



Kingdom of Cambodia

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THE ROYAL GOVERNMENT OF CAMBODIA

THE FIFTH NATIONAL REPORT TO THE
CONVENTION ON BIOLOGICAL DIVERSITY

2014

National Biodiversity Steering Committee

PREFACE

The Royal Government of Cambodia under the leadership and wisdom of **Samdach Akka Moha Sena Padei Techo Hun Sen**, Prime Minister, continues to view natural resources, including biodiversity as part of its efforts and commitments to reduce poverty and enhance economic development for Cambodia. In this regard, the Royal Government of Cambodia has developed relevant laws, policies, strategies and plans to support the protection and management of natural resources for development in a sustainable way, while meeting people's demands and alleviating poverty. Regional and international agreements and conventions, have been ratified, including the UN Convention on Biological Diversity (UNCBD), UN Framework Convention on Climate Change (UNFCCC) and UN Convention to Combat Desertification (UNCCD).

In response to commitments under the UNCBD, this Fifth National Report is developed based mainly on its guided outlines: (1) Cambodia's Exceptional Biodiversity, (2) NBSAP Implementation and Mainstreaming Biodiversity and (3) Progress toward the 2020 Aichi Biodiversity Targets and Contributions to the Relevant 2015 Targets of the Millennium Development Goals. The information needs were met through contributions and efforts from the concerned governmental ministries and non-governmental agencies working in the fields of environment and natural resources, in particular biodiversity in the Kingdom of Cambodia.

On behalf of the Ministry of Environment and the National Biodiversity Steering Committee, I would like to express my high appreciation to Excellencies, ladies and gentlemen from the line ministries, international organizations, non-governmental organizations, development partners and academia who provided data and information, including supporting references for the successful development of this Fifth National Report.

I would like to acknowledge the National Biodiversity Steering Committee members for their facilitation and coordination of the remarkable interventions on biodiversity activities and development of this report, with support from the Biodiversity Technical Working Group.

My special thanks are due to other relevant stakeholders and the experts for their efforts in contributing to important inputs and comments on the preparation of the report so that it even truly reflects the biodiversity situations in the Kingdom of Cambodia. I would like to express my sincere thanks to UNEP/GEF for its important cooperation and financial assistance for this successful report preparation.

Last but not least, although biodiversity conservation and protection in the Kingdom of Cambodia has been remarkably improved; there are still some constraints to be addressed. Taking this opportunity, I wish to appeal to all stakeholders from the governmental institutions, United Nations agencies, national and international organizations, development partners, private sectors and civil society as well as academic establishments to work hard together to ensure that our valuable natural resources continue to be the sustainable capital for the next generations and sources of poverty reduction and economic development.

Phnom Penh

Say Samal

Minister of Environment, and
Chairman of National Biodiversity Steering Committee

ACKNOWLEDGEMENT

This Fifth National Report to the Convention on Biological Diversity is the result of combined efforts and commitments made by the government institutions, local committees, and non-governmental agencies.

The Department of International Conventions and Biodiversity (ICBD) express our most sincere thanks and appreciation are due to **H.E Say Samal**, the Minister for the Ministry of Environment and Chairman of National Biodiversity Steering Committee (NBSC) for his leadership and initiatives on nationwide conservation and protection of natural resources, especially biological diversity which is part of Royal Government's commitments to the Convention on Biological Diversity as well as constant encouragement and support for the successful development of this report. Special thanks to the members of NBSC for their guidance and advice to ensure the quality of Cambodia's Fifth National Report (5NR) to the Convention on Biological Diversity.

We would like to express our deep thanks to **H.E Chay Samith**, Delegate of the Royal Government of Cambodia in charge of the General Department of Administration for Nature Conservation and Protection, **H.E Ouk Seiha**, Chairwoman of the multi-sectorial Technical Working Group on NBSAP Updating (TWG-NBSAP), for their supports and encouragement. We also thank to the members of TWG-NBSAP, and national and international consultants for their commitments and contributions to the whole preparation and development of 5NR process. Without their regular and effective involvement, this report would not be sufficient and produced on time.

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I also would like to thank the members of Secretariat of the NBSC and ICBD's staffs for their commitments, hard work, active, and patience for the successful development of this report.

Finally, I wish to thank all experts very much for their valuable time and efforts to provide significant ideas and feedbacks during the preparation and development process of the Fifth National Report to the Convention on Biological Diversity.

Phnom Penh, August 2014

Ms. Somaly CHAN
Director

TABLE OF CONTENT

Table of Contents

PREFACE	I
ACKNOWLEDGEMENT	II
TABLE OF CONTENT	III
LIST OF TABLES	V
LIST OF FIGURES	VI
EXECUTIVE SUMMARY	VII
INTRODUCTION	1
PART I: CAMBODIA’S EXCEPTIONAL BIODIVERSITY	2
BIODIVERSITY STATUS	2
<i>Species Status</i>	2
<i>Protected Areas Status</i>	4
<i>Forest Status</i>	6
BIODIVERSITY IMPORTANCE & TRENDS	8
<i>Gross Domestic Product</i>	9
<i>Agricultural Production</i>	9
MAIN THREATS TO BIODIVERSITY	13
<i>Habitat Loss</i>	13
<i>Politics: Stability & Will</i>	15
<i>Climate Change</i>	15
<i>Water: Changes in Hydrological Regime</i>	16
<i>Alien Invasive Species & Genetic Erosion</i>	16
<i>Marine Threats</i>	17
SOCIO-ECONOMIC AND CULTURAL IMPLICATIONS OF BIODIVERSITY CHANGES	17
<i>Business As Usual: Biodiversity Scenario</i>	21
PART II. NBSAP IMPLEMENTATION & MAINSTREAMING BIODIVERSITY	23
CAMBODIA’S NATIONAL BIODIVERSITY STRATEGY & ACTION PLAN	23
CAMBODIA’S BIODIVERSITY POLICY AND TARGETS	24
IMPLEMENTING CAMBODIA’S NBSAP	29
<i>Protection of Natural Resources: Protected areas, endangered species, Ex-situ conservation</i> 29	
<i>Freshwater Fisheries and Aquaculture</i>	30
<i>Coastal and Marine Resources</i>	30
<i>Forest and Wild Plant Resources</i>	31
<i>Animal Wildlife Resources</i>	33
<i>Agriculture and Animal Production</i>	35
<i>Energy Resources</i>	35
<i>Biotechnology and Biosafety</i>	37
<i>Tourism</i>	38
<i>Environmental Security</i>	39
<i>Land Use Planning</i>	40

<i>Water Resources</i>	40
<i>Climate Change and Biodiversity</i>	42
<i>Community Participation</i>	43
<i>Awareness, Education, Research Coordination and Development</i>	43
<i>Legislation and Institutional Structure</i>	46
<i>Quality of Life and Poverty Reduction</i>	47
REGIONAL COLLABORATION	49
PART III. PROGRESS TOWARDS THE 2020 AICHI BIODIVERSITY TARGETS AND CONTRIBUTIONS TO THE RELEVANT 2015 TARGETS OF THE MILLENNIUM DEVELOPMENT GOALS	50
PROGRESS TOWARD THE IMPLEMENTATION OF THE STRATEGIC PLAN FOR BIODIVERSITY	50
CAMBODIAN (AICHI) BIODIVERSITY TARGETS & INDICATORS AND PROGRESS TO IMPLEMENTATION	50
PROGRESS IN ACHIEVING THE CMDGS	57
<i>Summary of Progress on Selected CMDG Indicators</i>	58
FORESTRY ADMINISTRATION STRATEGIC PLAN 2014-18 PROGRAM INDICATORS.....	63

LIST OF TABLES

Table 1: Species List Estimates.....	3
Table 2: IUCN Red List Species in Cambodia (2011-2013)	3
Table 3: Significant Water Bird Species Status in Prek Toal Area (2004-2012)	4
Table 4: Major Ecosystems Covered Under Current Protected Area Systems	5
Table 5: Major Ecosystems Covered Under Current Protected Forests, Fish Conservation and Biodiversity Conservation Area.....	5
Table 6: Forest Cover (2002-2010)	6
Table 7: Changes in Forest Cover in Cambodia from 1965-2010.....	6
Table 8: Rice Production in Cambodia 2008-2012 (MAFF, April 2013).....	10
Table 9: Four Main Crop Cultivated Area (MAFF, April 2013)	10
Table 10: Production of Logs & Processed Forest Products, 2007-2011	11

LIST OF FIGURES

Figure 1: Forest Cover in 2010 (MAFF, 2013)	7
Figure 2: Forest Cover Change from 1965-2010 (MAFF, 2013)	7
Figure 3: Cambodia GDP Growth (2005-2014)	9
Figure 4: Composition of Sub-Sector in Agriculture (MAFF, April 2013)	10
Figure 5: Four Main Crops Cultivated Area (MAFF, April 2013).....	11
Figure 6: Family Livestock Production (Unit: Heads), (MAFF, April 2013)	12
Figure 7: Family (Chicken Ducks) Poultry Production (Heads), (MAFF, April 2013)	12
Figure 8: Production of Inland & Marine Capture & Aquaculture Production (MAFF, 2013).....	12
Figure 9: Rubber Development, 2008-2012 (MAFF, April 2013)	14
Figure 10: Number of Tourist Visit Cambodia from 1993-2011 (MoT, 2011).....	18
Figure 11: Trend of Tourism from 2008-2013 (MoT, 2013).....	19

EXECUTIVE SUMMARY

Cambodia is one of the few places on Earth blessed with abundant natural riches: home to the world's largest freshwater fish and extensive tiger habitat, the forests and rivers, grasslands and wetlands pulse with life, and with new species being recorded here every other day.¹ Cambodia has been a signatory to the Convention on Biological Diversity since 1995, and as per Article 26 of the Convention, this Fifth National Report is to provide updates on measures taken for the implementation of the Convention and the effectiveness of these measures in Cambodia.

Research on Cambodia's biodiversity has been limited but ongoing, and continues to identify a plethora of new species country records and occasionally entirely new species. Cambodia designated 23 protected areas in 1993 covering about 3,273,300 ha equal to 18% of the country by Cambodia's PA percentage under the authority of the Ministry of Environment. In addition, the Royal Government of Cambodia also made a series of designation of 10 additional Protected Forest areas administered by the Forestry Administration of the Ministry of Agriculture, Forestry and Fisheries covering 1.63 million hectares² and 58 fish sanctuaries supported by its Fisheries Administration.

The World Bank Country Overview on Cambodia³ describes the strength of the economy and how "economic growth broadened over the past few years, thanks to sustained growth in the agricultural sector, driven by increases in rice prices in global markets." In regards to forest management and timber production, there have been significant efforts to reduce deforestation and the Government has targets for increased forest cover. The consolidation of the results of forest assessments since 2002, when revisions of land-use classification were introduced, reveal that the country's forest cover declined from 61.15% in 2002 to 57.07% in 2010. The lack of protected areas management plans with formal conservation core zones has allowed for Economic Land Concessions to be placed within protected areas, sometimes with significant biodiversity impacts.

The status of Cambodia as a developing country with a large population aspiring to reduce poverty combined with exceptional biodiversity providing the basis of the economy, has seen many challenges in balancing conservation and development. Cambodia has significant legislations related to biodiversity but there is also significant overlap across legislation and as such confusion for implementation and difficulties for enforcement. The most critical direct threat and challenge for biodiversity in Cambodia is habitat loss. The Forestry Administration has documented the specific forest cover losses as a guide, but all habitats in Cambodia are currently being negatively impacted.

Agriculture is intrinsically linked to ecosystem services in Cambodia and as agricultural development and food security strategies are country priorities, the reduction of positive ecosystem services may have significant socio-economic and cultural impacts. The basis of

¹ Greater Mekong-Economic Analysis of Ecosystem Services, November-2013, WWF

² Forestry Administration, 2007 and 2010

³ World Bank – Cambodia Country Overview 2013

the food system in Cambodia is rice and fish and both could be negatively impacted by climate change and changes in hydrology such as dams on the upper Mekong. Effective biodiversity management requires a shift from the ‘business as usual’ approach with low participation and commitment leading to: Decreasing Natural/Biodiversity Resources; and Ineffective planning and management of Natural/Biodiversity Resources.

When the previous National Biodiversity Strategy and Action Plan was developed in 2002 Cambodia had a much shorter-term focus of rebuilding after years of internal conflict. Now Cambodia has some stability and a growing economy with reduced poverty and an increased understanding of biodiversity. The concept of ecosystem services and other biodiversity values is not fully understood but people are becoming more aware of the consequences of not managing the environment.

The Government’s direction is set by the Rectangular Strategy, which states the need to maximize agricultural production and ensure sustainable use and management of natural resources and maintaining biodiversity, which also means biodiversity is a consideration in many national plans, programmes and policies. This is reflected in positive moves toward meeting agreed targets including: Aichi, Millennium Development Goals, and Forestry Program Indicators. This Fifth National Report, helps to summarize these positive actions and comes at a time of reflection as the Royal Government of Cambodia is reviewing the National Biodiversity Strategy and Action Plan.

INTRODUCTION

Cambodia is located in Southeast Asia between the latitudes of 10° and 15° North and the longitudes of 102° and 108° East and with a land surface area of 181,035 km², extending approximately 580 km from east to west and 450 km from north to south. It shares its border of 2,438 km with Thailand in the west and the north, Lao PDR in the north, and Vietnam in the east and the southeast. In the southwest, the country borders the Gulf of Thailand, which provides over 440 km of coastline. Cambodia has been a signatory to the Convention on Biological Diversity since year 1995, and as per Article 26 of the Convention, this Fifth National Report is to provide updates on measures taken for the implementation of the Convention and the effectiveness of these measures in Cambodia.

Biological diversity or Biodiversity – the variety of life on our planet - is truly amazing. Biodiversity includes every species and all the genetic differences within each species. It encompasses the variety of ecosystems: forests, dry-lands, wetlands, mountains, lakes, rivers, agricultural lands and islands where living creatures, including humans, animals, insects and plants, form a community, interacting with one another and with the air, water and soil around them.⁴

Biodiversity is described at three interlinked levels: genetic, species and ecosystem. With growing understanding of the interrelatedness of all life on earth, there is growing appreciation of the significance of biodiversity. Historically, Cambodia was one of the first countries in the region to embrace the important biodiversity management concept of protected areas. In modern times, the Kingdom's commitment to environmental protection has been demonstrated by a number of significant legal measures to prevent pollution, reduce habitat damage, protect wildlife and more sustainably utilize natural resources, however practical implementation of these measures has been challenging. Cambodia is particularly vulnerable to climate change and understanding the role of ecosystem services for food security highlights one of the key biodiversity values for Cambodia. Human cultures have their roots in our biological resources, and our future will be modeled based on our ability to develop and adapt appropriate conservation and management strategies for biodiversity, this report seeks to identify some of the trends, threats and responses for biodiversity in Cambodia.

⁴ <http://www.cbd.int/youth/biodiversity>

PART I: CAMBODIA'S EXCEPTIONAL BIODIVERSITY

Cambodia is one of the few places on Earth blessed with abundant natural riches: home to the world's largest freshwater fish and extensive tiger habitat, the Greater Mekong's forests and rivers, grasslands and wetlands pulse with life, and with new species being recorded here every other day.⁵ Every ecosystem provides habitat for plants, animals and microorganisms which we can use or which perform useful functions. The World Resources Institute call ecosystems "the productive engines of the planet", providing us with everything from the water we drink to the food we eat and the fiber we use for clothing, paper, or wood for construction.⁶ Around 80 per cent of the Greater Mekong's 300 million people depend directly on the goods and services its ecosystems provide, like food, fiber and clean water.⁷ Cambodia has the largest contiguous block of natural forest remaining on the Asian continent's mainland and is an important constituent of the Indo-Burma Biodiversity Hotspot, which is one of 34 such hotspot designations worldwide. Five of nine high priority biodiversity conservation corridors in the Greater Mekong Sub-region, moreover, are in Cambodia.⁸ The country is also a sanctuary to some 1.6% of globally threatened species on the IUCN's Red List. This includes 2.5% of globally threatened mammals, 2% of globally threatened birds, and 5% of globally threatened reptiles. The list of globally threatened species includes 34 mammals 39 birds' and 20 reptiles.⁹

BIODIVERSITY STATUS

Species Status

An understanding of species is the basis for good biodiversity management, however research on Cambodia's biodiversity has been limited, but ongoing and current research continues to identify a plethora of new species country records and occasionally entirely new species. Cambodia is rich in species diversity: home to more than 135 species of mammals, 599 species of birds, 173 species of reptiles, 72 species of amphibians, 350 species of moths and butterflies, 955 fresh and marine fish and aquatic species, and more than 4,500 vascular plant species according to the most recent estimates of the Forestry Administration's International Cooperation Project on Biodiversity and Environmental Conservation supported by Korea.¹⁰

The Cambodian Journal of Natural History (CJNH) is Cambodia's first peer-reviewed scientific journal, launched in 2008 as a partnership between the Royal University of Phnom Penh and Fauna & Flora International, as part of a University Capacity Building Project. There are no confirmed extinctions for the period since the 4th National Report, however ongoing habitat loss is placing significant pressure on many species. With increased research more species have been identified and confirmed for Cambodia. Mammals are often the best known and researched species and since the last report more bat species have been confirmed for Cambodia bringing

⁵ Greater Mekong-Economic Analysis of Ecosystem Services, November-2013, WWF

⁶ World Resources Institute 2000

⁷ Greater Mekong-Economic Analysis of Ecosystem Services, November-2013, WWF

⁸ Forestry Administration 2013

⁹ European Union Delegation to Cambodia Country Environment Profile

¹⁰ The Cambodia Forest Management and TBCA 2013, European Union Delegation to Cambodia Country Environment Profile

the total from 53 to 61¹¹ and then a further increase to 66 bat species recorded for Cambodia in 2012.¹² In the recent publication of The Birds of Cambodia-An Annotated Checklist¹³, the previous of 545 bird species has now been increased to 599 country records and Forestry Administration has recorded 635 bird species. Fish base (2014) now shows 955 fish species recorded for Cambodia on the database, which is a significant increase, from the previous 874 species.

Table 1: Species List Estimates

Taxon	4 th Biodiversity Report	5 th Biodiversity Report
	Total Known Species	Total Known Species
Mammal species	123	135
Bird species	545	599
Reptile species	88	173
Fish species	874	955
Amphibian species	63	72
Vascular plant species	2,308	4,500
Hard coral	24	24
Soft coral	14	14
Sea grass	10	10

Source: Adapted from the 4th Biodiversity Report 2010 and Forestry Administration 2013

Table 2: IUCN Red List Species in Cambodia (2011-2013)

Red List Species		Red-List Status	
Taxon	Total	Type	Total
Mammal	26	VU	18
		EN	6
		CR	2
Bird	26	VU	9
		EN	10
		CR	7
Reptile	11	VU	7
		EN	3
		CR	2
Amphibians	2	VU	2
		EN	0
		CR	0
Fish	9	VU	0
		EN	6
		CR	3
Plant	23	VU	0
		EN	13
		CR	10

Source: IUCN 2011 and BirdLife International Cambodian Program 2013

Three new species of reptile have been identified in the Cardamom Mountains.¹⁴ Nine new species of Odonata have also been confirmed for Cambodia¹⁵ and research of rotifers in Lomphat Wildlife Sanctuary wetland's identified 196 species, including 47 new country records.

¹¹ Cambodian Journal of Natural History (2) 2011

¹² Cambodian Journal of Natural History (2) 2012

¹³ Goes 2014, The Birds of Cambodia An Annotated Checklist

¹⁴ Fauna & Flora International 2011 and Cambodian Journal of Natural History (2) 2011

¹⁵ Cambodian Journal of Natural History (2) 2012

These species update show a significant increase from the past and reminds us that Cambodia’s species are still poorly researched so when more resources are available more species are found.

Cambodia’s Exceptional Waterbird Species Diversity at Prek Toal

There has been an increasing trend in the population of waterbirds in Cambodia, specifically the Prek Toal core area of the Tonle Sap Biosphere Reserve. Monitoring activities conducted by the General Department of Administration for Nature Conservation and Protection in partnership with Wildlife Conservation Society identified that 2012 was the best year for waterbird breeding at Prek Toal. Among all the species shown in Table 3, number of Asian Openbill showed the significant increase from only 688 nests in 2004 to 12946 nests in 2012 respectively. Similarly, the number of Oriental Darter nests also rose rapidly from 1125 in 2004 to 6875 in 2012. Only Milky Stork seemed to be the rarest species among others as it had only 8 nests in 2012 increasing from only 2 nests in the early year. However, this “data on population trends of large waterbirds in this core area has been considered to represent one of the most complete datasets on trends in the population of any species, or group of species at any sites of tropical Asia”¹⁶

Table 3: Significant Water Bird Species Status in Prek Toal Area (2004-2012)

Species	2004 (Nests)	2005 (Nests)	2006 (Nests)	2007 (Nests)	2008 (Nests)	2009 (Nests)	2010 (Nests)	2011 (Nests)	2012 (Nests)
Greater Adjutant	56	39	59	77	120	123	126	146	198
Lesser Adjutant	158	217	242	253	220	348	312	363	289
Milky Stork	2	4	11	10	11	8	17	16	8
Asian Openbill	688	1386	2825	3844	9340	11364	13845	13042	12946
Painted Stork	1089	1707	1846	1841	2106	1910	2419	2345	2637
Spot-billed Pelican	1024	978	1575	1529	1456	1480	1475	1574	1710
Oriental Darter	1125	1843	2527	4053	5447	7308	5437	6751	6875

Source: Sun Visal & Mahood, S. (2013) Monitoring of large waterbirds, Prek Toal, Tonle Sap Great Lake, 2012.

Protected Areas Status

Cambodia was the first country in South-East Asia to have a protected areas system, in 1925 by firstly surrounding the naturally and culturally significant Angkor complex of temples, which is now designated as a World Heritage Site. In 1957, 173 forest reserves with 3.9 million hectares and six wildlife reserves with 2.2 million ha or 12 % of the total area designated for the protection of wildlife, in particular large mammals. The protected areas system was ahead of its time but effectively collapsed during years of internal conflict but over the past decade efforts at biodiversity conservation through protected areas recommenced and intensified. Cambodia designated 23 protected areas in 1993 covering about 3,273,300 ha equal to 18% of the country by Cambodia’s PA percentage under the authority of the Ministry of Environment.

¹⁶ Sun & Mahood, 2013

Table 4: Major Ecosystems Covered Under Current Protected Area Systems

Management Category	No.	Main ecosystem coverage	Area(Ha) 1993	IUCN Category
Protected areas under the Royal Decree of Nov 1993				
National park	7	Lowland evergreen forest also coastal forest, mangroves, Dacrydium/Podocarpus, swamp forest, corals reef and sea grass	742,250	II,IV
Wildlife sanctuary	10	Evergreen forest, Mangroves, Coral	2,030,000	II,IV
Protected landscape	3	Lowland evergreen forest also coastal	97,000	V
Multiple use area	3	Flooded forest, mangrove and coastal	403,950	VI
Community Protected Areas***	122 ¹⁷	Evergreen, open, and flooded forest	169,104	IV, V, VI

*** Community Protected Areas are located in the National park, Wildlife sanctuary, Protected landscape, Multiple use area

Table 5: Major Ecosystems Covered Under Current Protected Forests, Fish Conservation and Biodiversity Conservation Area

Management Category	No.	Main ecosystem coverage	Area(Ha) 2013	IUCN Category
Forest Protected areas				
Protected forests and Biodiversity Conservation Areas	20	Lowland and highland evergreen, semi evergreen, and deciduous forests and wetland	1,650,000	II,IV
Community Forestry	453	Lowland and highland evergreen, semi evergreen, deciduous and degraded forests and agro-forestry areas	399,880	IV, V, VI
Aquatic conservation areas				
Fish Conservation Areas	58	Inland wetlands, flooded forests	120,003	II,IV
Community Fishery	469	wetlands, flooded forests, mangrove, corals reef and sea grass	126,490 ¹⁸	VI

The protected areas system in Cambodia includes 7 national parks (4 are coastal and marine protected areas), 10 wildlife sanctuaries, 3 protected landscapes, 3 multiple use areas (one of which is a coastal and marine area), 31 fishery conservation areas and 2 protected forests. In addition, the Royal Government of Cambodia also made a series of designation of 10 additional Protected Forest areas administered by the Forestry Administration of the Ministry of Agriculture, Forestry and Fisheries covering 1.63 million hectares¹⁹ and 8 fish sanctuaries supported by its Fisheries Administration. The protected areas are fairly evenly distributed over

¹⁷ GDACP, 2014

¹⁸ Fisheries Administration, data in 2010

¹⁹ Forestry Administration, 2007 and 2010

the country and represent all major ecological regions and ecosystems. In principles, each protected areas system in Cambodia is subject to a range of uses and it has proved difficult to strictly remain to the management with clear zoning of each categories and conservation biodiversity resources in the country. The lack of protected areas management plans with formal conservation core zones has allowed for Economic Land Concessions to be placed within protected areas, sometimes with significant biodiversity impacts.

Forest Status

Cambodian forests are variously dominated by Dipterocarpaceae, Leguminosae, Lythraceae, or Fagaceae families and, in some places, Pinaceae or, Podocarpaceae families, or bamboo. The flora of lower altitudes is typical of the Indochinese floristic province and, as such, contrasts with that of the Chinese, Indo-Burma and Indo-Malayan provinces, while the higher altitudes share an affinity with those of the Indo-Malayan region.²⁰ In order to monitor the extent of the country's forestland, the Forestry Administration conducted a periodic series of forest cover assessments in 1993, 1997, 2002, 2006, and 2010, which divided the forest into Evergreen, Semi-Evergreen, Deciduous and other forest.

The consolidation of the results of forest assessments since 2002, when revisions of land-use classification were introduced, reveal that the country's forest cover declined from 61.15% in 2002 to 57.07% in 2010. That represents a decline of 4.08%, equivalent to a loss of 740,502 hectares of forestland during that eight-year period, or an average annual rate of loss of forestland of 0.5%. The assessments between 2002 and 2010 incorporated five forest land-use classes and, of those, the areas of evergreen, semi-evergreen and deciduous forest types decreased during the assessment period as demonstrated in the accompanying figure and table.²¹

Table 6: Forest Cover (2002-2010)

No.	FOREST TYPE	FOREST COVER					
		2002		2006		2010	
		Ha	%	Ha	%	Ha	%
1	Evergreen forest	3,720,493	20.49	3,668,902	20.20	3,499,185	19.27
2	Semi-evergreen forest	1,455,183	8.01	1,362,638	7.50	1,274,789	7.02
3	Deciduous forest	4,833,887	26.62	4,692,098	25.84	4,481,214	24.68
4	Other forest	1,094,728	6.03	1,007,143	5.55	1,108,600	6.10
	Total Forestland	11,104,291	61.15	10,730,781	59.09	10,363,788	57.07
5	Non-forest	7,056,383	38.85	7,429,893	40.91	7,796,886	42.93
	Total Area	18,160,674	100	18,160,674	100	18,160,674	100

Table 7: Changes in Forest Cover in Cambodia from 1965-2010

No.	Assessment year	Land		Total Area (Ha)
		Forest land	Non-forest land	

²⁰DyPhon; 1982

²¹. The Cambodia Forest Management and TBCA 2013

		Ha	%	Ha	%	
1	1965	13,227,100	73	4,883,400	27	18,110,500
2	1992/1993	10,859,695	60	7,293,290	40	18,152,985
3	1996/1997	10,638,209	59	7,514,776	41	18,152,985
4	2002	11,104,293	61	7,056,383	39	18,160,677
5	2005/2006	10,730,781	59	7,429,893	41	18,160,674
6	2010	10,363,789	57	7,796,885	43	18,160,674

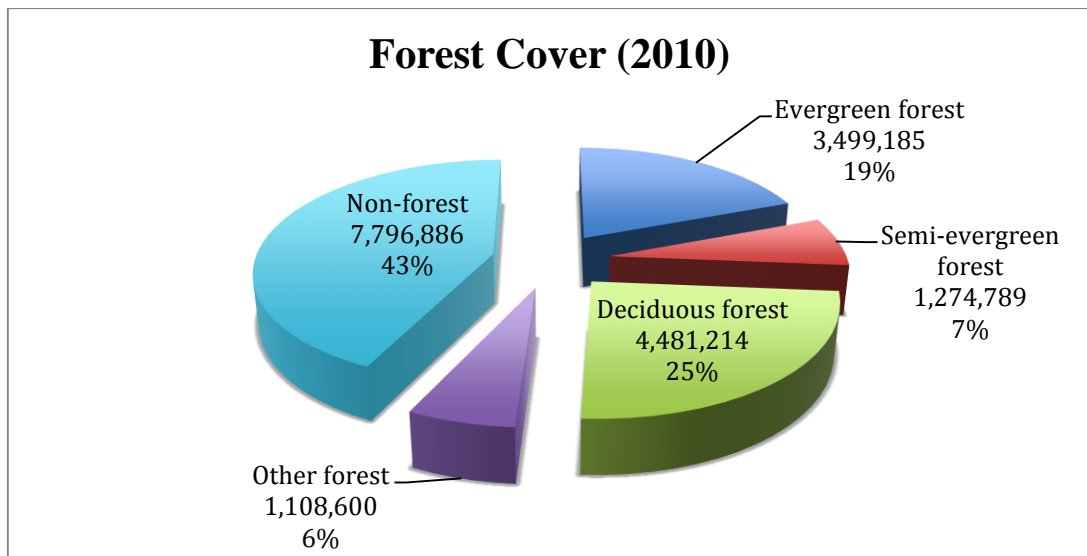


Figure 1: Forest Cover in 2010 (MAFF, 2013)

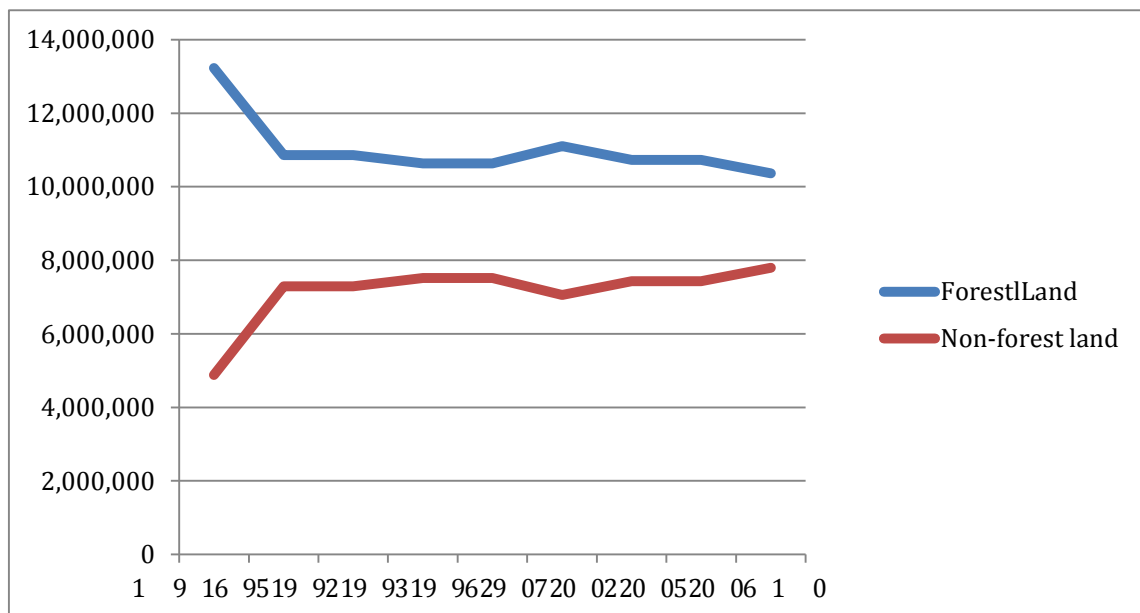


Figure 2: Forest Cover Change from 1965-2010 (MAFF, 2013)

BIODIVERSITY IMPORTANCE & TRENDS

Biodiversity is the core of human well-being and socio-economic development, but its value is often underestimated. In-line with the modern concept of triple bottom line, benefits arising from biodiversity can be considered in three groups: environmental, economic and social benefits. The Greater the diversity of life provides increased opportunity and potential for environmental, economic and social benefits. It is estimated that at least 40 per cent of the world's economy and 80 per cent of the needs of the poor are derived from biological resources, and that same biodiversity enhances our ability to adapt to new challenges such as climate change.²²Few places on Earth demonstrate so dramatically the fundamental link between people and nature: biodiversity supports Cambodians ecologically, economically, culturally and spiritually. Biodiversity plays an important role, providing many services such as food security, health, clean air, water, livelihoods and economic development to achieve the millennium development goals as well as poverty reduction.²³

The 2008 population census results are critical for the overall environmental, economic and social considerations for Cambodia. The population census results show that the Cambodian population has increased by 1.96 million over the last 10 years from 11.4 in 1998 to 13.4 million in 2008. The population density of the country increased from 64 to 75 persons per square kilometer, but the annual growth rate declined from 2.49% in 1998 to 1.54% in 2008. However, Cambodia accounted for 2.3 percent of the Southeast Asian population of 8.6 percent of the world's population of 6.7 billion in 1998 and continues to do so in year 2008.²⁴Cambodia's population in 2013 was estimated to be 15 million with an annual growth rate of 1.7%. Of the country's population, about 80% live in rural areas. The Royal Government of Cambodia is promoting decentralization for more effective management across its 25 provinces, 26 municipalities, 171 Khan/districts, 1,883 Sangkat/communes, and 13,406 villages.²⁵

Cambodia currently ranks 138 of 187 countries in terms of the UNDP's Human Development Index.²⁶ Various social conditions, including malnutrition, illiteracy, gender discrimination, limited access to social services, and weak social capital exacerbate those conditions. GDP per capita, nevertheless, increased from USD \$760 in 2008 to almost USD \$1,000 in 2012. The poverty rate, as a result, declined to 20% in 2012. Significantly, these achievements have made Cambodia the 15th fastest growing economy in the world during the past ten years, ranked 5th among developing countries achieving Millennium Development Goals, and ranked 1st in the Asia Pacific region in terms of improving social indicators.²⁷

²² www.globalissues.org/article

²³ *Cambodian Biodiversity Targets and Indicators, 2013*

²⁴ <http://www.nis.gov.kh/nis/census2008>

²⁵ Ministry of Interior 2014

²⁶ UNDP 2013

²⁷ MoFi- Poverty reduction profile 2009-2013

Gross Domestic Product

Cambodia's economic growth has been based on garments, construction, agriculture, and tourism, with the agriculture and tourism sectors most directly associated with biodiversity as well as timber for construction.

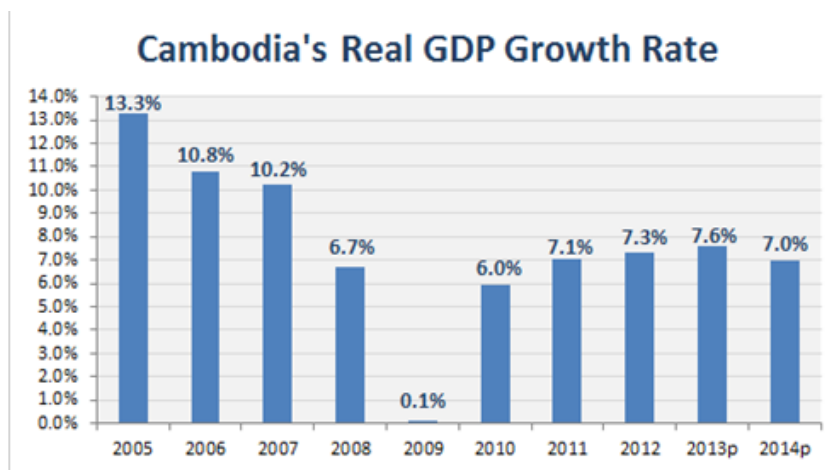


Figure 3: Cambodia GDP Growth (2005-2014)

In year 2013, based on primarily prediction and referred to formal statistic data of relevant institutions, joint monitoring of the Ministry on Economy and the Finance and National Statistic institute on June 2013, growth of GDP for year 2013 is 7.6% by constant price and whereas the GDP deflator is 0.8%. The GDP of the current price year 2013, there will be 61,525,000,000 Riel and or 15,191 million dollars and in number of 14.7 million people in year 2013 and GDP for one person is 1, 036\$ dollars.

Based on the prediction, the growth components is including (1) agriculture growth is 4.2% in which cropping growth is 4.1% and fisheries and aquaculture growth is 7.1% (2) industrial growth is 9.3% in which manufacturing growth is 7%; electricity, gas and purified water growth is 8.5% and construction growth is 17.2% and (3) services growth is 8.8% in which commercial growth is 7.7%, restaurant and hotel growth is 13.7%, financial growth is 12.3%, and real estate and business is 10.9%.²⁸

Agricultural Production

The World Bank Country Overview on Cambodia²⁹ describes the strength of the economy and how “economic growth broadened over the past few years, thanks to sustained growth in the agricultural sector, driven by increases in rice prices in global markets.” Farmers rely on services provided by ecosystems to produce agricultural crops and the health of those ecosystems are, in turn, dependent on biological diversity. The relationship and benefits between agriculture and biodiversity may be understood in two manners—first, as the biodiversity within farmland landscapes (i.e. the biodiversity of soil microbes, birds, insects, etc.) and second as the biodiversity of agricultural crops and animals, or agro-biodiversity (i.e., breeds of cattle, varieties of rice, etc.)³⁰. As shown in the figure below the main composition of the sub-sector in Agriculture for Cambodia includes: crop production, fishery, livestock and forestry.

²⁸ MEF- <http://www.mef.gov.kh>

²⁹ World Bank – Cambodia Country Overview 2013

³⁰ <http://www.sustabletable.org/268/biodiversity>

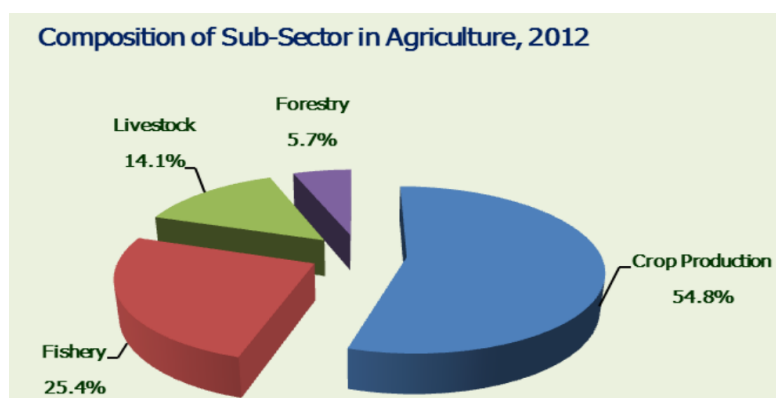


Figure 4: Composition of Sub-Sector in Agriculture (MAFF, April 2013)

Rice production has steadily increased, not only as the result of an expansion of the area cultivated, but also the growth in yield in response to the Government's promotion of more effective management and cropping techniques, including the development and use of higher quality seed varieties (see Table 8). This is reflected, especially, in the development of several different early, medium, and late-season rice seed varieties to take advantage of diverse ecological requirements. This has led to a growth of rice exports, approaching 200,000 tons in 2012, and corresponding increases in Cambodia's foreign exchange earnings.

Table 8: Rice Production in Cambodia 2008-2012 (MAFF, April 2013)

Description	2008	2009	2010	2011	2012
Cultivated Area (ha)	2,615,741	2,719,080	2,795,892	2,968,529	3,007,545
Harvested Area (ha)	2,613,363	2,674,603	2,777,323	2,766,617	2,980,297
Yield (mt/ha)	2.746	2.836	2.970	3.173	3.117
Production (mt)	7,175,473	7,585,870	8,249,452	8,779,365	9,290,940
Rice Surplus (mt)	2,025,033	2,244,598	2,516,752	2,780,328	3,031,017
Paddy Surplus (mt)	3,164,114	3,507,185	3,932,425	4,344,263	4,735,964

Table 9: Four Main Crop Cultivated Area (MAFF, April 2013)

Commodities	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Maize	93,362	91,203	90,732	108,836	142,391	163,106	206,058	213,622	174,257	216,330
Cassava	25,740	22,749	30,032	97,918	108,122	179,945	160,326	206,226	391,714	361,854
Mung Bean	44,940	39,089	60,570	85,140	65,261	45,605	49,599	69,206	68,111	66,850
Soya Bean	53,064	84,886	118,760	75,053	76,981	74,413	96,388	103,198	70,584	71,337
Total Crops	217,106	237,927	300,094	366,947	392,755	463,069	512,371	592,252	704,666	716,371

The recognition of the importance of promoting diversity into agriculture has also extended into Government initiatives to expand crop diversity, which has led to increases in cultivated areas, as well as production, of other agricultural crops including: corn, cassava, soybean, and mung-bean (see Table 9).

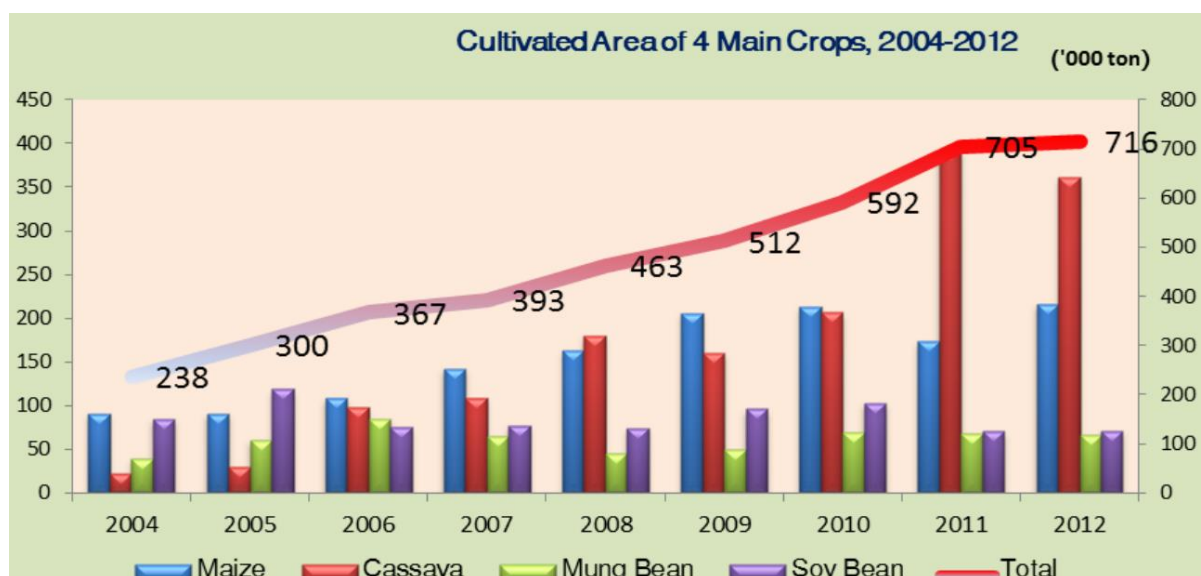


Figure 5: Four Main Crops Cultivated Area (MAFF, April 2013)

In regards to forest management and timber production, there have been significant efforts to reduce deforestation and the Government has targets for increased forest cover. The Practical Guide to Development for Forest Plantation Investment in Cambodia (2013), notes the following information regarding timber production:

- Mills increased in the 1990s and early 2000s under the forest concession system;
- The peak of formal timber harvesting was in 1994;
- Suspending forest concessions, has reduced formal timber harvesting;
- Domestic consumption of wood continues for industrial and construction uses,;
- The Forestry Law has provisions for the personal use of wood, but no official statistics, on the volumes and sources of timber, as well as the volumes of sawn and processed timber, to meet the demand of the domestic, as well as potential export, markets.

Table 10: Production of Logs & Processed Forest Products, 2007-2011

Forest Products	Units	2007	2008	2009	2010	2011
Round Logs Total	m ³	16,326	38,428	47,184	54,087	143,456
• <i>Domestic Coupe</i>	m ³	1,408	7,188	10,070	5,443	6,542
• <i>Economic land concession</i>	m ³	13,491	31,049	37,113	48,644	135,728
• <i>Bidding</i>	m ³	956	190	0	0	1,186
• <i>Top of Tree</i>	m ³	470	0	0	0	0
Sawn/Processed Timber	m ³	3,292	1,947	1,143	4,310	7,085

Source: *Forestry Statistics of Cambodia-2011; Forestry Administration*

It is apparent from those statistics that Economic Land Concessions have at least for the present become the primary source of the timber required in domestic markets, however more data is needed to better understand the rates of timber harvesting and market needs. The extraction of timber from the Economic Land Concessions may also impact Government forest cover targets.

With around 80% of the population living in rural areas the opportunity for and significance of livestock is high. In regards to family livestock the rates of head of cows and buffalo are decreasing, whereas pigs and poultry are increasing. There is limited up to date information on

livestock diversity, however past reports have identified the significance of Cambodia’s wild livestock relatives such as Banteng, Buffalo and Red Jungle-fowl (wild chicken). The tables below show the importance of poultry for family livestock, with over 23 million head, compared with only 6 million for cow Buffalo and pig combined.

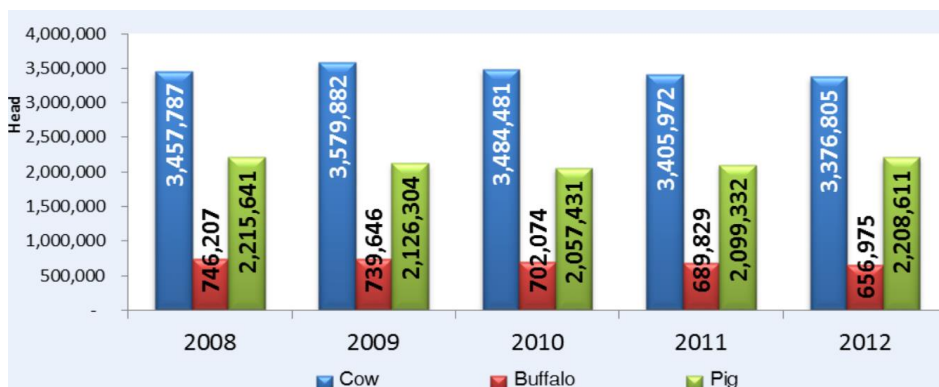


Figure 6: Family Livestock Production (Unit: Heads), (MAFF, April 2013)

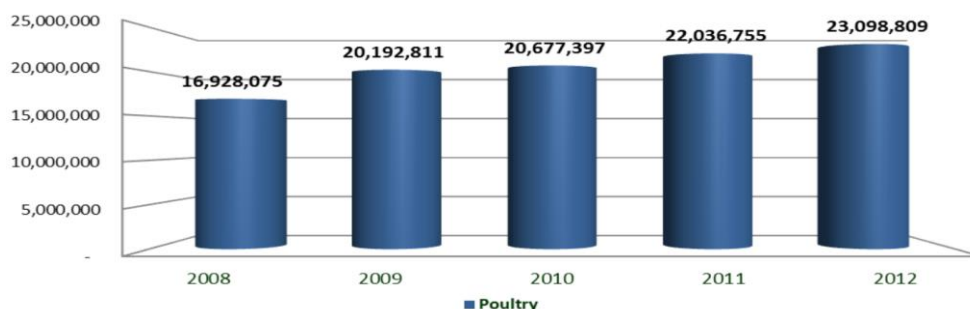


Figure 7: Family (Chicken Ducks) Poultry Production (Heads), (MAFF, April 2013)

Cambodia’s fisheries are some of the world’s most productive and they play a significant role in the development of the country. In regards to the fishery sector there have been increasing yields in inland and marine capture fisheries and aquaculture is also increasing. There are some concerns that the effort per catch is increasing and the fish diversity and size is decreasing, and this may show stress on the systems that may be exacerbated by potential impacts from upstream dams on the Mekong.

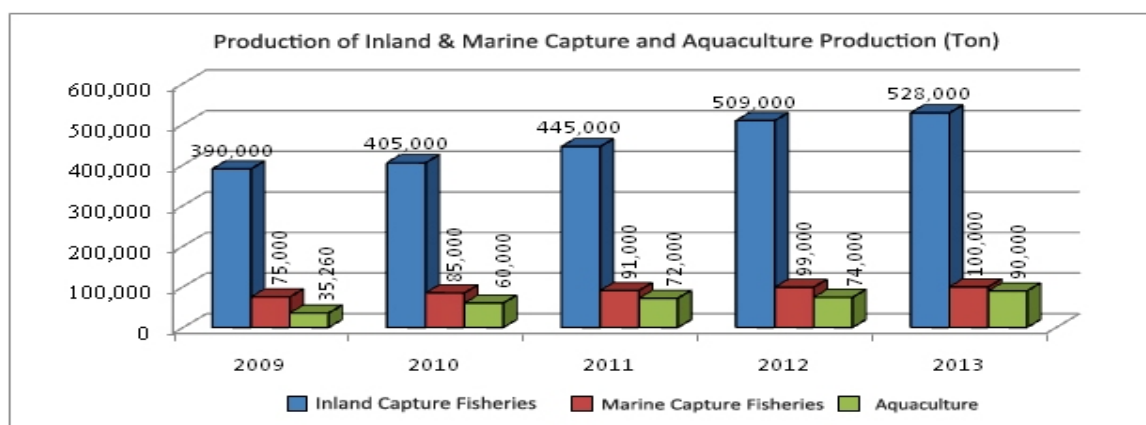


Figure 8: Production of Inland & Marine Capture & Aquaculture Production (MAFF, 2013)

MAIN THREATS TO BIODIVERSITY

The status of Cambodia as a developing country with a large population aspiring to reduce poverty combined with exceptional biodiversity providing the basis of the economy, has seen many challenges in balancing conservation and development. The most critical direct threat and challenge for biodiversity in Cambodia is habitat loss. The Forestry Administration has documented the specific forest cover losses as a guide, but all habitats in Cambodia are currently being negatively impacted. Biodiversity is directly linked to properties and quality of habitats. The ongoing deforestation in the tropics is a prominent example of the loss biodiversity rich habitats.³¹ Other prominent factor causing of the decline biodiversity are habitat fragmentation and isolation and land use intensification and overexploitation, species inventions, and adverse climate change impact. The impacts from losses of habitat will be compounded by expected significant climate change impacts, and as the ecosystems are placed under more pressure it is easier for other impacts, such as Alien Invasive Species to become established.

While these physical threats are significant the biggest challenge is in regard to governance of biodiversity. There is difficulty in balancing economic development pressures against environmental management considerations. A strong stable and consistent government platform is needed to promote Security and Law Enforcement; however biodiversity may be negatively impacted by a lack of political stability. Most people in Cambodia rely directly on biological resources for their livelihoods, nevertheless biological resources have been privatized and many cases over harvested. The Government has taken into account in mitigating threats to biodiversity in the country, through increased community development management and good governance. However, the main threats to biodiversity depended on increasing population pressure, owing to a lack of planning and law enforcement in natural resource management and conservation, as well as uncertainties in land tenure in those areas. In addition, this trend continues there is danger that important areas for conservation of biodiversity could be rapidly degraded or lost with serious ecological and economic consequences in the country.³²

Habitat Loss

As previously identified there is a significant trend in declining forest cover in Cambodia since 1965. The causes of forest decline and 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 cover area, as logging has concentrated on commercially valuable species and larger-size trees. Habitat is further impacted by other drivers of changes in land use such as the conversions of state land to agriculture by large corporations through economic land concessions and the actions of landless people. The former conversions affect very large areas, the latter much smaller areas. Economic Land Concessions, in essence, transfer the authority for the economic development of land from the Government to local and foreign investors. The RGC, as of April 2013, had approved almost 2,000,000 ha of Economic Land Concessions

³¹ FAO, 2006 and Klaus et al, 2008

³² Royal Government of Cambodia: NBSAP-2002

that had been granted to more than 200 concessionaires. Rubber, palm oil, cashew nuts, cassava, and livestock are the primary areas of investment.

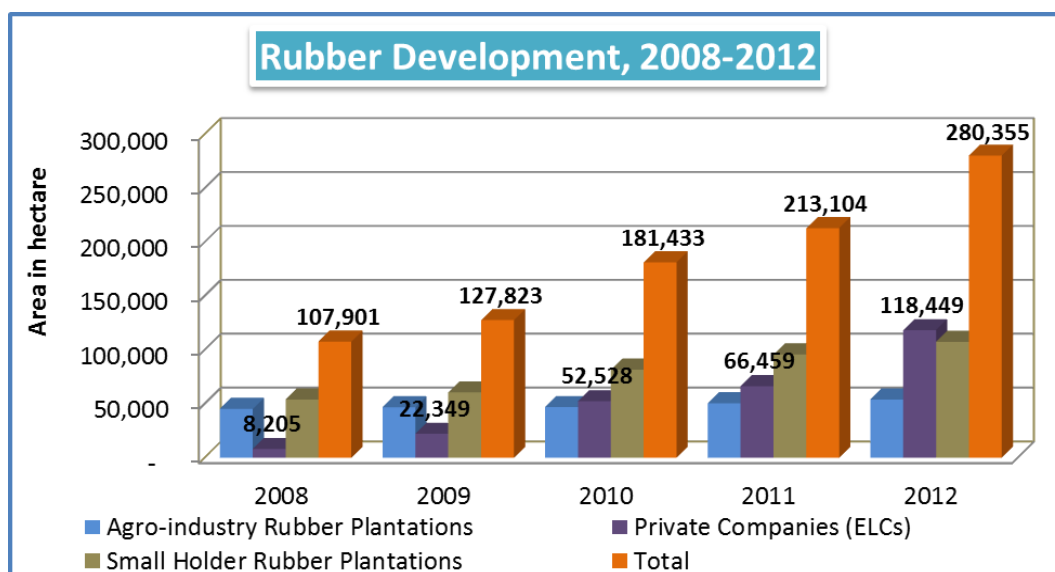


Figure 9: Rubber Development, 2008-2012 (MAFF, April 2013)

Cambodian government, and reference to plenary meeting of the Council of Ministers on 27th April 2012, especially seeing the necessary and urgent needs in insuring equity, strengthening and increasing in the effectiveness of economic land concession; the Cambodia government decided to issue the formal order to relevant ministries, institutions and competence authorities to carry out the order “No.01-BB, 07th May 2012, on the strengthening action and increasing in management system, land allocation and land use” in first point of order stated on the temporary postpone of economic land concession provision.

Indeed, in the next five years, more than 800,000 hectares of rubber are planned to be tapped, providing potential employment to 1.3 million workers and it will increased country forest cover additional of 800,000 hectares (MAFF Annual Report for Agriculture, Forestry and Fisheries 2012-2013) Economic Land Concessions can now be found in most of Cambodia’s protected areas so the conservation priority of protected areas has been blurred with development needs being prioritized over conservation. Stronger efforts are needed to ensure protection of the core areas and more sustainable utilization rather than exploitation of Cambodia’s natural resources.

Road developments are considered to be a significant driving factor for habitat loss, increasing accessibility and, thus, facilitating increases in other threats, including: agricultural expansion and intensification; illegal logging (for fuel wood and timber); mining; residential and tourism development; and dam construction. Increased access to previously isolated areas results in an expanding number of new land claims, increased wildlife hunting, and a flourishing of wildlife trade networks on local and international levels.³³

³³ European Union Delegation to Cambodia Country Environment Profile 2012

Politics: Stability & Will

Cambodia has significant legislation related to biodiversity, including the creation of an Environmental Secretariat in 1993, the enactment, in 1996, of the "Law on Environmental Protection and Natural Resource Management" creating a full-fledged Ministry of Environment and the adoption of a National Environmental Action Plan in 1998, Forest Law, Fisheries Law, Land Law, and Protected Areas Law. The National Assembly of the Government of Cambodia has also ratified several international conventions related to the environment including: the Convention on Biological Diversity, the Convention on Climate Change, the Convention on Wetlands of International Importance (Ramsar Convention), the Convention on International Trade in Endangered Species (CITES), the World Heritage Convention, the United Nations Convention on the Law of the Seas, International Convention for the Prevention of Pollution from Ships (MARPOL), the Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin, etc. Unfortunately there is also significant overlap across legislation and as such confusion for implementation and difficulties for enforcement.

The open access nature of aquatic resources, fisheries in particular, which do not require land ownership (commons), often becoming the resource of the last resort, attracting people who have no other means of subsistence. As such it is a key consideration for poverty reduction, as it is of most importance to those people who have the least. The Government has shown strong political will and responded to this with the closure of 35 fishing lots by the Prime Minister in 2012. The stated reason for the closure was "illegal overfishing to the detriment of local villagers," This marked the end of an era of fisheries management that had been started during the colonial period, in which fishing rights were auctioned to private bidders providing successful bidders with exclusive fishing concessions for periods of two-to-four years, persisted for over 140 years. Fisheries conservation zones have subsequently been established and there are currently 516 community fisheries that have been established, 328 of which are officially registered with the Ministry of Agriculture, Forestry and Fisheries.³⁴This may also mark the beginning of more political will in favor of community rather than private management of natural resources.

Climate Change

Cambodia has been identified as being highly vulnerable to the impacts of climate change and is regularly ranked in the top 10 most vulnerable countries. The reliance on agriculture and especially rain-fed rice makes the potential impacts of drought and flood major issues. The Royal Government of Cambodia officially launched the first-ever, Cambodia Climate Change Strategic Plan (CCCSP) 2014-2023 in November 2013. The CCCSP captures the main strategic objectives and directions for a climate-smart development of Cambodia in the next 10 years. It builds synergies with existing government policies to ensure a strategic cohesion to address a wide range of climate change issues linked to adaptation, GHG mitigation, and low-carbon development.

The CCCSP covers 8 strategic objectives, as follows:

- 1) Promote climate resilience through improving food, water and energy security;

³⁴Annual Report for Agriculture, Forestry and Fisheries 2012-2013

- 2) Reduce vulnerability of sectors, regions, gender and health to climate change impacts;
- 3) Ensure climate resilience of critical ecosystems (Tonle Sap Lake, Mekong River, coastal ecosystems, highlands etc.), biodiversity, protected areas and cultural heritage sites;
- 4) Promote low-carbon planning and technologies to support sustainable development of the country;
- 5) Improve capacities, knowledge and awareness for climate change responses;
- 6) Promote adaptive social protection and participatory approaches in reducing loss and damage;
- 7) Strengthen institutions and coordination frameworks for national climate change responses; and
- 8) Strengthen collaboration and active participation in regional and global climate change processes.³⁵

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 hydrology, freshwater fishery and agriculture. 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.

Water: Changes in Hydrological Regime

Sediments carried in by the Mekong River partly settle along the Tonle Sap River. They bring in the nutrients that are essential for the food chain leading to the production of fish and several of the globally threatened bird species. This lake is famous in Southeast Asia as well as in the world³⁶. 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. The basis of the food system in Cambodia is rice and fish and both could be negatively impacted. Fish production is potentially under strong influence from such change and development as not only the size and duration of flood, but also the timing of pulse flood particularly trigger fish migration. 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. The Mekong River Commission has modeled some of the hydropower project scenarios showing significant potential impacts to downstream countries such as Cambodia.

Alien Invasive Species & Genetic Erosion

The introduction of an alien species can cause the extinction, near extinction or displacement of native species. Although some introduced species may provide food, game, beauty or help to control pests, many can cause serious reductions in native biodiversity, especially when there are already pressures on the biodiversity. Introduced species often compete with native species for food or habitat or they may even prey on them. At present there are not documented cases of detrimental effects of alien invasive species in Cambodia. However, a number of known aggressive invaders are reported to present in Cambodia, including Mimosa: efforts are being

³⁵<http://www.camclimate.org.kh/>

³⁶ National Gap Analysis for Terrestrial Protected Area Coverage for Cambodia, 2010

made to better understand and manage the impacts. There are also many activities in agriculture, forestry, fisheries, horticulture, and rural development that involve intentional introduction of alien species. Fish Base lists 13 fish species introduced into the country.³⁷ The crop varieties are being lost through changes in agricultural systems, increasing use of agricultural chemicals, pesticides, and herbicides. Recent introduction of new modern varieties also cause threat to danger of replacing the remnant native landrace diversity of rice and other crops.³⁸

Marine Threats

The Cambodian coastline is approximately 440 km and comprise of beaches, mangroves corals and sea grasses and the National Marine Gap Analysis for Cambodia (2010) has identified some of the major threat as Management Issues: enforcement issues, assessment of management plans, overlapping legislations, cross border issues, encroachment and coastal development issues etc. In addition, Cambodia's coral reefs and sea-grass are in trouble, threatened by an increasing array of impacts from unsustainable and destructive fishing practices; sedimentation and waste dumping; and increasing population and development in coastal areas. The mangrove forests have experienced threats from charcoal production the expansion of salt farms and widespread shrimp aquaculture. The Provincial Environment Department has been destroying kilns and some mangrove re-growth and planting have been noted through collaborative efforts by government, NGOs and local communities. The rapid decline and loss of these marine ecosystems has significant social, economic and environmental consequences and will ultimately lead to increased poverty and a reduction in quality of life for people of Cambodia.

SOCIO-ECONOMIC AND CULTURAL IMPLICATIONS OF BIODIVERSITY CHANGES

Ecosystems have been described as the life support system of the Earth – for humans as well as all life on this planet.³⁹ Ecosystem services, the benefits that humans derive from ecosystems, are considered “free”, often invisible, and are therefore not usually factored into decision-making, however without these services all life on earth may cease. Cambodia is an agrarian country: about 72.3% of the population still thrives on agriculture, and the Cambodian national economy is also largely agriculture based, mostly rain fed, mono-cropped and mainly under rice based farming system.⁴⁰ Agriculture is intrinsically linked to ecosystem services in Cambodia and as agricultural development and food security strategies are country priorities, the reduction of positive ecosystem services may have significant socio-economic and cultural impacts. There are already many agricultural challenges including inadequate infrastructure, particularly irrigation and rural infrastructure, insecure land ownership, inadequate access to modern technology and agricultural extension services, limited access to affordable credit in some rural areas, incomplete market information, and relatively low public investment in the sector, but to add increased natural hazards such as floods, droughts, and insect, species and pest infestations, due to reduced ecosystem services would directly impact human well-being, livelihoods and poverty.

³⁷ FishBase 2013

³⁸ Ministry of Agriculture, Forestry and Fisheries Annual Report 2012

³⁹ MA Health Synthesis Report 2005

⁴⁰ National Institute of Statistic, Census 2008

The food security situation in Cambodia is already tenuous and further impacts on ecosystem services could lead to significant food insecurity, as well as environmental, economic and social impacts. Since many rural Cambodians do not produce enough agriculture (rice) for their consumption, declines in fisheries resources and NTFP's means that rural people have to face intense food insecurity. 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 fishing provinces of Cambodia, small scale fisheries can provide 65-75% of animal protein intake of the households. Unfortunately, water is one of the major areas where the most pressure is placed on ecosystem services, globally through climate change and locally through deforestation and dams.

The importance of rice is culturally reflected in the way it is used to name the three meals. With reduced ecosystem services the soil may become poor and the climate extreme: the loss of agrobiodiversity not only means a risk to food security but also the loss of culture. The intrinsic, aesthetic and intangible values of Cambodia's biodiversity through its rural landscape, with environmental and natural resources are high. The rural landscape is heavily represented in much of the local artwork dating from Angkorian-era bas-reliefs right up until today's artists. This landscape is also a cornerstone of Khmer proverbs, especially as they relate to the Tonle Sap's ecosystem role as the 'beating heart' of the country. Natural resources and the environment feature prominently in both traditional and modern Khmer music, and widely used as the setting for Cambodian music videos. Cambodia's natural 'bounty' is much treasured by citizens and visitors alike, widely demonstrated reverence and associations with famous natural products and features (i.e. various prominent 'Phnoms' or hills) from different parts of the country.

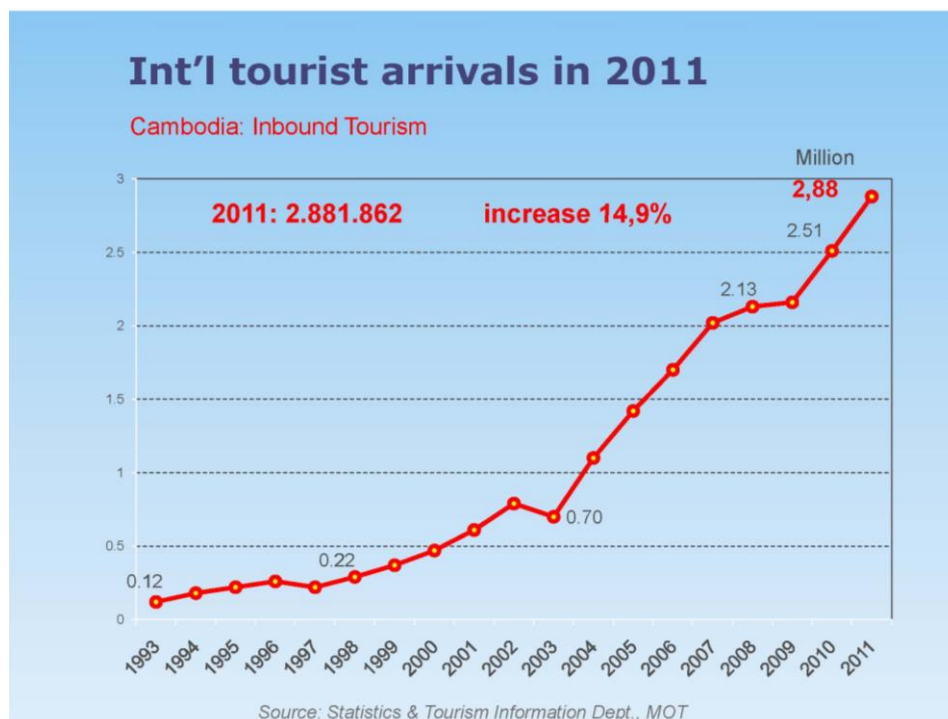
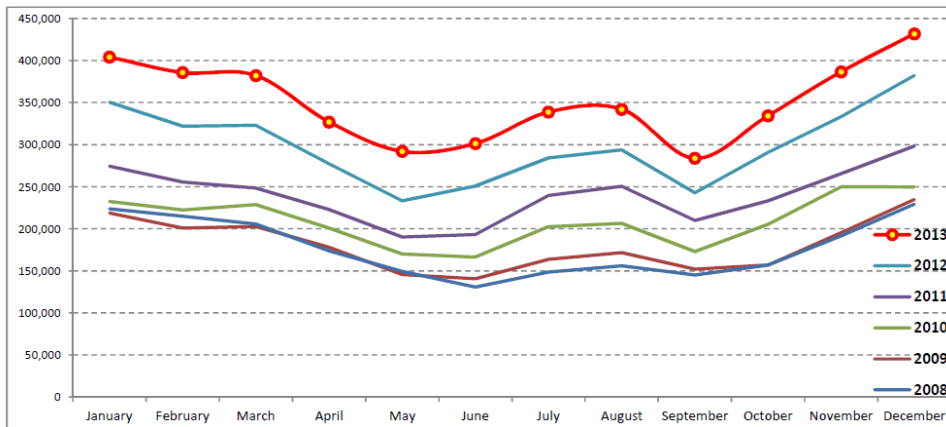


Figure 10: Number of Tourist Visit Cambodia from 1993-2011 (MoT, 2011)



Source: Statistics and ICT Department, MOT

Figure 11: Trend of Tourism from 2008-2013 (MoT, 2013)

In relation to biodiversity, the Minister of Tourism made the following statements and prioritized tourism sites include:

The key factors to stimulate tourism development in Cambodia, the huge potentialities of cultural, historical and natural resources are also respected as the primarily factors to highly competitive advantage of Cambodia tourism sector in regional and global. This mean, Cambodia is viewed as the home of natural resources and biodiversity where situated 23 protected areas (7 National Park, 10 Wildlife Sanctuary, 3 Protected Landscapes, and 3 Biodiversity zones), Ramsar, Protected Forest, Marine Resources, and Mangrove Forest which linkage with the global ecosystem namely Tropical forest Cardamom Mountains that remaining such potentiality and rich of endangers species in Asia.⁴¹

- ❖ Cultural tourism sites in Siem Reap-Angkor, linked to Preah Vihear temple and the Anlong Veng historical site, Great Lake and its peri-zone;
- ❖ Southern tourism corridor (coastal zone) is categorized for its ecotourism potential and strong attractiveness, especially connectivity with the Angkor area, Phnom Penh, Vietnam and Thailand. This area includes Cardamon mountains, which is rich in the biodiversity essential for ecotourism.
- ❖ Northeast ecotourism sites disclose its uniqueness, including Mekong river dolphins, natural spectacles and the culture and tradition of ethnic populations.
- ❖ Great lake peri-zone which is known for ecotourism potential along with culture and tradition of local people's livelihood, particularly agriculture, fishery and traditional handicrafts;
- ❖ Areas along Mekong rivers stretching to the Great lake and Bassac river blessed with cultural and ecotourism potential, as seen the attractive waterway journey.

The tourism sector in Cambodia Biodiversity makes the environment healthy for the tourists and the local people. Biodiversity also contributes to reinforcement of policies in relation with sustainable tourism development in the vulnerable biodiversity areas. Ecotourism is viewed as a tool to conserve the natural resources and environmental while Southeast Asia was claimed to become the biggest Ecotourism destination worldwide in near future and Cambodia is also

⁴¹Tourism Minister Dr.Thong Khon's speech at the 3rd world ecotourism conference in Sihanoukville; 2011

considered as a priority Ecotourism destination within the region. It could follow up to Ecotourism trend with highly demand (21 century Ecotourism trend is dramatically growth to about 20% every year while cultural tourism increases only 6%). As part of the National Ecotourism Policy and Strategic Plan (2010) the Ministry of Tourism has made key Policy Statements in relation to opportunities, challenges and guiding principles that sustainable tourism in Cambodia shall:

1. Balance between conservation and development which means a) minimizing negative impacts on Cambodian nature and culture, b) optimizing their conservation by appreciating the natural and socio-cultural carrying capacities, and c) respecting environmental laws and regulations as well as local cultural norms;
2. Ensure viable, long-term economic operations, providing socio-economic benefits to all stakeholders that are fairly distributed, including stable employment and income-earning opportunities and social services to host communities who are the caretakers of ecotourism resources;
3. Support the poverty alleviation efforts of the Royal Government of Cambodia by developing ecotourism in Northeast, Tonle Sap and Coastal & Cardamom Mountain Regions in the short- and medium-term as these regions possess ecotourism resources which support ecotourism products that are in demand among the markets;
4. Undertake sustainable marketing approach in developing the relevant products and promoting these to culturally and environmentally sensitive markets.

The Ministry of Tourism has identified current limited management of some tourism destinations as root causes, leading to the direct and indirect threats to biodiversity including:

- Development which was not properly controlled and adopted by the provincial authorities and lack of sufficient capacity to assess the proposals;
- Low ability to enforce laws and regulations concerning management of protected areas and adopting criteria for development, management of fishery and waste management;
- There is no provision of service on solid or liquid waste management and the communities could not afford the services;
- Land disputes due to lack of land available for people (for example, land allocation for agriculture, protected land, industrial zone for effective management and effective industrial waste management and zone selections for tourism development);
- Development project which forces the community members to move away from their communities and leads to arrests of the community members;
- Development which limits the movement of the local people from accessing the public areas;
- Negative impacts of the climate changes and extreme weather and sea-level rise.⁴²

⁴²RGC Ministry of Tourism 2012

Business As Usual: Biodiversity Scenario

The following provides some analysis of the 4 scenarios related to political commitment and stakeholder participation, with the responding likely outcomes: 1. Business as Usual; 2. Inequality; 3. Unsustainable; and 4. Sustainable. This is designed to support dialogues on scenarios for more sustainable or appropriate use of biodiversity and how political commitment and stakeholder participation are both needed for effectiveness.

Business as Usual (BAU) is the normal conduct of business or activities without regard to the changing circumstances. In regards to biodiversity management the concerns around BAU may be seen in relation to our current knowledge about ecosystem services of carbon related climate change but the lack of changes to our business practices and activities.

<p>Strong Commitment to Natural/Biodiversity Resources related policy implementation</p>	<p>2. Inequality</p> <ul style="list-style-type: none"> • Problems of Natural/Biodiversity Resources policy implementation mistrust • Natural/Biodiversity Resources management could be effective in short-term • Groundless Natural/Biodiversity Resources policy implementation • Forestland, wetland and other important habitats could be easily converted to other land use types (agriculture, economic concession etc.) 	<p>4. Sustainable</p> <ul style="list-style-type: none"> • Rural poverty alleviation • Sustainable utilization and management Natural/Biodiversity Resources • Forestland, wetland and other important habitats is respected and forest plantation and habitat restoration can be increased • Modality well managed of Natural/Biodiversity Resources • Governance on Natural/ Biodiversity Resources will be included and respected
<p>Weak Commitment to Natural/Biodiversity Resources related policy implementation</p>	<p>1. Business As Usual</p> <ul style="list-style-type: none"> • Decreasing Natural/Biodiversity Resources • Ineffective planning and management of Natural/ Biodiversity Resources 	<p>3. Unsustainable</p> <ul style="list-style-type: none"> • Fragile Land Tenure & Forest land Grabbing continuous conflicts in forest land ownership • Forest development will not be possible (because forest development needs long term investment)
	<p>Inactive Public, Private and Community Participation</p>	<p>Active Public, Private and Community Participation</p>

At the Convention on Biological Diversity's (CBD) 11th Conference of Parties in 2012 there was a session titled "An Opportunity to go beyond Business as Usual", which among other things placed ongoing emphasis on the need for more public funds and to better engage with the business sector⁴³. However, Peter Bakker is the president of the World Business Council for Sustainable Development and Simon Upton is the director of the environmental directorate at the OECD note that while some business have taken a positive lead, this is only piecemeal and that

⁴³www.cbdalliance.org/.../cop11/Biodiversity%20is%20a%20...

“it's the job of governments to mainstream rational, environmental behavior – including their own.”⁴⁴

In the 2013 CBD magazine “Business 2020: Business & Biodiversity”⁴⁵, they clearly state that “It is well understood that Business as usual is not an option”, however clearly the alternative options in Cambodia and elsewhere around the globe are not being taken up at the required pace. As such an important consideration for biodiversity management is in developing options and incentives to break away from the ‘business as usual’ model and be more responsive to the changing circumstances of our environment.

The table below seeks to show the linkages between participation and commitment for conservation. In Cambodia at present there is low participation and low commitment so this is considered the business as usual, in order to move toward sustainability both participation and commitment need to be increased. Effective biodiversity management requires a shift from the ‘business as usual’ approach with low participation and commitment leading to: Decreasing Natural/Biodiversity Resources and Ineffective planning and management of Natural/Biodiversity Resources.

If participation is increased but commitment remains low it will be unsustainable, whereby if participation remains low and commitment is increased it will be inequitable, a balanced and strategic approach is needed.

⁴⁴ www.theguardian.com › ... › Guardian Sustainable Business

⁴⁵ www.cbd.int/doc/newsletters/news-biz-2013-06-en.pdf

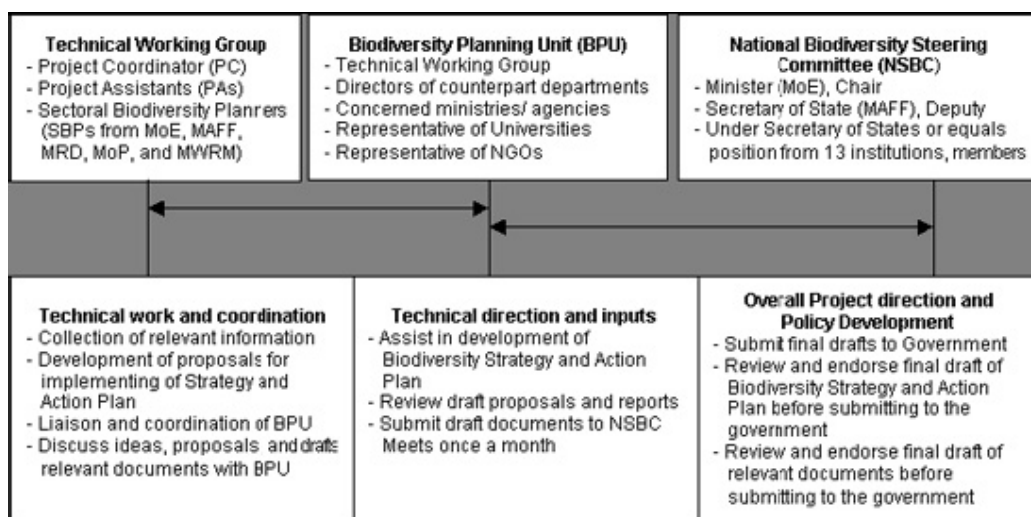
PART II. NBSAP IMPLEMENTATION & MAINSTREAMING BIODIVERSITY

CAMBODIA'S NATIONAL BIODIVERSITY STRATEGY & ACTION PLAN

The National Biodiversity Strategy and Action Plan adopted in 2002 is the culmination of, sectoral meetings with relevant government departments, combined with two national and three provincial workshops on biodiversity. 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.

In the process of development of National Biodiversity Strategy and Action Plan (2002) with fully participation from relevant institutions and stakeholders including civil society and local community, the coordination mechanisms have been established in different levels to fulfill specific tasks as follow:

National Biodiversity Steering Committee (NSBC) is composed of 14 government organizations and three provincial government representatives from highland, lowland, costal and marine areas. The NSBC is chaired by the Minister of Environment and Vice Chaired by a Secretary of State from the Ministry of Agriculture Forestry and Fisheries (MAFF). A Multi-Sectoral Technical Working Group (TWG) for developing NBSAP with relevant institutions with responsibility for technical works, and coordination with all stakeholders. The Biodiversity Planning Unit (BPU) was responsible for daily implementation and provided technical direction and inputs for the NBSAP.



Cambodia's NBSAP is currently being reviewed and as part of the review there will be greater emphasis on ecosystem services and National Biodiversity Targets and Indicators will be used to respond to the vision and mission and main strategic goals. The development of the Biodiversity Targets and Indicators and reporting for this Fifth National Report are part of the participatory process of the NBSAP Review. Through these discussions the NBSAP emphasis is still on

implementing the Convention on Biological Diversity, based on the three objectives of the Biodiversity Convention: 1. The conservation of biodiversity; 2. The sustainable use of biological resources; and 3. The fair and equitable sharing of benefits resulting from the use of genetic resources.

When the previous NBSAP was developed Cambodia had a much shorter-term focus of rebuilding after years of internal conflict. Now Cambodia has some stability and a growing economy with reduced poverty and an increased understanding of biodiversity. The concept of ecosystem services and other biodiversity values is not fully understood but people are becoming more aware of the consequences of not managing the environment. The Government's direction is set by the Rectangular Strategy, which states the need to maximize agricultural production and ensure sustainable use and management of natural resources and maintaining biodiversity, which also means biodiversity is a consideration in many national plans, programs and policies.

CAMBODIA'S BIODIVERSITY POLICY AND TARGETS

The 2002 National Biodiversity Strategy and Action Plan, provided the overall biodiversity policy and targets for Cambodia, but many other pieces of policy have also been enacted related to biodiversity. The following section identifies some of the key documents starting with the Royal Government of Cambodia's Rectangular Strategy 2009-2013,⁴⁶ which includes: Land Reform and De-mining (Distribution of land, Land management and utilization including Land registration and tenure security); Fishery Reform (Transformation of additional fishing lots as fishery conservation areas and community fishing grounds); and Forestry Reform (Sustainable forest management policy, Protected Areas System, and Community forestry). A focus of the Rectangular Strategy is on addressing enhancement of the agricultural sector by improving productivity and intensifying the agricultural sector. The strategy states the need to maximize agricultural production and ensure sustainable use and management of natural resources and maintaining biodiversity.

Other related biodiversity policy documents that have been developed in-line with the NBSAP include:

National Poverty Reduction Strategy (NPRS) (2003-05) recommends the promotion of sustainable management and use of natural resources and the environment.

National Strategic Development Plan (NSDP) (2006-2010) reaffirms the government's Rectangular Strategy and MDGs particularly the forestry reform and environmental conservation focusing on the implementation of environmental impact assessment, climate change mitigation and adaptation, biodiversity conservation and land degradation and defines key strategy and actions for agriculture and environmental conservation:

- Prepare comprehensive strategy for agriculture sector;
- Increase public investment in the sector;
- Enhance affordable micro finance availability;

⁴⁶Royal Government of Cambodia's Rectangular Strategy 2009-2013 (2004)

- Encourage and facilitate private sector involvement in agriculture and agro-processing;
- Improve food security and nutrition;
- Facilitate increase in yield through expending extension service try out innovative grassroots oriented intervention to reduce poverty;
- Ensure sustainable access to the poor in fishery sector;
- Strengthen and enlarge animal production;
- Better manage protected areas;
- Conserve forest through sustainable management practices;
- Formulate and implement a comprehensive land policy;
- Implement program of land allocation to poor framers; and
- Continue removal of land mines and UXOs.

The Ministry of Agriculture, Forestry and Fisheries (MAFF) Action Plan (2004-08), which incorporates objectives to continue forest sector reform through sustainable forest harvesting practices – improved classification system for forest, requirements for forest concession to conduct inventory and develop sustainable forest management plan; and fisheries reform through allocation of fishing areas under community management. The Statement of the National Forest Policy Sector includes the conservation and the sustainable management of the country's forest resources to ensure provision of a maximum contribution to the sustainable socio-economic development of the Kingdom of Cambodia. The Objective of Forestry sector reform as stated in the Forest Policy Reform is, among others, to ensure sustainable management of forest resources by maintaining the remaining national forest resources as permanent forest asset through conservation and sustainable management in order to maximize the forest covers and resources; and conservation and sustainable management of forest resources to maximize contribution to sustainable socio-economic development in the Kingdom of Cambodia. One of the objectives of the Fishery Sector Reform is to ensure conservation and research to enhance natural stocks in order to contribute to national economic development. Creation of Protected Area system to protect biodiversity and endangered species is addressed in the MAFF's development goals to support the Draft National Strategic Development Plan (2006-10).

The Ministry of Environment (MoE), Strategic Plan (2009-2013), identifies the priority actions for implementation of protected areas law and relevant existing regulations for effective management of protected areas system in which contribute to country economics and poverty reduction. The strategic plan also highlight the important for institutional capacity building and public awareness to manage natural resources for sustainable development and the need for feasibility study and research on economics values of biodiversity as well as development of central biodiversity database.

The Government's strategic plans and reforms show strong commitments to the conservation of natural resources: linking pro-poor economic policy to the sustainable use of natural resources. Government actions on decentralization and rural development have seen national resource and environment components incorporated into the Decentralization and Deconcentration policy. It is also streamlined into the commune development planning process, with biodiversity conservation incorporated in the participatory resource management by local community.

There has been a wide range of efforts by the government to implement conservation and community development projects with support from the NGOs and donor communities to reduce poverty in and around protected areas through community projects. Biodiversity is also promoted through development of eco-tourism and incorporation of tourism infrastructure for protected areas in the national tourism development plan. Some relevant initiatives include guidelines for engagement of private sector in implementation of Clean Development Mechanism, particularly in energy efficiency, and reforestation and afforestation is being promoted.

Government policy also encourages private investment in sustainable agricultural and eco-tourism development. It also supports the development of Small and Medium Enterprise (SME), the Development Framework of which focuses on three key areas (i) Regulatory and legal framework, (ii) Access to finance, and (iii) SME support activities. The support activities would focus on improving access to markets, upgrading of technology and human resources and on developing linkages. Organic farming and fish trade facilitation is also part of Cambodia's SME programme. Recognizing current barrier in SME to grow, the government has established the SME National Subcommittee to lead the reform process by identifying the inefficiencies in the business environment, and streamline regulatory and licensing requirements accordingly.

Most recently, to align with the Aichi Targets 2011-2020, which were adopted by the UNCBD COP-10 in Nagoya, Japan, Cambodia has recently defined 20 targets and biodiversity indicators based on the Aichi targets. Among the 20 defined targets, Cambodia has divided into four main parts including Education; Legal and Strategic Framework; Conservation; and Community and Sustainable Use (Annex 1). Cambodia has also signed and ratified the following international agreements and conventions, which all include targets related to biodiversity:

- Ratified to Cartagena Protocol on Biosafety in 2003; Accessed supplementary Protocol on Liability and Redress in 30 August 2013, Signed Nagoya Protocol on ABS in 1 February 2012.⁴⁷
- Ramsar Convention on Wetlands: ratified in 1999.⁴⁸
- UNESCO Network of Biosphere Reserves: Tonle Sap has designed in 1997.⁴⁹
- United Nations Framework Convention on Climate Change (UNFCCC): ratified in 1995 and signed on Kyoto protocol in 2002.⁵⁰
- United Nations Convention to Combat Desertification (UNCCD): signed 1994 & ratified in 1997.⁵¹
- Convention on International Trade of Wild Floral and Faunal Species (CITES): ratified in 1997.⁵²
- For the regional collaboration: joint to ASEAN member state in 1999.⁵³
- Mekong River Commission agreement in 1995.⁵⁴

⁴⁷ <http://bch.cbd.int/protocol/parties>

⁴⁸ <http://www.ramsar.org/cda/en/ramsar-documents-list-anno-cambodia/main/ramsar/>

⁴⁹ <http://www.britannica.com/EBchecked/topic/599316/Tonle-Sap#ref1057683>

⁵⁰ http://unfccc.int/essential_background/convention/status_of_ratification/items/; https://unfccc.int/kyoto_protocol/status_of_ratification/items/

⁵¹ <http://www.unccd.int/en/regional-access/Pages/countries.aspx?place=113>

⁵² <http://www.cites.org/eng/disc/parties/bonn.php>

⁵³ <http://www.nti.org/treaties-and-regimes/association-southeast-asian-nations-asean/>

Case study: Protected Areas & Economic Land Concessions

One of the more difficult areas to balance development and conservation priorities for the Government has been in relation to Protected Areas and Economic Land Concessions. Pursuant to Chapter 4 of the Law on Protected Areas, Article 11 on Zoning provides that each protected area is divided into core zone, conservation zone, sustainable use zone, and community zone. The sustainable use zone can be committed to investments and based on this, the law provides, “management areas of high economic values for national economic development and management and conservation of the protected area itself, thus contributing to the local communities, and indigenous minorities.”

“Development and investment in the protected areas are allowed by the Royal Government of Cambodia based on request made by the Ministry of Environment after consultations are made with concerned ministries and institutions, local authorities and local communities in line with the applicable laws and procedures.”

Based on the experience, land concessions for investment/development projects are only granted within the sustainable use zones in accordance with the Law on Protected Areas. Granting of economic land concessions to investment/development projects in the sustainable use zones is a mechanism to form a protection line to prevent land encroachment in the protected areas, especially in the conservation and core zones, providing the high economic values. It is worth noting that the majority of land concessions have been granted only in surrounding zones of protected areas that is the sustainable use zones. In this context, granting of economic land concessions to investment/ development projects in the sustainable use zones can be a protector of conservation and core zones and the investment/development projects carried out by the private sector plays a significant role in terms of economic growth in the Kingdom of Cambodia, especially local economies and livelihood enhancement of the people who live in and nearby the project areas. These people used to go into the forests of the PAs to collect forest products and none timber forest products or clear land for upper-land crop cultivation, shifting cultivation, or illegal logging to support their livelihoods in addition to their traditional farming which produced low yields and faced high risks. In addition to the said benefits, the investment projects in the sustainable use zones provide job opportunities, and new agricultural skills to the community people who live in and nearby the project areas as well as convert illegal activities of the community people such as logging in PAs, change income generation activities by working with the investment companies and change from traditional farming to specialized one and enable them to select high-yield but low risk rice seeds which are resilient to climate change facing the world. Therefore, granting of land concessions is a process of law regulations for the community people living in and nearby the PAs, especially the conservation and core zones.

⁵⁴ <http://www.mrcmekong.org/about-the-mrc/>

Concessions to investment/development projects are granted only in the sustainable use zones in the protected areas. In general, these areas are of low qualities for biodiversity and wildlife conservation. It can be put in other words that the biodiversity and wildlife are not seriously affected by these concessions. In contrast, it contributes to protection and replenishment of biodiversity as it works as the flood protector in the country. However, if concessions are allowed in the conservation and core zones, biodiversity and wildlife in the PAs are surely affected.

The concessions, which are granted to the investment do not affect the land offered by the State to the communities living in and nearby the PAs in terms of development of community protected areas (CPAs). The Royal Government of Cambodia with the Ministry of Environment as its secretariat facilitates and helps CPAs be part of effective management of natural resources and to support the livelihoods of the local communities, which depend on natural resources for their subsistence. For example, in Boeung Per Wildlife Sanctuary which locates in Kampong Thom, Preah Vihear and Siem Reap province, the local community people are entitled to development of CPAs in forest covered areas. In average, a family is entitled to 5 to 10 hectares of land. The community people are granted with rights to use and harvest natural resources such as wood for house construction, woods to be used as agricultural tools, and herbal medicines etc. based on management plans. With involvement of community people in forest management in form of CPAs, the Royal Government of Cambodia will encourage and facilitate the sales of forest carbon credit markets with hope to improve their livelihoods and use funds from sales of carbon credits to develop infrastructure and human resources in the communities.

The Law on Protected Areas aims at management of protected areas within the Kingdom of Cambodia in line with the policy of the Royal Government of Cambodia as well as policies of many other countries in the world. Right now, management of natural resources in the world not only focuses on conservation, but also the balance of conservation and development. It is noted that it is important to concentrate on both livelihoods of the people and economic development, ensuring that livelihood safety is sustained. With this in mind, the law provides that “Basic, sustainable development in line with Green Development Strategy” in the process of natural resource management and development to reach sustainable development and of helping the protection of social welfares contributes to successful execution of poverty reduction policy and Rectangular Strategy, Phase II of the Royal Government of Cambodia.

When concessions are granted to investment/development companies without impact assessment studies such as social and economic impacts and proper management mechanisms in place, the concessions, surely, spur the illegal logging and anarchic land grabbing in the PAs. Based on the experience on granted land concessions to investment/development projects in PAs, studies have been conducted to assess economic, social and environmental impacts and monitoring and evaluating mechanisms developed with involvement from concerned ministries, institutions of the Royal Government of Cambodia such as the Ministry of Environment, Ministry of Agriculture, Forestry and Fisheries, the Ministry of Economy and Finance as well as local authorities at sub-national levels to monitor the executions of concessionaires, the owners of the investment/development projects, especially mechanisms to promote and encourage each investment/development project to develop reports on impact assessments before the commencement of their plans. At the same time, each development company is required to explicitly state the positive and negative impacts on environment, society, culture and economy and risks emerging from each investment/development project and collection of products and sub-products from the project areas. With this, the Ministry of Environment has transparent and professional mechanisms to monitor and supervise the executions of each project.

Minister for Environment responds to Newspaper regarding to Economic Land Concession, (MoE, 2014)

IMPLEMENTING CAMBODIA'S NBSAP

As well as the aforementioned mainstreaming activities, there has been regular reporting and representation for international biodiversity related forums, but most significantly implementation of Cambodia's NBSAP, demonstrates Cambodia's commitment to the Convention on Biological Diversity. The following section summarizes some of the key activities achieved in implementing Cambodia's NBSAP. Overall the NBSAP has only partially been implemented and lessons learned are being further reviewed at the moment as part of the NBSAP Revision process.

Protection of Natural Resources: Protected areas, endangered species, Ex-situ conservation

The protection and management of the natural resources in Cambodia remain under the mandate of the two main institutions namely MoE and MAFF for protected areas and protected forests respectively. There has been significant activity in-line with the NBSAP and based on the 11 NBSAP (2002) Indicators under this theme, many of them have been implemented and achieved as follows.

Some remarkable progress have been made through the continuation of many conservation projects/program's implementation and activities in the protected areas such as the creation of more communities protected areas (CPAs) and the active involvement with the community's work. According to the General Department of Administration, Nature Conservation and Protection (2014), the total number of demarcation in protected areas is 791 while 2 mega management planning has also developed as of 2013. In addition, many projects with grants and loans have been implementing in different protected areas' sites to contribute to the protection of natural resources namely "Enhancing Climate Change Resilience of Rural Communities Living in Protected areas of Cambodia" project, Removing Barriers to Invasive Species Management in Production and Protection Forests in Southeast Asia-Cambodia Programme and Greater Mekong Sub-region Biodiversity Conservation Corridors Project, to name just a few, which aim at protecting the natural resources. Regarding the protection of endangered species and ex situ conservation, the strong effort has been made to maintain the existing activities and improve its quality although there is no new creation of official zoo or wildlife rescue location but the vulnerable and endangered species have been well protected to prevent the extinction.

MoE and MAFF in collaboration with NGOs are working on a range of biodiversity related programmes: Endangered species action plans, establishing a Southern Cardamom Biodiversity (elephant) Corridor; the Mekong Giant Catfish and Dolphin protection programmes; Lower Mekong Dry Forest Initiative; Wild Vulture Feeding known as Vulture Restaurants; Development of Rhino and Elephant Conservation Strategies, Monitoring of Tigers and their preys; planting and restoration of flooded and mangrove forests; Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme (in the four Lower Mekong Basin); Tonle Sap Environmental Management Project; Biodiversity and Protected Area Management project at Virachey National Park; WWF's Lower Mekong Dry Forest Eco-region Programme; and many other programmes/projects have been on-going in partnership with NGOs and local communities. National days for the environment, fish and forests are also celebrated across the country.

No national marine protected areas have been officially established at this time, but as discussed in regards to the section below on Coastal and Marine there has been significant progress on the designation and protection of important habitats including mangrove, coral reef and sea grass and some other important aquatic habitats through the community based approach MAFF has been actively engaged in identifying potential marine protected areas with IUCN and also promoting Community Fisheries and Community Forestry in wetland, marine and coastal habitats. The Ministry of Agriculture, Forestry and Fisheries is preparing two areas for marine fishery management: one in Rong islands and Kampong Smach estuaries for protection of coral reefs, sea grasses, mangroves and other marine fishery resources. MoE has identified three areas as Ramsar Site and one Biosphere reserve and 40 Important Bird Areas, and is supporting community-protected areas within wetland marine and coastal habitats.

Freshwater Fisheries and Aquaculture

Fish is an important food for Cambodian people since the ancient time. Cambodia is known as one of the four largest fish producers in South-East Asia, especially with regard to fresh water fish grown in rivers, ponds and lakes. Today, the size of fish production has declined due to the increasing number of fishermen in recent years. Many larger fish species have declined while at the same time the smaller fish species dominate the catch. It is the objective of setting up aquaculture systems in Cambodia to refill this gap to have a sustainable fish supply. Fish farm owners have formed a fish farmer community in order to facilitate the support from developing partners. Fish from natural fresh water (natural rivers and lakes) provides a high content of protein substance, good flavor and gives fishermen a higher price than aquaculture fish.

The Fisheries Administration of the MAFF, has demarcated boundaries for fisheries conservation areas, reviewing and removing all fishing lots to enhance community-based fisheries management. A range of projects including but not limited to the Tonle Sap Environmental Management Project/Sustainable Livelihoods Project and ECOSORN sought to support integrated management of the Tonle Sap including: environmental education and training; land use planning; resource zonation; community development; small scale industrial development; fish and agriculture products processing; and involvement of local authorities. As part of the fishery monitoring and protection activities, fish conservation areas have been established.

Coastal and Marine Resources

To ensure the protection of coastal and marine resources in Cambodia significant progress has been the designation and protection of important habitats including mangrove, sea grass, fish conservation areas and coral reef and some other important aquatic habitats through the community based approaches as well as including the marine species under the sub-decree on aquatic endangered species. Currently, the coastal and marine resources protection has also been done by linking with the climate change issue. Education program on climate change and adaptation in the coastal area project is currently implementing to help the communities to adapt to the climate change as well as better understanding the value of biodiversity protection such as encouraging the mangrove restoration and planting among other ongoing protection activities.

In order to protect the environment and manage the use of the natural resources for sustainable economic development, the government is involved in creating an integrated coastal zone management system in the coastal area with support from Danish Government. Activities focused on training personnel for the coastal zone in land management techniques. The Government is also initiating the implementation of a pilot project on State land inventory in the districts of Phnom Sruoch (Kampong Speu) and Chhouk (Kampot).

Forest and Wild Plant Resources

The Royal Government of Cambodia officially regards the ecologically, socially and economically viable conservation and sustainable management of forest resources to be an important pillar of public welfare that directly contributes to environmental protection, poverty reduction and socio-economic development. The RGC has embedded forestry sector reforms into the Cambodian National Strategic Development Plan (NSDP) 2009-2013, as well as into the country's Rectangular Strategy – Phase II of the fourth legislature policy priorities, which strives:

- To ensure sustainable forest management and the use of forests to improve the livelihoods of people living in rural areas and contribute to economic growth.
- To consider forest communities to be an important element in forest management and encourage the private sector to establish commercial forest plantations on degraded forestland based on agreed technical standards.
- To implement policy and the National Forest Programme to enhance development of sustainable forest management by aligning through international guidelines and the active participation of stakeholders.
- To enhance management efficiency of reserved forests and ensures their appropriate protection and development, including through ecotourism and the securing of forest carbon credits to generate employment and additional income for the people.

The RGC in October 2010 approved a National Forest Programme (NFP) aligned with these strategies (NFP) with six priority program areas to address from 2011 to 2029. The initial progress in implementing those programs was reviewed with the support of the European Community in October 2013. The programs include the following:

Forest Demarcation, Classification and Registration

The implementation of a plan developed under the RGC is currently in the process of demarcating the forest estate across the country using the provisions of Sub-decree 53 on Procedures for Establishment, Classification and Registration of the Permanent Forest Estate and the Forestry Law.

Forest Resource Management and Conservation

The planned outcomes of the Forest Resource Management and Conservation program include the development of (1) sustainable forest management plans; (2) management systems for production forests outside of community forests; (3) biodiversity management plans in Protected Forests; (4) the conservation of genetic resources from forests and the establishment of seed sources for planting programs; (5) multi-purpose tree plantations; (6) local forest product

development and market promotion; (7) the expansion of timber processing and use of more efficient technologies; (8) forest certification.

The World Bank's Forest Concession Management and Control Pilot Project had been previously established to provide technical assistance and oversee a process that would enable forest concessionaires to complete forest inventories and, on the basis of those inventories and consultations with local communities, prepare sustainable strategic and operational forest management plans. Prior to the completion of that process, however, logging operations in the forest concessions were suspended by the RGC. Sustainable forest management plans are currently required to be prepared to support planned timber harvesting activities in annual coupes administered under the Forestry Administration and sustainable management investment plans that account for the removals of initial forest cover are prerequisite to the establishment of agricultural and other related tree plantations in Economic Land Concessions.

In parallel with the preparation of these management plans, forest restoration activities, especially those associated with the planting of trees by the Government (Forestry Administration) on Royal Arbor Day each year, are now encouraging the use of native tree species, especially those that have been overcut or are otherwise limited in supply, to the exclusion of introduced tree species.

The RGC has also demonstrated its commitment to manage forests sustainably through various guidelines, regulations, and laws. Achievements include the following:

- The adoption of the Forest Concession Management Sub-decree.
- The adoption of Codes of Practice for sustainable forest management.
- The review of forest concessionaire performance in 1999/2000.
- The termination of forest concession agreements with 15 companies with a cumulative forest area greater than 3 million ha to be converted to protected forests.
- The decision to require 14 remaining forest concession companies to develop approved Sustainable Forest Management Plans and Environmental and Social Impact Assessments and to sign new investment agreements.
- The designation of 20 additional Protected Forest and Biodiversity Conservation areas administered by the Forestry Administration in the Ministry of Agriculture, Forestry and Fisheries covering 1.63 million hectares⁵⁵ and 8 fish conservation areas administered by the Fisheries Administration.
- The termination of agreements of commercial fishing lots and subsequent reservation for local community use.
- The decision that remaining forest resources of the country shall be considered as Permanent Forest Estate managed by exclusively promoting conservation and sustainable forest management initiatives that directly contribute to the rehabilitation and conservation of a maximum stock of forested land and forest resources.
- The decision that a wide range of coordinated multi-stakeholder processes shall be implemented to enable the harmonization of the different perceptions, interests and

⁵⁵ Forestry Administration, 2007 and 2010

objectives of the various forest interest groups at all levels.

- The decision to continue to support reforestation and afforestation of arable land and protect those trees for the development of forest resources.
- The declaration that conservation and the sustainable management of the country's forest resources shall provide a maximum contribution to the sustainable socio-economic development of the Kingdom of Cambodia.

Animal Wildlife Resources

Wildlife protection and management started in the early 1990s. In order to conserve and protect some key species of flora and fauna, additional production forest areas have since been designated, including 20 Protected Forests and 8 Biodiversity Conservation Areas.

In-situ conservation

The Forestry Law of 2002 states that all kinds of wildlife species in Cambodia are state property and components of forest resources, including all species of mammals, birds, reptiles, amphibians, insects, other invertebrates, and their eggs or offspring. Such wildlife is under the management, research and conservation of the Forestry Administration. The Ministerial Declaration (Prakas) on Classifications and List of Wildlife Species in Cambodia issued on January 2007 lists three categories of wildlife: Endangered species, rare species and common species. The Department of Wildlife and Biodiversity in the Forestry Administration is responsible for developing biodiversity conservation and wildlife management plans, including ecological monitoring, surveying, and research.

In-situ conservation has been addressed by the RGC with technical and financial cooperation from development partners and NGOs. Community development is taken into consideration while implementing in-situ conservation and local villagers cooperate in projects. Some targeted key wildlife species include: Tiger (*Panthera tigris*), Elephant (*Elephas maximus*), Eld's deer (*Cervus eldii*), Wild Water Buffalo (*Bubalus arnee*), and Hog deer (*Axis porcinus*). Some globally endangered bird species include: Giant Ibis (*Pseudibis gigantea*), White-shouldered Ibis (*Pseudibis davisoni*), 3 species of vulture (*Gyps spp*), Bengal Florican (*Eupodotis bengalensis*), and Sarus Crane (*Grus Antigone*). While some challenges remain, populations have increased. International development partners include the IUCN, Wildlife Conservation Society, World Wild Fund for Nature, Conservation International, Fauna and Flora International, Wildlife Alliance, BirdLife International, and IUCN.

Ex-situ conservation

There is a primary "Wildlife Rescue Center" located within the Phnom Tamao Zoological Garden. The Wildlife Rescue Center serves to minister to confiscated wildlife illegally traded in the country. The complete list of ex-situ wildlife management centers in the country includes the following:

- Phnom Tamao Zoological Park and Wildlife Rescue Center (Government)
- Prey Angkor Zoo (private)

- Angkor Center for Conservation Biology (private)
- Wildlife Development Center, in Kampot province (private)
- Koh Kong Safari World (private)

Forest Law Enforcement and Governance

The Forest Law Enforcement and Governance program plans to enhance sustainable forest management and strengthen law enforcement through legal and administrative reform, more effective law enforcement and monitoring and reporting of forest crimes, and the development of more rapid responses to reports of forest crimes.

Community Forestry

The purpose of the Community Forestry program is to strengthen sustainable forest management by improving the livelihoods of local communities. Community Forestry has been established in the country since 1991 and as of 2012 there were 453 community forests with a collective area of 399,880 ha. Community Forestry has become a national strategy for poverty alleviation and sustained livelihoods. There are eleven steps required to complete this process, including the development of a management committee and by laws, the demarcation of community forest boundaries, and the establishment of a management plan approved by the Forestry Administration. There have also been provisions for piloting several other forms of less traditional community forest management, including community-based production forestry, partnership forestry, community conservation forestry in protected areas administered by the Forestry Administration, and community protected areas in protected areas administered by the Ministry of Environment.

Capacity and Research Development

The Capacity and Research Development program entails the identification of strategic capacity requirements and the initiation of relevant capacity development programs.

Sustainable Forest Financing

The Sustainable Forest financing program has the responsibility for the identification and development of the means of utilizing economically sustainable sources of required funding to meet each of the NFP objectives. One of the potential sources of the funding is through payments for Reduced Emissions in Deforestation and Degradation (REDD+). Cambodia's forests have the potential to absorb substantial amounts of CO₂ and in May 2008, the Council of Ministers of the Royal Government of Cambodia declared Oddar Meanchey province with its highly degraded forests to be the first REDD+ implementation site in the country. The Forestry Administration has since collaborated with several development partners and NGOs to introduce REDD+ approaches in other areas, as well, including the Southwestern Cardamom Mountains and the Seima Protected Forest in the eastern part of the country. The Project Document in Oddar Meanchey has received validation through the Verified Carbon Standard (VCR) certification process and plans to receive payments for validated reductions in CO₂ emissions through the voluntary market continue as efforts involving the RGC, project partners, and

potential purchasers of carbon credits are extended to resolve remaining legal requirements. In the Seima Protection Forest, meanwhile, the development of responses to the comments of an independent auditor with regard to the Project Document remains ongoing.

Agriculture and Animal Production

Agricultural Improvements and Economic Land Concessions are supported by the Government in order to promote economic development and as such job opportunities in rural areas through. Training on new crop varieties and rotating crops and the System Rice Improvement (SRI), have been promoted for more productive rice farming to help in increasing rice supplies for local consumption and export. Schools also now have lifeskills as part of the curriculum to support agriculture and technology.

The Agricultural Sector Strategic Development Plan 2009-2013 and Strategy for Agriculture and Water are each aligned with the Government's Rectangular Strategy and efforts to achieve biodiversity indicator targets and Millennium Development Goals. The overarching intent of the Agricultural Sector Strategic Development Plan is to enhance agricultural productivity, diversification and commercialization in order to reduce poverty and promote economic growth consistent with sustainable natural resource management.

In order to achieve these conditions, the Ministry of Agriculture, Forestry and Fisheries has established these policy goals for the development of the agricultural sector. These policies promote pro-poor agricultural systems and community arrangements, effective agro-business development, efficient, sustainable and pro-poor management of land and water resources, including water quality, coordinated capacity for agricultural based research, information sharing and technology transfer and promoting good governance in agriculture. Integrated Water Resource Management supports the multi-sectoral use of water, including in the conservation of biodiversity and ecosystems. The Government's agricultural strategy promotes diversified farming systems, agro-forestry and protection, and the management of critical watersheds. Those strategies and their link to the maintenance of protected areas and biodiversity are critical to maintaining stability in agricultural systems and ensuring food security. The significant contribution of protected areas to the supply and regulation of water for agriculture is recognized. 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 regarding it as a public good. Cambodia also encourages increasing awareness among farmers regarding the use of improved variety of seeds, organic fertilizers, plant-based pesticides and compliance with instructions associated with the use of chemical pesticides.

Energy Resources

Over two billion people around the world cook with animal dung or, if they're lucky, wood, on basic stoves which are often no more than a few rocks clustered together; 1.6 million women and children die every year from using these stoves; 10 million Cambodians use wood for cooking; and if allowed to continue, within our lifetime all of Cambodia's natural forests will go,

quite literally, up in smoke. Amid all these numbers, there are some positives: in Cambodia an organization (GERES) is working with local craftsmen to make stoves that burn less wood, reducing demand on local forests. This has been complimentary to the Ministry of Mines & Energy (MME) and Ministry of Rural Development (MRD), which have been promoting energy efficiency programs for households to reduce emissions and fuelwood use including improved wood stoves, biogas digesters and renewable energy.

The Ministry of Rural Development has a national Biodigester Program, with technical training on biogas production in the provinces, and the Ministry of Mines & Energy has a Wood Energy Strategy to:

- Increase the efficiency of transformation process
- Improve cook stoves for households
- Improve the efficiency of wood fuel use in traditional industries
- Substitute wood fuel by other biomass, wood residue and agricultural residues.
- Identify the wood fuel distribution system, including market structures, resource flows, wood Fuel types, volume aspects of energy use, particularly in the residential sector,
- Promote the incorporation of wood energy analysis into relevant policy related initiative,
- Establish and demonstrate a capacity for wood energy research and policy analysis in key government agencies.

The energy development projects will follow the guidelines provide an overview of the industrial estate sector, and provide guidance on: environmental impact issues, negative impacts and mitigation measures, remission requirements, and monitoring management and training. There are two appendices, a checklist of environments parameters for industrial estates, and an extract from the National Reference Manual on Planning Infrastructure Standards.

The Energy statistics in 1995 indicate that 35% of industrial and commercial energy consumption was supplied from biomass energy, mainly fuel-wood and charcoal (MME). A study undertaken in 2010 indicates that wood is now a more and more favoured source of energy given the rising cost of (fossil fuel dependant) electricity and fuel oil. In regards to renewable Energy sources, the Government has identified that: Solar Energy: the average sunshine duration of 6-9 hours per day, giving an average 5kWh/day, thus, considerable potential of solar energy. Wind Energy: The southern part of the great lake Tonle Sap, the mountainous districts in the southwest and the coastal regions, such as Sihanoukville, Kampot, Kep and Koh Kong have the annual average wind speed of 5m/s or greater. The total area around 5%Hydro: The potentiality (10 000 MW, but current contribution to electricity production more than 20%). Significant progress has been made in increasing the available supply of electricity and the expansion of the electricity network. To guide the development of the energy sector, an Energy Sector Development Plan, 2005-2024 has been prepared. A Rural Electrification Master Plan focusing on the use of renewable energy has also been prepared and is being implemented.

The identified mineral resources in Cambodia were bauxite, carbonate rocks, natural gas, gemstones, gold, manganese, petroleum, phosphate rock, salt, silica, and zircon. With the

exception of carbonate rocks and gemstones, the country's mineral resources were largely unexploited. To attract domestic and foreign mining companies to invest in the mining sector, the Law of Minerals Management and Mining of Cambodia was promulgated by the government on July 13, 2001. The Ministry of Industry, Mines and Energy (MIME now is MME) is the main government agency that implements the country's mineral law and policy. The MIME's Department of Geology and Mines and Department of Energy are responsible for developing the country's mineral resources, providing mining assistance to the private sector, and administering mining-related regulations and inspections. The Cambodian Development Council (CDC) is the government agency that grants exploration licenses to investors. If exploration is successful, investors are required to present a master project plan to the CDC before being granted a mining license. The amount of investment approved for mining projects by the CDC totalled \$181 million in 2005(WB).

Offshore oil and gas fields are a common (State) asset for all Cambodians, now and in the future. So far, 28 exploratory wells have now been drilled in petroleum prospective areas to discover the potential oil and gas deposits. In 2004, some initial oil discoveries were made in offshore Block A. But further studies and explorations are required in order to make further realistic estimates of the extent and scope of oil deposits before the commercialized production of these oil resources could start. The Cambodian National Petroleum Authority (CNPA) is responsible for the management of petroleum resources in Cambodia. Through CNPA, the RGC has signed contracts with a number of companies from various countries to explore for oil and gas in six other off-shore blocks and two on-shore blocks. All the development projects on energy, hydropower as well as studying and mine exploration, The Ministry of Mine and Energy has cooperation with Ministry of Environment in conducting the environmental impact assessment in advance to ensure sustainability of development project related to community environment.⁵⁶

Biotechnology and Biosafety

Cambodia signed on to the Cartagena Protocol on Biosafety in 2003. Progress in relation to the

Case study: Biodiversity and Tourism

Tourism is directly and indirectly conducive to society, the economy, culture and environment. Tourism is a main factor driving economic growth through instant flow of foreign currency (tourism revenue) into the domestic economy, which accelerates economic activities, improves GDP, and creates and increases jobs, occupations, incomes and poverty alleviation. Cambodian tourism has been influenced by the global economic crisis, the spread of the A/H1N1 virus and political crises in neighbouring countries in the region. Such crises are a barrier against tourism growth in Cambodia, which nonetheless experienced a double-digit growth in tourism to 4.2 million tourists an increase of 17.5% in 2013. Moreover, ecotourism and community-based tourism development in rural areas and mountainous zones are captivating and ascertain that touring Cambodia-Kingdom of Wonder is truly peaceful and safe. Overall, this trend of Cambodian tourism will further grow in the future, since there is total support from the Royal Government of Cambodia and stakeholders while the country is peaceful, safe, politically stable and developing. According to Ministry of Tourism's statistics, tourism earned around 2,600 million (2013) in Cambodia economy with a double efficacy multiplier. Tourism employs a large segment of the population and improves people's livelihood and poverty alleviation through income generation.

protocol includes adoption of a national law on biosafety (2007), the extension of the mandate of the National Biodiversity Committee to also cover biosafety issues. Cambodia developed its Guidelines for Risk Assessment and Risk Management of Living Modified Organisms in 2007 and a draft National Action Plan on Biosafety and Biotechnology was developed in 2008. A biosafety clearing house has been established with the Ministry of Environment for the purpose of sharing information with the CBD secretariat and other Parties to the Protocol. Apart from implementation of Cartagena Protocol on Biosafety, biotechnology issue is important issues for all countries in the world. To date, even Cambodia is still invented and applied any new biotechnology in country; the precautionary approach is applying to prevent negative cause and effect from introducing new biotechnology from developed countries. To do this there are series of capacity building provided to technical staff of relevant institution at national and provincial level through training workshop and seminar. The main training workshop provided so far are Risk Assessment and Risk Management Resulting from LMOs, LMOs Monitoring and Management of Biosafety, LMOs Detection and Monitoring, LMOs Detection Bases on Protein Analysis in, Monitoring Compliance and Enforcement of Tran-boundary Movement of LMOs.⁵⁷

Tourism

Cambodia's Ministry of Tourism has a strong understanding and appreciation for the important role biodiversity plays in promoting Cambodia as an attractive destination. In-line with this they have developed a National Ecotourism Policy and Strategic Plan⁵⁸, which consists of four major regions for ecotourism development: (1) Northeast Region, (2) Tonle Sap Multiple Use Area, (3) Coastal and (4) Cardamom Mountain Region.

Northeast

In the Northeast Cambodia the resources include Virachey National Park, the mighty Mekong River and its biodiversity, Srepok Wilderness area, highland landscapes, domestic elephants, indigenous people, and unique species such as the Irrawaddy Dolphin, Sarus Crane, Mekong Giant Catfish and Siamese crocodile.

Tonle Sap Lake & Tonle Sap and Mekong Rivers

The Tonle Sap Lake, Tonle Sap River and the Mekong River with the reverse directional flow provide a unique natural resource for tourism development. The great water resource system provides a habitat for people and animals alike. Prek Toal, one of the core zones of the Tonle Sap Biosphere Reserve, is recognized as Asia's premier habitat for large water birds. Floating villages moving according to the tide illustrate the lifestyles of the people around the lake.

Coastal Region

The coastline of Cambodia is 435 km long and has a wide range of coastal habitats that include numerous off-shore islands, mangrove forests, sea grass beds, white sandy beaches and coral reefs with total area coverage of 55,600 km². By developing both blue and green ecotourism

⁵⁷ www.cambodiabiosafety.org

⁵⁸National Ecotourism Policy and Strategic Plan; MoT; SNV and the SRC, USC, 2010

products in the region, there is an opportunity to benefit the local communities, attract a specific market segment, extend the length of stay, and diversify the tourism product.

Cardamom Mountains

The Cardamom Mountains represents one of the largest intact tropical forest areas in mainland Southeast Asia. The mountain region spans more than one million hectares and constitutes three main massifs: Mount Samkos, the Central Cardamom Mountains, and Mount Aural. Ranging up to 1,771 meters, the mountains have a variety of natural forest types according to the altitude, aspect, geology and hydrology: dry deciduous forest, semi-deciduous forest, lowland evergreen forest, hill evergreen forest, bamboo thickets and pine forest. Human density is also very low, and settlements are mainly confined to lowland areas near rivers. Therefore, the variety of fauna and flora is big: there are at least 30 species of large mammals, well over 100 birds, 64 reptiles, 30 amphibians, 30 small mammal species and numerous plants and insects in the Cardamom region. A wide range of globally threatened species have been shown to be present in relatively high numbers, including tiger, Asian elephant, Asiatic wild dog, gaur, pileated gibbon, Siamese crocodile, elongated tortoise, various hornbills and green peafowl.

Environmental Security

The NBSAP (2002), raised the importance of integrating biodiversity protection into flood prevention awareness programmes and rehabilitation plans, a plan focusing on conservation and the protection of biodiversity, environment and ecology, creating environmental security for integrated biodiversity water resources management and development, preventing damage due to flood, drought, watershed degradation, erosion and sedimentation and protecting aquatic and fish resources. At present, the environment security issue is implemented by many institutions of Cambodia government because this issue is cross-cutting issue. Concerning to biosafety, biodiversity and biotechnology, MoE has Natural Resource and Environmental Protection Law and Biosafety Law and both laws used to prevent any cause and damage to genetic resources, biodiversity and introduction of LMOs to pollute environment and impact to human health. In addition to PA law and Biosafety law, MoE has one department is responsible for environment pollution control with equipping one Lab for water polluted analysis. For water resources management and meteorology issue, the MoWRAM has water law and the meteorology station that it can be circulate daily information forecast and any environmental disaster to all Cambodia people. Apart from MoWRAM, CNMC and Cambodia MRD are playing important role for trans-boundary water management through creating dialogue with the three countries (Cambodia, Laos and Vietnam) and find good resolution for effective approaches for integrated water resource management and also take into account water for irrigation, fisheries and aquaculture, hydropower and energy, tourism, navigation, water supply and sanitation and fish habitat of downstream country, especially Cambodia dolphin species.

The Rural Water Supply Department of the Ministry of Rural Development has set its vision by ensuring that in every 2025 people in rural communities have adequate water supply and sanitation as well as in the environment with sustainable sanitation. Ministry puts education training standard water treatment on the water tank to secure the family. Evaluation focused on

the services on rural water and sanitation in Cambodia.⁵⁹ Ministry of Rural Development has a clear strategic policy on water sector and has collaborated with UNICEF in 10 provinces, including: Flood responses; water quality (arsenic); Cooperation between the Ministry of Rural Development Fontaine 1001 for construction of 60 water treatment stations, with GRET for Piped water distribution and with RDI on Arsenic Research.

Land Use Planning

There has been significant institutional capacity building on land use planning including participatory land use planning. MLMUPC has invited the provincial land use plan departments and other participants from line government institutions to join the workshop, aims to improve a draft of document relating to establishing the National Base Map, Map Symbol Standards, and Master Plan for the National Spatial Data Infrastructure (NSDI) in Cambodia. The government of the Republic of Korea provided grant aid of US\$2.5 million to the MLMUPC to implement the project of Production of the National Base Map. The Inter-ministerial committee to coordinate the preparation and implementation of development projects along the west and north of the country was established for home construction, inspection and to set standards for agricultural land, residential land for construction sites, agricultural land application.

In order to support the decentralized Commune Councils, the central government intends to promote land use planning at local levels. Currently the MLMUPC is engaged in ongoing training about participatory land use planning techniques (PLUP) in Kampot and Kratie. At the same time, the processes of delimiting administrative commune boundaries and land use planning in the area of high economic potential are under preparation. With the support of LMAP an approach to land classification and mapping is now under discussion with other institutions and partners. A draft Housing Policy document has been prepared which focuses on the shelter needs of the poor.

The General Directorate of Agriculture of the Ministry of Forestry and Fisheries has been encouraging the development of law on agricultural land, plans of use of agricultural land, zonation of cropping areas, and improvement of agricultural land with an aim to ensure effective use of agricultural land.

Water Resources

Cambodia is a country rich in water resources, and is highly dependent on these resources for the economic mainstays of agriculture and fishery for the majority of its population. The country currently faces numerous challenges in developing, managing and conserving water resources in order for these to be used effectively, equitably and sustainably. Irrigation development and the management of water resources in the catchment context present serious governance challenges for all concerned stakeholders who use water for various purpose.⁶⁰

⁵⁹ Ministry of Rural Development: Service Delivery Assessment – Pers Comm. Mr.Ou Manira

⁶⁰ <http://www.cdri.org.kh/webdata/download/wp/wp54e.pdf>

In order to address challenges, the Ministry of Water Resources and Meteorology (MOWRAM) has been developing certain laws and regulations on establishments of national committees for water management, Lake Basin management, organizations of water users associations, provision of water licenses, and protection of water quality.

The creation of a Ministry of Water Resources and Meteorology centralizes jurisdiction over water resources policy and management. The ministry is responsible for management of fresh and marine water resources, including defining water resources policy & development strategies to support sustainable use, development, and national & international conservation & protection. The comprehensive Law on Water Resources Management defines 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 multi-sectoral water use planning including the need for conservation of biodiversity and ecosystems. However, there is still a long way to go with regards to the implementation of the concept. Regardless of the Mekong River Sustainable Development Agreement (1995), the current hydro dam developments are becoming hot issues for countries in the region, including Cambodia where the EIA capacity remains weak.

The government has set directions and roadmap at short, medium and long term with respect to water consumption to fulfill the needs of the country's development, of the industry and preserve those of urban and rural populations. MOWRAM has efforts to improve its service quality and to minimize the impacts of its developments and operations on the environment and surrounding communities. And collaborate and participate in the management of the Mekong Basin, considering both the management of water resources, in order to sustain biodiversity aquatic and fish life. MOWRAM has rehabilitated irrigation and flood prevention embankments in the Mekong basin which is important for irrigating paddy rice plantation and other agriculture sectors. MOWRAM has implemented with exploration substances in well water in cooperation with UNDP has control on uses of groundwater pumping for people living in rural areas and control arsenic water (poison). MOWRAM has strong control arsenic in water pumping from the underground water for people living in urban and rural areas. The discharge, disposal or deposit of polluting substances, which are likely to deteriorate the quality of water or to endanger humanity, animal and plant health into water, the soil or the sub-soil shall be subject to a license or permit. According to the law on water resources management in the article 22 has stated that the polluting substances provide for in this article and the technical standard shall be determined by sub-decree. All the operational work in the article the MOWRAM shall consult with the other institutions such as the Ministry of Environment, Ministry of Mines and Energy for urban waste water treatment programme in Phnom Penh.

In regards to hydropower projects the reservoirs are cleared of forest to ensure water quality is maintained, and that forest debris will not block the turbine during operation. The bidding processes includes assurances that associated taxes for the national budgets are paid and based on economic analysis, electricity production may have greater national economic gains than those from forest products and non-timber forest products in the reservoir.

Climate Change and Biodiversity

The Ministry of Environment's Climate Change Department in collaboration with other partners and supported from donors have been implementing many important activities, which contribute to biodiversity management. Priority actions in the NBSAP include the integration of biodiversity objectives into the future National Climate Change Action Plan, improvement of weather forecasts to ensure timely warnings of natural occurrences and of the meteorological networks, & the lobbying of developed countries to decrease emission related to climate change.

Being a current Party to UNFCCC and the Kyoto Protocol, Cambodia's Climate Change Office (CCCO) was established and is responsible for a wide range of climate change-related activities including planning and policy formulation, implementation of the UNFCCC, assessment of new technologies to adapt to the adverse effects of climate change or to mitigate greenhouse gas emissions, and capacity building and awareness raising. It also serves as the Secretariat of the National Climate Change Committee, established in 2006 and CDM National Designated Authority established in 2003.

As of 2013, Cambodia has actively continued its missions and made a lot of achievements including the development of national climate change adaptation strategic plan and mainstreaming by sectors 2014-2018, funding 19 climate change projects, building up capacity and awareness raising at national and sub national levels, institutional strengthening and technical capacity building as well as actively in the international negotiations for the benefits of climate and biodiversity protection.⁶¹

Climate change is widely accepted as one of many main threats to diversity of lives on earth. In Cambodia, climate change has been evidenced to negatively affect lives in different forms which adaptation is required and implemented. Frequent severe floods and prolong droughts are the recent two noticeable negative impacts among others resulted from the increased temperature and change in rainfall which affect the yield and production of agricultural products alerting the food insecurity in Cambodia. In fact, "as of mid-November 2013, 20 provinces have been affected by serious flooding, with the worst damage and crop losses reported in the northwest provinces of Banteay Meanchay, Battambang, and Siem Reap. The Asian Development Bank (ADB) recently reported that it was providing US\$3.0 million to the Cambodian government to assist with its ongoing disaster response efforts, to provide needed rice seed for re-planting and repair irrigation infrastructure and rural roads. The ADB estimated that the floods caused US\$1.0 billion in total damage and affected roughly 1.7 million people".⁶²

In addition, rapid climate change also affect the ability of various types of species on earth to adapt that lead to the reduction of biodiversity, as they cannot survive under the change of ecosystem, food chain and water sources among others.⁶³ According to Ministry of Environment and Plan International Cambodia (2013), there are 39 climate change adaptation projects as a national program in agriculture, water resources, infrastructure, human's health and coastal zone

⁶¹ Ministry of Environment Climate Change Department 2013

⁶² United States Department of Agriculture 2013

⁶³ Shah 2014

which showed that Cambodia has been threatened in various sectors including the increase in biodiversity loss under the current climate change condition that adaptation approach has been implementing and linked to almost all sectors in Cambodia.

Community Participation

Cambodia has embarked on a process of decentralization and democratization, including the establishment of elected Commune Councils in early 2002. The authors describe a project supported by the Ministry of Rural Development and the German bilateral agency, GTZ, and undertaken with local non-government organizations, to identify and support active community groups and improve their capacity to interact with the Commune Councils, while at the same time seeking ways for the Commune Councils to support the different groups. And although the Constitution guarantees that ethnic minority populations have equal status with all Cambodian citizens for participation in any activities for protecting natural resources.

Together with the decentralization and democratization action, in term of biodiversity conservation and the natural resources protection, both Ministry of Environment and MAFF have been promoting and encouraging to local community member and ethnic group to participate in meeting and seminar/workshop to provide ideas and comments on the natural resources preservation and protection as well as planning development. Apart from this, the MoE and MAFF are encouraging local people living around and inside the protected areas and protected forests to create CPAs and CF and MAFF. Practically, the number of CPAs created by and under MoE is increasing every year from 3 CPAs communities in year 1999 and 122 CPAs in year 2014. The nationwide number of local people to participate in CPAs is 28,782 families from 224 villages and also covering on 169,104 ha of forest size. The number of CFs under management of FA/ MAFF is 453 and covering on the land areas of 399,880 ha, while CFis is 469 covering on the total areas of 126,490 ha in 2010.

Ministry of Rural Development has implemented a national policy on the development of indigenous peoples in the direction to achieve the Circular on the procedure and method of implementation of the Policy, depending on the development and identification of indigenous communities. Development of indigenous communities in order to enhance the quality of life of ethnic minorities, as well as maintaining traditional culture, their customs and beliefs. Ministry of Rural Development has also been promoting about their lives and living indigenous communities. Make their community to show unity of ethnic, social, cultural style of residential utility. Furthermore, to promote Human Resource Development for Rural communities, the Ministry of Rural Development, with other partners, has been organizing, publicizing and making possible local TRAINING PROGRAMS, SEMINARS and WORKSHOPS that relate to identified relevant and specific Rural training needs, so developing individual talents and skills that, collectively enhance community independence through employment opportunities.

Awareness, Education, Research Coordination and Development

Nationally education is considered as an important sector in capacity building and development of human resources to respond social and national needs. In this regard, the Ministry of

Education Youth & Sport (MoEYS) has their mission to guide manage and develop education youth and sector. MoEYS integrate the environmental issues into national school curriculum (from primary to secondary school) especially biodiversity and ecology and ecosystem. The integration of environmental issues into the school curriculum, MoEYS is aim to provide knowledge and skills as well as to change student behaviors in biodiversity issues relating to environment, health, economic, agriculture, water resources and tourism. Life skill is specifically clarified as knowledge-skill, inter-personality and professionals that can be assisted in decision making, efficiently communication and also can be used to solve problem and self-manage. This life skill contribute to promote welfare and effective and productive livelihood. Until now MoEYS has integrated 30 modules into curriculum as follow: understanding on the environmental issue, home garden, rice cultivation, string bean growing, organic vegetables, mushroom farm, fish, frog and chicken raising, and tourism. The Ministry of Agriculture, Forestry and Fisheries has been promoting research and dissemination of agriculture in the fields in order for the farmers to apply agricultural techniques based on technical standards to ensure food security for the farmers and sustainability of biological diversity.

The Royal Government has made significant progress in implementing the “Education for All” strategy by ensuring equity of access to and the basic nine-year education for most Cambodian children. Other major achievements include the gradual increase in the number of schools and teachers, and the improved enrolment rates at all levels of primary and secondary education, particularly in the rural areas. Lower secondary schools have been built in almost all communes/Sangkat in the whole country. The number of technical and vocational training schools, universities and teaching staff increased as well. The government has also substantially increased budget for the education sector for which current budget expenditure has doubled in 2007 from 2003 level, accounting now for approximately 19 percent of the total current budget. The government has achieved remarkable progress in improving cooperation in education with development partners including NGOs and the private sector.⁶⁴

Key biodiversity achievements of the Educational Sector include:

1. implementing activities for environmental sustainability on biodiversity and education
2. knowledge, skills and good behaviours for country progress and development and promote to biodiversity conservation .
3. tourism sector attracting people to visit recreation sites rich in biodiversity.
4. agricultural sector reserach on genetics and species.
5. promoting good health, from plants and animals on the earth.
6. promoting water resources for all living organisms
7. econominc and financial benefits of biodiversity products including agriculture, timbers, crop and fish production to promote economic growth because this provide benefit and money to state income. Not only agriculture sector that provide state income but for other sectors including tourism, water resources, health and education do as well.

⁶⁴ National Strategic Development Plan: Year 2009-2013

Department of Environmental Education & Communication

A review of historical documents indicates that environmental education principles were first incorporated into Government policies with the establishment of the Ministry of Environment (MoE) in 1993, which is responsible for promoting environmental protection and conservation of natural resources throughout the Kingdom. The Ministry has the role of motivating and supporting public participation in decision-making to resolve environmental and natural resource use issues. The Department of Environmental Education and Communication (DEEC), has been assigned to accomplish four main program areas: human resources development, environmental education and training, environmental information and dissemination, writing and research on environmental information.

In carrying out its mission, the Ministry collaborates with other Ministries of the Royal Government, other institutions, national and international organizations, non-government, the private sector and the people of Cambodia. A variety of NGO's conduct some environmental education but the organizations with an environmental education focus include: Mlup Baitong, Live and Learn, Save Cambodia's Wildlife, SiPAR. While significant smaller scale and ad-hoc environmental education activities are ongoing in Cambodia, the last time a large scale national environmental education and awareness campaign was conducted was 2005 as part of the GEF supported Tonle Sap Environmental Management Project (TSEMP).

Limited resources, i.e. finance, human resources and manpower, equipment etc, have reduced the Department's and other institutions and organisation's ability to conduct large-scale campaigns, and created a more ad-hoc approach to environmental education. Even with limited resources DEEC and other institutions and organizations have been conducting a range of activities grouped as Formal Education and Informal or Non-formal Education. These activities as described below provide some foundation but without a vision and unifying consistent messages the effectiveness of these environmental education activities is greatly diminished.

Formal Environmental Education

Activities directly or indirectly related to formal environmental education include: curriculum and schools activities, training and capacity building workshops. Many of these activities are most traditionally linked with formal education in schools and universities. With the support of DEEC and a range of other partners the Ministry of Education Youth and Sport has been increasing the number of environmental topics in the curriculum.

Training is a major component of government and non-government activities alike, and as such there is an abundance of environmental training being given to participants by a large number of providers but with a great deal of variation in quality. Technical training aimed at developing environmentally sound practices contributes to improve the sustainability and productivity of resource based activities. However, for the interest of environmentally sound management and sustainability of natural resources it is vital that the quality of these trainings programs be assessed to ensure that the information provided and taught to participants is accurate and up-to-

date, furthermore staff that are trained need supportive institutional structures and resources to effectively use these skills.

The focus of the DEEC Formal Education activities is through working with the Ministry of Education Youth and Sport (MoEYS) and VVOB for the integration or mainstreaming of environmental concepts into the curriculum. They are currently working with the National Institute of Education and potential support from UNESCO to revise adapt and test Biodiversity Learning kits to integrate Education for Sustainable Development into the curriculum. They also support this with an Environmental Education Primary School Teacher Guide, developed with MlupBaitong, Save Cambodia's Wildlife and other partners. In-line with the ASEAN guidelines on Eco Schools (2013), they are piloting in Phnom Penh but there is potential for regional expansion, including Monduliri.

With limited resources the DEEC have developed a range of train the trainer materials on environmental topics that they use with teachers and key stakeholder representatives who then further spread the messages. They are also developing training or trainer materials on peace education as a tool in reducing natural resource conflict and promoting environmental management. In-line with the DEEC use of media for informal education, they have a well trained broadcast unit and also conduct journalist trainings on environmental topics.

Non-Formal & Informal Environmental Education

In addition to the above-mentioned initiatives in the formal education sector, the DEEC along with different ministries, international organizations, and international and local NGOs have carried out environmental activities in the non-formal (community and extra-curricula) and informal (media) education sectors. , Including the use of radio broadcasts, monk speeches, posters, TV, CDs VCDs and special events. Up to 80% of what we learn is done outside of formal education so it is a very important consideration for environmental education. The range of non-formal environmental education is diverse as the scope of environmental education is so broad. Some practitioners may not call what that they are doing environmental education but it can still be considered as such.

These non-formal activities make up the bulk of environmental education in Cambodia. Non-formal environmental education initiatives are diverse. Current DEEC activities include: Print (MoE Environmental magazine, Press releases, and articles for newspapers); Radio (support and involve in Mlup Baitong and radio call back shows – related to environmental issues); Television (Debate program on environmental themes and video clips or documentaries); and Website (new local language MoE website being developed – www.moe.gov.kh).

Legislation and Institutional Structure

As part of an effort to increase resources for implementation of CBD, a national capacity self assessment (NCSA) accompanying an action plan for national capacity development regarding implementation of the 3 UN Conventions was developed and adopted by the government in 2007. The Royal Government of Cambodia recognized that there is a lack of capacity for concerned ministries, especially the 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 the private sector to invest for sustainable development in Cambodia.

The prime minister made a call to those who care about preserving biodiversity and land quality, preventing climate change, and poverty reduction to support the NCSA Action Plan and push for along term plan. As noted in Cambodia Third National Report, 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 lie 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 the overall budget of any agency. Nevertheless, the percentage of budget allocation for the 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.

The Environmental Endowment Fund was established under the Law on Environmental Protection and Natural Resource Management (1996), but is too small and without a focus on 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 the budget process. At the field level, however, there are cases where revenues have been generated through eco-tourism initiatives and collection of access fees in which the revenue may be used directly at the place where they are generated⁶⁵.

Quality of Life and Poverty Reduction

There is a direct correlation between poverty and biodiversity, with poor people utilizing a range of natural resource to supplement their food security and provide livelihoods. Poverty reduction strategies are typically social and economic responses but these need to be developed with environmental (biodiversity) considerations, just as environmental (biodiversity) management needs to consider social and economic aspects in order to support poverty reduction: poverty and biodiversity must be managed together as part of a triple bottom line approach incorporating environment, society and economy.

Cambodia's Rectangular strategy places significant emphasis on poverty reduction and agricultural improvements. In support of this strategy schools now have life-skills as part of the curriculum to support Agriculture, Information Technology, Tourism and Engineering and there are extension campaigns to support training for agricultural improvements such as the System for Rice Intensification, crop rotation and new crop varieties. The Government has also been promoting economic development and as such job opportunities in rural areas through Economic Land Concessions. Reductions in levels of poverty and increases in rice exports show some success in this approach, however there has also been increasing disparity in income among the rich and

⁶⁵ Fourth National Report 2010

poor with corresponding social tensions and reductions in biodiversity, including; agricultural biodiversity, impacts on ethnic minorities and habitat loss. This strong focus on economic aspects to reduce poverty has had some positive impacts but without balancing social & environmental considerations it is showing some negative impacts. The government is learning from and adapting approaches to implement the rectangular strategy so as to find more balance.

Poverty levels in Cambodia have registered a significant decline since 1993, in those parts, which were surveyed then. Such decline has occurred mainly through widespread economic growth. The latest survey figures highlight the areas of still lingering poverty needing focused attention and targeted action to reach Cambodia Millennium Development Goals (CMDGs) in reducing poverty. It is time now that resources begin to be properly directed and effectively used to maximize benefits for the disadvantaged and the deprived to lift them into the mainstream.⁶⁶As the Cambodian situation is changing, new calculations for the poverty line are needed. The Ministry of Planning has invited other Ministries and NGOs to participate for Cambodia poverty assessment, estimating household monthly consumption/expenditure. Based on the calculation of the food poverty line is defined as the cost of purchasing food equivalent to 2,200 Kilocalories. At the same time, the government decided that the target for reducing the poverty rate would continue to be a priority.

The Cambodian government also pays specific attention to the welfare of the minority indigenous peoples in Cambodia. The Ministry of Rural Development has developed a National Policy on Indigenous Development, including indigenous rights to use land that indigenous communities are occupied and used traditional including land residences farmland land reserves necessary for the shifting crops, forest spirits recognized by the administrative authorities and neighbors. The land use and access to forest protection and products that have been their tradition and custom. This policy was put under general law related real estate. National policy on the development of indigenous peoples shows the vision policy goals and actions of the Government of Cambodia to Indigenous towards development in all sectors in order to reduce poverty and promote standard provides education comfortable better and help protect and maintain the culture of the ethnic minorities.

There has been significant growth in community-based natural resource management programs across forestry, fisheries, and protected areas, and also including participatory land use planning approaches. MLMUPC has collaborated with MAFF to protect environment related to construction and mapping for the protected areas. The Ministry of Rural Development has been supporting ethnic communities to protect forest community and has consultative workshop on land use regulations indigenous communities in the Province. Create and manage the national information center on indigenous practices in the mountainous high lands and plains, in collaboration with relevant institutions, international organizations and countries. MLMUPC has also been implementing programmes with relevant ministries to provide awareness to the rural people on the sustainable use of natural resources, especial cutting forest and wildlife hunting. There are significant programs on sustainable livelihoods and climate change mitigation and adaptation.

⁶⁶ <http://planipolis.iiep.unesco.org/upload/Cambodia/PRSP/Cambodia%20PRSP%202005.pdf>

REGIONAL COLLABORATION

Cambodia is a member of the 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 alia, 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) 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 the Regional Custom Cooperation Framework, Intergovernmental Panel on Forests/ Intergovernmental Forum on Forests (IPF/IFF).

Tran-boundary biodiversity conservation is an important issue in Cambodia, as well as in the neighboring countries of the Mekong Sub-region, because each one of those countries recognizes that wildlife freely crosses national boundaries and moves from one country to another along neighboring borders. It is in responding to that recognition that Cambodia participates in the conservation of biological resources through the implementation of the ITTO Trans-boundary Biodiversity Conservation project, the ADB Biodiversity Corridors Initiative and the Association of Southeast Asian Nations' Wildlife Enforcement Network etc.

As an example, the Forestry Administration of Cambodia and the Royal Forestry Department of Thailand, joined forces as executing agencies to implement the project Management of the Emerald Triangle Protected Forests Complex to Promote Cooperation for Trans-boundary Biodiversity Conservation between Thailand, Cambodia and Laos - Phase III. They have made concerted efforts in the first two phases of the project to achieve its Development Objective, which is to contribute to the conservation of trans-boundary biodiversity in the Emerald Triangle Protected Forests Complex. That objective is to be accomplished in this third phase of the project through the realization of the project's Specific Objective which is to apply the lessons learned from the previous phases of the projects to strengthen the protection of trans-boundary habitats of protected wide-ranging plant and wildlife species. This project marks another important milestone in the collaborative efforts between the Forestry Administration of Cambodia, the Royal Forestry Department of Thailand and the Department of Forestry of Lao PDR to support biodiversity conservation in the lower Mekong River Basin region.

In its efforts to contribute to the attainment of the CBD targets, the Government of Japan has provided approximately \$2 million dollars of \$2 billion it pledged worldwide during the UN CBD COP 10, organized in October 2010 in Nagoya Aichi, Japan, to the implementation of Phase III of the ITTO project on 'Management of the Emerald Triangle Protected Forests Complex to Promote Cooperation for Trans-boundary Biodiversity Conservation between Thailand, Cambodia and Laos.'⁶⁷

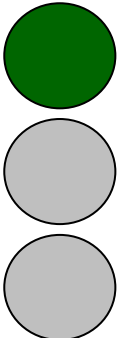
⁶⁷ Forestry Administration, 2013

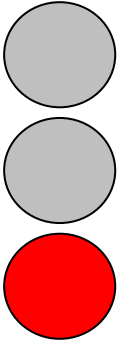
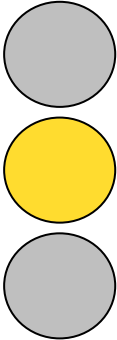
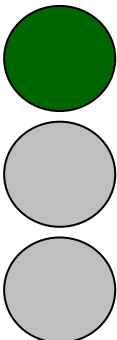
PART III. PROGRESS TOWARDS THE 2020 AICHI BIODIVERSITY TARGETS AND CONTRIBUTIONS TO THE RELEVANT 2015 TARGETS OF THE MILLENNIUM DEVELOPMENT GOALS

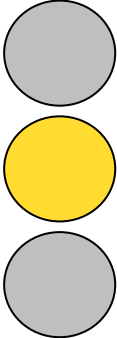
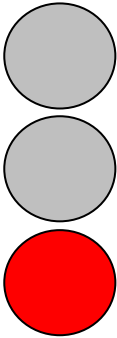
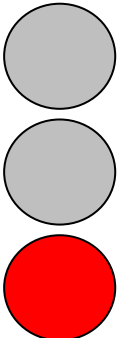
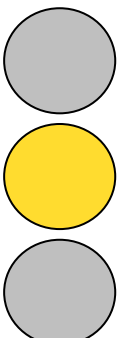
PROGRESS TOWARD THE IMPLEMENTATION OF THE STRATEGIC PLAN FOR BIODIVERSITY

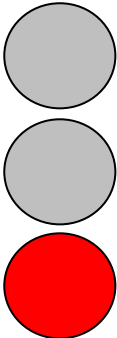
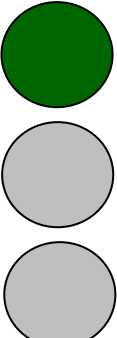

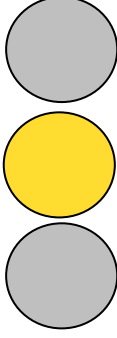
The UN CBD COP 10 has adopted twenty targets so called Aichi Biodiversity Targets which are to be achieved during the period from 2011 to 2020 to ensure the use of biodiversity resources in a balanced manner and the equitable sharing of the benefits of the use of those resources. These have been considered and adapted for Cambodia’s biodiversity targets and indicators in 2013 (annex 1), and are now being utilized in the current review of the Cambodia NBSAP updating. The table below summarizes some of targets and national responses.

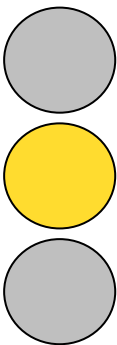
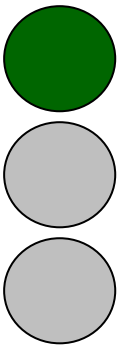
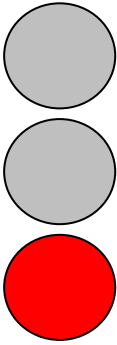
CAMBODIAN (AICHI) BIODIVERSITY TARGETS & INDICATORS AND PROGRESS TO IMPLEMENTATION

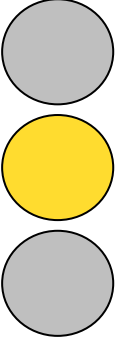
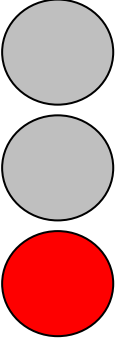
Biodiversity Targets	Indicators for Measuring Progress	Progress (Traffic Lights)
<p>Target 1 (Aichi Target 1): By 2020, knowledge of the stakeholders on biodiversity values (economic, social, health, recreational etc.) has been improved.</p>	<ul style="list-style-type: none"> • Number of Educational and Media materials, programs and means on biodiversity values has been developed and delivered. • Number of Educational and Media materials and programs has been provided to educators and learners. • Number of stakeholders at all levels aware of the biodiversity values (method to evaluate capacity building and knowledge of the relevant stakeholders). • Number of people whose behavior has been changed due to awareness and knowledge of Biodiversity values. • Biodiversity location, provider and receiver biodiversity knowledge have been identified. 	

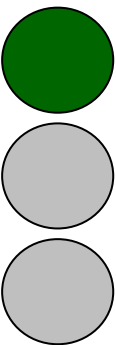
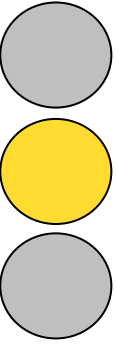
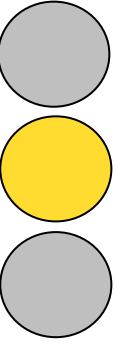
<p>Target 2 (Aichi Target 20): By 2020, a financial mechanism modality (for both national and international funds) has been established and implemented at national level.</p>	<ul style="list-style-type: none"> • Mechanism ensuring the sustainable management of natural resources has been established. • National budget allocation for biodiversity conservation has been increased. • Sources of funds budgeted (government, development partners or donors, and private sectors) for managing biodiversity sustainably. • Biodiversity Trust Fund has been established. • Financial mechanism modality for Cambodia and development partners on biodiversity management and conservation has been implemented. 	
<p>Target 3 (Aichi Target 2): By 2020, biodiversity values have been integrated into development plans at national and sub-national levels.</p>	<ul style="list-style-type: none"> • Values and functions of biodiversity have been integrated into development plans at national and sub-national levels. • Sectoral national budgets have been allocated for managing biodiversity. • By 2015, allocated budgets for managing biodiversity have been increased in each relevant institution. • Existing cooperation mechanisms have been strengthened. 	
<p>Target 4 (Aichi Target 6): By 2020, aquatic biodiversity and ecosystems have been improved and managed sustainably.</p>	<ul style="list-style-type: none"> • Illegal fishing substantially reduced in maximum. • Fish sanctuaries (number and areas) have been increased and effective management. • Fish stock levels and ecosystem have been maintained and restored to levels that can produce maximum sustainable yield. • Illegal fishing Management Plan has been established and practiced effectively. • Level of annual aquaculture fish yield (15%) • Legal systems and relevant legislation regarding management, use and harvesting of aquatic life have been improved, established and practiced effectively. 	

<p>Target 5 (Aichi Target 7): By 2020, areas under agriculture, aquaculture and forestry have been used and managed sustainably, contributing to biodiversity conservation.</p>	<ul style="list-style-type: none"> • Proportion of harvest from agriculture, aquaculture and forestry has been sustainable practiced and increased. • Area of land for agriculture, aquaculture and forestry has been sustainably managed and increased. • Number of certified (qualification & environment) products. 	
<p>Target 6 (Aichi Target 14): By 2020, ecosystems and their functioning have been restored and preserved benefiting local communities particularly women, old person, children and indigenous people.</p>	<ul style="list-style-type: none"> • By 2015, budget for livelihood development of local communities has been established. • Number of special areas as part of community protected areas (CPA, CF, CFi) has been established, recognized and managed well. • Number of restored areas in the community protected areas (CPA, CF, CFi) and ecosystems protections have been achieved 30%. 	
<p>Target 7 (Aichi Target 4): By 2020, Government, private sector and other stakeholders have taken steps and been responsible for reducing negative impacts on ecosystems caused by development activities.</p>	<ul style="list-style-type: none"> • Number of market based incentives has been developed and implemented for sustainable production and consumption. • Legislations and other programs (green growth development, Satoyama Initiative...) supporting sustainable development has been established and implemented. • Number of certified (qualification and environment) products. 	
<p>Target 8 (Aichi Target 11): By 2020, conservation of existing protected areas has been continued while protected forest and fresh water and marine protected areas will be established additionally.</p>	<ul style="list-style-type: none"> • Number of existing protected areas and protected forest have been zoning. • Number of management plans has been developed for existing protected areas, protected forest and freshwater and marine protected areas. • Number of protected forest, and freshwater and marine protected areas established additionally. • Number of coordination mechanisms established for PAs. 	

<p>Target 9 (Aichi Target 3): By 2020, programs or projects of Payment for Ecosystem Services (PES) have been encouraged throughout the country.</p>	<ul style="list-style-type: none"> • Number of biodiversity friendly incentives and PES programs or projects has been developed and implemented. • Number of legislations regarding Payment for Ecosystem Service (PES) has been developed and implemented. • Identification of key ecosystem services and their benefits. 	
<p>Target 10 (Aichi Target 12): By 2020, all known threatened species (fauna & flora) at national level have been protected and conserved.</p>	<ul style="list-style-type: none"> • Population distribution of threatened species (fauna & flora) has been identified in a national document. • Red List of threatened species has been updated in every two years. • Number of restoration programs and action plans to manage and conserve threatened species. • Size and distribution of habitats for threatened species identified • Number and size of habitats to be identified. • Number of illegal activities on the threatened species has been declined. 	
<p>Target 11 (Aichi Target 15): By 2020, ecosystems and their services have been better assessed, protected and improved.</p>	<ul style="list-style-type: none"> • Number of restoration and rehabilitation programs and area (ha). • Quantity of natural carbon stocks (Forest cover, and reforestation have been prevented). • Number of legislations on natural resources protection has been established, adopted and practiced. 	
<p>Target 12 (Aichi Target 5): By 2020, the rate of natural habitat loss will have reduced, and restoration of natural habitat and wildlife corridors will have improved.</p>	<ul style="list-style-type: none"> • Plan of habitat loss prevention, habitat and important ecology restoration. • Areas and size of habitat restored and protected. • Number of rangers and operational equipment and facilities. • Assessment report on current rate of habitat loss and important ecosystem degradation. 	

<p>Target 13 (Aichi Target 16): By 2020, Cambodia will ratify the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS), and develop Legislation and National policy on ABS in order to implement in 2020.</p>	<ul style="list-style-type: none"> • Education and capacity building programs on the Nagoya Protocol on ABS have been organized and implemented. • Ratification letters of the Nagoya Protocol on ABS. • Relevant Laws and policy frameworks on ABS have been established. • Case study on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS). 	
<p>Target 14 (Aichi Target 17): By 2015, the National Biodiversity Strategy and Action Plan (NBSAP) have been updated and integrated into relevant sectoral and cross-sectoral plans and will be implemented effectively in 2020.</p>	<ul style="list-style-type: none"> • Number of national, sub-national and sectoral plans in which biodiversity conservation has been integrated. • National Biodiversity Strategy and Action Plan (NBSAP) has been updated on time and published. • Actions taken to demonstrate outcomes of implementation of NBSAP. 	
<p>Target 15 (Aichi Target 10): By 2020, anthropogenic activities (pollution, exploitation, sedimentation...) on coral reefs and vulnerable ecosystems have been reduced to minimum level.</p>	<ul style="list-style-type: none"> • Report of coral reef status and its ecosystems by 2015. • Location of coral reef and its vulnerable ecosystem has been determined and updated by 2015. • Number of coral reef locations and its vulnerable ecosystems has been protected by 2015. • Number reduction programs of the anthropogenic activities on coral reef and its vulnerable ecosystems have been implemented. • Laws on exploitation, pollutions, ecosystems damaging and vulnerable species have been recorded and established. • Number of vulnerable fishermen have received education and awareness on coral reef and environmental protection law. • Assessment report on public awareness on coral reef protection. 	

<p>Target 16 (Aichi Target 8): Pollutant pressures on terrestrial and freshwater ecosystems substantially reduced by 2020.</p>	<ul style="list-style-type: none"> • Water quality standards such as Total Suspended Solids (physical), Oxygen levels (chemical). • Educational programs on water pollutant. • Assessment report on changing behavior of people in usage, storage and management of solid waste and waste water. • Pollution monitoring reports and EIA practices. 	
<p>Target 17 (Aichi Target 18): By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.</p>	<ul style="list-style-type: none"> • Rights, traditional knowledge and customary usage have been written in national policy on Indigenous People Development. • Education and strengthening law enforcement both at national and sub-national levels. • Number of local communities and indigenous people have been involved in planning processes. • Number of traditional products certified has been recognized. • The indigenous children have been provided at least primary and secondary education. • Indigenous people will receive relevant professional training according to their needs and locations. • Culture of the indigenous people has been better protected and conserved. • Identification of the different indigenous cultural groups has been conducted. • The indigenous people have been provided legal rights to own and use their lands. 	

<p>Target 18 (Aichi Target 9): By 2020, major Invasive Alien Species (IAS) and their pathways have been identified, prioritized and controlled.</p>	<ul style="list-style-type: none"> • Number of Invasive Aliens Species identified. • Laws and policy frameworks developed for control of IAS. • Areas affected by Invasive Aliens Species identified. • Trends in habitat conversion caused by IAS. • Number of Invasive Aliens Species control programs under management programs. • Feasibility study on biodiversity has been researched. • Protection and eradication measures on the IAS. 	
<p>Target 19 (Aichi Target 19): By 2020, a Biodiversity database including its values and functions has been established and maintained in the responsible institutions for wide sharing among stakeholders.</p>	<ul style="list-style-type: none"> • National biodiversity information/database system has been established and operated. • Coordination mechanisms have been established for information gathering and sharing among relevant institutions. • Biodiversity status reports have been developed and shared through Clearing House Mechanism (CHM) including threats to biodiversity and ecosystems. • Educational programs, workshops and training activities on use of informational technology for biodiversity management. 	
<p>Target 20 (Aichi Target 13): By 2020, Ensure genetic diversity of plants and animal (natural and domesticated species) has been protected and conserved In-situ and Ex-situ.</p>	<ul style="list-style-type: none"> • Establish plant nurseries and zoos for researching protection, conservation, germination, breeding and local genetic pools. • Prepare and develop laws on Genetic Resources (standard) for internal and external investments. • Germination, transplantation, reproduction and conservation of vulnerable fauna and flora species. • Number of local genetic pools has been established. • Number of relevant national legislations and policy frameworks has been established. • At least 30% of local genetic pools have been preserved in-situ and 5% ex-situ. 	

Note: National Targets Traffic Light
Green = good implementation;
Yellow = partial implementation;
Red = no implementation yet





















PROGRESS IN ACHIEVING THE CMDGS

The Cambodia Millennium Development Goals provide relevant targets to biodiversity. The targets have been assessed and the various diagrams presented in the previous sections have illustrated the extent to which key indicators for each CMDG were on track for their latest value relative to the linear path between baseline and target, as well as the likelihood of targets being met given projections based on current strategies outlined in the NSDP.

The assessments made in these sections are summarized for key indicators in section 3. In summary, these assessments show:


























- The greatest progress has been achieved in CMDG4 (Child Mortality), and in CMDG6 (HIV/AIDS and Malaria, Dengue Fever and TB). For both of these, all key indicators are on, or better than, their current target. However, child mortality rates remain high and the targets could be revised upwards.
- CMDG9 (De-mining, ERW and Victim Assistance) is moderately off-track but has a framework in place to achieve its key targets.
- CMDG2 (Primary Education) and CMDG3 (Gender Equality) are lagging in some of their indicators, which need focused attention. For education, these are the primary flow rates; children aged 6-14 out of school, and literacy rates. For Gender, these include literacy of adult women, wage employment in the service sector, and the proportion of women in top decision-making positions at all levels.
- CMDG1, 5 and 7 (Poverty and Hunger, Maternal Health and Environmental Sustainability) have elements that are seriously off-track and require robust intervention. For CMDG1, this includes equity issues in growth, food poverty and child labor. For CMDG5, this includes maternal mortality, the use of contraception and access to emergency obstetric care. For CMDG7, this includes effective protection of natural resources, fuel wood dependency and land titling.
- CMDG8 (Global Partnership for Development), shows good progress in ODA and use of ICT, but needs attention to trade. It is not possible to assess progress in the absence of clear targets. These will be set in the revised framework.

















Summary of Progress on Selected CMDG Indicators






Indicator	Baseline Value	Baseline Year	Current Value	Current Year	2015 Target	Current linear Target	Status
Cambodia MDG1: Eradicate extreme poverty and hunger							 
1.1 Proportion of people whose income is less than the national poverty line	47	1993	30.1	2007	19.5	29.5	on-Track 
1.2 Share of poorest quintile in national consumption	8.5	1993	6.6	2007	11.0	10.1	off-Track 
1.3 Proportion of working children aged between 5-17 years	16.5	1999	n/a	2010	8.0	10.7	off-track? 
1.4 Prevalence of under weight (weight for age <2SD) children < 5yrs of age	38.4	2000	28.8	2008	19.0	28.1	on-Track 
1.5 Proportion of people below the food poverty line	24	1993	18	2007	10.0	15.1	slow 
1.6 Prevalence of stunted (height for age <2SD) children <5 years of age	49.7	2000	39.5	2008	25.0	36.5	slow 
1.7 Prevalence of wasted (weight for height <2SD) children <5 years of age	16.8	2000	8.9	2008	6.0	11.0	on-Track 
1.8 Proportion of households using iodized salt	14	2000	71.5	2008	90.0	54.5	on-Track 
Cambodia MDG2: Achieve universal primary education and if possible, extend to basic education							 
2.1 Net Primary admission rate	81	2001	92.4	2009	100	91.9	on-track 
2.2 NER in Primary education	87	2001	94.8	2009	100	94.4	on-track 
2.3 Net enrolment ration lower secondary education	19	2001	31.9	2009	100	65.3	off-track 
2.4 Proportion of 6-14 year olds out of school	35	1998	19.8	2008	0	14.4	off-track 
2.8 Literacy rate of 15-24 years old	82	1999	87.5	2008	100	92.1	slow 
2.11 Primary Completion rate	58.9	2001	83.2	2009	100	82.4	on-track 
2.12 LS Completion rate	24.8	2001	48.7	2009	100	67.8	off-track 
2.13 Primary Gender Parity Index	0.9	2001	1	2009	1	1.0	on-track 

2.14 Lower secondary Gender Parity Index	0.8	2001	1.1	2009	1	0.9	on-track	↑
2.15 Primary repetition rate	10	2000	8.9	2008	5	7.3	slow	↓
2.16 Primary drop-out rate	11	2000	8.3	2008	5	7.8	slow	↓

Indicator	Baseline Value	Baseline Year	Current Value	Current Year	2015 Target	Current linear Target	Status	
Cambodia MDG3: Promote gender equality and empower women							♀	↓
3.1 Ratio of girls to boys in upper secondary education	48	2001	72.9	2008	100	74.0	on-track	↑
3.2 Ratio of girls to boys in tertiary education	38	2001	57.5	2008	85	61.5	slow	↓
3.3 Ratio of literate females to males 15-24 years old	87	1998	95.7	2008	100	94.6	on-Track	↑
3.4 Ratio of literate females to males 25-44 years old	78	1998	85.9	2008	100	90.9	slow	↓
3.5 Female share in wage employment in agriculture (primary sector)	35	1998	44	2008	50	43.8	on-Track	↑
3.6 Female share in wage employment in Industry (secondary sector)	44	1998	56	2008	50	47.5	on-Track	↑
3.7 Female share in wage employment in services (tertiary sector)	21	1998	30	2008	50	38.1	slow	↓
3.8 Proportion of seats held by women in national assembly	12	2003	22	2008	30	19.5	on-track	↑
3.9 Proportion of seats held by women in senate	13	2003	14.8	2007	30	18.7	slow	↓
3.10 Proportion of female Ministers	8	2003	7.7	2008	15	10.9	off-track	↓
3.11 Proportion of female secretaries of state	6	2003	8	2008	18	11.0	off-track	↓
3.12 Proportion of female Under-secretaries of state	5	2003	14.6	2008	20	11.3	on-track	↑
3.13 Proportion of female Provincial Governors	0	2003	0	2008	10	4.2	off-track	↓
3.14 Proportion of female deputy Provincial Governors	1	2003	16.5	2009	15	8.0	on-track	↑
3.15 Proportion of seats held by women in Commune Councils	8	2003	14.6	2009	25	16.5	slow	↓
3.16 Proportion of population aware that that violence against women is wrong and criminal	41.5	2005	67	2009	100	64.9	on-track	↑




Cambodia MDG4: Reduce child mortality									
4.1 Under-five mortality rate (per1,000 live births)	124	1998	83	2005	65	99.7	on-track		
4.2 Infant mortality rate (per1,000 live births)	95	1998	60	2008	50	68.5	on-track		
4.3 Proportion of children under 1year immunized against measles	41.4	2000	91	2008	95	70.0	on-track		
4.4 Proportion of children aged 6-59 months receiving Vitamin A capsules	28	2000	79	2008	90	61.1	on-track		
4.5 Proportion of children under 1 year immunized against DPT3–HepB	43	2000	92	2008	95	70.7	on-track		
4.6 Proportion of infants exclusively breastfed up to 6 months of age	11.4	2000	65.9	2008	70	42.7	on-track		
Cambodia MDG5: Improve maternal health									
5.1 Maternal mortality ratio (per 100,000 live births)	437	1997	461	2008	250	322.7	off-track		
5.2 Total fertility rate	4	1998	3.1	2008	3	3.4	on-track		
5.3 Proportion of births attended by skilled health personnel	32	2000	58	2008	87	61.3	on-track		
5.4 Proportion of married women using modern birth spacing methods	18.5	2000	26	2008	60	40.6	off-track		
5.5 Proportion of pregnant women with 2 or more ANC with skilled health personnel	30.5	2000	81	2008	90	62.2	on-track		
5.9 Proportion of pregnant women delivered by Caesarean section	0.8	2000	2	2008	4	2.5	slow		
Cambodia MDG6: Combat HIV/AIDs, malaria and other diseases									
6.1 HIV prevalence rate among adults aged 15-49	1.9	1997	0.7	2008	0.6	1.1	on-track		
6.2 HIV prevalence rate among pregnant women, 15-24 years old visiting ANC clinic	2.1	1998	1.1	2006	0.4	1.3	on-track		
6.7 Proportion of people with advanced HIV infection receiving ART	3	2002	92	2008	95	45.5	on-track		
6.8 Malaria case fatality rate reported by Public Health sector (%)	0.4	2000	0.35	2008	0.4	0.4	on-track		
6.13 Dengue case fatality rate reported by Public Health sector (per 1000 population)	1.5	2003	0.3	2009	0.3	0.9	on-track		
6.14 Prevalence of all forms of Tb per 100,000 population	928	1997	664	2007	464	670.2	on-track		
6.15 Tb death rate per 100,000 population	90	1997	75	2008	32	54.6	off-track		

Indicator	Baseline Value	Baseline Year	Current Value	Current Year	2015 Target	Current linear	Status	
Cambodia MDG7: Ensure environmental sustainability								
7.1 Forest Cover (% of total area)	60	2002	57.6	2009	60	60.0	off-track	
7.2 Surface of 23 protected areas (millions of hectares)	3.3	1993	2.9	2009	3.3	3.3	off-track	
7.3 Surface of 6 new forest-protected areas (millions of hectares)	1.4	1996	1.5	2009	1.4	1.4	on-track	
7.4 Number of rangers in protected areas	600	2001	480	2010	1200	985.7	off-track	
7.5 Number of rangers in forest protected areas	500	2001	315	2010	500	500.0	off-track	
7.6 Proportion of fishing lots released to local communities	56.7	1998	56.7	2009	56.7	56.7	on-track	
7.7 Number of registered community based fisheries	0	2000	236	2010	470	313.3	off-track	
7.8 Surface of fish sanctuaries (thousand hectares)	23.5	2002	46.6	2010	60	46.0	on-track	
7.9 Proportion of households dependent on fuel wood	92	1993	83.6	2008	52	64.7	off-track	
7.10 Proportion of rural population with access to safe water source	24	1998	41	2008	50	39.3	on-track	
7.11 Proportion of urban population with access to safe water source	35	2005	54.4	2009	80	53.0	on-track	
7.12 Proportion of rural population with access to improved sanitation	6	1998	23.2	2008	33	21.9	on-track	
7.13 Proportion of urban population with access to improved sanitation	56	1998	81.5	2008	74	66.6	on-track	
7.14 Proportion of land parcels having titles registered	0	2003	23	2009	65	32.5	off-track	

Indicator	Baseline Value	Baseline Year	Current Value	Current Year	2015 Target	Current linear Target	Status	
Cambodia MDG8: develop a global partnership for development								
Cambodia MDG9: De-mining, EWR and Victim assistance								
9.1 Annual numbers of civilian casualties recorded	1691	1993	241	2009	0	461.2	on-track 	
9.2 Percentage of severe/high/medium/low suspected contaminated are as cleared	11	2000	45	2009	100	53.2	slow 	

Source: Ministry of Planning: Achieving Cambodia Millennium Development Goals, Update 2010

Note-the above table, an indicator is considered:

- On-track**  If its deviation from current projected target is less than 5 percent or positive;
- Slow**  If its deviation is 5 percent to 25 percent below current target;
- Off-track**  If its deviation is more than 25 percent from current target or if it has fallen below a constant value that it was supposed to maintain (such as Surface of protected areas)

NOTE: This is NOT a complete list of CMDG indicators and it includes indicators and targets that are different from the original 2003 framework as the CMDG/NSDP M&E framework is currently being reviewed and is expected to be finalized for the NSDP Update Mid-Term Review

FORESTRY ADMINISTRATION STRATEGIC PLAN 2014-18 PROGRAM INDICATORS

Result indicators	2014	2015	2016	2017	2018
Protected Forests and wildlife conservation area (ha)	50,000	50,000	50,000	50,000	50,000
Reforestation (ha)	25,000	25,000	25,000	25,000	25,000
Community Forestry (CF) established and strengthened (site)	32	32	32	32	32

There are sub-programs:

SP 5.1: Management and Conservation of forest and community forestry

Indicators	2014	2015	2016	2017	2018
Forest demarcation (Km/y)-RGC+DP	350	455	592	769	1000
Identify and establish CF (RGC+DP)	32	32	32	32	32
CF development and CF livelihood (RGC+DP)	100	100	100	100	100

SP 5.2: Development of Forest Plantation and Silvi-culture

Indicators	2014	2015	2016	2017	2018
Forest plantation (ha)	25,000	25,000	25,000	25,000	25,000
Pilot Agro-forestry Plot (site) and raising awareness 100 CF	5/20	5/20	5/20	5/20	5/20
Tree Seedling production	10 mill.	10 mill.	10 mill.	10 mill.	10 mill.

SP 5.3: Conservation of Biodiversity and Zoological Management

Indicators	2014	2015	2016	2017	2018
Protected forests and wildlife conservation areas established (ha)	50,000	50,000	50,000	50,000	50,000
Management of wildlife rearing site (register)	10	10	10	10	10
Nature based-tourism site identified	1	1	1	1	1

SP 5.4: Development of Forest Product Processing Technology and Trade

Indicators	2014	2015	2016	2017	2018
Sawn mill, processing shop, kiln registered	340	340	340	340	340
Train wood process in technology (person)	200	200	200	200	200

Forest products exported and imported (m3)	21,051	23,480	25,909	28,338	30,767
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SP 5.5: Research and Development of Forest and Wildlife

Indicators	2014	2015	2016	2017	2018
People trained (person)	360	390	420	450	480
Study result publicized	2	4	4	4	4
Research project developed and implemented	3	3	4	4	4

SP 5.6: Forest Law Enforcement and Governance

Indicators	2014	2015	2016	2017	2018
Training and Extension on laws and regulation (course)	45	45	45	45	45
Illegal case decreased	1000	950	900	850	800
Illegal cases checked and verified	150	150	150	150	150

SP 5.7: Management of Forest Financing, Planning and M&E

Indicators	2014	2015	2016	2017	2018
Program and sub-program developed	7	7	7	7	7
M&E project implementation	7	7	7	7	7
Financial Database Management System	2	2	2	2	2