

State of Environment in Cambodia Presents in Environment statistic workshop in Hanoi Vietnam 05-07 December 2011

Cambodia Team:

Geography

- Cambodia small country
- Located in South-East Asia
- Borders Vietnam on the east and south, Thailand and Lao People's Democratic Republic the north



Geography and Demography

Geography:

- Mainland area: 181 035 km²
- Comprised of the central alluvial plains of the Mekong river, Tonle Sap basin, and mountainous and highland areas that surround the central plains
- Mekong River (~500 km) flows through the country
- Coastal zone in the south-west borders the Gulf of Thailand (~435 km long)

Geography and Demography

- The country is divided into 23 provinces and 1 municipality with a total of 159 districts and 1,417 communes for the provinces and 8 Khans (districts) and 204 Sangkats (quarters) for the municipality

Demography

- about 13.4 million people in 2008 (Phnom Penh accumulates 1.32 million)
- Approximately 80.5 percent of this population lives in rural areas
- population density, as of 2005, was 78 persons per square kilometer
- Grew at an average rate of 1.54% annually (NIS 2008)

Environmental Issue

Non CO₂ Air Pollution Emissions in 1995

Pollutant	Amount (metric tons)
<i>Sulfur dioxide</i>	<i>18,000</i>
<i>Nitrogen</i>	<i>67,000</i>
<i>Carbon monoxide</i>	<i>2,301,000</i>
<i>Non-methane volatile organic compounds</i>	<i>168,000</i>

Source: World Resources Institute Earth Trends. 2003. Earth Trends Country Profiles: Climate and Atmosphere – Cambodia. Available: http://earthtrends.wri.org/pdf_library/country_profiles/cli_cou_116.pdf

Emission Inventories in 2005 in Phnom Penh of mobile and stationary air pollution

Sources	Pollutants (tons/year)				
	SO _x	NO _x	CO	SPM	VOC
Industry/factory	918	1,230	169	195	98
Mobile sources	488	7,600	36,250	539	6,260
Residential cooking	25	33	4,440	1,620	2,830
Service sector	9	26	159	12	35
Solid waste burning	4	26	366	70	57
Gasoline station	-	-	-	-	456
Paved road	-	-	-	877	-
Unpaved road	-	-	-	1,770	-

Results of Roadside Air Quality Monitoring in Phnom Penh

Parameter	2001		2002		2003		2005	
	Mean	Max	Mean	Max	Mean	Max	Mean	Max
CO (mg/m ³)	3.94	6.25	3.06	3.5	4.37	5.25	4.32	5.62
NO ² (µg/m ³)	-	-	-	-	-	-	0.022	0.0038
SO ² (µg/m ³)	-	-	-	-	-	-	106.6	215.8

Source: MoE and Ministry of Health (2006)

Ambient Air Pollution in Phnom Penh

Parameter	2000		2001		2002	
	Mean	Max	Mean	Max	Mean	Max
CO (mg/m ³)	3.06	7.12	1.98	2.42	3.5	5.71
NO ² (µg/m ³)	32.08	47.17	2.45	3.77	30.19	56.60
SO ² (µg/m ³)	-	-	2.60	7.80	7.80	13.00
TSP(µg/m ³)	-	-	0.63	0.84	0.41	1.00

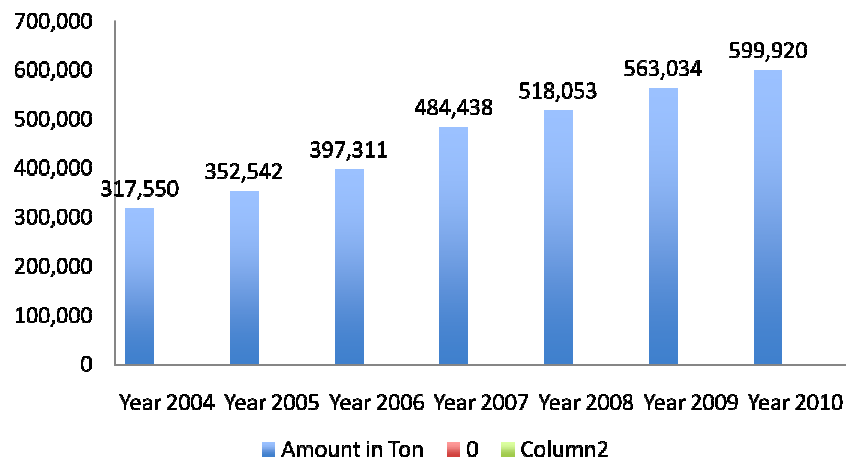
Source: MoE and Ministry of Health (2006)

Solid Waste Management

Type of Municipal Waste Composition of Phnom Penh, Cambodia

	Type of Municipal Waste Composition (in %)						
	Food wastes	Paper	Plastic	Metal	Glass	Others	GDP/Ca
Phnom Penh	63.3	6.4	15.5	0.6	1.2	13	513

The amount of annual total solid waste estimated from landfills across the country



Overview of known species diversity

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

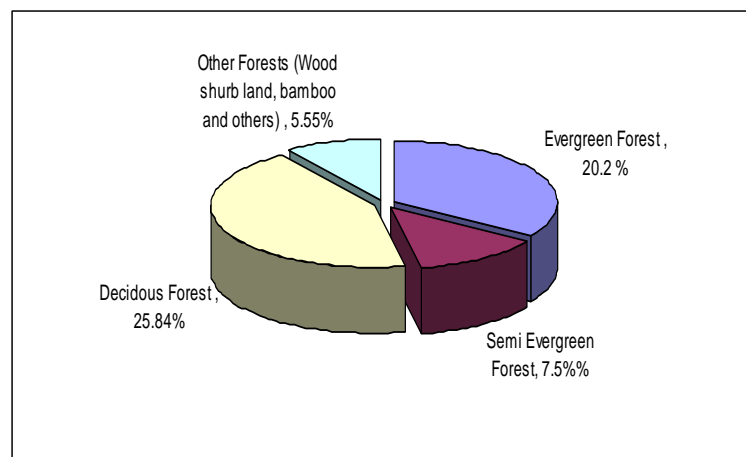
Overview of known species diversity

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

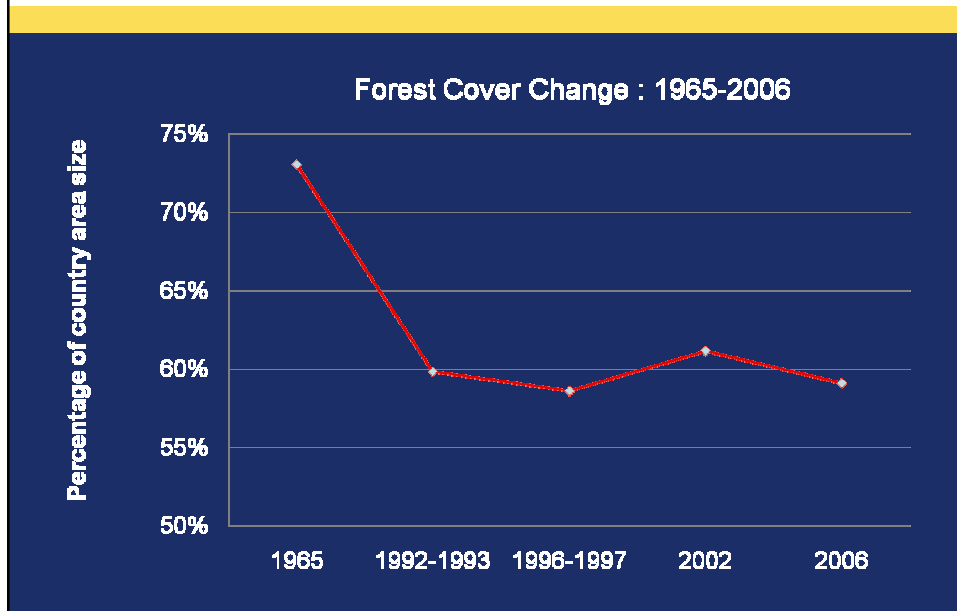
Extent of forests in Cambodia by category

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

Type of National Forest Resources



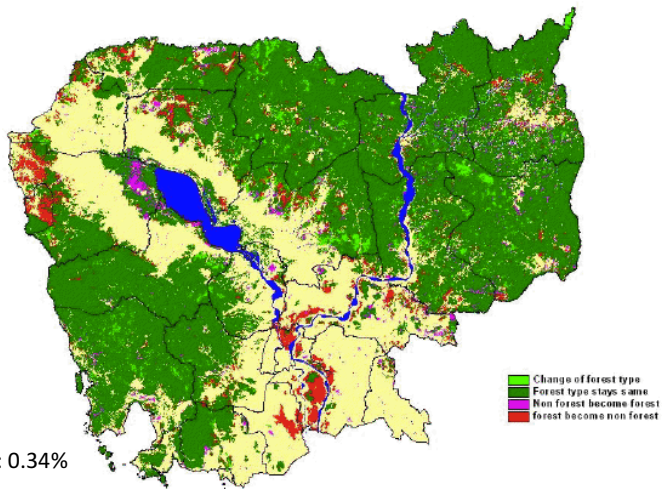
Forest cover change



Forest cover change

Forest Cover Changes in Cambodia, 2002-2006 (TWG Forestry and Environment)

- 1965 : 73.04%
- 1992/93 : 59.82%
- 1996/97 : 58.60%
- 2002 : 61.15%
- 2005/06 : 59.09%



Annual deforestation rate: 0.34%
(1965-2006)
Annual deforestation rate: 0.5%
(2002-2006)

Protected Areas in Cambodia

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

Major ecosystems covered under current national protected areas systems.

Management category	Number	Main ecosystem coverage	Area (hectare)	IUCN Category
<i>Protected areas system under the Royal Decree of Nov 1993</i>				
National park	7	Lowland evergreen forest also coastal forest, mangroves, <i>Dacrydium/ Podocarpus</i> , swamp forest, corals reef and seagrass	742,250	II, IV
Wildlife sanctuary	10	Evergreen forest, Mangroves, Coral reef	2,030,000	II, IV
Protected landscape	3	Lowland evergreen forest	9,700	V
Multiple use area	3	Flooded forest, mangrove and coastal wetland	403,950	VI
<i>Forest protected areas</i>				
Protection forests	6	Lowland evergreen forest and wetlands	1,350,000	II, IV
<i>Aquatic conservation areas</i>				
Fish sanctuary	8	Inland wetlands	23,544	II, IV

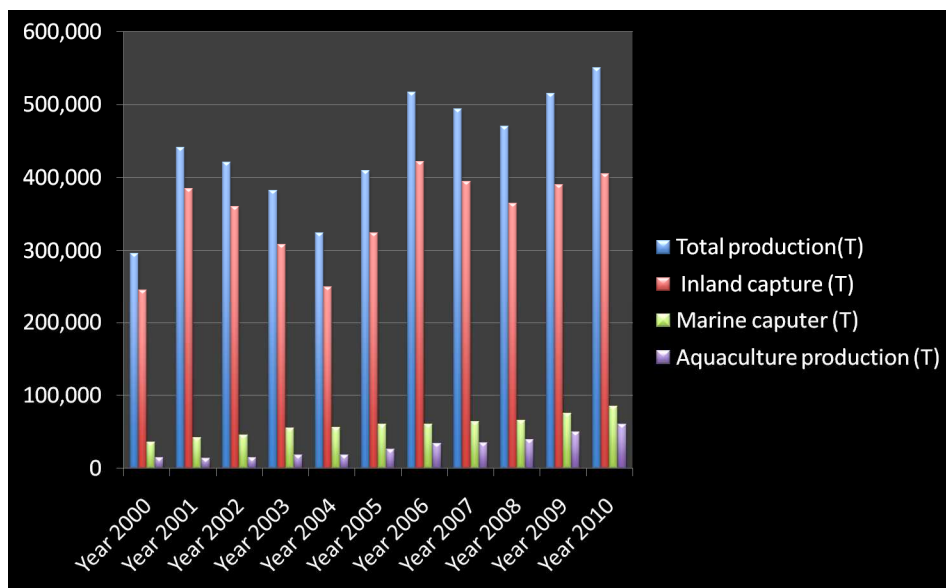
Key large animal species

- latest status information of the key large animal species is provided through Cambodia community wildlife ranger tiger and elephant conservation program
 - A population of 9 tigers and 20-30 elephants estimated in patrol areas in Mondulkiri, and 10-20 tigers and 15-25 elephants in Cardamoms but for elephants informally it was speculated that something like 50 to 100 elephants may be present in each of the two regions.
 - 116 Asian elephants are reported in the Seima Biodiversity Conservation Area

Freshwater

- The freshwater floodplains of Cambodia can be categorised into varieties of habitat types including marshes/swamps, shrublands, grasslands, flooded forest, and rice fields
- The fish yield of Tonle Sap floodplain is 139-190 kg/hectare/year (Lieng and van Zalinge 2001) and 230 kg/hectare/year (Baran et al. 2001a)
- 490 freshwater fish species occupying various ecological niches
- At least 45 fish species are already to be commercially important and 22 threatened fish species are recognised for their conservation significance
- The annual inland fish catch in Cambodia is estimated between 130,000 and 682,000 tonnes.

Annual Fish capture



Change of aquatic habitats

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

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

Threats and pressure

Habitat loss



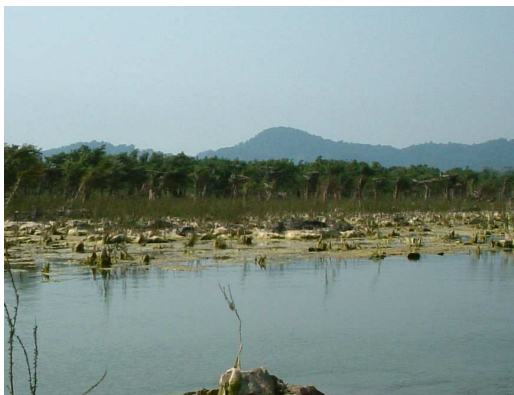
Threats and pressure

Unsustainable harvesting



Threats and pressure

Change in hydrological regime



Threats and pressure

Pollution



Threats and pressure

- *Alien species*



Relevant Inter-sectoral policy

- The Government Rectangular Strategy (Phase II)
- The Cambodia Millennium Development Goals (CMDGs 2001)
- The National Strategic Development Plan (NSDP) 2006-2010, now to be extended to 2013
- The National Environmental Action Plan (1998-2002)
- The National Biodiversity Strategy and Action Plan - NBSAP (2002);
- Organic law on sub-national administration
- 19 TWGs established in 2004-05

Policy and law related to environment protection

- The law on Environmental Protection and Natural Resource Management, 2006;
- The Protected Area Law, 2007;
- The Royal Decree on Creation and Designation of the National Protected Area System, 1993; and
- Sub-decree on Environmental Impact Assessment; 1999;
- The National Environmental Action Plan, 1998-2002;
- The Environmental Strategic Plan, 2004-2008 and 2009-2013;

Policy and law related to environment protection

- Guideline on Environment Impact Assessment
- Sub-Decree on Air pollution and Noise Disturbance (July 2000)
- Sub-Decree on Solid Waste Management (April 1999)
- Sub-Decree on Water Pollution Control (April 2000)

Forest sector: selected instruments in place

- National Forest Programme (NFP);
- National forest policy statement, 2002;
- Forestry law, 2002;
- Community Forestry Sub-Decree, 2003 and guidelines, 2006;
- Forest crime monitoring and reporting, since 1999;
- Joint forest sector review, 2004;

Fisheries sector: selected instruments

- Fisheries policy statement, 2005
- Fisheries law, 2006;
- FDAP, 2005-2008;
- Community fisheries sub-decree, 2005 amended 2007
- Sub-decree submitted for 57 threatened aquatic species

Policy related to Statistic

- Statistic law
- Sub-decree statistical system: Coordination C statistics advisory council, statistics coordination committee
- Sub-decree on degenerated on official statistic

Challenges in Environment statistic

- Although most of the statistics produced are sector or project specific
- An absence of statistical capacity in a number of ministries and institutions;
- Limited financial, computing and technical capacity for statistical activities in other ministries and institutions;
- There has been little donor support to build capacity for environment and natural resource statistics
- annual reports of various other ministries
- Statistics Capacity to relevant line ministries

To oversee this challenges

- On job training on statistic management to related ministries
- To conduct planned annual environment management surveys.
- Capacity building to relevant line ministries

Thank you