted by the government agencies, academic institutions, research institutions and NGOs can be grouped in three broad categories: *actions promoting awareness and capacity building of government staff and local communities for biodiversity conservation and sustainable use of biological resources*; *actions promoting the implementation of community-based natural resource management*; *and actions aimed at clarifying ministerial jurisdictions, reducing responsibility overlap and promoting inter-ministerial coordination and collaboration in a sustainable development perspective*.

The NBSAP also emphasized mechanism for implementing and monitoring this action plan, which included: the production of an annual national report on policies, activities and plans aimed at implementing the Strategy; coordinating the implementation of national and international elements of the Strategy through a permanent Interdepartmental Biodiversity Steering Committee and National Secretariat for Biodiversity; measures to allow and encourage non-government participation in the implementation of the Strategy; regular reporting on the indicators identified for each strategic objective reporting on the status of biodiversity at the country level; and, revision of the Strategy after an initial implementation phase of two years.

Successful implementation of the Strategy will be determined, in large measure, by the degree to which all parts of society adopt its vision and principles and contribute to achieving its goals. Ultimately, the conservation of biodiversity and the sustainable use of biological resources will require the support and participation of individual citizens, local communities, urban and local authorities, conservation groups, business and industry, educational and research institutions. The implementation of the actions listed in the Action Plan will be decentralized, de-concentrated and under the responsibility of each participating ministry, agency or non-governmental organization.

To monitor and evaluate the progress through the report, it is necessary to fix target of some available indicators in the plan. The priority actions and indicators can be used to effectively monitor and evaluate the effectiveness of the NBSAP through the measurable indicators for the themed actions.

Despite many policy makers viewed that NBSAP is a stand alone policy instrument, however, the themes presented in NBSAP clearly sought to highlight a sectoral approach to biodiversity management and address some cross sectoral issues. Among the cross sectoral issues, there are many areas of overlap throughout the themes, and these should compliment each other rather than lead to duplication such as biodiversity and poverty reduction, biodiversity and climate change. A future revision of the NBSAP should address inter-linkage issues as much as possible to ensure the quality of the policy and its implementation.

Finally, the product of the NBSAP is the culmination of, sectoral meetings with relevant government departments, academic institutions, research institutes add NGOs, combined with two national and three provincial workshops on biodiversity. At least two NBSC meetings were convened to discuss and approve the document. The workshops highlighted the key issues for biodiversity in Cambodia, which are highlighted in each theme. The sectors have given background information and commented on the relevant themes and specifically given the governments focus in Priority Actions for these themes.

Insofar, the Royal Government of Cambodia since the 3rd term (2003-2008) and entering the 4th term (2008-2013) and many international organizations have recognized the significance of Cambodia's biodiversity conservation and sustainable use, and are showing increased interest in conducting activities that reduce biodiversity threats. Many activities currently being undertaken are concentrating on the important links between biodiversity and sustainable development, while at the same time encouraging the protection of representative components of Cambodia's biodiversity. Such approaches will help to ensure Cambodia's ability to use, protect and manage biodiversity for sustainable development, and prosperity into the future. Most priority actions under the NBSAP have been implemented. The success of the implementation is not only depending on the existing of projects sustainable funding to remove barriers and threats and economic growth to contribute to the reduction of poverty for more than 5 million people who live within 5 km from protected areas.

1. Indicators Incorporated into the NBSAP

All indictors that have been incorporated in the NBSAP are not exactly the same as adopted in the CBD or its decisions. Indicators in the NBSAP are basically set in a very general term according to the nature of each priority action and for the purpose to monitor the achievement of the each priority action. The indicators are not as precise as the output or outcome of the actions intended for. Relevant indicators are incorporated in other national policy such as National Strategic Development Plan and while some indicators and targets are set in the Cambodia Millennium Development Goals.

Table 8: Indicators in the NBSAP

#	Priority Actions	Indicators
Theme 1 Protection of Natural Resources		
1.1	Strengthening the on-going management of designated protected areas by development and enforcing management policies, guidelines and plans	number of management plans developed
1.2	Integration of the Management of the Tonle Sap Biosphere Core Zones into the management of the hole Tonle Sap Ecosystem Approach for sustainable use of biological diversity	increase in protected areas budget
1.3	Identification and designation of new protected areas within wetland; marine and coastal habitats	number of signs posted, number of protected areas demarcated

1.4	Identification and designation of new fish reserves and sanctuaries	number of new protected areas established
1.5	Economical evaluation and assessment of resources for potential development of revenue-based activities within protected areas	number of people reached by awareness programs
1.6	Training programs targeted for park rangers, technical staff and protected areas directors; and local community	number of reports, meetings, workshops
1.7	Integrated conservation and development of Cardamom's protected areas	number of illegal events recorded, number of fines issued
1.8	Integration of the management of Kulen Prom Tep Wildlife Sanctuary into the Northern Plain Landscape Conservation.	number of meetings; number of conflicts solved, number of joined resolutions
1.9	Integration of the management of protected areas in the northeastern dry forest plain conservation landscape	number of management guidelines developed; protected areas legislation developed; organizational review; policy review; monitoring and evaluation guidelines
1.10	Sustainable integration of the Management of Biodiversity and Virachey National Park with the development of local indigenous community to provide a model for integrated conservation and development.	Trust fund development; national sustainable financing mechanism assessment
1.11	Development of an approach to build a linkage between conservation and local society by enhancing conservation and sustainable use of biological resources associated with Kirirom, Bokor and Ream National Parks.	GIS system and database developed and shared, information-sharing mechanism developed
1.12	National assessment and recovery program for species, populations and ecosystems at risk	number of recovery programs in place
1.13	Application of IUCN Red List criteria for groups & production of national red lists	Red list production and database
1.14	CITES implementation, capacity building and awareness program	number of people reached by workshops or training programs, report of implementation
1.15	Improve the critically endangered species program provided to conservation and development	Number of zoo, release programs, and in-captive breeding
1.16	Establishment of a National Botanical Garden	number of plants and cultivars represented in seed banks or other ex situ collections
1.17	Establishment of general herbarium	number of native plants used in reforestation activities
1.18	Identification and collection of plant species and cultivars in need of protection for propagation	number of plants and cultivars represented in seed banks or other ex situ collections
1.19	Training program in wildlife husbandry techniques for the Phnom Tamao Wildlife Rescue Centre staff and private zoo	number of training in wildlife husbandry and zoo established
Theme 2 Animal Wildlife Resources		
2.1	National campaign against illegal hunting	number of fines issued

2.2	National monitoring program and database on alien invasive species and exploited wild animal species	monitoring programs in place
2.3	Management plans for commercially valued species	Plans, policy in place and monitoring programs in place
Theme 3 Freshwater Fisheries and Aquaculture		
3.1	Demarcation and management of fisheries areas	number of fishing lots, and fisher sanctuaries established
3.2	Community-based fisheries management program	number of community fisheries established, plans
3.3	Tonle Sap Great Lake Floodplain integrated management program	number of fishermen reached by awareness or training programs, awareness
3.4	Fisheries environment protection program	percentage of flood forest and wetland ecosystem protected
3.5	Indigenous fish Aquaculture development project	number of indigenous fish protected
3.6	Critical fisheries ecosystem monitoring and protection program	monitoring program established
3.7	Revision of Department of Fisheries organizational structure	effective organizational structure established
Theme 4 Coastal and Marine Resources		
4.1	Development of a full Monitoring Surveillance and Control (MSC) Plan for industrial fishing and establishment of a working pilot scheme for MSC of artisan fishery	MSC in place
4.2	Monitoring and management programs for target fish species	MSC used in target fish species
4.3	Protection of mangrove forests	number in ha of mangrove planting and protection efforts made
4.4	Capacity building and training program for fishery staff	number of staff trained
4.5	Provision of patrol boats to Department of Fisheries	number of equipment provided
Theme 5 Forest and Wild Plant Resources		
5.1	Development of a comprehensive national plan for the management of the forest estate	forest management plan developed
5.2	Development of sustainable forest management plans	forest management plans developed
5.3	Development of environmental impact assessment guidelines for forest exploitation activities	EIA guideline developed
5.4	Forest Concession management and control Pilot project	monitoring procedure
5.5	Community-based forestry management program	number of community based programme existed
5.6	Vegetation survey and assessment of the current status of wood extraction	assessment of vegetation conducted
5.7	Extension of the Forest Crime Monitoring Unit (FCMU) Project	number of forest crime dropped

5.8	Development of policy and guidelines promoting the use of native species in cultivation and restricting the introduction of introduced species	management policy on native species developed
Theme 6 Agriculture and Animal Production		
6.1	Farmers' training on improved cultivation and livestock production systems respectful of the environment	number of animals covered by sanitation measures, production increased
6.2	Extension of Integrated Pest Management (Farmer Field School) program	number of farmers reached by training programs or awareness campaigns
6.3	Agricultural diversity promotion program for food security	agriculture production increased
6.4	Agricultural land protection and land-use program	quantity of chemical fertilizers and pesticides used by farmers
6.5	Adoption and improvement of sustainable cultivation management systems	agro-forestry practice in place
6.6	Strengthening research in new and alternative crops	health farm and crop production increased
Theme 7 Energy Resources		
7.1	Energy efficiency program for households in areas where fuelwood is limited	quantity of fuelwood used by household
7.2	Promotion of fuelwood and multipurpose tree plantations at the family and community level	number of community planting trees for fuelwood increased
7.3	Environmental guidelines and impact assessment for energy development projects	EIA guideline in place
Theme 8 Mineral Resources		
8.1	Study on the feasibility, costs and benefits of correcting existing mining industries for environmental soundness	number of mining projects submitted to EIA procedure
8.2	Development of Environmental Guidelines for Mining Activities	Mining procedure in place
8.3	Establish EIA procedures for mining development projects	EIA guideline in place
Theme 9 Industry, Technology and Services		
9.1.1	Awareness program on Environmental Impact Assessment and Environmental Pollution Control and Monitoring System for the manufacturing sector	level of public understanding on pollution control and monitoring in place
9.2.1	Development and implementation of a Biosafety strategy and action plan in compliance with the international protocol on Biosafety	biosafety action plan in place
9.3.1	Integrating biodiversity conservation and environmental management concerns into tourism policy and development plans and guideline	biodiversity plan developed
9.3.2	Village based tourism development program	number of self managed tourism activities in communities in place
9.3.3	Integrating conservation on cultural heritage and nature through the development tourism program in demarcate areas for protected area landscape	integrated conservation plan in place
9.3.4	Set up a national master plan to promote ecological tourism in natural areas	ecotourism plan developed
Theme 10 Environmental Security		
10.1	Integrating biodiversity protection measures in flood prevention awareness programs and rehabilitation plans	damage on property and biodiversity from flood dropped

10.2	An important aspect of the vision is conservation and promotion of Biodiversity, Environmental protection and Ecology.	biodiversity conservation introduced
10.3	Creating environmental security for integrated biodiversity water resources management and development.	increased conservation of wetland and aquatic life
10.4	Preventing the damage that may occur as a result of flood, drought, watershed, degradation, erosion and sedimentation to protect aquatic and fish resources and other biodiversity.	fish habitats maintained; a way to cope with flood and drought introduced
Theme 11 Land Use Planning		
11.1	Institutional capacity building program on land use planning	number of staff trained
11.2	Development of national land use master plan and provincial land use plans integrating environmental concerns and community consultation	land use policy developed
11.3	Development of community-based land use plans	land use policy developed
Theme 12 Water Resources		
12.1	Management of water resources program	water resource management program in operation
12.2	Public water program to improve water quality so as to be able to satisfy present and future demands and ensure that water bodies have the capacity to sustain biodiversity aquatic and fish life, to protect human and animal health.	capacity on water improved
12.3	To ensure the financial sustainability of hydraulic infrastructure program	hydraulic infrastructure in place
12.4	Groundwater monitoring program	monitoring program in place or capacity building for monitoring of ground water
12.5	Water pollution prevention program for industry sector	programs on water pollution in place for industry
12.6	Water pollution prevention program for agriculture sector	programs on water pollution in place for agriculture
12.7	Urban waste water treatment program	waste water treatment established for urban
Theme 13 Climate Change and Biodiversity		
13.1	Integration of biodiversity objectives into the future National Climate Change Action Plan	Cross-cutting policy established
13.2	Improvement of weather forecasts to ensure timely warning of natural occurrences such as typhoon, floods and drought. Improvement to the meteorological networks	capacity building for weather forecast improved
13.3	Lobby developed countries to decrease emission related to climate change	lobby mechanism established, joint program for emission reduction in the country in place
Theme 14 Community Participation		
14.1	Strengthening institutional training in community-based natural resource management (for forestry, agriculture, fisheries)	capacity building for forestry, agriculture, and fisheries sector established
14.2	Development of community based wildlife protection program	community based wildlife protection in place
14.3	Development of community based forestry program	community based forest in place

14.4	Development of community based agriculture program	community based agriculture in place, extension
14.5	Development of community based fisheries program	community based fisheries in place
14.6	Development of community based land use and rural development programs	community based land use and rural development in place
Theme 15 Awareness, Education, Research Coordination and Development		
15.1	Biodiversity Awareness Program	certain biodiversity awareness program in place, public understanding on biodiversity
15.2	National Biodiversity Research, Training and Information Center and Library	research center and library established
15.3	Integrating environmental and biodiversity issues in school curriculum	school curriculum established or mainstreamed
15.4	Government staff capacity-building program	capacity building for government staff in place
15.5	Biodiversity research development program at Royal University of Phnom Penh	biodiversity program at RUPP in place
15.6	Set up training program on management of natural resource and Environment conservation to the member of community that has biodiversity.	certain programs in biodiversity and community based in place
Theme 16 Legislation and Institutional Structure		
16.1	Development/Amendment of by-laws and regulations on biodiversity related issues	certain by-laws in place
16.2	Institutional capacity building project on Environmental Impact Assessment.	legal framework on EIA established
16.3	National awareness campaign on Environmental legislation.	public understanding on environmental legislation
16.4	Continued implementation of regional cooperation with neighboring countries in joint projects and programs aimed at environmental protection and conservation of common natural resources.	joint bilateral projects in place, regional projects in place
Theme 17 Quality of Life and Poverty Reduction		
17.1	Community-based natural resource management programs	programs in place on community-based on NRM
17.2	Environmental awareness programs in rural areas	number of communities aware of biodiversity
17.3	Poverty monitoring and analysis programs	poverty monitoring conducted
17.4	Poverty reduction strategy formulation	poverty reduction strategy developed
17.5	Participatory Poverty assessment	poverty assessment conducted

In Cambodia Millennium Development Goals, Cambodia has set clear targets in CMDG 7. 14 targets have been set to be achieved by 2015. The targets have relevancy to the NBSAP review that is why they are brought for highlighting here (Table 9). Only targets 7.1 to 7.9 are relevant to the NBSAP. These targets are pertinent to the NBSAP in themes 1, 3, 5, 6, 7, 11, and 12.

Table 9: Cambodia MDG 7: Targets set under Cambodia MGD 7

Cambodia MDG: Ensure Environmental Sustainability	
Number of Targets	Targets
Overall targets 13: integrate the principles of sustainable development into country priorities and programme and reverse the loss of environmental resources	
7.1	*Maintaining forest coverage at the 2000 level of 60% of total land area through 2015*
7.2	*Maintaining the surface of 23 protected areas at the 1993 level of 3.3 million ha through 2015*
7.3	*Maintaining the surface of 6 new forest-protected area at the present level of 1.35 million ha through 2015*
7.4	*Increasing the number of rangers in protected areas from 600 in 2001 to 1,200 by 2015*
7.5	*Maintaining the number of rangers in forest protected areas at the level of 500 through 2015*
7.6	*Increasing the proportion of fishing lots released to local communities from 56% in 1998 to 60% in 2015*
7.7	*Increasing the number of community-based fisheries from 264 in 2000 to 589 in 2015*
7.8	*Increasing the surface of fish sanctuaries from 264500 ha in 2000 to 580,800 ha in 2015*
7.9	*Reducing the fuel wood dependency from 92% of households in 1993 to 52% in 2015*
Overall target 14: Halve by 2015 the proportion of people without sustainable access to safe drinking water	
7.10	*Increasing the proportion of rural population with access to safe water source from 24% in 1998 to 50% in 2015*
7.11	*Increasing the proportion of urban population with access to safe water source from 60% in 1998 to 80% in 2015*
Overall target 15: Halve by 2015 the proportion of people without sustainable access to improved sanitation	
7.12	*Increasing the proportion of rural population with access to improved sanitation from 8.6% in 1996 to 30% in 2015*
7.13	*Increasing the proportion of urban population with access to improved sanitation from 49% in 1998 to 74% in 2015*
Overall target 16: Increase the proportion of the population in both urban and rural areas with access to land security by 2015	
7.14	*Increase the percentage of land parcels having titles in both urban and rural areas from 15% in 2000 to 65% in 2015*

Source: Cambodia MDGs, MOP-2003.

Similarly, the National Strategic Development addressed the targets on agriculture, forest, fisheries, and land. These targets are crucial in assessing priority action in theme 5, 6 and 11 of the NBSAP despite they are not in the NBSAP (Table 10).

Table 10*: Targets set for 2010 for the Agriculture Sector*

Targets	**2005 (est.)**	**2010 targets**
Rice Production (million tons)	4.17	5.5
Rice Yield per hectare, tons	1.97	2.4
Fish catch (Inland, Marine and Aquaculture (tons)	374,000	450,000
Irrigated area (% of rice area), including supplemental irrigation	20	25
Land Reforms -- no. of titles issued to farmers -- % of total land	12	24
Forest area (% of total land area)	60	60
Fuel wood dependency (firewood, charcoal): households %	85.5	61

Source: National Strategic Development Plan, 2006-2010.

In fact, rice production in 2008 was more than 6.8 million tons, which exceeded the 2010 target with an average yield of 2.7 tons per hectare.

2. NBSAP and the CBD Implementation

All 98 priority actions in 17 themes of the NBSAP are fallen under various articles of the CBD starting from article 6 to 20, which are the key articles of the conventions addressing the conservation and sustainable use of biological diversity. Each priority action does not spell exactly the same of the article of the CBD states, but the substance is captured the article addresses. From theme 7 to 17 ate mostly address cross-cutting issues such energy, education, climate change, land use planning, water resources, environmental security, industry, community participation and poverty reduction.

Table 11: Priority Actions of NBSAP in implementing the CBD

#	Priority Actions	CBD
Theme 1 Protection of Natural Resources		
1.1	Strengthening the on-going management of designated protected areas by development and enforcing management policies, guidelines and plans	Article 6, 8 and 10
1.2	Integration of the Management of the Tonle Sap Biosphere Core Zones into the management of the hole Tonle Sap Ecosystem Approach for sustainable use of biological diversity	Article 8, 9, 10, 12, and 13
1.3	Identification and designation of new protected areas within wetland; marine and coastal habitats	Article 6, 7 and 8
1.4	Identification and designation of new fish reserves and sanctuaries	Article 7 and 8
1.5	Economical evaluation and assessment of resources for potential development of revenue-based activities within protected areas	Article 10, 11, 14 and 18
1.6	Training programs targeted for park rangers, technical staff and protected areas directors; and local community	Article 12 and 13
1.7	Integrated conservation and development of Cardamom's protected areas	Article 6 and 8
1.8	Integration of the management of Kulen Prom Tep Wildlife Sanctuary into the Northern Plain Landscape Conservation.	Article 6 and 8
1.9	Integration of the management of protected areas in the northeastern dry forest plain conservation landscape	Article 6 and 8
1.10	Sustainable integration of the Management of Biodiversity and Virachey National Park with the development of local indigenous community to provide a model for integrated conservation and development.	Article 6 and 8
1.11	Development of an approach to build a linkage between conservation and local society by enhancing conservation and sustainable use of biological resources associated with Kirirom, Bokor and Ream National Parks.	Article 6, 8, 12 and 13
1.12	National assessment and recovery program for species, populations and ecosystems at risk	Article 9 and 14
1.13	Application of IUCN Red List criteria for groups & production of national red lists	Article 9, 10 and 14
1.14	CITES implementation, capacity building and awareness program	Article 9 and 13
1.15	Improve the critically endangered species program provided to conservation and development	Article 8, 9 and 14

1.16	Establishment of a National Botanical Garden	Article 9 and 10
1.17	Establishment of general herbarium	Article 9 and 10
1.18	Identification and collection of plant species and cultivars in need of protection for propagation	Article 9 and 10
1.19	Training program in wildlife husbandry techniques for the Phnom Tamao Wildlife Rescue Centre staff and private zoo	Article 9 and 10
Theme 2 Animal Wildlife Resources		
2.1	National campaign against illegal hunting	Article 6, 7, 8 and 13
2.2	National monitoring program and database on alien invasive species and exploited wild animal species	Article 6, 7, 8 and 13
2.3	Management plans for commercially valued species	Article 6, 7, and 8
Theme 3 Freshwater Fisheries and Aquaculture		
3.1	Demarcation and management of fisheries areas	Article 6, 7, and 8
3.2	Community-based fisheries management program	Article 6, 7 and 8
3.3	Tonle Sap Great Lake Floodplain integrated management program	Article 6 and 8
3.4	Fisheries environment protection program	Article 6 and 8
3.5	Indigenous fish Aquaculture development project	Article 6 and 8
3.6	Critical fisheries ecosystem monitoring and protection program	Article 6 and 8
3.7	Revision of Department of Fisheries organizational structure	Article 6 and 8
Theme 4 Coastal and Marine Resources		
4.1	Development of a full Monitoring Surveillance and Control (MSC) Plan for industrial fishing and establishment of a working pilot scheme for MSC of artisan fishery	Article 6 and 7
4.2	Monitoring and management programs for target fish species	Article 6 and 7
4.3	Protection of mangrove forests	Article 8
4.4	Capacity building and training program for fishery staff	Article 8, 12 and 13
4.5	Provision of patrol boats to Department of Fisheries	Article 8
Theme 5 Forest and Wild Plant Resources		
5.1	Development of a comprehensive national plan for the management of the forest estate	Article 6 and 8
5.2	Development of sustainable forest management plans	Article 6 and 8
5.3	Development of environmental impact assessment guidelines for forest exploitation activities	Article 6, 8 and 14
5.4	Forest Concession management and control Pilot project	Article 6 and 8
5.5	Community-based forestry management program	Article 6 and 8
5.6	Vegetation survey and assessment of the current status of wood extraction	Article 6 and 8
5.7	Extension of the Forest Crime Monitoring Unit (FCMU) Project	Article 6 and 8
5.8	Development of policy and guidelines promoting the use of native species in cultivation and restricting the introduction of introduced species	Article 6 and 8
Theme 6 Agriculture and Animal Production		
6.1	Farmers' training on improved cultivation and livestock production systems respectful of the environment	Article 9, 12 and 13

6.2	Extension of Integrated Pest Management (Farmer Field School) program	Article 9, 12 and 13
6.3	Agricultural diversity promotion program for food security	Article 9, 10, 12 and 13
6.4	Agricultural land protection and land-use program	Article 9, 10, and 12
6.5	Adoption and improvement of sustainable cultivation management systems	Article 6, 9, 10, and 12
6.6	Strengthening research in new and alternative crops	
Theme 7 Energy Resources		
7.1	Energy efficiency program for households in areas where fuelwood is limited	Article 9, 10, 11, and 12
7.2	Promotion of fuelwood and multipurpose tree plantations at the family and community level	Article 9, 10, 11, and 12
7.3	Environmental guidelines and impact assessment for energy development projects	Article 6, 10, 11, and 12
Theme 8 Mineral Resources		
8.1	Study on the feasibility, costs and benefits of correcting existing mining industries for environmental soundness	Article 9, 10, 11, 12 and 14
8.2	Development of Environmental Guidelines for Mining Activities	Article 10, 11, 12 and 14
8.3	Establish EIA procedures for mining development projects	Article 10, 11, 12 and 14
Theme 9 Industry, Technology and Services		
9.1.1	Awareness program on Environmental Impact Assessment and Environmental Pollution Control and Monitoring System for the manufacturing sector	Article 11, 12, 13 and 14
9.2.1	Development and implementation of a Biosafety strategy and action plan in compliance with the international protocol on Biosafety	Article 11, 12, 18 and 19
9.3.1	Integrating biodiversity conservation and environmental management concerns into tourism policy and development plans and guideline	Article 6, 11, and 12
9.3.2	Village based tourism development program	Article 8, 11, and 12
9.3.3	Integrating conservation on cultural heritage and nature through the development tourism program in demarcate areas for protected area landscape	Article 15 and 16
9.3.4	Set up a national master plan to promote ecological tourism in natural areas	Article 8, and 15
Theme 10 Environmental Security		
10.1	Integrating biodiversity protection measures in flood prevention awareness programs and rehabilitation plans	Article 6, 12 and 14
10.2	An important aspect of the vision is conservation and promotion of Biodiversity, Environmental protection and Ecology.	Article 6 and 12
10.3	Creating environmental security for integrated biodiversity water resources management and development.	Article 8, 9 and 17
10.4	Preventing the damage that may occur as a result of flood, drought, watershed, degradation, erosion and sedimentation to protect aquatic and fish resources and other biodiversity.	Article 8 and 9
Theme 11 Land Use Planning		
11.1	Institutional capacity building program on land use planning	Article 12
11.2	Development of national land use master plan and provincial land use plans integrating environmental concerns and community consultation	Article 12, 13 and 17
11.3	Development of community-based land use plans	Article 12

Theme 12 Water Resources		
12.1	Management of water resources program	Article 6, 7 and 8
12.2	Public water program to improve water quality so as to be able to satisfy present and future demands and ensure that water bodies have the capacity to sustain biodiversity aquatic and fish life, to protect human and animal health.	Article 6, 7 and 8
12.3	To ensure the financial sustainability of hydraulic infrastructure program	Article 8, 11 and 20
12.4	Groundwater monitoring program	Article 6, 7 and 8
12.5	Water pollution prevention program for industry sector	Article 6, 7 and 8
12.6	Water pollution prevention program for agriculture sector	Article 6, 7 and 8
12.7	Urban waste water treatment program	Article 6, 7 and 8
Theme 13 Climate Change and Biodiversity		
13.1	Integration of biodiversity objectives into the future National Climate Change Action Plan	Article 6, 7, 17 and 18
13.2	Improvement of weather forecasts to ensure timely warning of natural occurrences such as typhoon, floods and drought. Improvement to the meteorological networks	Article 6, 7, 17 and 18
13.3	Lobby developed countries to decrease emission related to climate change	Article 6, 7, 11, 17 and 18
Theme 14 Community Participation		
14.1	Strengthening institutional training in community-based natural resource management (for forestry, agriculture, fisheries)	Article 12 and 13
14.2	Development of community based wildlife protection program	Article 6, 7, and 17
14.3	Development of community based forestry program	Article 6, 7, and 17
14.4	Development of community based agriculture program	Article 6, 7, and 17
14.5	Development of community based fisheries program	Article 6, 7, and 17
14.6	Development of community based land use and rural development programs	Article 6, 7, and 17
Theme 15 Awareness, Education, Research Coordination and Development		
15.1	Biodiversity Awareness Program	Article 6, 7, and 17
15.2	National Biodiversity Research, Training and Information Center and Library	Article 6, 7, and 17
15.3	Integrating environmental and biodiversity issues in school curriculum	Article 6, 12, 13 and 17
15.4	Government staff capacity-building program	Article 6, 12, 13 and 17
15.5	Biodiversity research development program at Royal University of Phnom Penh	Article 6, 12, 13 and 17
15.6	Set up training program on management of natural resource and Environment conservation to the member of community that has biodiversity.	Article 6, 12, 13 and 17
Theme 16 Legislation and Institutional Structure		
16.1	Development/Amendment of by-laws and regulations on biodiversity related issues	Article 6, 12, 15 and 17
16.2	Institutional capacity building project on Environmental Impact Assessment.	Article 6, 12, 14 and 17
16.3	National awareness campaign on Environmental legislation.	Article 6, 12 and 17

16.4	Continued implementation of regional cooperation with neighboring countries in joint projects and programs aimed at environmental protection and conservation of common natural resources.	Article 6, 12 and 17
Theme 17 Quality of Life and Poverty Reduction		
17.1	Community-based natural resource management programs	Article 6, 12, 11 and 17
17.2	Environmental awareness programs in rural areas	Article 6, 12, 13 and 17
17.3	Poverty monitoring and analysis programs	Article 6, 11, 12, 13 and 17
17.4	Poverty reduction strategy formulation	Article 6, 12 and 17
17.5	Participatory Poverty assessment	Article 6, 12, 17 and 18

3. NBSAP Priority Actions Implementation and Outcomes

Protection of Natural Resources: In 2007, protect areas management was highly paid attention including research, boundary demarcation, and law enforcement. As a result, at least 21 protected areas throughout Cambodia focused in enforcing law to reduce illegal activities such as land encroachment, hunting, illegal logging, charcoal production inside protected areas, illegal fishing, etc. There are 69 research and development projects related to biodiversity conservation and sustainable use covering a period from 2007-2012 with the support from various donors including, UNDP/GEF, UNEP/GEF, UNIDO, ADB, WB, IFAD, GTZ, USAID, AusAID, CIDA, SIDA, EU, DANIDA, IDRC, bilateral agreements and charities.

Up to present time, MOE has planted 262 cemented poles in the boundary of protected areas to safeguard the areas from encroaching and other illegal activities. MAFF has also planted a number of poles to safeguard their protected forests under their jurisdiction. The two agencies have recruited approximately 2,000 rangers[8] to conduct patrol and conservation duties. There are several cases presenting as a modal illustrated as examples in implementing priority actions in the NBSAP, (Box 1).

Box 1: Tonle Sap Environment Management Project

[8] MOE/GDANCP recruited 910 rangers (2008).

Tonle Sap Environmental Management Project (2002-07) is intended to be the first step in a series of ADB interventions (ADB's Tonle Sap Initiative) for sustainable management and conservation of natural resources and biodiversity in the Tonle Sap Basin. The project has objectives to strengthen natural resource management coordination and planning, organize communities for natural resource management, and build management capacity for biodiversity conservation. A Sub-project of the TSEMP is the Environmental Information Database Project (TSBR-ED). The main objective of TSBR-ED is to establish an environmental information database within the TSBR Secretariat that will support the Secretariat's coordination function and serve the information needs of partner agencies, non-governmental institutions and civil society. The project is funded by ADB and UNDP/GEF and participating by MOE, MAFF, and Cambodian National Mekong Committee (CNMC) with fund amounting to almost $20 million. Now Tonle Sap is under the Tonle Sap Authority with the vision to protect Tonle Sap as "By 2020 the Tonle Sap Biosphere Reserve will be a productive and restored environment supporting biodiversity, conservation and sustainable development. It will be supported through internationally recognized management models, trainings, environmental education, research and monitoring programs". www.tsbr-ed.org/english/projects&program/projects.asp

Animal Wildlife Resources: Cambodia has established 5 zoos and 5 wildlife farms throughout the country. One of the zoos is conducting a research and in-captive breeding is Phnom Tamao zoo. More than 92 of mammals, birds, and reptiles exist in Phnom Tamao Zoo in 2008. Forest Administration is conducting in-captive breeding on several species with assistance from international organizations. Names of the five zoos are (1) Phnom Tamao Zoological Garden and Wildlife Rescue Center, (2) Koh Kong Safari World, (3) Prey Angkor Zoo, (4) Wildlife Development Center, and (5) Angkor Center for Conservation Biodiversity. All of wildlife farms are breeding long-tailed crab eating monkeys for food and researches (MAFF/FA, 2007). Cambodia has identified 3 species of wildlife as "*national animal symbol*" including Bos sauvali-CE, Pseudibis gigantean-CE (Giant ibis), and Batagur baska-GT (Royal turtle).

Freshwater and Fisheries Aquaculture: Inland fish caught in 1980 was 18,400 tons and increased to 250,000 tons in 2004 while marine fish caught was 1,200 tons and 42,000 tons in 1980 and 2004 respectively. Cambodia has promoted aquaculture to reduce pressure on natural fish catch. The production of fish aquaculture was 1,610 tons in 1984 and increased to 33,500 tons in 2004. Crocodile farming is a productive business in Cambodia. The country has successfully increased its production 4,372 heads to 75,600 heads in 1989 and 2004 respectively. Currently, Cambodia has carried out at least 28 related fisheries project in 2007 and carried out to 2008. These annual activities were all funded by Fisheries Administration (FiA) with funds provided by the Multi-Donor Livelihoods Facility (MDLF). The use of annual activity plans and the associated reporting procedures was a trial process which will eventually be extended to all FiA activities irrespective of funding source. The activities cover Planning; Administration; Fisheries Domain Division; Aquaculture Division; Quality and Processing Division and Community Fisheries Development Division. MAFF under Fisheries Administration has established Inland Fishery Research Institute with the aim promote production and conservation activities (MAFF/FiA, 2007). Cartlocarpio Siamensis (Giant Mekong barb) is the 4th species identified as a symbol of national animal and threatened species. Cambodia is proposing 57 aquatic species as endangered (EN) in 2009, (*FiA/MAFF, 2009 in the annex of the Sub-Decree Aquatic Endangered Species).*

Forest and Wilde Plant Resources: Cambodia has move quickly to reduce logging and finally to ban all timber productions. Forest production reach a sky rocket more than 800,000m^3, it reached near zero production in 2002. The government has paid attention on sustainable forest management through managing forest protected areas. The government invested a lot of money in forest plantation as an effort to promote biodiversity and carbon sequestration credits. From1992-1999, the government planted

between 200 and 600 ha of trees. The figure reached almost 1,400 ha in 2003. The movement of tree planting occurred at various levels including government agencies, NGOs, students, monks and local communities.

Cambodia has put significant efforts to reduce forest crimes. The forest crimes were 825 cases and rose to 1152 cases in 2005. However, the crimes dropped to 899 cases in 2006. All cases are categorized into land concession, timber, wildlife hunting, property damages, land encroachment, internal uses, mining, and other uses. This was because of good cooperation between concerned agencies including Forest Administration, Ministry of Environment, Military Policy, Police and provincial authorities (MAFF/FA, 2006-07).

Cambodia has identified10 gene-ecological zones including commentaries on the geographical, geological, climatic, and biological character of each region. The descriptions include a listing of high priority tree species that occur in each zone and a summarization of species distributions across gene-ecozonal boundaries. As earlier noted, the Cambodia Tree Seed Project aspires to record at least two unique seed sources for every priority species that is represented in a gene-ecological zone.

To date RGC embarked on a Forest Gene Conservation Strategy in order to conserve the genetic diversity of useful and economically important tree species. A favored method is to increase their use in tree planting activities, which will ease the pressure on natural populations and contribute to environmental conservation. A well-managed forest resource may contribute towards economic and social welfare, thus enhancing local and national development. Cambodia has identified Borassus flabellifer (sugar palm tree), Mitrella mesnyi (Rumdoul) and Musa aromatica (banana) are a national tree symbol (MAFF, 2008).

For the same purpose, Ministry of Environment of Cambodia has cooperated with People's Republic of China in establishing a National Botanic Garden in Siem Reap province in 2007. There are hundreds of private nurseries, which mainly breed commercial plants.

Box 2: DANIDA Tree Seed Program

The Tree Seed Program funded by DANIDA focused on conserving local tree seeds in natural habitats. Deforestation and logging of the remaining primary forests continues, the genetic resources of some of the economically important indigenous species become endangered, and therefore, the potential for good seed sources and reforestation of natural species is deteriorating. To date, indigenous species and populations have not been included in tree improvement programs. Indigenous tree species are therefore believed to have a large potential for improvement in quality and growth rate. Unfortunately, the handling of indigenous tree seed is an area of which little is known, and therefore, further research is necessary to develop simple but effective methods of handling and storage. It is increasingly recognized that maintenance of forest genetic resources is a pre-condition for sustainable development. A number of tree species are vulnerable or endangered, and at the same time, genetic erosion is occurring through continuous selection of the best trees for cutting. Conservation of genetic variation at species and population level is important for future tree seed supply and tree improvement programs, and for adaptation to environmental changes and planting sites. www.treeseedfa.org/

Agriculture and Animal Production: Agriculture sector plays important role feeding the entire population, support economic growth and sustainability since 85% of the population live in rural areas and

75% of the poor are heads of family households. Cambodia produced rice in 2006 more than 6.2 million tons. The production of un-milled rice has increased 12 percent in 2008 (6.8 million tons), creating a surplus of 2.8 million tons, up 300,000 tons over last year's figures (2007). Rice production is expected to increase rapidly over the next couple years because the government has heavily invested on irrigation and agriculture related activities.

Cambodia produced more than 4 million heads of cattle and buffaloes, 2.7 million of pigs, and 15.1 million of poultry in 2006. Most cattle and buffaloes are employed in agriculture sector as labor forces (MAFF, 2007).

Coastal and Marine Resources: Numerous activities related to the coastal zone management have been implemented under the Environmental Management of Coastal Zone (EMCZ) project, targeted at education and raising environmental awareness, various community-based resources management initiatives and alternative livelihood pilot programs among others. Most of the activities carried out since the project started in 1997 are listed and briefly described here. The Second Phase of the Project is called "Integrated Coastal Zone Management" funded by DANIDA. Through integrated coastal zone management project with assistance from DANIDA and Royal Government, 4 coastal resource centers were established in 2005 and function to as marine lab to test water quality, database on marine resources and serve research education purposes. RGC through Ministry of Environment and local authorities have been trying hard to ensure the function of the 4 coastal resource centers after completion of the project. Cambodia through MOE planted 600 ha of mangrove forest along the coastal area from 1998-2008 with the assistance from IDRC. They also did conservation activities that allowed 7,000-8,000 ha of mangrove trees to regenerate in (satellite image in 2005), (MOE/CZM, 2007).

Moreover, Ministry of Agriculture, Forestry and Fisheries (MAFF) has conducted conservation activities on coral reef and sea grass and marine conservation of some islands. MAFF under Fisheries Administration has marine research institute in 2008 with the aim to promote marine production and conservation activities of marine resources including coral reef, sea grass, and threatened species. Insofar, known species of coral reef is 70 (MAFF/FiA, 2008).

Biosafety and Biotechnology: Cambodia became a Party to Cartagena Protocol on Biosafety in 2003. Cambodia has developed its national biosafety framework in 2004. The framework covers: regulatory regime, administrative regime, a system to handle application, monitoring and enforcement of LMOs release into the environment and public participation, awareness and education.

In December 2007, the National Assembly passed the biosafety law, which allows the country regulate biotechnology activities and LMOs commercial activities to promote the safety to biodiversity and human beings. Cambodia has sectoral laws but none of them can regulate the transboundary movement of the LMOs. Cambodia decided to draft a law on biosafety under the assistance from UNEP/GEF project. The Biosafety law[9] will help Cambodia to regulate handling, packaging, transit and transport of LMOs and their risks. The draft sub-decree to that law was also developed, in which it addressed details requirement for control the LMOs movement and their risks. This effort indicated Cambodia's effort to implement the Cartagena Protocol on Biosafety, not only its article 2.

Box 3: UNEP/GEF Biosafety Capacity Building Project

Cambodia obtained the assistance from UNEP/GEF for an enhancing capacity of biosafety in March 2006. This made Cambodia became the Second Country out of the countries participated in the Development of the National Biosafety Framework in undertaking the implementation of its NBF. This project would help RGC to strengthen the existing institutional and technical structures and infrastructures needed to meet the obligations of the Protocol, and have an operational National Biosafety Framework. In 2007, MOE developed a National Guideline on Risk Assessment and Risk Management of LMOs, Glossary on Biosafety and Biotechnology, Action Plan on Biosafety and Biotechnology, a Training Manual on Biosafety, Monitoring and Evaluation of LMOs and Regulation. Moreover, MOE with assistance from UNEP/GEF is building a mini-lab for LMOs detection and identification. www.cambodiabiosafety.org

[9]

Environmental Security: Cambodia always paid a close look on environmental impact assessment and brown and gray issues. With the existence of a Law on Environmental Protection and Natural Resource Management, E.I.A Sub-decree, Solid and Liquid Waste Management Sub-Decree, Water Pollution Control Sub-Decree, Air Pollution Sub-Decree and relevant regulation, MOE together with relevant agencies focused on building capacity of officials to enforce regulation effectively such as dumping sites for garbage, water quality etc. In 2007, MOE reviewed E.I A for 15 projects, monitored 52 on-going projects, signed contracted with companies for 61 projects to ensure they comply with regulation.

Land Use planning: Land Reforms are crucial to increase agricultural production by providing titles and security of tenure to people, especially farmers over lands they are legally occupying. Already the increases in population are bringing pressures on land ownership. From every farmer owning some land in early 1980s an estimated 12% of farmers do not own any land at present. However, in other critical areas, some progress has been achieved. An Inter-Ministerial Council for Land Policy was established in 2000. The first phase of government's 15-year Land Administration, Management and Distribution Program (LAMDP) was approved in 2002. Its goals are to improve land tenure security and promote the development of efficient land markets. The Land Law was enacted in 2001 as a comprehensive law on land and an Interim Land Policy Framework was adopted in 2002. Out of the 2001 estimates of 6-7 million land parcels or plots needing to be issued titles in the country, work has progressed well by issue of several hundred thousands of land titles under the systematic land registration and sporadic land registration processes. A land dispute resolution mechanism through the Cadastral Commission has been established; this Commission resolved 889 cases between 2003 and 2005, out of 3,257 cases. As part of the Land Reforms program, the sub-decree on Social Land Concessions, equitably allocating disposable state land1 for social and economic development, is being implemented. A sub-decree on state land management and a sub-decree on economic land concessions have been issued. A pilot social land concessions project is under preparation and its implementation is expected to commence in 2006.

In 2002, 5% of the land was allocated for agriculture land concession, 23% for forest concession10 and 5% for fishing concession and 15% of all land is under cultivation11 (MAFF, 2002 and SOE, 2004). Agriculture land concession increases rapidly such as rubber plantation, cassava, cashew nut, palm oil, sugar cane, durian, tea, coffee and teak plantation. This development will shrink some of the forestland and protected areas land combined with land speculation and land encroachment.

The Mine Clearing Program has been in operation for a number of years. Reported annual casualties from landmines and UXOs decreased from 1,743 in 1996 to 797 in 200512. The land freed from land mines stood at 1,225 ha in 1993 and increased to 32, 974 ha in 2005 (estimates). Much work still remains to be done (NSDP, 2006).

Water Resources: 86 % of Cambodian territory lies within the catchments of the Mekong River. With a drainage area of 810,000 km^2 and a total length of 4,425 km, the Mekong is one of the major rivers of the world. The mean annual discharge entering Cambodia exceeds 300 billion m^3, and it is estimated that, with the contributions of downstream tributaries, some 500,000 m^3 is discharged annually to the sea. The annual flow of the Mekong River at Kratie is 440 billion m^3 at he discharges at this segment range from 1,250 m^3/s to 66,700 m^3/s (MOE/SOE quoted MRC, 2001a).

An important feature of the Mekong system in Cambodia is the Tonle Sap. During the wet season, as the water level in the Mekong rises, the flow in the Tonle Sap River draining the lake to the Mekong reverse and the lake fills, reducing the discharge downstream of Phnom Penh. By September/October, the level of

[10] Most portion of this land was converted into forest protected areas and forest community land by 2005.
[11] Farmland is over 2.5 million ha in 2008.
[12] This causality further dropped in 2009 (CMAC Report, 2009).

the lake may have risen by 3m to 4m and the area extended to 10,500 k m^2. As the level of the Mekong falls, the water starts draining back, enhancing downstream dry seasonal flows, and the lake eventually shrinks to about 2,600 k m^2 and less than 2m depth in the dry season. The annual rise in the Mekong causes extensive flooding downstream of Phnom Penh.

The first reconnaissance of the lowlands was undertaken to determine the availability of groundwater for dry season irrigation. The second reconnaissance was a general description and evaluation of groundwater availability based on test drilling data and well records obtained in the course of a USAID rural water - well development program at various times between 1960 and 1993. The program drilled 1,100 wells, 72% of which were productive. Depth ranges from 2m to 209m with an average of 23m. Information is also available from well drilling program done since the 1980s by NGOs and others, in particular OXFAM and UNICEF. The latter drilled over 5,000 wells throughout the country with depths ranging from 20m to 50m. Recently, JICA completed a detailed groundwater survey in Takeo, Kandal, Svay Rieng, Prey Veng and Kampong Speu provinces.

Of almost 7,600 wells for which UNICEF have records, less than 3 percent have yields higher than10 m^3/hour. To date no groundwater sources of sufficient potential for large - scale irrigation have been identified. Any use of groundwater for irrigation is thus likely to be restricted to small scale vegetable and fruit gardens, especially those cropped in the dry season. In Cambodia, wells are categorized as hand tube wells, shallow tube wells, deep tube wells and treadle pump wells (MOWRAM, 2008).

Table 12: The water use in Cambodia

Consumption	**Million m^3/year**
Agriculture	455
Domestic purpose	136
Livestock	100
Industry, commerce, and institutions	30

Source: MOE/SOE, 2004, data dated 2003.

Water resources form a crucial component of the nation's environment and natural resource base. Cambodia's watercourses - especially those of the Tonle Sap system -- provide the basis for fisheries, irrigated agricultural production, domestic and industrial water supply, hydro-electric potential, and navigation. Even with abundant fresh water resources -- rivers, streams, lakes, and aquifers-parts of Cambodia suffer from droughts affecting and destroying crops. Construction and improvement of irrigation facilities, flood protection dykes and sea protection dykes are therefore an important priority. Also, Cambodia's water resources are vulnerable to activities in other countries upstream of the Mekong River. A National Policy on Water Resources Management was adopted in January 2004 and a draft Law on Water Resources Management is being considered by the National Assembly. In the past five years (2001-2005), the achievements have been: 315 irrigation systems for rice cultivation covering an area of 153,149 ha; flood control dykes that provide protection for an area of 113,500 ha; prevention dykes protecting 16,680 ha of cultivable land from sea water intrusion. In 2006, RGC was able to irrigate 600,000 ha for farming. This will be target to 650,000 ha by 2010 so as to promote agricultural products (NSDP, 2006 and MAFF, 2008).

Community Participation: Cambodia has embarked on a process of decentralisation and democratisation, including the establishment of elected Commune Councils in early 2002. Given the lack of a tradition of

encouraging civic participation in public affairs, however, there was initially little general awareness of how to engage with these Councils. In January 2007, Cambodian Government and the United Nations Development Program (UNDP) have inked an agreement for a new three-year project aimed at reducing poverty through improving local governance in poor rural areas. The three-year US$34.8 million Project on Support Democratic Development through Decentralization and Deconcentration (PSDD) would increase public and community participation in democratic process and especially in natural resources decision-making and planning. In 2008, the government passed the Organic Law, which would grant more power to provincial and communal authority in handling overall development including environmental and natural resource management issues (NSDP, 2006). Cambodia has established 264 protected forest communities, 405 fishery communities and 82 protected areas communities (MAFF, 2008 and MOE, 2008).

Training, Education and Awareness: Training, education and awareness activities on biodiversity and sustainable use in Cambodia were carried out by several ministries, NGOs, academic institutions and provincial authorities. Ministry of Environment has conduct awareness on biodiversity, climate change-CDM, and biosafety. At least 600 students participated in debate on climate change, more than 1,000 students participated in environmental youth debate on biosafety and unaccounted number of audiences have participated in biodiversity debated or related issues. Ministry of Agriculture, Forestry and Fisheries regularly conducted debates on animal production, fisheries and forestry protection. Ministry of Tourism, Ministry of Rural Development, Ministry of Interior, NGOs and provincial authorities undertook various forms of awareness and training on biodiversity conservation at various locations both formal and informal. Some ministries and NGOs organized a song and painting contest on nature conservation. It is observed every year, National Biodiversity Day, International Wetland Day, World Water Day have been organized throughout the country to promote the understanding on respective themes, their value and conservation value. Insofar, Cambodia has 20 universities, at least three of whom offer courses in life sciences including biology, fisheries, forestry, animal production, veterinary, land use, microbiology, etc. The most relevant universities name: Royal University of Agriculture, Royal University of Phnom Penh, and Preak Agricultural College All of them offer a Master Degree in Biodiversity Conservation and its related fields.

Legislation and Institutional Structure: Since became a Party to CBD and Cartagena Protocol, Cambodia has move quickly to passing Protected Areas Management Law (2007), Forestry Law (2002), Fisheries Law (2006), Land Law (2003), Water Resource Management Law (2007), Biosafety Law (2008), Law on Crop Seed Management and Rights of Plant Breeders (2008) and its related regulations. These provide mandates to the country to act properly and quickly to conserve and use biological diversity resources. In addition, biodiversity and sectoral policies such as forestry, fisheries, land use, water and climate change have been mainstream into a national development plan. Ministry of Water Resource and Meteorology is processing water application in four provinces around Tonle Sap.

4. NBSAP Implementation and Cross-Cutting Themes

Energy Resources: Availability of assured, abundant, low-cost electricity is a key to development of the country. High cost of electricity affects all productive sectors and hinders industrial investments and competitiveness. Attracting private sector investment and participation in the generation and distribution of electricity to key provincial and urban centers, rural areas, and putting in place power transmission grids to link Cambodia with neighboring countries have therefore been high RGC priorities. Total electricity generation in Phnom Penh and provincial towns increased from 163.4 Gwh in 1993 to 759.7 Gwh in 2004. New power plants have been completed. Work is to be completed on several provincial towns' power rehabilitation works. Agreements have been signed and implemented with neighboring countries to import power for use in border areas. In many district towns private operators provide local energy needs. RGC is also promoting development of cheaper, renewable, alternative energy sources, viz., solar energy (already installed in some areas), wind energy, biogas, and mini-hydro schemes. A very

important new development is the discovery of oil and gas resources in some off-shore trial wells already drilled, raising hopes of an abundant source of supply in a few years to provide a boost to economic growth, in turn raising income levels and rapidly reducing poverty. The challenge is to plan well ahead to use this valuable resource, especially associated gas which otherwise traditionally goes waste (NSDP, 2006).

Climate Change and Biodiversity: Cambodia is a Party to UNFCCC and Kyoto Protocol in 1995 and in 1997 respectively. Despite in LDC country group, Cambodia actively implements Kyoto Protocol that contributes to the biodiversity conservation in the country. Insofar, Cambodia approved 5 CDM projects. Angkor Bi-Cogen that uses rice husk to generate energy. Cambodia Biogas-TTY, this project will capture liquid CH_4 from factories used diesel, to general electricity which will reduces 66.402 tCO_2 eq. ton per year. The project that captures CH_4 from swine farms in Kandal province. It will reduce GHGs 6.792 tCO_2 eq. ton per year. A project uses heat from cement factory in Kampot province to generate electricity. It contributes to reduce GHGs 20.066 tCO_2 eq. ton per year and avoid burning fossil oil. Another project deals hydro-power dam-BOT in Kamchay waterfall. This is the large CDM project in Cambodia that has the capacity to produce 194.1 MW and replace using fossil oil for considerable amount in the country. The project will reduce GHGs 370.496 tCO_2 eq. ton per year. There are several hydro-power dams have been constructed recently, which would address CDM issues (MOE/CCO, 2008).

Quality of Life and Poverty Reduction: Poverty was widespread during the communist regime (1979-1990). During that time it was difficult to calculate the poverty through income. Until the country opened to the free market, poverty level by income is with 36% of the Cambodian population living below the poverty line of US$0.46-0.63 at the exchange rate (2005). Generally people move in and out of the poverty, which makes definition of the poverty lines and better knowledge on cyclical, seasonal, and unexpected shocks important. Current level of poverty largely results from high population growth, inadequate opportunities, low capabilities, insecurity, exclusion, and vulnerability. Poverty line has dropped to 34.7% in 2006. It dropped from 39% to 28% in 56% of the country covered by both 1993 and 2004 surveys. In 2004, 90% of the poor were in rural areas and, among the poor, a larger share was closer to the poverty line. Greater, targeted attention to the rural areas would have an immediate and significant impact in reducing poverty levels.

Except for a couple of years, Cambodia has witnessed in the past 12 years, robust and steady macro-economic growth. GDP at constant prices grew at an average of 7.0% per year, led by rapid growth mainly in garments manufacturing, tourism and construction. Per capita GDP registered similar growth 4.7% despite increase in total population. Inflation was kept at below 5%. The riel-US$ exchange rate was fairly stable, declining gradually. Government revenues and expenditure both in actual terms and as percentage of GDP improved at a strong pace. In the Financial Sector, reforms are progressing and various measures have been put in place to regulate and foster the sector to grow in an orderly and assured manner.

Despite poverty reduction averaging one percent per annum (1 percent p.a.) over the past 10 years, the poverty rate in 2004 was still at 34.7% (the rate was as high as 45.6% in rural inaccessible areas), with a target of 19.5% by 2015. With 85% of Cambodian population residing in rural area, the greatest challenge for Cambodia lies in alleviating rural poverty and avoiding inequality. Close attention is being paid to ensure that the two digit (average 10 percent) economic growth Cambodia has enjoyed over the past three years can be equitably shared across the entire population. More information on the cross-cutting issues implementation is elaborated in Chapter III.

5. Effectiveness of NBSAP

The effectiveness of the NBSAP is depending upon regular check on the progress, finding a way to correct and removing threats toward biodiversity and especially regular review to improve the quality of the NBSAP. As indicated in the NBSAP, there are six cycle steps to see the progress of the NBSAP implementation.

a. ***Progress in change and status***: Cambodia has by and large made a significant progress toward implementing the NBSAP and for the purpose of conservation and sustainable use of biodiversity. Capacity building has been made at individual level, institutional level and system level. Significant number of government agencies received short-term and long term trainings in natural resource management, forest resource management, biology, conservation biology, ecology, sustainable forest management, etc. Some of them have engaged with NGOs and provincial authorities. All 23 protected areas, 6 protected forest areas and all fish sanctuaries have their checkpoints and stations with permanent rangers to safeguard the areas. Cambodia continued to advance in conducting researches by using camera traps, animal surveillance GPS tool and other facilities to monitor, protect conserve rare and threatened species of wildlife. Cambodia has increased capacity for in-captive breeding of threatened species of wildlife. At the institutional level, Cambodia continued to have more and more laws and relevant regulation to manage, protect and conserve natural resource in a sustainable manner. At least 3 workshops were specifically offered to 200 local judges, prosecutors and lawyers in environment and law enforcement of natural resources to promote justice within natural resource management area. Approximately 400 PA rangers and forest protected areas rangers have been trained as law enforcement officers in the past couple years. At the systemic level, Cambodia has established a lot of mechanisms to enable environment of coordination and the flow of information on natural resources management, regulation and law enforcement to assist in decision-making and policy development. These mechanisms include 19 Technical Working Groups on various sector including Agriculture and Water Resource, Forestry and Environment, Fisheries, etc. These TWGs are to ensure resource mobilization to the priority areas. At the higher body, other mechanisms cover the National Biodiversity Steering Committee, Land Degradation Steering Committee, Climate Change Steering Committee, and Coastal Zone Steering Committee that provide opportunities and dialogues among inter-ministries over natural resource management and conservation.

b. ***Addressing threats adequately***: The current NBSAP was well-addressed threats to biodiversity as identified in Chapter I. What matters is the delivery of these priority actions on the ground. The threats are huge, which is difficult to be removed such as community settlement and poverty, which involve other sector to participate in the process. Hunting, illegal logging, illegal fishing and wildlife trade have been declined in overall with the improvement in law enforcement. Land encroachment has been a difficulty to halt as population increase, the demand for agriculture land to improve the productivity and land speculation have been a major cause of losing some lands of protected forest and forest protected areas with more human settlement.

c. ***Way to improve NBSAP***: The existing NBSAP is a useful tool directing the way for relevant agencies within the country to develop their projects and programs for the conservation and sustainable use of biodiversity. However, insofar it is time for NBSAP to be taken for a review to ensure relevant emerged issues such as climate change, land degradation, biodiversity and biosafety are well-addressed in the revised version.

Therefore, following steps should be undertaken to review and improve the quality of the NSBAP:

i. The review should be taken place before 2010 so that the revised NBSAP can be report to the CBD Secretariat on time during COP 10. The NSBAP should be set for a period of 5 years before next review is scheduled to take place;
ii. The review should look at relevant policy reports: National Strategic Development Plan, NCSA action plan, NAPA, NAP for land degradation, Wetland action plan, Biosafety and Biotechnology action plan, POWPA, Coral Reef and Seagrass Action Plan, Sectoral Strategic Action Plans on forestry, fisheries, agriculture and animal husbandry to avoid overlapping in setting priority action;
iii. The review should be extended to Cambodia MDGs (goal 7 and 8) so that some targets can be reset. Indicators in the NBSAP should be revised to reflect precisely the development of conservation and sustainable use of biological resources in the country and notably they can be measured or captured the progress;
iv. Incorporate new themes into the NBSAP such as climate change, land degradation and biosafety and possibly extending to Intellectual Property Rights (IPR);

Chapter III: Sectoral and cross-sectoral integration or mainstreaming of biodiversity considerations

1. Intersectoral policy

Cambodia ratified the Convention on Biological Diversity (CBD) in 1995, but the country's history on implementation of the convention related principles dates back to 1925, long before the establishment of Convention and of the Ministry of Environment (1993), when the first protected area in Southeast Asia was established. Although the concept and principles of the convention have been increasingly picking up in many government and sectoral policy documents, biodiversity is not always expressly elaborated and frequently embedded under the term natural resources.

The government policy framework governing Cambodia's implementation of CBD provisions by sectoral agencies and also providing the basis for participation and input by development partners, NGOs and communities of the provisions of CBD lie in the following documents:

- The Government Rectangular Strategy (2009-2013)
- The Cambodia Millennium Development Goals (CMDGs 2001)
- The National Strategic Development Plan (NSDP) 2006-2010
- The National Environmental Action Plan (1998-2002)
- The National Biodiversity Strategy and Action Plan - NBSAP (2002).

Started in the late 1990's Cambodia has undertaken numerous initiatives to embark on a decentralisation process that involves a three-tire system of planning and budgeting focused on the commune, district, provincial and the national levels under the Royal Government of Cambodia's (RGC) overall reform programme. The reform was further reinforced through the government's rectangular strategy announced in 2004 and now entered into the second term of implementation[13].

Governance reforms lay the foundations in which local Commune/Sangkat Councils along with the District and Provincial Councils will have the power to govern, coordinate and provide oversight in resource management, with the technical support of line departments at these various levels. As a result of this effort the demand for natural resources, biodiversity protection and sustainable use in particular, has been picking up and become increasingly seen in the commune development planning processes.

To support the reform process, a national committee to support decentralization and deconcentration is formed with mandates, among other things, to promote mainstreaming of natural resource and environmental management with an overall development objective to achieve sustainable management of natural resources and the environment, assure secure and equitable access to land and natural resources and create opportunity for natural resources related economic activities, thus contribute to poverty reduction.

Organic law (2008) on sub-national administration provides further basis for the establishment of sub-national councils with the responsibility to oversee local development and natural resources management. The law requires the review of the functions at the national level and their delegation to the lowest most effective levels, including those related to natural resource management. Since its passage in mid 2008, a national committee for subnational democratic development with mandate to review the national sectoral

[13] The strategy emphasizes good governance as its core component and one of the four strategic pillars addresses enhancement of agricultural sector through improving productivity and intensifying agricultural sector, and land, forestry and fisheries reforms. The strategy states the need to maximize agricultural production and ensure sustainable use and management of natural resources including Biodiversity. The second phase of it implementation is 2009-2013.

functions for their reallocation to sub-national councils is decreed on Dec. 31, 2008. The election of the district and provincial councils is scheduled to be held in May 2009.

Cambodia Millennium Development Goals (CMDGs) are the national version of the MDGs adopted by member countries to the UN and provide a diagnosis of Cambodia's major policies and programs contributing to each CMDG. The CMDGs are the cornerstones of country's development policies and strategies. The relevant CMDG goals are listed in appendix 4.

The NSDP was developed, based on a results-oriented emphasis, with extensive consultations among all stakeholders - government ministries and agencies, external development partners, civil society organisations - to agree upon overall priority goals and through a series of workshops bringing together all the parties to jointly look at the goals and constraints to be overcome to achieve them. A public investment programme for 2006-2008 was developed to support the implementation of the NSDP. Both plans were approved by the meeting of the council of ministers in January 2, 2006. Benchmark and target values for most relevant CMDG7 indicators at key time horizons are presented in appendix 4.

The Government of Cambodia also commits to improving development effectiveness through a process of harmonisation and alignment. The RGC's Action Plan for Harmonisation and Alignment (H&A) 2006- 2010 has been prepared to implement the Agreement between RGC and Development Partners on Enhancing Aid Effectiveness signed in December 2004. A key part of that Action Plan is the greater uptake of more programmatic approaches to development support. This process has been agreed through discussions between the government and the donor community which supports development in Cambodia. The process is an effort to promote the implementation of output from discussions that ultimately led to an endorsement in early 2005 of so called the Paris Declaration on Aid Effectiveness. It aims at improving aid effectiveness in order to increase the development impact on reducing poverty and inequality, increasing growth, building capacity and accelerating achievement of the Millennium Development Goals.

A mechanism for government and donor coordination collaboratively assisting the government to progress relevant sectoral development in Cambodia was developed, as a result a total of 19 Government-Donor Technical Working Groups (TWGs) were set up in 2004-05 and after for key sectors and thematic areas in order to provide a link between high-level policy dialogue and field implementation or project work. The main responsibilities of the TWGs are to coordinate for implementation of the relevant sectoral plans, develop and report on annual basis of the progress of implementation of TWG action plans and H&A action plans against agreed joint monitoring indicators (JMIs) to the Cambodia Development Cooperation Forum. Each key reform agency thus has to join hand in their respective TWG's secretariat to develop a TWG action plan and H&A action plan including setting JMIs in addition to the sectoral plans developed consistent with the NSDP. The TWGs holds regular meetings, usually one every two months, to exchange information and discuss the different issues in their related fields, including the assessment of the JMIs for which it is responsible.

Examples of TWG activities are provided here. A Four Year Action Plan for Forestry and Environment 2007-2010 has been developed by Technical Working Group on Forestry and Environment (TWG-F&E) and has recently been approved. Informed by the NSDP 2006-2010 and the overall forest policy statement, the prime objective of the plan is the development of a national forest programme (NFP) including coordination and planning of the NFP. The Plan includes a major development element of capacity building activities down to the level of communes and rural people. It involves comprehensive planning and process oriented actions, which will be new challenges to the Forestry Administration (FA) and TWG-F&E.

Similarly, Technical Working Group on Fisheries (TWGF) takes its own similar initiative. It is now in the process to develop a three year action plan 2009-2011 and a strategic plan 2009-2015. In order to enhance

greater uptake of more programmatic approaches to development support, an integrated policy planning and review process for fisheries sector is developed. This is to provide an opportunity for bringing the various development efforts together into a coordinated programme of interventions that breaks away from the current project-driven approach. It also provide basis to stimulate discussion through the TWGF and to help assess the potential of such an approach in the fisheries sector.

TWG-F&E and TWGF as a coordinating and supporting national body links not only the domestic and the donor support to the relevant forest and environmental and fisheries sector respectively, but considers also other important adjacent sectors like management of land, local government and the private sector. TWG-F&E is not replacing genuine line department or ministry tasks, but facilitates inter-ministerial and donor dialogues on the above issues. Other Technical Working Groups including Technical Working on Agriculture and Water, Technical Working Group on Land, and so on totally 19, have similarly developed their own action plans with members from relevant government ministries.

2. Sectroal policy

2.1 Environment Sector

The main instrument mandating MoE to implementing the provisions of CBD includes:

- The law on Environmental Protection and Natural Resource Management, 2006;
- The Protected Area Law, 2007;
- The Royal Decree on Creation and Designation of the National Protected Area System, 1993; and
- Sub-decree on Environmental Impact Assessment; 1999;
- The National Environmental Action Plan, 1998-2002;
- The Environmental Strategic Plan, 2004-2008;

National Environmental Action Plan for 1998-2002 (now being revised) and the National Biodiversity Strategy and Action Plan (NBSAP) of 2002 emphasise the need to prepare and implement management plans for biodiversity conservation and to integrate them into the government's broader policy framework for environmental management. The Environmental Impact Assessment (EIA) system, as set out in the 11 August 1999 Sub-Decree on the Environmental Impact Assessment Process, makes it clear that Ministry of Environment (MoE) is responsible for examining and evaluating EIA reports as well as "monitoring, observing and taking action to ensure that the project owner follows the environmental management plan during the construction, operation and termination" of the project. While MoE is the primary government authority leading the review and evaluation of the EIA reports submitted by project owners, other government institutions, ministries and local agencies with the authority participated in such a review only for the projects that are relevant to their respective sector and within the scope of their jurisdiction.

The EIA Sub-Decree requires project owners to submit an initial EIA and feasibility study for all proposed and ongoing projects that are listed in the annex to the sub-decree and to request MoE to review them. A full EIA and feasibility report are required for projects with potential to have a heavy environmental impact on natural resources, the ecosystem, health and public welfare. While the EIA Sub-Decree itself does not contain standards to guide MoE in reviewing feasibility studies and EIAs for decision, a *prakas* is under preparation that provides full scope of definition on EIA to include social, economic and health aspects and also to cover risk assessment. MoE does not have the authority to reject project proposals, and is limited to providing recommendations to project owners and monitoring the implementation of such recommendations. Please refer to Chapter 2 for actions related to NBSAP and relevant progress and actions undertaken under the sector.

2.2 Forest sector

Forests have been a major sector of the country economy and also involve contested issues. Since 1993-1998, the RGC started activities to consider on development of a national forest policy. In late 1995,

MAFF and the Ministry of Economy and Finance (MEF) conducted a joint study on Forest Policy Assessment in the country with the support from World Bank, FAO and UNDP with the report submitted for consideration by the government in 1996. Since then the RGC expressed strong interest on the forest management policy reform. As a result, a National Committee to Manage and Execute Forest Management Policy (NACOMFOP) was created under the chairmanship of Prime Minister. The Committee was mandated to identify a concept to monitor and assess forest policy, coordinate for forest policy development and investment through Government-Donor Consultative Group meetings, and to launch plan of actions for the implementation of the forest policy by relevant agencies.

The process of developing a National Forest Programme (NFP) has resulted in a national forest policy statement formulated in 2002. The policy statement defines forest resources of the country as permanent forest estate to be managed by promoting conservation and sustainable forest management initiatives that directly contribute to the rehabilitation and conservation. It stipulates that "The Royal Government of Cambodia commits itself to the conservation and management of the country's unique forest resources in a sustainable manner now and for future generations".

The results and the follow up processes of the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 were taken into account to consider the concept of sustainable forest management within the framework of the sustainable development of Cambodia. The RGC acknowledges the multiple perceptions, interests and objectives of the numerous forest interest groups of the country's society, in the region of the Mekong Basin and at the global level regarding the conservation and sustainable management of forest resources. A long term NFP to be implemented has to be consistent with the framework of the Inter-governmental Panel on Forests/Intergovernmental Forum on Forests (IPF/IFF) promoted by the International Arrangement on Forests with the United Nations Forum on Forests and the Collaborative Partnership on Forests.

With support from Asian Development Bank (ADB), a Sustainable Forest Management Project was implemented between 1999 and 2000 when forest concession contracts and agreements were reviewed and developed into a new model of forest concession agreement, supported of the preparation of the community forestry policy and guidelines for its implementation, supported drafting of the new forestry law and supported operation of the secretariat of the NACOMFOP.

Article 8 of the forest law (2002) strengthens the move articulating an imperative for establishment of a National Committee to Prepare National Forest Sector Policy, chaired by the Minister of Ministry of Agriculture, Forestry and Fisheries, with membership from other relevant ministries.

The 2002 National Forest Policy Statement outlines the country's key forest management objectives. The statement is centred on sustainable forest management, with particular reference to the conservation of biodiversity, soil and water resources. It also dedicates appropriate forest lands to a permanent forest estate. A large part of the statement, however, relates to social and development objectives for forest management. The statement anticipates sustaining and increasing the supply of forest products for social and economic development, and enhancing the welfare of the population, while also assuring the traditional rights and privileges of local communities. Communities are expected to undertake greater participatory roles in forest management, protection and development, and the policy emphasizes support to community forestry programmes.

The current forestry reform provides for regimes of protection as a development strategy. The forest policy and law require concession management plans to become vehicles for biodiversity conservation and the establishment of special protection zones. The values of forests for development, such as water regulation and quality, soil erosion control and NTFPs, in addition to their timber are to be given greater emphasis in forest management strategies. Forestry legislation and policy reform: The Forestry Law, Community Forestry Sub-Decree, and Statement of the Royal Government on Forestry Policy are part of a

comprehensive reform package. A forestry policy is currently being developed by MAFF in consultation with related sectors including MOE. Relevant targets for the sector are presented in appendix 4.

Contribution of Forest sector

In 1997, the RGC issued a ban on export of round logs and rough sawn timber and the ban is still valid till present. Four studies were then conduced to explore options for Forest Policy Reform, Forest Concession Management, Logging Control and Log Verification, and Legal Counsel Assignment.

The FA's initiatives established six protected areas covering 1.35 million hectares providing significant contribution to conservation of internationally important biodiversity and the maintenance of development values other than timber. Establishment of the Sarus Crane Reserve and Cardamom Mountains Forest Protected Area, are a significant contribution to conservation of internationally important biodiversity and the maintenance of development values other than timber. The central and southern Cardamom Mountains Forest Protected Areas have been designated to provide a link with Samkos and Aural wildlife sanctuaries in their north and southern extremes.

An intimate working partnership between MoE and MAFF has been initiated for inclusive management of the national protected areas system. For example, the Forest Crime Monitoring and Reporting Project bring MAFF and MoE together to work on an issue of great mutual concern, including on control of illegal exploitation of forest and wildlife resources. The link between the two agencies is established at both the central and local levels and thus, promotes co-operation and collaboration between two important natural resource management agencies in dealing with forest crime. The linkage also bridges the gap between the central and provincial/district levels. This positive contribution of the project needs to be strengthened, however, and expanded in other aspects of planning and management of forests and protected areas. For example, difficulties remain in sorting out management consistency and arrangements for the fish sanctuaries overlying parts of the multiple use area. Another linkage is through representation of the officials from MoE in the Joint TWG-F&E and TWGF.

MAFF has established two “gene pool conservation areas” in existing protection forest areas. All protected areas act as gene banks. The designated two gene pool conservation areas covering forest systems is an important step by MAFF in acknowledging the importance of maintaining endemic plant and animal stocks in situ as a sound investment. To promote species conservation, a list of Cambodia national animals and trees species has been developed and adopted by MAFF including two species of one large mammal, one bird, one turtle, one fish, one palm tree and two plant species.

Community Forestry (CF) has been promoted for over a decade and guidelines were finalised in early 2006, and there are now 264 CF sites covering an area of about 179,020 hectares approved by MAFF; a logging moratorium has been imposed on all existing logging concessions; 2,158 cases of forest crimes have been entered into the case tracking system; 606 offenders have been arrested and sent to courts; 1,636 illegal saws, 2,776 m^3 of round and squared logs and 14,925 m^3 of sawn-wood, as well as 3,044 kg and 6,971 heads of wildlife, were confiscated; 215,521 hectares of forest land have been reclaimed from land grabbing and encroachment; several annual bidding coupes have been prepared to meet domestic timber demands;

Tree planting and forestation activities have all been significantly increased; a sub-decree has been issued on the procedures for using state forest land for tree planting to facilitate and encourage local individuals, communities and the private sector to participate in such activities; the capacity development of local communities has been implemented in parallel with legalisation of existing forestry communities and establishing new community forestry. 15 Tree planting stations produced 2 millions seeding in 2007 for distribution and planted by themselves and military personnel and community. As a result, 1000 ha of

acacia and eucalyptus are planted by the stations, 1,579 ha by military personnel, and unknown areas are planted in national arbour day and by local communities.

Until early 2008 1,231,522 ha economic concessions has been awarded to 98 companies, of which 37 companies have their land concession covering 332,240 ha have been cancelled for lack of proper management plan and activities. 37 of the remaining 61 companies have their development plans approved and 22 currently invest on rubber plantation, teak, polonia, acacia, eucalyptus, cashew, cassava, and sugar cane over 29,696 ha and planted 449,516 teaks along designated roads, and other 21 are on their preparatory stage to implement their plans. Of target 8,338 ha commercial plantation, 7,173 planted in 2007, covering mostly fast growing exotic species such as acacia, teak, with 11 economic land concessionaires (MAFF Annual Report 2007-2008).

2.3 Fisheries sector

A new fisheries law was adopted in 2006. In relation to the old fisheries law, this new law defines fisheries domain based on an ecosystem approach and an emphasis is laid on conservation of fish habitats and resources therein which is contrasting to the old one in which revenue generation was a focus. The fishery policy defines the goal of the fisheries sector to maximize the contribution of sector to the achievement of national development objectives especially those related to improving rural livelihoods of the poor, enhancing food security and the sustainable development and equitable use of the fisheries resource base.

Six priorities addressed in the sector strategy and action plan for 2005-08 emphasis the improvement of the policy, plans, legislation, institution and capacity of the sector; increase access for family fishing; enhancement of fish stock through conservation and research study; promotion of community based fisheries management as a means for livelihood diversification, participatory approach to fisheries management, improving livelihood of poor rural people by enhancing the role of fish in food security, employment and income generation while adhering to Cambodia's international obligations in relation to aquatic resource-use such as CBD, World Trade Organisation (WTO), CITES, ASEAN and with due reference to FAO's Code of Conduct for Responsible Fisheries.

Contribution of Fisheries Sector

Regimes of protection have been introduced as a development strategy in the fisheries sector. The Fisheries Policy and new Fisheries Law reinforce the importance of fish habitat sanctuaries and seasonal fishing controls in maintaining fish stocks and their diversity. Relevant targets for the sectors are presented in appendix 4.

An initial system of 8 fish sanctuaries has been established at national level. The fish sanctuaries play significant role in sustaining the viable population for fish reproduction. 1,900 ha of seagrass beds have been protected results in increase of fish catch in the surrounding areas and illegal fishing practice reduced by 75%. Two crab refuges have been established and protected.

Community Fisheries have been established to facilitate management and use of common fisheries resources. National policies recognise the rights of fisheries communities to manage local fisheries and the importance of their involvement in protection of the resource. Furthermore, they emphasise the importance of increasing habitat protection to ensure the sustainable use of the resource. The Fisheries Law includes provision for community co-management and fish sanctuaries. In total 468 Community Fisheries (CFi), 433 in the inland and 35 in the coastal area established covering 126,390 households and 49% of them are designated fish refuge.

A draft sub-decree on national listing of 57 threatened aquatic species is submitted for consideration by MAFF and for approval by the government. FiA works actively to conserve the dwindling population of Irrawaddy dolphin in collaboration with NGOs and local communities. The result of the last few year effort has seen the decline in death rate of the dolphin calves. Four seahorse spawning grounds have been identified and actions are now in the process to put them under protection.

Similarly, aquaculture production of fish and shrimp is also promoted by FiA, and meets target 40,000 tonnes for 2008, including 156,500 crocodile of 80,000 crocodiles planned for the same year, and 37.2 million of target 50 millions fish seed were produced in 2008. FiA celebrates national fish day in selected provinces on an annual basis when fish seed of indigenous species are released to the wild to replenish existing stock. In 2008, 44,000 flooded forest seedlings and 382,750 mangrove seedling were planted in the Tonle Sap lake and in the coastal area respectively.

2.4 Agriculture sector

Agricultural sector strategic development plan for 2006-2010 is developed along with the Agriculture and Water Strategy (2006-2010) that was adopted in 2007 and defines development goals to include pro-poor agricultural system and community arrangements; effective agro-business; efficient and sustainable and pro-poor management of land and water resources, and water quality; coordinated capacity for agricultural based research, information sharing and technology transfer; and promoting good governance in agriculture. Integrated Water Resource Management is the main principles to support multisectoral use including the use for conservation of biodiversity and ecosystems.

The government's agricultural strategy promotes diversified farming systems, agro-forestry and protection, and management of critical watersheds. Those strategies, and their direct link to the maintenance of protected areas and biodiversity are key to maintaining stability in agricultural systems and therefore to food security. The significant protected area contribution to the supply and regulation of water for agriculture is recognised. Populations are expanding and bringing agricultural activities to the edge of protected areas, including subsistence plots, market gardens and commercial operations. Farmers and commercial operators acknowledge this contribution, although it is treated as a free gift.

System of rice intensification has been an on-going effort to promote in the field trials and farm introduction. 70 field trails on SRI have been conducted in 2007 with 500 households in 5 provinces adopted the approach. The trend of areas for and farmers engaged in SRI is presented in Figure 1 below[14].

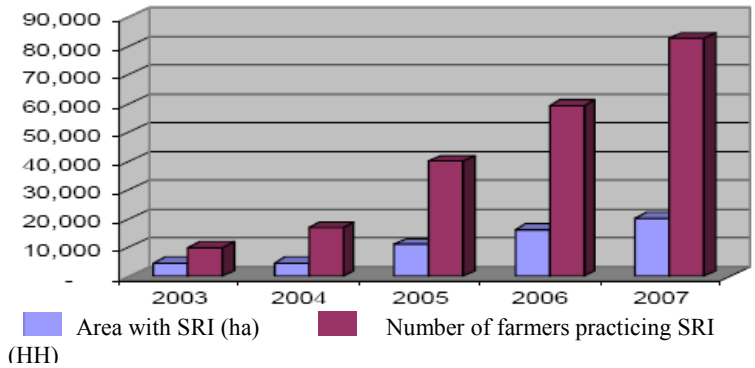

Figure 1: Trend in land for System of Rice Intensification and participating farmers.

Cambodia also sees increasing awareness among farmers on use of improved variety of seeds, organic fertilisers, plant-based pesticides, and compliance with instruction when chemical

[14] MAFF's Annual report, 2008

pesticides are applied. The trend for such practice between 2003 and 2007 is illustrated in Figure 2[2].

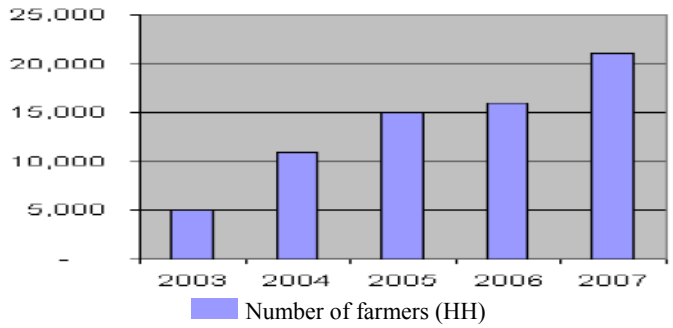

Figure 2: Trend of farmers inclining for environmentally friendly farming practices

2.5 Water Resources sector

The creation of Ministry of Water Resources and Meteorology (MOWRAM) centralises jurisdiction over water resources policy and management. The ministry is responsible for management of fresh and marine water resources, including defining water resources policy and development strategies to support sustainable use, development, and national and international conservation and protection. The comprehensive Law on Water Resources Management prescribes the rights and obligations of water users, proclaims the fundamental principles of water resource management, and identifies the institutions with authority to implement and enforce the law and to regulate the participation of users in the sustainable development of water resources.

The principle of Integrated Water Resource Management requires coordinated multisectoral water use planning including the need for use to conserve of biodiversity and ecosystems. However, there is still a long way to go with regards the implementation of the concept. Regardless of the Mekong River Sustainable Development Agreement (1995), hydrodams are becoming hot issues for countries in the region including Cambodia, where the EIA capacity remains weak. The other achievements include the development and implementation of Farmer Water User Groups.

2.6 Energy sector and mining

Cambodia is in the move to tap its mineral resources including offshore oil, inland mineral deposit and hydropower potential. Article 21, paragraph 2 of the Law on Management of Mineral Exploitation (2001) recognizes the need for environmental protection as stated in the Law on Environmental Protection and Natural Resource Management (1996) and the Sub-decree on Environmental Impact Assessment (EIA) Process (1999) including the need for environmental management plan for each mineral exploitation. However, mineral exploration and exploitation now become a priority and the relevant activities are reportedly almost every where both legally and illegally, including within national protected areas system,

The 1999 Sub-decree on Environmental Impact Assessments requires an EIA to be completed for hydropower plants exceeding 1 MW and for all “petroleum mining research.” The EIA Sub-decree thus provides a level of environmental review for energy development projects. The sub-decree is supported by EIA guidelines for hydropower and other energy development prepared by MIME.

Protected Area review[15] in 2003 found the first two hydropower projects for which the EIA system in Cambodia is not working effectively, with minimum involvement by the GDANCP and protected areas

[15] see www.mekong-protected-areas.org

staff at central government and on site. Consequently, the full effects of the projects for other development sectors, such as tourism, and for other values of the host protected areas have not been adequately studied. In principle MIME follows the Asian Development Bank's EIA guidelines and procedures and seeks to develop contracts for work on energy projects on the basis of an EIA report and the mitigation measures it recommends.

There is no mechanism for the energy sector and beneficiaries to pay for the ecosystem services. The economic benefits of the two hydropower schemes will be substantial. Currently the critical role played by biodiversity and ecosystems in maintaining the productivity and lifespan of hydropower projects has been taken a free service.

Mining in protected areas had previously been prohibited by 1994 Prakas on protected areas but it was repealed in August 2006 to open a way for government revenue generation. Under the Protected Area law (2008), each protected area should first go through a process of zoning its territory; after which it can potentially allow mining activity to take place, but only in those areas classified as 'sustainable use zones'. As a result between August 2006 and January 2008, mining operations had started in five of Cambodia's protected areas, particularly in Mondulkiri Province, a heavily forested area of northeast Cambodia, where a large number of mining concessions have already been allocated.

2.7 Tourism sector

The National Tourism Policy includes the development of infrastructure and conservation of touristic values in protected areas for which MOE and MOT have embarked on a cooperative initiative to develop a master plan for selected protected areas to promote eco-tourism. The recognition of the potential for nature based tourism is implicitly enshrined in a number of relevant instrument including the government Rectangular Strategy, NSDP, NEAP, and Organic law on Sub-national Administration.

Government including local government and communities increasingly recognises the broader development values of natural ecosystems, especially relating to tourism. Already in some parks tourism is bringing in significant revenue for local communities. A number of initial investments have been made in infrastructure in some parks, with NGOs assisting in establishing community based ecotourism in many sites. In 2006-07, three eco-tourism destinations have been established and two more destinations are being developed. Although assessment of tourism potential in some PAs and other sites may have been made, there are no clear guidelines on regulation carrying capacity for tourism activities.

2.8 Environmental Education

Awareness and education on biodiversity is mainly taken in the form of environmental education and awareness. Although this is not explicitly in the education curricula, the education policy opens for mainstreaming of relevant social and environmental issues and biodiversity is one which is most welcomed by the Ministry of Education, Youth and Sports for integration on case by case and to specific locations. As a result, teacher guidebook and students manuals have been developed under various initiatives and have been in used in schools haphazardly throughout the country.

Awareness campaigns are also undertaken on semi-regular basis under an initiative by the MoE's Department of Environmental Education and Communications. TV spots and radio shows, including music and songs dedicated to biodiversity protection are strongly promoted. Awareness is also undertaken through national days such as the National/International Environment Day, National Arbour day, National Fish day, and World Wetlands Day. While such education and awareness campaigns focus mainly on students and public at large, newsletters are also produced under project targeting decision and policy makers, and practitioners.

2.9 Financial sector

As part of effort to increase resources for implementation of CBD, a national capacity self-assessment (NCSA) accompanying with action plan for national capacity development in implement the 3 UN Conventions was developed and adopted by the government in 2007. The RGC recognized that there is a lack of capacity for concerned Ministries, especially Ministry of Environment and Ministry of Agriculture, Forestry and Fisheries to work on biodiversity, climate change and land degradation. It also agreed that capacity is a cross-cutting issue that requires help from relevant ministries, NGOs, Universities and private sector to invest for a sustainable development in Cambodia. A call thus made by the prime minister for a support to implement the NCSA Action Plan from the short term to long term among those who care for biodiversity, protecting climate change, land quality and the poverty reduction.

As noted in Cambodia NR3, it is impossible to calculate the total financial resources allocated by the Cambodian Government (at all levels) to address matters related to the implementation of the Convention of Biological Diversity as the issues related to the Convention lies with many different government Ministries and its line agencies and also it is not possible to segregate the amount spent on matter related to Biodiversity from overall budget of any agency. Nevertheless, the percentage of budget allocation for central Ministry of Environment and Ministry of Agriculture, Forestry and Fisheries increased from approximately 0.27% and 1.06% of the total national budget in 2003 allocated for expenditures at the central level for the two ministries respectively. The budget allocation for line departments of each of the two ministries above at the provincial level also increased from 2003 at 25.3 and 41.15 % of the global budget allocated for each of the two ministries respectively.

Environmental Endowment Fund is established under the Law on Environmental Protection and Natural Resource Management (1996) but is too small and without focus for biodiversity. Although biodiversity is under commercial exploitation for national revenue, the current financial system requires all revenue be put in the national treasury before it is allocated through annual budget process. At field level, however, there are cases where revenues have been generated through eco-tourism initiatives and collection of access fee and the revenue may be used directly at the place where they are generated.

3. Other International Agreements

Cambodia singed on Cartagena protocol on Biosafety in 2003. The progress in relation to the protocol includes adoption of national law on Biosafety (2007), the extension of the mandate of the National Biodiversity Committee to also cover the biosafety issues. Cambodia developed it's Guidelines for Risk Assessment and Risk Management of Living Modified Organisms in 2007 and a draft National Action Plan on Biosafety and Biotechnology is developed in 2008. A Biosafety clearing house is thus established with the Ministry of Environment for sharing information with the CBD secretariat and other Parties to the Protocol (www.cambodiabiosafety.org).

Ramsar Convention:
Cambodia ratified the Ramsar Convention on Wetlands in 1999 along with its listing of three sites of international importance covering three main habitat types: river system, floodplain system and coastal mangroves with MoE serving as the National Administrative Authority. A draft country wetland action plan was developed in 1999 through a participatory process in which relevant agencies and NGOs have full involvement, and attempt has been made to establish a national wetland committee but neither of output of this effort has been formalised. The Ramsar's New Guidelines for management planning for Ramsar sites and other wetlands is adapted.

Nevertheless, through joint effort with relevant national and provincial sectoral agencies, local authorities and NGOs, progress made to date includes a draft management plan has been developed for the three sites. In addition, a comprehensive assessment[16] of the biodiversity conservation significance of the Mekong

[16] Timmins, R. J. 2006. An assessment of the biodiversity conservation significance of the Mekong Ramsar site, Stung Treng,

Ramsar site in Stung Treng province was made to identify resource in place and basis for potential zoning scheme for development of an improved management plan for the site. The assessment also benefited from an application of a test for development of a tool on Integrated Assessment of Biodiversity which provides a useful means for integrated approach to considering frequently heavily dependent on wetlands resources communities into negotiation for planning of the area.

As part of the joint effort with BirdLife International, 1 EBA (Endemic Bird Area) and 40 IBAs (Important Bird Areas) covering 8 different landscapes over approximate total area of 4.4 million ha equivalent to 24% of the total land area have been identified[17]. Of the 40 IBAs, 27 critically endangered species and 29 IBAs support endangered species. The work was done under a collaborative effort between FA, GDANCP, BildLife and WCS.

UNESCO Network of Biosphere Reserve:

Pursuance to Cambodia's nomination of the Tonle Sap lake as biosphere reserve in the UNESCO's global network of Biosphere Reserves in 1997, three biodiversity hot spots in the lake area were designated core areas and framework for management and administration is set in place. As the area is under overlapped responsibility between MoE and MAFF, a Royal Decree was issued in 2001 to clarify responsibilities concerning the Tonle Sap Biosphere Reserve, with MoE is given the mandate for managing three core areas, while FiA/MAFF is responsible for managing the buffer zone in collaboration with other agencies. This collaborative framework has yet to work effectively in practice.

The progress in this area also includes a draft policy for Tonle Sap Biosphere Reserve developed (2007) using multidisciplinary spirit of team from relevant government agencies (FiA and MoE at both national and local levels) and academy (the Royal University of Phnom Penh) to address the multi-disciplinary and multi-sectoral approach to management of the resources and their uses with three goals, i.e., to contribute to biodiversity conservation and habitat restoration, to foster sustainable socioeconomic development and equitable access to assets, and to build supporting system for biodiversity conservation and sustainable development. Immediate success seen includes the cessation of waterfowl hunting and their population increase including of selected species in IUCN red list, reduction of illegal fishing, and legal instrument committing for a review of fishing lot system in every five years in favour of biodiversity conservation purpose.

United Nations Framework Convention on Climate Change (UNFCCC)
Cambodia ratified UN Convention on Climate Change in 1995 and the signed on Kyoto protocol in 2002. In 2005, the country analysed its policies to identify gaps in address climate change impacts in the country and developed National Adaptation Programme of Action to Climate Change (2006). Inventory of GHGs found land use change contributes significantly to the share of national emission with industrial processes and agricultural sectors start to take its toll. In addressing Climate Change issues, a National Climate Change Committee was established (2006) chaired by the Minister of Environment and participated by secretary of state and equivalent from relevant ministries.

In implementing Kyoto protocol, MoE is nominated Designated National Authority with the CCCO facilitate private and community involvement in implementation of Clean Development Mechanism (CDM) through establishment CDM project review and endorsement and publication of manual on CDM related requirements and potentials in the country. The results include 5 projects (1 - biomass, 2 biogass, 1 - heat recovery and 1 hydropower projects) submitted to of which 3 projects are registered with executive board and 2 under validation. All the 5 projects together would have the potential for avoidance and

Cambodia. MWBP. Vientiane, Lao PDR

[17] Seng Kim Hout, Pech Bunnat, Poole, C. M., M. Thordoff, A. M., Davidson, P. and E. Delattre (2003) Directory of Important Bird Areas in Cambodia: key sites for conservation. Phnom Penh: Department of Forestry and Wildlife, Department of Nature Conservation and Protection, BirdLife International in Indochina and the Wildlife Conservation Society Cambodia Program.

capture of 431,956 tonnes CO_2-equivalent annually for 7 years. See www.camclimate.org.kh for more detailed information. Cambodia is among the first country to initiate Reduced Emissions from Deforestation and Degradation through sustainable community-based management of forests. A REED pilot project is established aiming to assist local communities in 12 CF sites in NW of the country.

United Nations Convention to Combat Desertification (UNCCD)
Cambodia is also a signatory to the United Nations Convention on Combating Desertification for which Cambodia had ratified in 1997 with MAFF serving the focal point. The Draft National Action Plan is being developed to combat land degradation, develop capacities on how to sustainably manage land, and integrate landscape approach sustainable land management into national and sub-national policies and planning.

Convention on International Trade of Wild Floral and Faunal Species (CITES)

Cambodia ratified CITES in 1997 with the country CITES Management Authority is established within the Ministry of Agriculture, Forestry and Fisheries (MAFF). Cambodia CITES Scientific Authority is comprised of three agencies including FA for terrestrial species, FiA for aquatic species, and GDANCP for species originated from Protected Areas.

In implementing CITES, Cambodia has developed and implements its national registration and monitoring. The registration process involves submission of a summary document including among others a description of the type and purpose of facility, and number of animals, a letter of endorsement from the Council for Development in Cambodia (CDC) (attached to the letter to the Minister); and a letter of support from the Forestry Administration (FA). For crocodile, the Fisheries Law of 2006 which provides the main legal basis for crocodile management in Cambodia, and a *Prakas* issued by the Minister of MAFF on 21 February 2005 that concluded crocodiles, turtles and frogs are under the jurisdiction of the Department of Fisheries.

Convention on Conservation of Migratory Species
Cambodia has not ratified the Convention on Conservation of Migratory Species. However, the country, through MAFF, signed an MoU on Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and Southeast Asia in 2003 which is a instrument under the Convention on Migratory Species. Effort under the initiative includes joining the East Asian Network for Migratory Birds, producing field guide for identification of marine aquatic animals including marine turtle, and proposing for listing of selected marine turtles as part of the national list of aquatic endangered species (now before MAFF).

Cambodia is also a party to other international conventions including the International Plant Protection Convention (1952). Cambodia is also a signatory to the World Heritage Convention - 1991 with the progress being the designation of Angkor complex in 1992, Preah Vihear temple in 2008, and a series of other sites being prepared for nomination including Banteay Chhmar complex, Banteay Prei Nokor complex, Beng Mealea complex, Preah Khan complex at Kampong Svay; Sambor Prey Kuk cluster, Koh Ker, Angkor Borei and Phnom Da, Uddong, and Koulen. Central Cardamom complex was also once promoted by MoE for listing but has not been materialised on the ground of the need for further study. (For other multilateral and bilateral agreements, see National Report 3).

4. Regional Agreements

Cambodia is a member of Association of South East Asian Nations (ASEAN) and thus is bound by its Agreements, particularly on the Conservation of Nature and Natural Resources. ASEAN's forestry program includes, *inter alias,* the development of guidelines for Criteria and Indicators, trade

harmonization and promotion through the ASEAN Forest Product Industry Club (AFPIC), and work on forest fires and haze.

Cambodia has representation in the ASEAN Senior Officials on Forestry (ASOF) and has been involving in many regional programmes including, among others, international issues affecting forestry and forest products, International Forest Policy Process (IFPP), Peer Consultation Framework (PCF), Social forestry policy, Asia Forest Partnership (AFP), Forestry research and development, Forest law enforcement and governance (FLEG), Monitoring assessment and reporting mechanism (MAR), Clean development mechanism (CDM) in forestry, Asia forest alliance improving the sustainable management of forest resources and biodiversity in Asia, and Regional Custom Cooperation Framework;

The Forestry Administration of Cambodia has involved actively in ASEAN forum on forestry including ASOF meeting, ASEAN Expert Group (AEG) meeting, workshop, etc. Cambodia, in 2005, was endorsed to be a lead country in coordinating activities of the ASEAN member countries to implement the international forest policy and forest regime, and to develop guidelines as a common reference framework for implementation of the IPF/IFF Proposals for Action and the MAR format for SFM in the ASEAN region.

So far, the guideline for the implementation of the Intergovernmental Panel on Forests/Intergovernmental Forum on Forests (IPF/IFF) Proposal for Action and the MAR Format for SFM in ASEAN based on "the ASEAN Criteria and Indicators for Sustainable Management of Tropical Forests" (ASEAN C&I) 2006 are being developed in consultations among ASEAN member countries. The ASEAN Start-up Workshop for the Filed Trial on Application of ASEAN C&I 2006 and "ASEAN Guideline for the Implementation of the IPF/IFF Proposals for Action" was conducted in Phnom Penh, Cambodia in 2007, as an awareness campaign to get involvement from all relevant forestry stakeholders. Within this process, the drafted guideline and the MAR format for SFM in ASEAN are being tested in Cambodia by Cambodian National Task Forces (NTF).

Participation in Policy Round-table Discussion of ASOF from which the ownership and commitment for regional cooperation in forest policy, the common understanding on principles of regional forest policy and on the effectiveness of the International Arrangement on Forests have been gained. The Policy Round-table Discussion gives additional knowledge to Cambodia in its preparation of reports for United Nations Forum on Forests. Cambodia also designates two NPs, Virachey NP and Preah Monivong NP as ASEAN Heritage Parks.

Cambodia also signed up to undertake the goals determined by the *Millennium Resolution* and *Millennium Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region* as part of its commitments to the participation of local communities in fisheries management. The *Resolution, paragraph 5,* states that: "states should encourage effective management of fisheries through delegation of selected management functions to the local level." The *Plan of Action, paragraph 1 of Fisheries Management,* also emphasises that "states should establish and implement comprehensive policies for innovative fisheries management, such as the decentralisation of selected fisheries management functions to the local level."

5. Impacts of biodiversity mainstreaming on poverty:

There is no assessment of how much implementation of biodiversity conservation and development as mainstreamed in the different sectors so far has any particular impact on poverty reduction or social wellbeing. However, a broader picture is given through mid-term review in

2008 of the implementation of National Strategic Development Plan (2006-210) in which biodiversity plays an important role.

Cambodia in the recent years had seen double digit economic growth although it continues to be narrowly based. Poverty level, though remains high, especially rural poverty, has been reducing and thus its pressure on natural resources remains high. An overall poverty level has been estimated to decrease from 34.7% in 2004 to 30.1% in 2007, a reduction of more than 1 percentage point per year. Poverty levels have declined at all sub-national levels including 0.8% from 4.6% in Phnom Penh, 21.9% from 24.7% in other urban areas, and 34.7% from 39.2% in rural areas.

By sector, the increase in productivity of rice per hectare has not been very significant, at a little over the 2005 level, i.e., 2.48 tonne/ha, and is well below the figures for many neighbouring countries. Large potential to increase productivity remains. Fish constitutes 75% of total animal protein diet of Cambodians, and fish and fish products are important sources of nutrition for the vast majority of rural population. About 4.5 million people earn a living out of fishing. The sector contributes about 7% of GDP and employs 10.5% full time and 34% part time of the total employment. Several annual bidding forest coupes have been prepared to meet domestic timber demands. Tree planting and forestation activities have all been significantly increased, particularly to meet local demand for energy and construction materials. The promotion of forest management regimes at national and regional levels, especially the Reduced Emissions from Deforestation and Degradation (REDD) is under way to generate revenue for local community.

Protection and conservation of the unique eco-system Cambodia contribute to sustain livelihood of all Cambodians either directly from employment in the conservation work or from sustainable use of the resources therein. In 2006-07, three eco-tourism destinations have been established and several more destinations are being developed. Community Fisheries (CFi) and Community Forestry (CF) have been promoted for over a decade and now 468 CFi and 264 CFs benefit from access to sustainable use of fisheries and forest resources respectively. Of total 82 Community PAs, 46 become economically viable and thus encourage their involvement in protection and sustainable use of resources in defined zones within PAs. In 2006-07, an area of 3,606 ha of illegally occupied lands was taken back in protected areas. At least further 215,521 hectares of forest land have been reclaimed from land grabbing and encroachment. However, environmental protection and natural resource management continue to face constraints with regard institutional and legal framework, in particular the weak coordination among concerned agencies and authorities.

Chapter IV: Conclusions: Progress Towards the 2010 Target and Implementation of the Strategic Plan

A. Progress Towards the 2010 Target

1. Result-based against 2010 Target

Cambodia has not established its national goals or targets with regard 2010 target as agreed by Parties to the CBD. Some targets were set in varieties of reports and plans, therefore, information of assessing targets is provided through descriptive analysis and assessment other than filling in the matrix table as suggested by the guideline of the 4NR preparation and in its annex II, decision VIII/15.

The entire Chapter IV drew upon the information in the first three Chapters of the report to analyze and synthesize how national priority actions taken to implement the CBD are contributing to achievement of the 2010 target and relevant goals and objectives of the Strategic Plan. Understood that Chapter IV is very much a summary Chapter, which builds on previous Chapters (I, II, and III) and this Chapter is necessary to provide summary information on how Cambodia intended to report against the guidelines for these chapters.

In the matrix table provided in the annex II on provisional framework of goals, targets and indicators to assess progress towards the 2010 biodiversity targets, two more columns have been added. The second column is on "related national targets". With regard to 2010 target, Cambodia has not set any specific targets pertinent to biodiversity conservation and sustainable use. However, at least some targets were set on POWPA and Cambodia MDGs, which are brought to address in the second column. With respect the third column on relevant national indicators, information on the indicators were collected and assessed from NSDP, NBSAP implementation, Agriculture Sector Assessment and Strategic Development Plan, annual reports of water resources, environment, forestry, fisheries, land use, and etc. The forth column is optional given to explain further to indicators addressed in the third column.

Table 13: Provisional framework of goals, targets and indicators to assess progress towards the 2010 Biodiversity Target

Goals and targets	*Related national targets*	*Outcomes*	*Remarks*
Protect the components of biodiversity			
Goal 1. Promote the conservation of the biological diversity of ecosystems, habitats and biomes			
Target 1.1: At least 10% of each of the world's ecological regions effectively conserved.	- Maintaining forest coverage at the 2000 level of 60% of total land area through 2010 and 2015; - Maintaining the surface of 23 protected areas at the 1993 level of 3.3 million ha through 2015; - Maintaining the surface of 6 new forest-protected areas at the present level of 1.35 million ha through 2015.	- Current National PAs size is 26.1% of the country; - Over 6 million ha is a farmland to maintain agro-biodiversity;	- Cambodia set aside more than a quarter of its land for protection and this does not include some of fish sanctuaries, which allow for commercial activities and conservation. - Unaccounted areas of Cambodian PA have been privatized.
Target 1.2: Areas of particular importance to	- By 2009, redesign the protected areas system	- 3 biosphere reserves have been designated and strictly	- Cambodia has not included provincial

Goals and targets	*Related national targets*	*Outcomes*	*Remarks*
biodiversity protected	and corridors as identified through the national assessment of the management effectiveness of the protected areas and gap analysis and complete by 2010 terrestrially and 2012 in the marine environments the establishment of comprehensive and ecologically representative national and regional systems of protected areas.	protected for international significant waterfowls with 46,000ha; - 3 Ramsar sites were established with 54,600 ha; - Other important areas for bird protection were indentified 40 including Ang Trapeng Thmar (12,659ha); - 2 sites designated as World Heritage site in 1992 and 2008 and 9 additional cultural heritages are being prepared for designation; - Central Cardamom area is protected EN species such dragon fish, Siamese crocodile; - Cambodia has several ecosystems in supporting the specie richness: lowland evergreen forest, coastal forest, mangrove forests, swamp forest, coral reef, flooded forest and wetlands; - 23 forest gene sources have been identified and protected.	protected areas into its PA list yet. - 40 important bird areas, important habitats for certain internationally significant species, are not list as conservation areas yet. - An estimate undertaken by Fishery Administration, a number of Giant catfish is 60 heads, Pangasus spp 6,000 heads, Dolphins 100 heads (2008). - Siemese crocodile population is between 200-250 (FFI, 2008); -Wild Asian elephant population is 116 (WCS, 2008) but the population could be more than this according to FFI and CECG, it is between 400-500;
Goal 2. Promote the conservation of species diversity			
Target 2.1: Restore, maintain, or reduce the decline of populations of species of selected taxonomic groups.	- Increase population in the IUCN Red list to 10 by 2010; - At least 840 ha of coral and 9,000 ha of seagrass are under sustainable management by 2016; - 300 ha each of coral reef, seagrass beds and mangroves are effectively protected within the next 3 years (starting 2008); - 7 endangered coral species effectively protected within the next 3 years (starting 2008).	- Managed to recover mangrove forest more than 7,600ha; - Population in IUCN Red list increased to 8; - Cambodia is working on in creasing endangered population of Tiger, Siamese crocodiles, Irrawaddy dolphins, Eastern Sarus crane, Giant cat fish, Pangasus spp, vultures, Asian Elephants, Guar, White-winged ducks, Giant ibis and certain primate species; - Certain potential areas of seagrass and coral are identified and protected; - 13 fish sanctuaries and aquatic protected areas has been established at national and local levels with 24,392 ha; - Two crab refuges have been	

Goals and targets	*Related national targets*	*Outcomes*	*Remarks*
		established and protected.	
Target 2.2: Status of threatened species improved.	- None	- Vegetation was mapped from satellite imagery in 2003. The focal pattern processes, and communities identified in the Biological Assessment of the Lower Mekong Dry Forest Ecoregion studied and suggested for habitat improvement; - The population Eastern sarus crane has increased due to habitat improvement; - 39 species of birds are globally threatened; - 49 species of mammals are globally threatened or near threatened; - Endangered aquatic species 57 in 2009; - PA land: 26.1%	- Cambodia has threatened species of higher plants-29, mammals-24, birds-19, reptiles-10 and fish-7 in 2003.
Goal 3. Promote the conservation of genetic diversity			
Target 3.1: Genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species conserved, and associated indigenous and local knowledge maintained.	- None	- Almost 80% of the area in Cambodia is cultivated with local, unimproved varieties of rice, maize, sesame, vegetables and sweet potato; - Cambodia posses more than 2,000 rice varieties whose genes are conserved at IRRI; - Cambodia has more than 500 species of birds, 834 fish species; 100 species of terrestrial mammals; 28 species of reptiles; and vascular plants 8,260 species in Cambodia, 10% of which is endemic; - Cambodia identified 200 species of flooded forest; - Cambodia has recorded 586 species of plants out of 134 families as medicinal plants for traditional therapies; - Cambodia has at least 90 species of legumes; - 70 coral species were identified in 2008; - Cambodia still exist domestic cattle, water buffalo, wild swamp buffalo, several breeds of domestic pig and exotic pigs (Yorkshire, Hainan). South)-East pony and domestic elephants are still working in remote areas;	Cambodia has not recorded properly on crop species varieties.

Goals and targets	*Related national targets*	*Outcomes*	*Remarks*
		- There are at least 15 tree nurseries and unaccounted number of commercial nurseries produced sandal wood seeds for commercial purposes; - Cambodia has 82,000 ha of rubber plantation as of 2007, scattered in 9 provinces and exported nearly 20,000 tons in 2007; - Original species of rubber is Hevea brasiliensis but 8 sub-species (GT1, IRCA109, PB260, IRCA41, PB217, RRIC100, RRIV2, RRIV4) of introduced species resisted to various soil types existed in the country; - Planted 10,000 ha of trees/annum and distributed over 2 million of tree seeds (at least 18 species) in 2008; - 37.2 million of fish seeds were produced in 2008;	
Promote sustainable use			
Goal 4. Promote sustainable use and consumption.			
Target 4.1: Biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistent with the conservation of biodiversity.	- 20% of the nation's forests will be managed by local communities and to legalize several hundred more sites over the next three years (Chapter III, p.8)	- 46 protected areas communities have managed natural resources in a sustainable manner through ecotourism, tree planting and agro-forestry practices; - 468 CFi, 433 in the inland and 35 in the coastal area established covering 126,390 households and 49% designated as fish refuge; - Conserved 28 species of chili, egg plants, tomatoes, Amarandus (Ptee) , and long bean; - Released 1.3 million fish seeds to ponds and natural habitats in 2008; - Established more than 1,450 bio-gas kilns (2008) to substitute firewood consumption; - DO in coastal water in Cambodia was between 5.00-6.00 mg/l in 2005-06; - All rives along the coastal zones has BOD less than 1mg/l in 2005-06;	

Goals and targets	*Related national targets*	*Outcomes*	*Remarks*
		- Nitrogen deposition was 0.07 mg/l on islands in 2005-06 and in overall rivers in the coastal zone, Nitrogen deposition dropped 0.10 mg/l;	
Target 4.2: Unsustainable consumption of biological resources or that impacts upon biodiversity, reduced.	- By 2009, effective mechanisms for identifying and preventing, and/or mitigating the negative impacts of key threats to protected areas are in place.	- Successfully managed shifting cultivation to a permanent agriculture; - Installed 100 facilities to kill insects (Brown planthopper) causing destruction of rice field; - A number of forest offense cases dropped from 1,152 to 899 in 2005 and 2006 respectively; - A number of fishery offense cases (3,216) also dropped 155 cases in 2007; - Illegal marine fishing practice reduced by 75%;	-Economic land concession; - land grapping; -Weak law enforcement - Most illegal fishing tools were destroyed.
Target 4.3: No species of wild flora or fauna endangered by international trade.	- None	- Cambodian exported 20,000 monkeys in 2008 for researches and studies; - No change much in Cambodia's CITES appendix but managed to change 2 species of slow loris from appendix II to I of CITES and enlisted sandal wood to appendix II;	- Long tailed monkey is in appendix II of the CITES and most of the monkeys exported are from farms. - Cambodia exported monkeys and crocodiles, which are from farms.
Address threats to biodiversity			
Goal 5. Pressures from habitat loss, land use change and degradation, and unsustainable water use, reduced.			
Target 5.1. Rate of loss and degradation of natural habitats decreased.	-None	- Cambodia lost 1% between 1997 and 2002 (IFSR, 2004) and 2% between 2002 and 2005 in average of its primary forest; - Mangrove forest was reduced 17% from 1993 to 2003; - Higher composition of short life fish in the catch due from 1995 to present due to over-fishing of larger fish in the wild; - Certain natural ponds have been filled due to development; - Seasonal flooded ecosystem-Tonle Sap became shallower due to deforestation and mining; - Cambodia paid attention to enhance productivity of a small	Cambodia also encourages agro-forestry activities on the highland communities to increase variety of species.

Goals and targets	*Related national targets*	*Outcomes*	*Remarks*
		number of target species (rich and cash crop species) with effort to eliminate non-desirable species;	
Goal 6. Control threats from invasive alien species			
Target 6.1: Pathways for major potential alien invasive species controlled.	- None	- Cambodia does not have a nationwide measure to control potential alien invasive species such as mimora pigra, water hyacinth, rosy wolf snail, giant African snails, chromolaena odorata, brown tree snake etc. The control measures were carried out individually, not systematically, when farmers need to clear land for farming or increase fish production in their ponds; - Cambodia has 12 invasive fish species of which 50% are introduced;	
Target 6. 2: Management plans in place for major alien species that threaten ecosystems, habitats or species.	As appropriate, but no later than 2010, develop or update management plans for protected areas with the aims of conservation, rehabilitation, prevention, suppression of offenses, and sustainable use of natural resources and ecosystem and built on the above process, to better achieve the three objectives of the Convention	- Insofar, Cambodia does not have plan or concrete policy to get rid of potential invasive species; - Cambodia does have IPM program to help farmers to increase crop productions by killing or preventing pest; - The country assisted certain provinces facing with the invasion of Brown planhoppers;	
Goal 7. Address challenges to biodiversity from climate change, and pollution			
Target 7.1. Maintain and enhance resilience of the components of biodiversity to adapt to climate change.	250,000 ha of degraded forest land will be planted with trees (Chapter III, p.8).	-Cambodia is implementing biodiversity corridors to improve habitat fragmented and corridors of wildlife; -Planted 10,000 ha of trees/annum and distributed over 2 million of tree seeds (at least 18 species) in 2008; - In 2008, 44,000 flooded forest seeds and 382,750 mangrove seeds were planted in the Tonle Sap lake and in the coastal area respectively;	
Target 7.2. Reduce pollution and its impacts on biodiversity.	None	- Nitrogen deposition was 0.07 mg/l on islands in 2005-06 and in overall rivers in the coastal zone, Nitrogen deposition	

Goals and targets	*Related national targets*	*Outcomes*	*Remarks*
		dropped 0.10 mg/l; - Cambodia regularly monitors water quality by collecting water sample in 19 stations throughout the country to analyze 18 chemical substances and microorganisms according to ISO 17025; - Nitrogen deposition in the Mekong River: 0.1-0.3mg/l and DO and DO4was 4-7mg/l in 2001; and annual sediment load was 130 ton/km2.	
Maintain goods and services from biodiversity to support human well-being			
Goal 8. Maintain capacity of ecosystems to deliver goods and services and support livelihoods			
Target 8.1. Capacity of ecosystems to deliver goods and services maintained.		- 931 plant species of identified 2,304 species are used by communities (edible and medicines);	
Target 8.2. Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people maintained.	Reducing the fuel wood dependency from 92% of households in 1993 to 52% in 2015 and 61% by 2010;	- Biodiversity and NTFPs support 42% of low income households and 30% of medium income households; - Fisheries support 65-75% of animal protein intake of households in fishing provinces; - In average each Cambodian consumed 75.6 kg/year of fish protein; - 88% of Cambodians rely on fishing and fishing related activities for livelihood and income generation; - 90% of the population depend on agriculture; - Unaccounted numbers of wildlife products such bile duck of bear, snake, hog task, snake blood, honey, ant eggs, have been used as medicines; - 85.5% of Cambodians still depend fuelwood or charcoal for cooking including those used electricity and gas;	
Protect traditional knowledge, innovations and practices			
Goal 9 Maintain socio-cultural diversity of indigenous and local communities			
Target 9.1. Protect traditional knowledge, innovations and practices.	Establish by 2009 mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas.	- 14 ethnic groups with their languages existed in Cambodia. They live inside PAs and in the jungle. Most of them can speak their own languages and Khmer. - Some traditional knowledge	

Goals and targets	*Related national targets*	*Outcomes*	*Remarks*
		of these peoples has been documented such as method of tapping resin, sustainable fishing practices, and traditional curing certain diseases.	
Target 9.2. Protect the rights of indigenous and local communities over their traditional knowledge, innovations and practices, including their rights to benefit-sharing.	Full and effective participation by 2010, 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	- No indicator on benefit sharing of genetic resources; - Every years NTFPs have been collected by local communities and sold at the market; - The government provided incentives for the change of a behavior in unsustainable shifting agriculture.	
Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources			
Goal 10. Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources			
Target 10.1. All access to genetic resources is in line with the Convention on Biological Diversity and its relevant provisions.	Establish by 2009 mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas.	- No indicator;	
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	By 2009 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.	- Limited information and indicators on benefits sharing from utilization of genetic resources; - There are hundreds of traditional medicine shops operate in Cambodia regulated by Ministry of Health;	
Ensure provision of adequate resources			
Goal 11: Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention			
Target 11.1. New and additional financial resources are transferred to developing country Parties, to allow for the effective implementation of their commitments	-None	- Cambodia annually provides financial support to CBD in the form of membership fee since 1995.	Cambodia has not known what resources exist in their designated PAs and forested PAs because of insufficient financial resources for

Goals and targets	*Related national targets*	*Outcomes*	*Remarks*
under the Convention, in accordance with Article 20.			R&D. This leads to inappropriate value of their PAs in decision-making.
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.	-None	- Cambodia signed a Sister Park Agreement with Sequoia National Park in the US in exchange program of capacity building; - Cambodia has bilateral agreements with ASEAN Member States, ARCBC (now ACB), MRC, and GMS to build capacity in natural resource management; - 100 NGOs and IOs are working on R&D and capacity building in nature conservation and management; - Cambodia also has bilateral agreement with AusAID, USAID, JICA, DFID, DANIDA, CIDA, and SIDA and sent some government officials to study in natural resource and management in their countries; - Cambodia received most technical assistance from UNDP and WB for biodiversity conservation;	In overall, Cambodia's capacity to implement the CBD fell short of sufficiency. In some areas and provincial government, capacity to implement the CBD is still lacking and severely lacking.

Through the matrix table 26, Cambodia has made certain progress toward achieving the 2010 targets in overall. Targets set are not consistent to 2010 and some were set by 2015. Cambodia is not able to achieve these targets but at least made a significant progress towards nearing the achievement of those targets.

The country has maintained 26.1% of the land for conservation and sustainable use of biological resources. In addition, more fish sanctuaries have been identified and protected. Capacity building of the country has increased in term of human technical, organizational, constituency and financial. Human capacity is a concern in provinces that could be trouble in implementing the CBD or NBSAP and it needs to be improved. The government has expanded its capacity conducted R&D and in PAs and marine to know more about biodiversity. The government has increased its capacity to plant more trees every year and release more fish seeds into ponds and natural habitats. Water quality of marine and inland water is still in good condition for aquatic life and consumption but there is a concern about increase of sedimentation every year buildup that could disturb habitats of aquatic life and movement of water.

By and large, despite the government has undertaken some activities to improve the population of endangered species but this is not enough to ensure the population return to the satisfaction level. It is wise that the government formed PA communities, protected forest communities and fishery communities to handle the sustainable use of natural resources. In the absence or limited of fund, the government should recognize more communities to handle this practice. Rights of communities have been acknowledged, their languages and practices of natural resources in sustainable manner have been documented.

The number of forest crimes, despite dropped, is still a constraint to biodiversity conservation and sustainable use. Remarkably, a number of fishery crimes were dramatically dropped but there is an increasing of endangered aquatic species as seen in the proposed sub-decree in 2009.

Aquaculture has increased every year that could support the decline of natural fish stock in terms of consumption. There limited indicators on the in-captive breeding of endangered aquatic species.

The country has fallen short in achieving a target on fuelwood. In 2008, the 85% of the population still depend upon fuelwood as targeted to 61% by 2010. Within less than two years, 24% cannot be achieved unless enough electricity including transmission lines are set up in major rural areas. But encouragement of planting trees is a good culture in supporting the reduction of dependence on natural fuelwood of rural households.

There is no national plan or strategy to deal with alien invasive species but the government has recognized the troublesome cause by these species. More studies are being undertaken on alien invasive species including aquatic and terrestrial. However, there is an on-going IPM program to tackle with pests causing the decline of rice and other crop production.

The increase of industrial plantation could shrink the forestland protected area land such rubber, cashew nut, sugar cane, palm oil, acacia, eucalyptus, jetropha, etc. However, these plantation paly certain roles in climate change and biodiversity, and support local economy.

There is insufficient information of traditional medicine practices in Cambodia, despites 586 plant species have been use in this sector. No clear system that addresses access to and benefit-sharing arising out of utilization of genetic resources.

The increase bio-gas kilns is supportive indicators for biodiversity conservation and sustainable use. This could help reduce rural people becoming less dependency on natural fuelwood and in addition, it can help increase crop production, and minimize the emission of GHGs into the atmosphere.

100 NGOs and IOs are working on biodiversity conservation and sustainable use of biological diversity. Some of them have engaged in agriculture sector. This is stimulus for the country to address certain threats to biodiversity in meeting the obligation of the CBD.

2. Obstacles encountered

2.1 Societal obstacles

In remote areas where infrastructure is not reachable, local communities are not awareness of the obligations to implement the CBD, they just practice use of biological resources based on their own way of living including shifting cultivation. This also prevents them from participation in relevant activities of biodiversity conservation organized by the government such as planning, awareness campaign, and development. Moreover, relevant sectors are not well enough mainstreamed biodiversity conservation and sustainable use into their plans, policies and strategies.

2.2 Institutional, technical and capacity-related obstacles

Institutional capacity of some agencies is not sufficient and needs to be developed. MOE is not adequately empowered as the lead agency in this biodiversity conservation and sustainable use. Dissemination of information between MOE and relevant agencies and vise versa still needs to be improved to support planning and decision-making. Human resources are lacking at provincial level while at the national level still needs to be improved despite some human resource have been built in the past 15 years (1993-2008). Traditional knowledge on the conservation and sustainable use of biodiversity is not appropriately

documented. Scientific research is not sufficiently delivered to conduct pertinent to the species and ecosystem study, economic valuation of the area and the usefulness of the areas conserved due to the lack of funding from the government side.

2.3 Lack of accessible knowledge/information

Insofar, Cambodia has no knowledge of how many species have been lost due to human activities except *Bos sauvali*, *Gaur,* and how many species have been introduced into the country. Dissemination of CBD related information including COP decisions, conferences and meetings at national and provincial levels is not sufficient to ensure greater participation of agencies in implementing the COP decisions. Some agencies do not have a website for stakeholders to access to information. Some agencies have websites but contained out of date of information related to biodiversity, nature conservation, forestry, fisheries, land use and water.

a. Economic policy and financial resources: appropriation of public fund to concerned agencies such as MOE, MAFF and MOWRAM is not sufficient while GEF fund is not fully drawn from the RAF. Cambodia does not have any economic incentives on nature conservation but has incentives for commercial (forest and PA) land concession. In terms of benefit-sharing of genetic resources such as medicinal plants is not in practice yet.
b. Collaboration/cooperation: implementing the CBD, required participation and cooperation of relevant stakeholders, insofar, this did not occur at the satisfied level. Cooperation with Defense and Interior Ministries are essential to mitigate impacts on the conservation and sustainable use of biodiversity.
c. Legal/juridical impediments: despite Cambodia has passed some laws but those laws are required to develop sub-decrees and other by-laws to arrive a full implementation.
d. Socio-economic factors: Cambodia still has constraints on population, whereby approximately 5 million live within 5 km from PA and protected forests and 90% of the poor. This created a lot of pressure to the conservation and sustainable use of biodiversity. Cambodia still lacks of capacity in wood processing in terms of sustainable consumption and sustainable forest management. Some fish sanctuaries have declined their stock due to in appropriate management of resources and the use of illegal fishing equipments.
e. Natural phenomena and environmental change: Cambodia suffers seasonal flood and this may cause by the climate change and the effects of ice melting from Tibet plateau flowing into the Mekong River basin. As a result, the spread of dengue fever occur in rural areas. The rise of sea level in Cambodian coastal area will be 20 cm by 2040 and 100 cm by 2100 (Vietnam conducted the assessment in 2008). This will affect ecosystem in the region.

B. Progress Towards the Goals, Objectives of the Strategic Plan of the Convention

Cambodia does not develop its own goals, objectives of the strategic plan of the Convention. With regard to table 8, all information relevant information and indicators have been collected and plugged in as much as possible to reflect the goals and objectives of the strategic plan of the Convention.

1 Overall state of progress

Cambodia has a significant progress in overall goals and objectives provided in table 27. On the objectives 1.1 to 1.3, the country developed several plans and policies on biodiversity and especially mainstreamed biodiversity into sectoral plans including forestry, fisheries, agriculture, land use, tourism, water resources, energy and rural development. Biodiversity has been integrated into cross-cutting conventions

such UNFCCC, UNCCD and Ramsar Convention. Biodiversity is also mainstreamed into donor agencies' annual operational plans. Cambodia is keen with neighboring countries to add biodiversity into a regional plan and policy such as Vientiane Programme of Action, GMS and Mekong River Commission. At least 100 NGOs and IOs are working directly and indirectly on natural resource conservation in Cambodia.

Relating to objectives 2.1, 3.1, 3.3, and 3.4, Cambodia has improved its capacity to implement the CBD since it became a party. Several plans and policies have been developed to gain a better management. Although, not all PAs and forest protected areas have a management. There is limited ODA allocated to biodiversity except its linkages to poverty reduction.

With regard to objectives 1.4, 2.4, 3.2 and 4.2, Cambodia made two reports to the CBD Secretariat on its implementation of the CPB that included interim report to the CPB implementation and first national report to CPB implementation. Biosafety and biotechnology is new for many Cambodians. Cambodia have been undertaking UNEP funded projects on capacity building to development of the national biosafety framework, in which public awareness for high level to local communities have been outreached by employing media services including TV, radio, brochures, newsletters and website. Cambodia has established its national biosafety clearing-house (www.cambodiabiosafety.org), which contained most up to date information pertinent to biosafety, biotechnology, decision on LMOs and regulation in the country. Cambodia has its own law on biosafety, which allows the country to regulate LMOs intended for various uses. In 2008, Cambodia managed to have a glossary on biosafety and biotechnology and risk assessment and risk management guideline in Khmer. Cambodia is establishing its LMOs Lab under MOE with limited capacity but can perform function to identify LMOs.

With reference to objectives 4.1, 4.3 and 4.4, there are 751 communities participated in natural resource management as a collective force with the government agencies and NGOs to conserve and use natural resources in a sustainable manner. Cambodia integrated biodiversity into primary and secondary curriculum. At university level, at least two universities offer a Master Degree in Biodiversity Conservation. Since 2005, almost every weeks Cambodia TVK aired youth debate on environment and biodiversity related issues. Cambodia paid attention in promoting CDM projects, insofar, the country approved five projects. For more information and indicators on the progress of the country in implementing the goals and objectives of the Convention, a reference should be made to table 7.

Table 14: Goals and objectives of the Strategic Plan and provisional indicators for assessing progress

Strategic goals and objectives	*Possible indicators*
Goal 1: The Convention is fulfilling its leadership role in international biodiversity issues.	
1.1 The Convention is setting the global biodiversity agenda.	- Cambodia every year organized International Biodiversity Day (May 22) to increase value of biodiversity among public; - Other International Days for Water, Wetlands, Ozone, and Environment are also held; - Cambodia has mainstreamed biodiversity into its regional plan with Greater Sub-Mekong Region and ASEAN Vientiane Action Program; - Cambodia developed and mainstreamed global initiative on capacity development into the NCSA Action Plan of the 3 conventions: UNCBD, UNFCCC and UNCCD;
1.2 The Convention is promoting cooperation between all relevant international instruments and processes to enhance policy coherence.	
1.3 Other international processes are actively supporting implementation of the Convention, in a manner consistent with their respective frameworks.	
1.4 The Cartagena Protocol on Biosafety is widely implemented.	- 500 copies of Biosafety Law, RA and RM guidelines have been distributed throughout the

Strategic goals and objectives	*Possible indicators*
	country; - Cambodia has developed a National Action Plan for Biosafety and Biotechnology in 2008 and will be submitted to the Council of Ministers in 2009 for approval; - Most articles of the CPB have been implemented except articles 26-27 but they have been raised in a number of meetings locally.
1.5 Biodiversity concerns are being integrated into relevant sectoral or cross-sectoral plans, programmes and policies at the regional and global levels.	- Cambodia has mainstreamed biodiversity into sectoral plans and policies such as forestry, fisheries, agronomy, animal production, water resources; - Biodiversity Conservation has been integrated into a country operational plan of UNDP,UNEP, UNIDO, FAO, WB,ADB, DANIDA, EU, UNDP/GEF Small Grant Programme, IDRC, USAID, AusAID, MRC and ACB; - Biodiversity Conservation has been mainstreamed into a programme of works of Technical Working Group on Forestry, Environment and Technical Working Group on Fisheries and Decentralization and Deconcentration Programme of the RGC; - There are 100 NGOs and IOs dealing with natural resource management in Cambodia (as of December 2008);
1.6 Parties are collaborating at the regional and subregional levels to implement the Convention.	- Cambodia is the ASEAN Member State, which is willing to ratify the ASEAN Agreement on Natural Conservation but the agreement is being placed in a revising process; - Cambodia is a Party to GMS Agreement and Mekong Agreement, which also tackle biodiversity conservation along riparian counties in the region; - Cambodia is a Party to COBSEA.
Goal 2: 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.	- Financial capacity of Cambodia stands between lacking and severely lacking; - Human capacity stands between lacking and sufficient, but at the national level, the government has better capacity than the provincial government; - Organizational capacity stands between lacking and severely lacking; - Constituency capacity stand between lacking and severely lacking;

Strategic goals and objectives	*Possible indicators*
	- In general at the national level, capacity for planning and implementing the NBSAP is much better than the provincial level. However, poor incentives do not long enough keep competent staff to work for the government.
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.	Cambodia's ODA in environment and conservation was USD8.6 million and funding from NGOs was USD322,000 in 2007. This is supported by Agriculture sector with ODA USD41.2 million, and NGOs USD2.3 million in 2007 (87 projects).
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.	Cambodia has established, maintained and updated a BCH with resourceful information from on-going project activities, legislation and decision on LMOs release into the environment.
2.4 All Parties have adequate capacity to implement the Cartagena Protocol on Biosafety.	- Cambodia promoted public understanding on obligation of CPB for students, government ministries, customer officers, border control officers, NGOs and private companies. - Cambodia has at least 10 labs and research institutes but none of these can perform a reliable test on LMOs items. An LMO Detection Lab is being constructed by MOE and CARDI with some equipment from UNEP (2008-09).
2.5 Technical and scientific cooperation is making a significant contribution to building capacity.	- Cambodia has cooperated with WildAid, WCS, WWF, FFI, and CI to conduct research and conservation activities inside Cambodia PAs system including 10 law enforcement trainings held with approximately 400 rangers (MOE and FA); - Cambodia is able to conduct researches on key species such as Elephants, tigers, vultures, Ibis, Dolphins, Crane, etc and set up system to monitor them; - Cambodia is conducting wildlife breeding of certain endangered species at Wildlife Rescue Center- Phnom Tamao; - Four Marine Research Centers have been established in the coastline to assist the marine aquatic research and conservation; - Cambodia is cooperating with DANIDA and a university in Denmark to conduct a research tropical tree seeds so as to conserve the seeds; - Cambodia has several exchange programs

Strategic goals and objectives	*Possible indicators*
	with the US government, EU, Japan and Australia to improve capacity in PA system management, Environmental impact assessment, Sustainable Forest Management etc. - Most capacity has been transferred from national level to local communities in handling natural resources management.
Goal 3: 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.	- Cambodia developed NBSAP with 98 priority actions; - NCSA Action Plan with 160 priority action over a period of 10 years (2007-2016); - Fishery Development Action plan (2005-08); - Coral Reef and Sea grass Action Plan (2006-2015); - POWPA with 103 priority actions (2008); - Biosphere Reserve Framework Policy - Agriculture Sector Strategic Development Plan (2006-2010); - Cambodia National Forest Program (draft); - NEAP is being revised (2008-09); and several sector policies and protected area management plans have been developed such as Central Cardamom, Mondulkiri Eastern Plain Forest Area, Virachey National Park, Koh Kapik Ramsar Site etc.;
3.2 Every Party to the Cartagena Protocol on Biosafety has a regulatory framework in place and functioning to implement the Protocol.	- Cambodia passed a Biosafety law in December 28, 2007 and promulgated in February 15, 2008. The law addressed five elements: regulatory system, administrative system, system of handling a request to release LMOs into the environment, enforcement and monitoring of impacts from LMOs and public participation, awareness and education. - Cambodia is drafting a sub-decree to manage LMOs in the country in 2008-09.
3.3 Biodiversity concerns are being integrated into relevant national sectoral and cross-sectoral plans, programmes and policies.	Biodiversity concerns are integrated into relevant plans and policies including: NAP, NAPA, Water Resource Policy, Land Use Planning, ASDP, NSDP, Development Agencies' annual plans, and provincial programmes.

Strategic goals and objectives	*Possible indicators*
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.	Biodiversity has been mainstreamed into various plans and strategies to achieve the 3 objectives of the CBD. 98 priority actions in the NBSAP, 160 priority actions in the NCSA Action Plan, 103 priority actions in POWPA, 23 priority actions in Coral Reef and Sea grass Action Plan,118 priority Actions in the ASDP and in related policies and plans of development agencies and NGOs in the county.
Goal 4: 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.	- All 100 NGOs and IOs dealing with nature conservation and environment have conducted awareness activities. They have mainstreamed awareness of nature conservation into their projects and programs at national level and provincial level; - MOE, FiA/MAFF, FA/MAFF, and DAHP/MAFF have run their awareness activities on natural conservation through TV, radio and leaflets. - Cambodia has integrated biodiversity in primary and secondary school curriculum since 2000. At the tertiary level, only two universities offer a Master Course in Biodiversity.
4.2 Every Party to the Cartagena Protocol on Biosafety is promoting and facilitating public awareness, education and participation in support of the Protocol.	- Cambodia conducted 2 biosafety and biotechnology youth debates via TV, one radio talk show, two TV roundtable discussions, one workshop for media and member of Parliament; - Cambodia developed RA and RM Guideline in local language assist relevant ministries assessing risk from LMOs; - Cambodia developed a glossary in Khmer on Biotechnology and distributed to relevant stakeholders for widely; - Cambodia developed biosafety and biotechnology awareness training manual, RA and RM training manual for training; developed curriculum for secondary school.
4.3 Indigenous and local communities are effectively involved in implementation and in the processes of the Convention, at national, regional and international levels.	- Cambodia is drafting a legal framework on access to and equitable sharing of benefits arising out of utilization of genetic resources (2009); - There are 751 communities participate in natural resource management (PA communities, fishery communities, and protected forest

Strategic goals and objectives	*Possible indicators*
	communities). A few representatives are invited to attend national and regional workshops; - Certain traditional knowledge of local communities have been studied and documented by NGOs and IOs;
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.	-Cambodia approved 5 CDM projects undertaken by private sector. The project would indirectly contribute to CBD implementation; - Cambodia million of dollars from private individuals (Angelina Jolie etc.) and companies (Ford Foundation etc.) in the USA and Japan (Rotary Club) by providing fund to PA conservation and sustainable use and tree planting.

2 Analysis of obstacles

Resource mobilization is the main problem in developing its own goals and objectives of the strategic plan of the Convention to ease in the implementation process. Institutional capacity is still weak that is a barrier to achieve in implementing the objectives of the goals. Human capacity is another obstacle preventing them from participating in the implementing each objective such as capacity to undertake a sustained in-captive breeding rather than a one-time show of animal rescue. Limited fund reached communities, who can perform some research and study their traditional practices of utilization of biological resources. This might involve non-economic activities made at the central and middle government line agencies including the degree of governance in natural resource management and leadership.

3. Conclusion

Over 15 years since the first election, organized by the UNTAC in 1993, Cambodia has made a significant progress on overall sectors including environment and natural resource conservation and management. Ministry of Environment and other relevant ministries play a crucial role protecting natural resources, particularly, biological resources in order to fulfill obligation of the Convention on Biological Diversity. The country has increased land for conservation from 18% to more than 26.1% of the total land excluding some fish sanctuaries and some important bird areas. 3 Ramsar sites, 3 core areas of Biosphere Reserves and 2 World Heritage sites have been designated. 9 additional sites have been studied for designation as World Heritages sites. In order to promote wildlife habitats and poverty reduction of local communities in the areas, Cambodia has further launched several projects to provide alternative livelihood of local communities and study at least 3 corridors including coastal-central cardamom, northern plain in Preah Vihear, north-eastern plain in Mondulkiri and several projects around Tonle Sap so as to reduce threats to biodiversity.

Cambodia is a land of species richness in South-East Asia. 8,260 species of vascular plants, 200 species of flooded forest, 2,000 rice varieties, more than 500 species of birds, 834 fish species, 100 species of terrestrial mammals, 28 species of reptiles, 70 species of coral, 90 species of legumes are know in Cambodia. The country has recorded more than 586 species of plants have been used as traditional medicines. 39 species of birds and 49 species of mammals are globally threatened species. 57 aquatic species is being proposed as endangered species in 2009. There are on-going efforts to increase certain wildlife population back into the wild despite some financial capacity.

All four dimensions of capacity of the government, i.e. human technical, constituency, organization and financial is still lacking in arriving at effective implementation of the Convention. Noticeably, human capacity has concentrated central government agencies but capacity at the provincial level is severely lacking. Organizational capacity, i.e. legislation, policies and strategies in place, is better but enforcing those laws and policies is constrained by poverty and political economic activities. This requires improving governance of natural resources and leadership enhancement to gain another grade of Convention implementation.

Cambodia paid attention in increasing its rice production to support economy, which will result increasing income of major poor who rely on natural resources. This has to deal with expanding capacity of irrigation for farming from 25% (current) to 75% or more and taking into account of environmental impacts and relevant negative externalities to aquatic life and human settlement from dam building. However, the country is working on leveling the productivity of industrial crops such rubber, cashew nut, palm oil, acacia, eucatyptus, jetropha, sugar cane, cotton, etc., which could end up in clearing more forestland and land of PA.

Capacity to plant trees 10,000 ha/annum and fish seeds (1.3 million in 2008) release is a remark achievement in increasing production for domestic consumption while reducing threats to natural forest and aquatic life. More variety of species release should be considered to improve the diversity in the wild.

Water quality in coastal area, Tonle Sap and Mekong River is basically good with nitrogen deposition 0.07 mg/l and 0.10 mg/l respectively. However, the increase in sedimentation deposition is a concern to aquatic habitats. Other issues link with this such as mining and deforestation should be addressed. There is a concern of water quality in Tonle Sap near the capital, which is caused by factories dumping effluent into the river without proper treatment prior to the release into the river.

The integration of communities in handling natural resource management is a smart approach to reduce poverty and threats to biodiversity. This practice should continue to some areas that the government is unable to handle effectively.

Despite approving 5 CDM projects, the government should encourage private sector take part in the CDM projects to increase capacity in enhancing land fertility, carbon sequestration, land degradation and species diversity. Implementing REDD and PES should be established to allow funding partners to mainstream their funding into these activities, rather than implementing biodiversity as standalone theme.

While insufficiency of financial resource, mainstreaming biodiversity into sectoral themes is very useful as the country has done in past 10 years. This has built ownership across various sectors, political constituencies, civil society, national, provincial and community level.

In the future, Cambodia should enhance the implementation of the Convention on Biological Diversity through improving the four dimensions of the capacity. These capacities should be raised from lacking to sufficient so that most obligations and COP decisions under the Convention can be taken to effectively implement. The country should increase capacity for a real in-captive breeding program of endangered species for plants, aquatic life, and wildlife. The country should not allow commercial activities of wildlife species, whose status is not known. Agro-forestry practices should be encouraged among communities to contribute to agriculture and biodiversity. Since there is not regulation on access to and equitable sharing of benefits arising out utilization of genetic resources in the country, the government should regulate traditional medicine shops and proper document which and where plants, micro-organisms, fish, wildlife by-products are taken as sources of medicines.

Finally, Cambodia should enhance cooperation with ASEAN member states, GMS countries, MRC riparian countries to implement the Convention especially in terms of capacity building and information sharing. The country should have its own goals, objectives of the strategic plan to assess targets beyond 2010. Only commitment of the government and political determination can establish the enabling environment to prevail this obligation of the UNCBD.

Appendix 1: Information concerning reporting Party and preparation of national report

A. Reporting Party

Contracting Party	Kingdom of Cambodia
NATIONAL FOCAL POINT	
Full name of the institution	***Ministry of Environment***
Name and title of contact officer	***H.E. Chay Samith, Director General***
Mailing address	***General Administration of Nature Conservation and Protection***
Telephone	
Fax	
E-mail	
CONTACT OFFICER FOR NATIONAL REPORT (IF DIFFERENT FROM ABOVE)	
Full name of the institution	***General Administration of Nature Conservation and Protection***
Name and title of contact officer	***Ms. Chan Somaly, Director***
Mailing address	***Department of International Convention and Biodiversity***
Telephone	
Fax	
E-mail	
SUBMISSION	
Signature of officer responsible for submitting national report	***H.E. Dr. Mok Mareth, Senior Minister, Minister for Environment***
Date of submission	***April 10, 2009***

B. Process of preparation of national report

Arriving at the Fourth National Report to CBD took 3 months. The work was carried out by General Department of Administration for Nature Conservation and Protection (GDANCP) and Technical Working Group with close cooperation and assistance from national consultants and relevant stakeholders started the work in middle of January 2009 and ended early April 2009. The assessment and compilation of relevant reports were carried out by Technical Working Group of GDANCP and the consultants in order to reflect in each chapter of the entire report format as

required by the CBD Secretariat and Decision VIII/14. Secondly, the first draft of the report was placed for discussion during the national consultation workshop, took place in March 23, 2009. After integrating feedbacks from participants of relevant agencies, NGOs and academic institutions, the second draft is available for the National Biodiversity Steering Committee to provide comments and approve for submission to the CBD Secretariat.

Appendix 2: Further sources of information

Other sources of information that can be checked to see the progress in the conservation and sustainable of use biodiversity beyond this report in Cambodia are:

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6. Secretariat of Coastal Zone Steering Committee: www.czmcam.org/

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Appendix 3: 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

Overview:
Cambodia has ratified the Convention on Biological diversity in 1995 and the National Biodiversity Strategy and Action Plan was developed and adopted in 2002. Under theme 5 of the Plan: Forest and Wild Plant Resources, no priority actions relevant to implementation of strategy of plant conservation is identified, therefore the country has not implement the Strategy.

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

No national target is set.

Incorporation in the Forest Gene Conservation Strategy: 4.2.2. Species monograph.

An initial list of 284 terrestrial plant species was developed in 2004 by the Forest Administration, and a list of medicinal plants is developed by Ministry of Health. The list is developed mainly to identify seed source location for species either of conservation significance or commercially or locally valuable for protection.

Various projects provide additional list of identified plants species but these have not been included to the currently 2,308 known species of seed plants. It is also known that some 300 plants species are imported and are listed as mostly fruits and ornamental species. Known use of plant species include 328 species as food, 69 species as condiments, 586 species as medicine, and 410 species for other purposes (SoE, 2004).

There is lack of coordinated effort, plan and resources to commission the action. Most activities are project based and thus lack of continued effort to consolidate the results.

Target 2: A preliminary assessment of the conservation status of all known plant species, at national, regional and international levels

No national target is set.

The target is included in the Forest Gene Conservation Strategy:

4.3. Assessment of species distribution and overall conservation status;

4.5. Assessment of conservation status within gene ecological zones.

A preliminary assessment of selected species was made through the forest seed source project as part of the initiative to develop a forest gene conservation strategy in 2003 using a nationally define forest gene ecology to denitrify particularly important species for protection and for their gene conservation.

21 priority tree species identified for their distribution and ecology and also for status against IUCN criteria.

There is lack of programme to take the initiative forwards. With limited resources particularly from donor, efforts are mainly targeting pilot activities and overall conservation than to ensure all information is in place before actions are taken.

Target 3: Development of models with protocols for plant conservation and sustainable use, based on research and practical experience

No national target is set.

Forest Gene Conservation Strategy: 4.7. Identification of appropriate conservation methods.

National Biodiversity Strategy and Action Plan: Priority action 5.1 development of a comprehensive national plan for the management of the forest estate, including revision and update of present legislation regarding forest conservation.

Effort has been made through ecosystem approach to protect the forest landscape both in terrestrial and aquatic environment. Research is encouraged for projects to provide recommendations for sustainable use of plant species.

A rapid assessment and prioritization of protected area management (RAPPAM) methodology is developed to identify priority areas of biological significance for protection. A tool on Integrated Assessment of Biodiversity is tested to assist in assessing wetlands for conservation taking into account the biodiversity, economic and livelihood perspectives.

Plants are not the only elements that deserve attention. In most cases livelihood approach is taken into account where issues to be addressed need to include all resources including wildlife that are potentially under threats.

Target 4: At least 10 per cent of each of the world's ecological regions effectively conserved

No national target is set.

National target involves around the different category of PAs and protected habitats to cover different ecosystems. Incorporate under activity 1.1.3 under goal 1.1 of the national programme of work on PAs (2008).

A national protected areas review was conducted in 2003 to identify linkage of the current PAs system with sectoral development and recommend for a review of current protected areas system for inclusion of poorly represented ecosystems.

Ecosystems are maps and attention have been made toward their protection, e.g., the Cardamom; the Northern and Eastern Plains Dry Forests; the Mekong River and Major Tributaries of Sekong, Sesan and Sre Pok; the Central Lowland Semi-evergreen Forests, the Tonle Sap Inundation Zone; the North-western Mekong Delta Wetlands; and the Cambodia/Laos/Vietnam Tri-border Forests (DF5) of different conservation significance.

As most lands are allocated for specific use, it is difficult to change their status, particularly from non-conservation to conservation. Poor recognition of long term outcome from conservation effort and the need for immediate return is also a barrier. With limited budget available, efforts have to focus on effective management of the existing system.

Target 5: Protection of 50 per cent of the most important areas for plant diversity assured

No national target is set.

It is integrate into the CMDGs, Target 9: Integrate the principles of sustainable development into county policies and programmes and reverse the loss of environmental resources.

Efforts made include identification of important habitats for plant diversity at local and national level and prioritization of important areas in each ecosystem through zoning within PAs and enactment of legislation and regulations to ensure plant protection, through implementation of effective conservation measures.

Too limited knowledge and documented information to form basis for actions and as in target 5 above.

Target 6: At least 30 per cent of production lands managed consistent with the conservation of plant diversity

No national target is set.

One of the four pillars of the Government Strategy is set to promote sustainable agriculture under which agriculture production, and forestry, fishery and land reforms the focus. Forestry reform policy incorporates sustainable forest management requiring the forest concession to develop forest management plan and its submission for review.

37 economic concessions cancelled for lack of management plans and activities. Number of community forestry, community fisheries, protected areas community, and community based resource management developed and function for which local resource use plan incorporates conservation of target species and habitats.

There is a trend for development of agro-industry for which the focus is on monoculture and economic return than to conserve plant diversity. Poor law enforcement is one of major constrains.

Target 7: 60 per cent of the world's threatened species conserved in situ.

No national target is set.

As under target 4, a landscape approach has been taken to cover different ecosystems that depend on each other for their existence and function. Guidelines for engaging local community in forest management are adopted. An integrated pest management and integrated farming system are promoted. Two forest gene conservation areas established and 23 forest gene sources (conservation stands) identified and protected.

There is currently lack of understanding of the threatened plants species and limited resources available to address the issues.

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

No national target is set.

The target involves NBSAP's priority action 13.2: Develop ex-situ conservation capacity for endangered wild plants and cultivars, and 1.2.1: Develop and implement recovery programmes for all endangered vertebrate and vascular plant species (1.2.1)

Establishment of three Research and Development Institutes for Agriculture, Forestry and Inland Fisheries including the forest and fishery research centres;

Establishment of ex-situ conservation stand covering 11 species as a pilot action plan. Over 2000 rice varieties collected and stored at IRRI. Prioritization of plants for potential use in recovery and restoration programmes.

There is limited capacity and facility for ex-situ collection and storage.

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.

No national target is set.

Relevant provisions in the Government's Rectangular Strategy (2004) sets priority to improve agricultural productivity and diversification; NBSAP's strategic objectives include Develop a national database on species at risk (Objective 1.2.3); Reduce illegal hunting and trade of wild animals (2.1); MAFF's Action Plan (2004-08): Strengthening research on new and alternative crops and Conservation of crop genetic resources; and Protection of commercially important and other species is incorporated in various sectoral plans.

Many of pockets of traditional farming practice remain and are under protection through promotion of eco-tourism and securing access to communal land ownership. Cambodia Agriculture Research and Development Institute conduct research to protect and propagate crops of indigenous origin of socio-economic importance.

Increasing pressure from land claims and agro-industry secludes local people from practicing their tradition.

Target 10: Management plans in place for at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems

No national target is set.

A short list of some potential harmful alien species identified. Some limited studies have been undertaken on the presence, distribution and impacts of pests to crops but not on their threats to other biodiversity. A few training workshops were organised to enhance awareness of the presence and potential impacts from alien weeds. Communication with neighbouring country has been made for potential assistance in relevant training on assessing and control of alien species. National biosafety law aimed at control the transboundary movement of LMOs is passed.

There is limited knowledge of and capacity to explore the potential impacts of alien species.

Target 11: No species of wild flora endangered by international trade

No national target is set.

The target is incorporated in NBSAP's Strategic Objective 1.2.2: improve the implementation of the convention on international trade of endangered species (CITES) and minimize impacts of illegal trade on wildlife, and Objective 1.2.3: Develop national database on species at risk.

A joint programme to implement the provisions of the Convention is implemented with TRAFFIC; Guidelines for law enforcement against trade of species under CITES has been developed and implementing regulations have been issued and enforced. List of national species under CITES developed. A declaration issued to guide farm registration and record-keeping procedures, the requirement for a slaughtering permit from the FiA, tagging procedures, export permit provision, destination and buyer details, fees, disposal of unused CITES tags, penalties, and provides the basis for setting domestic export quotas. Hunters are engaged to become rangers and alternative livelihoods are provided to others.

There is poor law enforcement and lack of appropriate procedures and facility to distinguish between farmed and wild species. The sub-decree on Phyto-sanitary Control adopted in 2003, and relevant strategy to address the phyto-sanitation has been developed, however it is poorly enforced and issues related to import of exotic plants are poorly controlled.

Target 12: 30 percent of plant-based products derived from sources that are sustainably managed

No national target is set.

Promotion of community forestry; Code of Practice for Sustainable Forest Management was adopted in 1999 and in use; Forest concession performance was completely reviewed and forest concessions are required to submit their management plan or face removal.

A set of tools available for Cambodia and its implementation to ensure sustainable forest management include: Legislation (2002); National Forest Policy (2006); National Code of Forest Harvesting (2000); RIL guidelines (ground-based crawler tractor or rubber-tired skidder systems); Silviculture systems prescription, Forest zoning, RIL Demonstration forest; Code and RIL training; and is conducting research to support code and RIL Implementation.

Difficulty lies with lack of system for certification and to track down the source of products. Silviculture is not well implemented.

A significant problem created by a lack of post-harvest management, is transmigration into forest areas, made possible by harvesting roads. This results in further wood and non-wood forest products extraction causing progressive forest degradation and deforestation.

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.

No national target is set.

The rights of indigenous people for access to land and resources are recognised in the various laws including land law, forestry, and fisheries law. Indigenous people's access to communal land is secured. Local people are encouraged to participate in community forestry, community fisheries and community based eco-tourism. Research on local farming practices is conducted including research by villagers on local use of plants to support their livelihood and treatment of illnesses.

There lack of understanding of the need for conserving plant resources and associated indigenous and local knowledge. There is stronger influence by commercial interest in the remote areas where indigenous communities live.

Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes.

No national target is set.

Various educational and training programmes developed and implemented for which plant diversity and conservation needs incorporated including in school curricula, informal educational programmes, newsletters, and other media. Promotion of awareness on plant based traditional medicines.

Most of the education and awareness work is project based and there is no assessment of impact of such activities.

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.

No national target is set.
National tree seed nursery and forest gene equip with necessary facility and equipment including training.

Most effort is on production than on conservation. Insufficient government staff received training to work on plant conservation.

Target 16: Networks for plant conservation activities established or strengthened at national, regional and international levels

No national target is set.

Cambodia adhered to the International Plant Protection Convention in 1952; Cambodia also adopted ASEAN Agreement on the Conservation of Nature and Natural Resources, Mekong River Commission; and Partnerships in Environmental Management for the Seas of East Asia.

An Open Source of Weeds Assessment in Lowland Paddy Rice Field in Cambodia is set to initiate a long-term cooperation between European and Indochina' s institutions, involved in IT& C application in agriculture , through a project based on the transfer of IT& C to the extension services and the farmer level. This will be followed by a sustained network for the transfer of know-how between European tropical area (Reunion Island) and Indochina. To promote cooperation between two southern countries in the area of applied IT &C for agriculture; namely Cambodia and Lao PDR.

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

In January 2008, the Ministry of Environment had, in collaboration with other relevant government agencies and conservation NGOs active in the country, developed and approved a National Programme of Work on Protected Areas to respond to the call in the seventh conference of the Parties to the Convention on Biological Diversity. The programme follows the global goals and targets and identifies 103 priority activities that can be used by all relevant line ministries and agencies and also NGOs partners for translating into activities under their respective mandate and programmes or projects.

Goals and Targets of the Programme of Work on Protected Areas

Goals	Target	Indicators of Progress/Constraints
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 [18]/ 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	Progress to date: - PAs system of 23 PAs (>3 mill ha) and additional 6 (1.34 million ha); 8 FS 23,544; - Biosphere Reserve, 3 Ramsar sites; - 40 IBAs, 23 forest seed sources; - Gap analysis of PAs in 2006 with a strategic plan for addressing the findings; - 2 World Heritage Sites established in 1992 and 2008, 9 additional sites being prepared, Challenge - The system is too big to be effectively manage; - Different ministries with different policy and regulation managing PAs; - Prospect for further expansion or adjustment is narrow; - Institutional challenge of authority.
1.2. To integrate protected areas	By 2015, all protected areas and	Progress to date:

[18]/ Terrestrial includes inland water ecosystems.

Goals	Target	Indicators of Progress/Constraints
into broader land- and seascapes and sectors so as to maintain ecological structure and function.	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.	- Cardamom complex, Conservation Area Landscape Management (CALM) of Northern Plain, Srepok wilderness area and Phnom Prich, SW Elephant Corridor (SWEC) programme; - Coastal waters and islands included in a National Park; - A corridor between Preah Monivong and Kirirum national parks; - A network of PAs and tiger-friendly buffer zones and corridors; - Ministries and agencies incl. sub-national authority and local communities; - Biodiversity planning manual developed with ecosystem approach in making, strategy for participation, and reporting procedure; <u>Challenge:</u> - A shift is needed from a defensive mode looking inward at the immediate challenges of protected area management, to looking beyond their boundaries and actively engaging in the planning and priority setting of development in surrounding landscapes. - Limited consideration, although there is appreciation, of the contribution of PAs to the surrounding areas and/or other development sectors and vice-verse; - Increasing problem of land claim and people migration, and large concession within the landscape.
1.3. To establish and strengthen regional networks, trans-boundary protected areas (TBPAs) and collaboration between neighbouring protected areas	Establish and strengthen by 2010/2012 [6]/ trans-boundary protected areas, other forms of collaboration between neighbouring protected areas across national boundaries and regional	<u>Progress to date:</u> - 7 potential trans-boundary protected areas identified; - GMS Biodiversity Conservation Corridors recognises the tri-border forests of the Virachey - Dong Am Pham - Chu Mom Ray, Country position paper drafted; - 2 PAs designated as Asean Heritage Park;

[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.

Goals	Target	Indicators of Progress/Constraints
across national boundaries.	networks, to enhance the conservation and sustainable use of biological diversity, implementing the ecosystem approach, and improving international cooperation	- Trans-boundary marine conservation between Kampot and Phu Quoc island being discussed; - Mekong agreement 1995; - FOA Regional Code of Conduct for Responsible Fisheries; Challenge: - Limited capacity and funding for implementation; - Much of the trans-boundary and ecosystem approach activities rely on external funding and technical expertise from NGOs.
1.4. To substantially improve site-based protected area planning and management.	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	Progress to date: - PAs management plans developed as part of the National Legal and Planning Framework and some into landscape-level strategy (eg. CALM) - 18 PAs boundary demarcated; some with official mapping; - 3 Core areas of TSBR under management; - 3 Ramsar sites have some form of management plan; - Guidelines: CPAs, Small Grant, Ecotourism Strategy ; Eco-trail Construction and Maintenance manual, Signage Design and Specifications Manual, and Ranger-based data collection manual; - Species management include Dolphin, Crocodile, Giant Cat Fish, Vulture. Challenge - Inadequate and non-systematic training - particularly in the field; - Poor resourced staff; - Managerial challenges.
1.5. To prevent and mitigate the negative impacts of key threats to protected areas.	By 2008[a], effective mechanisms for identifying and preventing, and/or mitigating the negative impacts of key threats to protected areas are in place.	Progress to date: - Increasing number of PAs have zoning plans; - Increased patrolling, apprehension of violators; - A biological monitoring program (eg. Seima CA); - Wildlife Rapid Rescue Team; - Significant awareness raised.

Goals	Target	Indicators of Progress/Constraints
		Challenge - Weak enforcement due to limited resources, limited incentives; - Recent interest for private investment, particularly in mining operation and hydropower development; - Policy decision ruled out existing regulation in force.
2.1. To promote equity and benefit-sharing.	Establish by 2008[a] mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas	Progress to date: - Economic valuation: Ream NP and Stung Treng Ramsar site; - Guidelines for Community based Organisations; - Alternative livelihood programmes, engagement in PA work, CBET, Eco-friendly agricultural system (eg. in SWEC). Challenge - Most activities are project based and lack long term perspectives. - Limited attention on ecosystem services.
2.2. To enhance and secure involvement of indigenous and local communities and relevant stakeholders.	Full and effective participation by 2008[b], 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	Progress to date: - National inter-ministerial committee on consultation and conflict resolution in WS and NP; - Provincial sub-committees established (eg. VNP, Lomphat WS); - 46 of total 82 Community PAs become economically viable; - 264 CFs to manage 179,020 ha forest; REDD project cover 12 CFs being tested; - 468 CFi, 166 Community Fish Refuges developed; - Engagement in income earning conservation activities; - An mapping programme to delineate specific land use areas; - Environmental education and awareness; - National awareness campaign aimed at reducing demand for wildlife products; - Community Agriculture Development Project.

Goals	Target	Indicators of Progress/Constraints
		Challenge: - Securing rights to participation while reinforcing the obligations and accountability that comes with it.
3.1. To provide an enabling policy, institutional and socio-economic environment for protected areas.	By 2008[a] 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.	Progress to date: - PAs law passed in 2007; - Mainstreams biodiversity conservation in relevant sectors such as tourism, forestry, agriculture within a landscape (eg. CALM); - A tourism management strategy (eg. VNP); - Forestry and fisheries reform continue to provide basis for conservation; - Law on Subnational Administration, 2008, review functions and responsibility decentralization. Challenge: - Regardless, increasing pressure exists, e.g., from development and mining.
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	Progress to date: - Community land-use tenure, community contracts and incentives for biodiversity supportive land-use practices to mainstream biodiversity into the forestry and tourism productive sectors (eg., CALM); - Education (Master) at RUPP; - National ranger training built at Bokor NP; - About 1,100 staff trained between 2000 and 2006 including Ecotourism, First aid, GPS, Land-use planning, Law and legal procedures, Natural resource management, Project cycle management, Participatory rural appraisal, Procurement, Ranger-based data collection and MIST database, Wildlife survey. Challenge: - Institutional capacity remains largely limited.
3.3. To develop, apply and transfer appropriate technologies for	By 2010 the development, validation, and transfer of appropriate	Progress to date: - Biodiversity values being introduced into landscape level land-use planning processes; - Building the capacity of provincial departments

Goals	Target	Indicators of Progress/Constraints
protected areas.	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.	and authorities and integrate specific projects initiatives established provincial planning processes; - Sister park, e.g., with sequoia. Challenge: - Lack of appropriate incentives for retaining staff.
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.	Progress to date: - Collection of service and entry fee, eg. Kirirom NP, Prek Toal; VNP; - Guidelines for budget planning manual for PAs; - A Financial Procedures Manual, incl. Manuals which cover budget planning at PAs level and at national level; - Concept for the development of a sustainable financing strategy. Challenge: - Non-systematic application of revenue generation.
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	Progress to date: - An Outreach Strategy was developed in 2003; - A manual for "General Environmental Education at District and Provincial Level developed in 2005; - A series of Video and TV and Radio broadcast; - Environmental awareness forums with key stakeholders held; - Provision of formal environmental education including teachers manual and practical tools for schools flipchart & toolkit; and information guidebook; - Developing and testing environmental education

Goals	Target	Indicators of Progress/Constraints
		and awareness methodologies and tools. Challenge: - The impacts from such effort remains limited as people who are largely poor still have to depend to large extent on the resource to meet their immediate need.
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.	Progress to date: - Adoption of FAO code of conduct for sustainable fisheries; - Participatory local land use planning; - Manual for the construction and maintenance of eco-trails; - Manual for design and specifications of park entry and directional signs; - Step-by-step guide for law enforcement; - Code of conduct for eco-tourism rangers developed. Challenge: - The criteria are not applied in a systematic manner as capacity remains limited.
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 trans-boundary protected area levels adopted and implemented by Parties	Progress to date: - RAPPAM (Rapid Assessment and Prioritization of Protected Area Management) methodology; - World Bank and WWF site-level management effectiveness tracking tool (Stolton et al. 2003) adopted. - Establishment of a Long-Term Wildlife Monitoring Programme for Phnom Prich Wildlife Sanctuary (PPWS) and the Eastern Mondulkiri Biodiversity and Genetic Conservation Area (BGCA). Challenge: - The adopted framework is not uniformly applied due to capacity limitation.
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	Progress to date: - The MIST database, which contains data on biodiversity, illegal activities, ranger performance and tourism, is used at the protected area site level and at GDANCP;

Goals	Target	Indicators of Progress/Constraints
	trends at national, regional and global scales, and to assist in evaluating progress in meeting global biodiversity targets	Challenge: - Overall there is no systematic actions in place to generate information as baseline against which trend can be assessed.
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	Progress to date: - The data collection standards and tools tested and implemented including ranger-based data collection, community-based data collection, visitor data collection, and specific monitoring programmes. Challenge: - Limited financial resources are the main barrier to advance such effort.

[a] National Target 2009;
[b] National Target 2010;

Appendix 4: National indicators used in the report

a. CMDG: of overall 9 goals and 106 specific targets, goal 7 on Ensuring environmental sustainability articulates the following most relevant targets:

- Target 7.1: Maintaining forest coverage at the 2000 level of 60 % of total land area through 2015
- Target 7.2: Maintaining the surface of 23 protected areas at the 1993 level of 3.3 million ha through 2015
- Target 7.3: Maintaining the surface of 6 new forest-protected area at the present level of 1.35 million ha by 2010 and through 2015
- Target 7.8: Increasing the surface of fish sanctuaries from 264,500 ha in 2000 to 580,800 ha in 2015.

b. Benchmark and target values for most relevant CMDG7 indicators at key time horizons as presented in NSDP 2006-2010

Indicators	Benchmarks		Targets		
	Value	Year	2005	2010	2015
7.1. Forest coverage as a percentage of total area	60	(1)	60	60	60
7.2. Surface of protected areas (PAs) (million hectares)	3.3	1993	3.3	3.3	3.3
7.3. Surface of 6 new forest PAs (millions hectares)	1.35	1996	1.35	1.35	1.35
7.4. Number of rangers in PAs	600	2001	772	987	1,200
7.5. Number of rangers in forest PAs	500	2001	500	500	500
7.6. Proportion of fishing lots allocated to local communities (percent)	56	1998	58	60	60
7.7. Proportion of community-based fisheries	264	2000	364	264	589
7.8. Surface of fish sanctuary (thousand hectares)	264	2000	582	581	581
7.9. Fuelwood dependency (percentage of household)	92	1993	70	61	52

(1) The benchmark is the average forest coverage in the last decade (1992-2002).
Note: Figures have been rounded.

c. Relevant target set for Forest Sector

- Maintaining 60% forest cover;
- Maintain forest conservation areas at 1.35 million ha by 2010
- Reduce the household dependence on natural wood energy to 61%
- Plant trees for socio-economic use of 40,000 ha by 2010 (minimum 10,000ha per year);
- 20% of the nation's forests to be managed by local communities and to legalize several hundred more sites over the next three years.
- Protected area system to protect biodiversity and endangered species: Increased 5000 ha forest annually;
- Community forestry as a sound, transparent and locally managed program: 50,000 aware of sustainable use of forest resource and advantage of forest resource annually
- 250,000 ha of degraded forest land planted with trees;
- Clear guidelines for forest resource management;

d. Relevant target set for Fisheries Sectors

- At least 840 ha of coral and 9,000 ha of seagrass are under sustainable management by 2016;
- Incidence of illegal activities that cause harm to coral and seagrass reduced by 50%; overall awareness increased by about 60% to reduce damage from human impacts;
- Mangrove planting is one of continued effort with local communities; 45.5 ha planted in 2008;
- Fisheries refugia, 1- for blood cockle, 1 - for crab, and 1 - for Siganus spp fish;
- 1,900 ha of segrass placed under effective protection;
- 300 ha each of coral reef, seagrass beds and mangroves are effectively protected within the next
- 3 years; and 7 endangered species effectively protected within the next 3 years.

The development of indicators for (a) and (b) above was part of the NSDP and CMDG development process for which guidance and coordination were provided by Ministry of Planning (MoP). As part of the process, each sectoral ministry was advised to develop its own chapter with indicators developed follows each ministry planning mechanism and with comprehensive discussion and analysis within each sector, and then consolidated through inter-ministerial meeting organised by the MoP. For more information of the process, please refer to the NSDP 2006-2010. As for the (c) and (d), the indicators were developed and updated as part of the sectoral strategic and annual planning process[19]. The sectoral indicators here are more for each sector to monitor its own progress but provide good basis for moving toward achieving national targets.

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[19] For basis on which forestry sector indicators are developed see Per Christensen. 2007. Report on Organizational Analysis of the Forestry Administration in the Ministry of Agriculture, Forestry & Fisheries in the Royal Government of Cambodia. Forestry Administration and the Centre for Forest & Landscape, Denmark in www.twgfe.org and for Fisheries sector see TWF. 2006. Department of Fisheries institutional review. Secretariat of the Technical Working Group on Fisheries. Phnom Penh. www.twgf.org