FAA 118 / 119 ANALYSIS*

CONSERVATION OF TROPICAL FORESTS

AND

BIOLOGICAL DIVERSITY

IN CAMBODIA

APRIL 2005

*This report fulfills the planning requirements as set out by two provisions of the Foreign Assistance Act.

Section 118(e) "Country Analysis Requirements.--Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of-- (1) the actions necessary in that country to achieve conservation and sustainable management of **tropical forests**, and (2) the extent to which the actions proposed for support by the Agency meet the needs thus identified."

Section 119(d) "Country Analysis Requirements.--Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of-- (1) the actions necessary in that country to conserve **biological diversity**, and (2) the extent to which the actions proposed for support by the Agency meet the needs thus identified."

TABLE OF CONTENTS

A. INTRODUCTION

"Natural resources are the big issue: Cambodia has nothing else."[1]

Cambodia, as a country emerging from a long and devastating civil war, faces many challenges resulting from unlawful behavior, greed, poor governance, little infrastructure, a weak educational system, and severe poverty. Management of the country's rich natural resources, especially forests and the Tonle Sap Lake, is hampered by corruption, extreme inequality of access rights, insufficient or nonexistent rights of tenure, a weak civil society ethnic divisions, and growing population pressures.

Cambodia is a tropical country in mainland Southeast Asia with a territory of 181,035km^2. It abuts the Gulf of Thailand on the south and shares borders with Thailand (west and north), Laos (north), and Vietnam (east). Compared to neighboring countries, Cambodia has lower population densities and larger areas of relatively intact natural ecosystems, but forests and biodiversity face a host of threats many derived from poor governance especially corruption, including illegal logging, over-hunting and wildlife trafficking, expanding land under cultivation, and growing use of pesticides and fertilizers.

Cambodia's forests are significant as remnants of larger ecosystems and species populations that no longer exist more widely in the region. In addition to their global biodiversity value, forests are critical for providing communities with food, medicine, fuelwood, non-timber forest products, and cash income. Forests also have very important cultural and spiritual values. They can play a significant role in economic development if managed properly. However, the reality has been the unsustainable harvesting of forest plants and animals, logging of high-value timber species, permanent conversion of forests to agricultural lands, creation of new settlements in forested areas, and over-exploitation to satisfy the growing domestic and international demand for wood and animal products (World Bank 2003: 3). Poor forest management leads to increased soil erosion, loss of vital topsoil, river sedimentation and associated impacts on aquatic life, altered river flows, change in flood regimes, loss of critical habitat, and loss of biodiversity (World Bank 2003: 3). Over the last 30 years, Cambodia's forest cover is estimated to have shrunk from 90% to less than 50%, as logging and illegal extraction of forest resources have taken their toll (World Bank 2003: 3). Annual rates of deforestation are estimated at 1-2% per year, or 100,000 hectares per year lost between 1973-1997 (World Bank 2003: 3).

Most of the country consists of plains and wetlands centered around the Tonle Sap Lake and the Mekong River Basin (Figure 1). Central Cambodia is dominated by these wetlands, which form 30% of the country. The Mekong river enters Cambodia at the Laotian border on the north and flows south through the country into Vietnam, where it forms a substantial delta. The Tonle Sap Lake system is connected to the Mekong River through the Tonle Sap River. In the rainy season, the force of the Mekong River's flow impedes and reverses of the flow of the Tonle Sap River into the Tonle Sap Lake, flooding it and extending its size five-fold to 10,400 km^2. The resulting flooded forests are a critical resource in terms of food and agricultural nutrients for those who live in the region.

[1] Mogens Laumand Christensen, DANIDA (Personal Communication, January 2005)

Figure 1: Map of Cambodia with Forests and Sparsely Populated Areas

Significant highland regions include the Cardamom and Elephant mountain ranges in the southwest, near the Thai border. A small portion of the Annamite range, most of which is in Vietnam and Laos, lies to the east. On the north, the Dangkrek Mountain escarpment rises along the Thai border. Cambodia claims 435km^2 of coastline, including mangroves, sea grass beds, and coral reefs. Transboundary issues impacting Cambodia include management of the Mekong River (actions such as dam construction by China, Thailand, and Laos affect river flows, fisheries, and water quality) and the flow of illegal logs and wildlife into neighboring Thailand and Vietnam.

Cambodia's population was 13.4 million in 2003 with an annual growth rate of 1.6% (World Bank World Development Indicators). Eighty percent of the population is rural and 90-95% of the country's poverty occurring in rural areas (UNHCHR 2004:5). The average rural household obtains food and income through farming, hunting, fishing, gathering wood, and collection of non-timber forest products (NTFPs). It is estimated that crop, livestock, fisheries, and forestry production contributed 40.1% to GDP in 1999. There are approximately 2 million farm households with an average land holding of about 1 hectare. The dominant agro-ecosystem is lowland rain-fed rice. While the rice varieties used are unimproved, the system features high genetic diversity among rice varieties as well as high levels of associated fish and aquatic organisms that live in the flooded rice paddies. Fish provide 70% of protein and fill important gaps in the availability of rice, the staple food. In the highlands, shifting cultivation of upland rice and vegetables is practiced. NTFP collection (including vines and creepers, rattan, fuelwood, resin, turtles, frogs, bamboo shoots, and mushrooms) and hunting are especially important in highland regions.

Monocultural crop systems and plantations are becoming more prevalent. Between 1993 and 1999, the Government granted over one third of the most productive agricultural lands to private entities in the form of commercial concessions for forestry, agriculture, fishing,

mining, and tourism (UNHCHR 2004: 3). As of 2003, 40 economic concessions covering 809,296 hectares had been granted (UNHCHR 2004:16).

A 2001 assessment of Cambodia's environment and natural resources has described the close relationship between rural populations and natural resources, and the threats to rural livelihoods caused by mismanagement and degradation of these resources (ARD 2001: 38).

> "Rural Cambodian populations always live closely with and rely on natural resources. Small landholdings, landlessness, lack of irrigation water, natural disasters, lack of capital, household emergencies, and large households cause many rural households to face food shortages between two and nine months of the year. During food shortages, people subsist on non-timber forest products from nearby forests and aquatic products from rice fields and wetlands. In Cambodia, where a social safety net does not exist, people must resort to extraction of natural resources for survival when times are bad, and for many necessities of life at other times. Government decisions regarding the exploitation, management, and protection of natural resources have rarely considered existing human uses, often badly impacting the livelihoods of local people. Rural people are politically and economically weak, making it difficult for them to defend their access rights."

This description indicates the directions that need to be taken to conserve forests and biodiversity while improving the livelihoods of the rural poor. These directions include promoting good governance and increasing the rights of the poor to the natural resources upon which they depend. Furthermore, given the dependence of the poor on natural resources, they would have the greatest incentives for conservation if given management rights, appropriate tools for management and access to markets.

B. LEGISLATIVE AND INSTITUTIONAL STRUCTURES AFFECTING FORESTS AND BIODIVERSITY

Legislation

In 1993, Cambodia emerged from decades of civil war and the subsequent administration of the country by the United Nations Transitional Authority for Cambodia (UNTAC) with a new Constitution as the supreme law of the land. Article 58 of the Constitution declares that the state owns natural resources including land, minerals, mountains, rivers, forests, etc. and Article 59 calls upon the state to protect the environment and manage natural resources (National Report 2003:37).

Important laws affecting forestry and biodiversity include (Community Based Natural Resources Management (CBNRM) Learning Institute, 2004: Chapter 2):

- 1996 Environmental Protection and Natural Resources Law
- 2001 Law on Commune Administration (part of the decentralization process)
- 2001 Land Law
- 2002 Forestry Law

- Wildlife Law

Important subdecrees include
- Subdecree on Concession Management (moratorium on logging and log transport)
- Subdecree on Community Forestry
- Subdecree on Environmental Impact Assessment
- Subdecree on Industrial Agricultural Concessions
- Subdecree on Social Concessions

Other instruments include
- 1993 Royal Decree on Protected Areas
- 2002 National Biodiversity Strategy and Action Plan
- 2002 moratorium on logging and ban on log transport
- 2004 Rectangular Strategy (policy adopted by the government on good governance, decentralization, poverty reduction, and locally based management)

Important laws currently in draft form include
- Protected Areas
- Anti-corruption
- Fisheries
- Water Resources Law

Important subdecrees or implementing guidelines currently in draft form include
- Forest Concession Management
- Community Forestry (guidelines)
- Community Fisheries
- Reduction in size of Agricultural Concessions
- Recognition of Indigenous Communities
- Management of State Property.

The above was summarized from ARD (2001) and CBNRM Learning Institute (2004, Chapter 2).

International Conventions

Cambodia is party to a number of important international conventions but compliance and related actions in accordance with these agreements is highly variable (ARD 2001; World Bank, 2003). Several NGOs and donors are working with RGC to help Cambodia fulfill its mandates. The relevant conventions are listed below.

1. The Ramsar Convention on Wetlands has been ratified and Cambodia has identified three wetland sites for recognition: Boeng Chhmar in the Tonle Sap floodplain, Koh Kapik on the coast, and a portion of the middle Mekong river north of Stung Treng. In addition, the Tonle Sap is recognized as a UNESCO Biosphere Reserve.
2. The Angkor complex of temples near Siem Reap is recognized under the United Nations World Heritage Convention.

3. Cambodia ratified the Convention on Biological Diversity in 1995. In 1997, the government prepared a biodiversity prospectus and in 2002 completed a National Biodiversity Strategy and Action plan.
4. Cambodia is a party to the Convention on the International Trade in Endangered Species (CITES).
5. Cambodia is party to the United Nations Framework Convention on Climate Change (UNFCCC).
6. Cambodia is signatory of the International Tropical Timber Agreement (ITTA).
7. Cambodia is party to the Mekong River Basin agreement.

Cambodia is not a member of the World Conservation Union (IUCN).

Customary Systems and Rights for Management

More than 85% of Cambodians are rural and depend heavily on forest resources for their livelihoods. Customary systems of communal ownership and management exist. The centrality of forests to cultural practices and spiritual beliefs must also be recognized. Customary rights to land are recognized and ownership may be individual or communal, even if land titles do not exist on paper. Upland groups, including ethnic minorities, are especially dependent upon forests for swidden cultivation, hunting, and collection of NTFPs. Community institutions for natural resources management have been weakened by the long disruption of the social fabric caused by the Khmer Rouge regime and the resulting large-scale internal migration. Forest-dependent peoples are particularly vulnerable to loss of lands and access rights to timber concessions and various forms of land grabbing by powerful elites. The 2001 Land Law began a process of land titling (supported by the World Bank) but the Sub-decree on Recognition of Indigenous Communities, which will recognize the legal rights of traditional forest users, had not been approved as of November, 2004. While a new Sub-Decree on Community Forestry has been approved, implementation guidelines (prakas) are still in draft form. Several NGOs, including those supported by USAID are working with local communities to establish community forests. Similar support for fishing-dependent peoples is helping communities to sustainably manage fishing lots that were handed over to them as a part of the government's reform and decentralization process.

Government Institutions

Responsibility for natural resources is split between the relatively weak Ministry of Environment (MOE) and the much stronger Ministry of Agriculture, Forestry, and Fisheries (MAFF). Much of MAFF's strength can be attributed to its control over natural resources exploitation through timber concession management and distribution of fishing lots. Other relevant ministries include Water Resources and Meteorology, and Land Management, Urban Planning, and Construction. The latter oversees the controversial system of economic (land) concessions, discussed elsewhere. Jurisdictional issues are not always clear as a result of these divisions. For example, the law on environmental protection places protected areas under MOE's jurisdiction, but the wildlife within protected areas are under the management of MAFF's wildlife department. Similarly,

bodies of water are overseen by the Ministry of Water Resources but the fish within those waters are under MAFF's jurisdiction.

Donors and International Organizations

Asian Development Bank

The Asian Development Bank (ADB) is promoting management and conservation of the natural resources of Cambodia's Tonle Sap basin through a concessional $10.9 million equivalent loan approved in 2002. The aims of the Tonle Sap Environmental Management Project are to strengthen natural resource management coordination and planning; organize communities for natural resource management; and build management capacity for biodiversity conservation.

The work in the Tonle Sap is also related to the ADB's Regional Technical Assistance to the Greater Mekong Subregion, (GMS) which includes Cambodia. The program's overall purpose is to establish sustainable management regimes to restore ecological (habitat) connectivity and integrity and at the same time as providing benefits of natural resource (forest, water, soil, air) goods and services that contribute to improving livelihoods of peoples living in and around the biodiversity corridors and protect the developmental, particularly physical infrastructure, deemed central to economic integration and sustainable development in the Subregion.

Danida

Danida's new five-year program will place all its funds into the environment. It will work jointly with DfID on governance issues regarding commune council decentralization. They will work to secure livelihoods through participation in Land Management Administration Project (LMAP) and by working with the private sector.

FAO

FAO's current focus is on food security and fisheries. The organization is no longer very active in forestry but the new country director envisions a possible modest emphasis on community forestry. FAO did collaborate with the Forestry Administration on a draft forest resources assessment, as a part of a global FAO study of forest resources. A food security project is working on efficiency in water management for agricultural production. Another focus is FAO's dialogue with RGC on acceptance of the international revisions to the UN Convention on Plant Genetic Resources.

FAO is providing technical assistance on a new ADB-funded community-based natural resource management project in the Tonle Sap area, focused on community capacity to manage resources such as fisheries. A related project, FAO's Tonle Sap Participatory Natural Resource Management Project, has been funded by the Belgian Government since 1995. This project's objectives are the development of community fisheries, the

establishment of community forestry, the promotion of community development based in natural resource management, and institutional strengthening and capacity building in Siem Reap province. Currently, the project assists 116 villages organized into 13 community fisheries organizations to manage 108,000 hectares of fishery and flooded forest. All sites have approved management plans. Thirteen community fish sanctuaries to protect brood stock have also been established. The focus of the community fisheries work is income generation, reduction of destructive fishing practices, extension and outreach communication, and control of access to local resources. In community forestry, the project has helped establish 40 sites, 21 of which have approved management plans. The focus of this work is on income generation, management planning, extension, and resource protection. An additional 54 villages have requested FAO assistance in establishing new community forests. This project, however, will end in April, 2005.

GTZ

GTZ has supported the formation of the Cadastral Commission as created by the 2001 Land Law, charged with adjudicating land disputes. The Commission works on cases where there is no land title, while the courts handle cases where a title exists. Generally speaking, poor people are claimants before the Commission, where cases are seldom resolved, especially those involving people with different levels of power. The weakness of the Commission may be attributed to a lack of support from the government. The related cadastral surveys are proceeding, but slowly.

UK Department for International Development (DfID)

DfID's focus is on fisheries. Few donors focus on this sector despite its importance to livelihoods. Problems in the sector include 1) lack of capacity within the Department of Fisheries; 2) the impact of over 10,000 crocodile farms owned by wealthy individuals; 3) lack of capacity of communities to manage fishing lots that were released to them; 4) underdevelopment of coastal fishing industry; 5) the role that commune councils are now playing allocating fishing lots is leading to overfishing; 6) the lack of good data on illegal fish harvests and cross-border trade. DfID's priorities in the sector include 1) support to government decentralization by focusing on provinces in the North and Northeast and encouraging the LMAP project to tackle land titling problems, access and rights issues in these regions; 2) capacity building of the central Department of Fisheries offices; 3) raising awareness that community forestry and community fisheries are two very different models; 4) development of alternative livelihoods such as post-harvest processing and new markets.

Activities include analysis of the impact of fisheries lot policy change, assessment of post-harvest opportunities, and capacity building of the Department of Fisheries and its community fisheries office. Interests for new work include alternative income generation from processing, and development of the coastal fishing sector. DfID's geographic focus will be in the Northeast and Mekong River.

World Bank

The World Bank has opted not to work with the MAFF on large agriculture projects or with the MOE because of RGC's failure to improve on governance issues. The Land Management Administration Project (LMAP), focused on systematic cadastral surveying and land registration and titling. A new component of this project focuses on land use and land suitability analysis (funded by GTZ and AusAID, possibly CIDA). The World Bank's new land management project is Land Allocation for Social and Economic Development (LASED). This is a land reform program focused on equitable land distribution, in some ways countering the egregious impacts of economic concessions. The World Bank is encouraging the government to continue a smallholder model of development to replace the failed large plantation system model illustrated by the forestry concession system. The Ministry of Land Management has agreed to a series of World Bank studies of comparative land management systems, focused on the economic benefits of different systems. Some of the comparisons will be large versus small farm sizes; smallholder agriculture versus plantation forestry; Cambodian smallholders compared to Thai smallholders; and smallholder agriculture compared to community forestry.

The World Bank had also been working with the Forestry Administration to build capacity for concession management. It also funds a monitor of illegal logging and wildlife poaching. A great deal of controversy arose for numerous reasons. Currently, the role of concessions and community forests in Cambodia's development is under consideration.

Donor Working Group on Forests

The Technical Working Group on Natural Resources is a joint donor/government representative body to coordinate assistance and manage RGC progress towards targets established by the Consultative Group Meeting each year. The working group on forests meets on a fairly regular basis. The group was responsible in 2004 for review of the forest sector, which was to lay the basis for programming in the sector.

Non-Governmental and Related Organizations

WildAid

WildAid works to protect endangered wildlife in developing countries, including Cambodia. The focal areas in this country include enforcement of protected areas, curtailing the illegal trade in wildlife, and carrying out an ad campaign against consumption of wild animals. A second focus is rescue and care of confiscated animals. In three years of work, WildAid has rescued almost 20,000 animals. A final area of focus is park protection in seven Cambodian parks, with a special emphasis on the southern Cardamom mountains, location of WildAid's Southwest Elephant Corridor project. They are also working with communities to improve agricultural production as an alternative to wildlife trafficking and deforestation.

Community Forestry Alliance for Cambodia (CFAC)

The Community Forestry Alliance for Cambodia (CFAC) is designed to support the development of community forestry (CF) in Cambodia by contributing to the improvement and implementation of national policies and field programs. CFAC aspires to build the capacity of Cambodia's rural communities to manage forest lands. It also channels flexible funding to innovative Cambodia NGOs that are engaged in CF policy development, CF extension and training, and CF field project implementation.

East West Management Institute

The East West Management Institute provides training on the Land Law, sub decrees and regulations to representatives of ministries, judges, prosecutors, court personnel, representatives of bar associations and NGO representatives working in outreach programs. Training programs focus on the legal and technical aspects of the land law, and includes basic legal skills such as legal reasoning, legal research, and the evaluation of evidence of land rights. Another training program is on the resolution of land disputes. The East West Management Institute also implements USAID's Human Rights in Cambodia Project (HRCP) to enhance the enforcement of human rights in Cambodia.

Global Witness

Global Witness focuses on the links between environmental and human rights abuses. In Cambodia it has been reporting on illegal and corrupt practices in the forestry sector and the impacts of forest over-exploitation on the poor.

Conservation International (CI)

Conservation International works to conserve Cambodia's biodiversity through strengthening protected areas management and law enforcement. Conservation International is engaging local communities in wildlife management through facilitating the development of more effective national policies and support programs. It is also working to provide health care to remote communities.

The Mekong River Commission

The Mekong River Commission (MRC) was established on 5 April 1995. The member countries are Cambodia, Lao PDR, Thailand and Vietnam. The MRC also maintains regular dialogue with China and Burma located in the upper portion of the Mekong River Basin. The MRC member countries agree to co-operate in all fields of sustainable development, utilization, management and conservation of the water and related resources of the Mekong River Basin, such as navigation, flood control, fisheries, agriculture, hydropower and environmental protection. The MRC consists of three permanent bodies:

The Council, the Joint Committee (JC) and the Secretariat. The Secretariat is currently located in Vientiane, Lao PDR. The National Mekong Committees (NMCs) act as focal points for the Commission in each of the member countries and are served by the respective National Mekong Committee Secretariats.

Agri-Business Institute Cambodia (ABiC)

The Agri-Business Institute Cambodia (ABiC) is a local NGO based in Phnom Penh in support of community rights to forests and land and sustainable agriculture. It has been producing a monthly newsletter since October 2004 to share information from communities. It is also promoting and strengthening the legal rights of forest communities through raising awareness of Cambodia's new forestry and land laws.

NGO Forum

The NGO Forum is made up of local and international non-governmental organizations working in Cambodia. The NGO Forum shares information, debates and advocates priority issues affecting Cambodia's development such as forest conservation. The NGO Forum facilitates the Forest Network, comprised of local NGOs and forest communities, as a mechanism for communities to report forest crimes and conflict, and coordinate with each other (ARD, 2004).

Oxfam America

Oxfam America's Mekong River Project is examining the effects of dam development in the river system on local communities' ability to use natural resources. The geographic focus is Ratanakiri province, where three important tributaries enter Cambodia from Vietnam and Laos. Monitoring of dam effects is through networks of villages in Ratanakiri and also Stung Treng, where reports are of waves from the irregular release of water from upstream dams. Such stream flow disruption destroys traditional forms of fishing and riverbank agriculture needed for local people's survival. Oxfam's work focuses on livelihood studies such as alternatives to fishing, and mobilization of people through awareness raising, training, and capacity building to know their rights. More dams are planned and under construction in Vietnam. Laos may build more as well.

Oxfam Great Britain (GB)

Oxfam GB's Livelihoods Program focuses on food security, sustainable agriculture, and natural resource management, including the forestry, fisheries, and land sectors. Activities include research, community capacity building, advocacy, policy development and consultation. In each sector, the livelihoods focus is on adding value through processing and promoting small to medium-sized enterprise development. In forestry, a new five-year European Commission funded project on community forestry will focus on community empowerment (both capacity and awareness of rights), forest management, advocacy at

national levels on policy development, and extension. The livelihoods component will examine NTFP marketing possibilities. The project will work in 7 provinces (Kompong Chhang, Oddar Mencheay, Preah Vihear, Stung Treng, Kampong Thom, Pailin, and Pursat) with eight partners. Fisheries work takes a similar approach in the Tonle Sap Lake and Mekong areas, combining research, policy work, community networking, capacity building, and sustainable management of community fisheries. The livelihoods aspect looks at the fish trade and expanding post-harvest activities.

SGS

SGS is the Government of Cambodia's Forest Monitoring Unit to monitor forest crimes in Cambodia in compliance with requirements of the World Bank's Structural Adjustment Loan for Forestry. Such crimes include the illegal harvest and transport of timber, forest encroachment and wildlife trafficking.

Wildlife Conservation Society

The Wildlife Conservation Society (WCS) is supporting wildlife conservation in the Northern Plains of Cambodia. It identifies through surveys, the most important areas for conservation. In collaboration with the government, communities and private sector, it develops partnerships for the conservation of wildlife and their habitats. It has co-written a directory of important areas for bird conservation. It is also advancing the conservation of the endangered Irrawaddy dolphin. WCS has worked with the Cambodian Government to establish conservation activities in Prek Toal, one of three Core Areas of the Tonle Sap Biosphere Reserve. The project works to protect the waterbird colonies from egg and chick collection, and to gather baseline research and monitoring data on bird populations and breeding ecology.

World Wildlife Fund-Cambodia

World Wildlife Fund-Cambodia works on the management of strategic areas such as the Dry Forest Ecoregion of northeast Cambodia, Srepok Wilderness Area and the Phnom Prich Wildlife Sanctuary. It is actively involved in promoting community-based management through the CBNRM Learning Institute and the implementation of participatory land-use planning in select communities. The MOSAIC Project of WWF Cambodia (Management of Strategic Areas for Integrated Conservation) has been working in central and northern Mondulkiri for 3 years, initially doing research and now promoting participatory land use planning (PLUP) and community based natural resource management (CBNRM) in some of the most remote indigenous communities in Cambodia. The MOSAIC project helps commune councils in resource management. WWF's Living Mekong Initiative works with the Mekong River Commission on addressing threats by dams and infrastructure while working on protected areas management and sustainable livelihoods.

C. ECOSYSTEM CHARACTERISTICS

Forests

Major forest types include mangrove, evergreen, and deciduous dry dipterocarp forests (Figure 2). Descriptions of forest types below excerpted from ARD (2001).

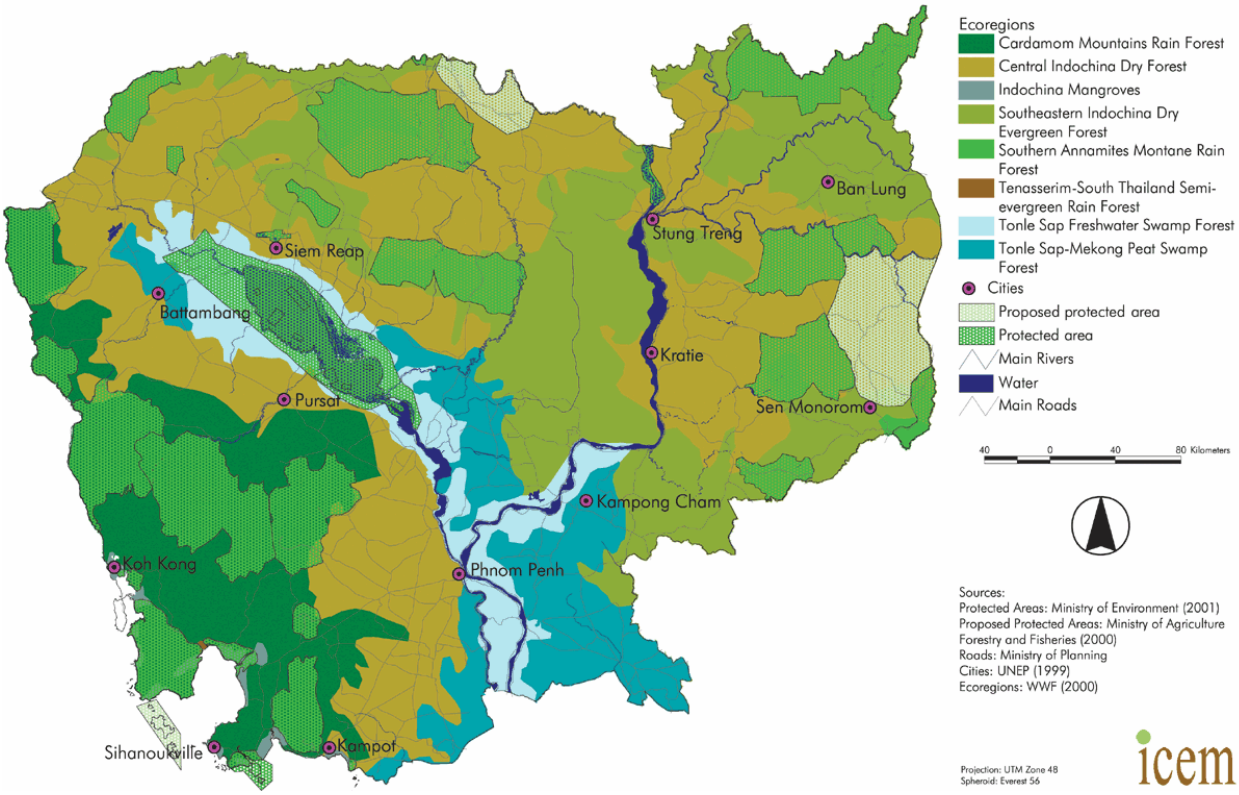

Figure 2: Ecoregions of Cambodia. From Cambodia National Report on Protected Areas and Development 2003, p. 27.

Wet evergreen forests

Wet evergreen forests are found along the south-facing slopes of the Cardamom and Elephant mountains in Southwest Cambodia, where rainfall is heaviest. The canopy of this forest is typically irregular, enabling enough light to penetrate to support a rich understory of palms and lianas. A number of sub-types of wet evergreen forests, including a dwarf forest type are found at different elevations and on different soil types throughout these mountains.

Semi-evergreen forests

Semi-evergreen forests are similar to wet evergreen forests and found in areas where there is less rainfall that falls in a more seasonal pattern. This forest type is highly variable, with a complex and tall canopy structure and extremely rich in species composition. Principle areas of this forest type in Cambodia include the northern slopes of the Cardamom and Elephant Mountains, the central alluvial plains, and the hills of the northeast. It is thought that this forest type was once the predominant landscape type in Cambodia before anthropogenic changes such as fire and swidden agriculture degraded the landscape to primarily savanna and agricultural lands.

Mixed deciduous forests

Mixed deciduous forests are found where there is seasonally high rainfall over 1,500 mm annually, followed by a dry season of five to six months. Although teak (*Tectona grandis*) is often characteristic of this forest type in Southeast Asia it is not naturally present in Cambodia. These forests are similar to semi-evergreen forests and are found in similar parts of Cambodia.

Deciduous dipterocarp forests

Deciduous dipterocarp forests, often called dry dipterocarp forests, are low in stature and found on arid soils up to about 600 m in elevation. Occasional fires are necessary for these forests to develop, and the widespread distribution of this habitat may be due to anthropogenic factors. In Cambodia, these forests are found primarily in lowland areas north of Tonle Sap and east of the Mekong River and also on the northern and eastern slopes of the Cardamom and Elephant Mountains.

Lowland pine forests

Lowland pine forests include only one species of pine, *Pinus merkusii*, which may be interspersed with other tree species. In Cambodia, these forests are found primarily south of Tonle Sap on the plateau of Kirirom National Park and the southeastern area of the Elephant Mountains.

Montane forests

Montane forests are found above 800 m in Cambodia where conditions are cool and humid. In Cambodia these forests are found in the Cardamom and Elephant Mountains and in the mountains and plateaus of the northeast.

Flooded forests

Flooded forests, also known as seasonally inundated forests are found primarily around the Tonle Sap and Mekong River floodplains. Most of these trees are deciduous and lose their leaves when submerged, although a few species remain evergreen throughout the year.

These forests are known to be important nursery grounds for the extensive fishery of the Tonle Sap. Flooded forests around the lake also provide habitat for waterbirds, turtles, crocodiles, otters, etc. The endangered Mekong giant catfish (*Pangasianodon gigas*) is known to migrate from the Tonle Sap to upper Laos. Much of this forest type has been degraded to low shrubby growth by anthropogenic activities.

Coastal mangrove forests

Coastal mangrove forests are found along the coastline and nearby islands, covering 85,000ha. Some mangroves back up into paperbark swamps, another important forest type. Mangroves are important spawning and feeding ground for fish and shellfish and provide for a significant fish catch (estimated at more than 30,000 tons per year) (World Bank 2003: 10). Mangroves also provide important environmental services such as protecting shorelines during storms and filtering water. While mangrove forests in Cambodia are relatively intact, there are some worrisome trends that threaten both habitats and local livelihoods. These include wood cutting for charcoal production and fuelwood as well as conversion of mangroves to shrimp farms and salt farms. Charcoal production in particular is increasing and much of the product is exported illegally. Shrimp farming is a recent trend. The largest area of relatively undisturbed mangrove is found in Koh Kong province and along its offshore islands.

Wetlands and Freshwater Systems

Cambodia is distinctive for its freshwater ecosystems associated with the Mekong River and the Tonle Sap (Great Lake). Together, they dominate much of central Cambodia (Figure 3). The Mekong River originates in the Tibetan Plateau and travels through a number of countries in the region before entering Cambodia at the Laotian border. In Cambodia the river flows south through Stung Treng and Kratie, then westward at Chhlong and south again through Phnom Penh and on to Vietnam where it becomes a delta. A number of tributaries enter the Mekong throughout its course. A major feature is the Tonle Sap River, which flows from the Tonle Sap lake south to join the Mekong River near Phnom Penh during the dry season, and reverses it's flow north from the Mekong back into the Tonle Sap Lake during the wet season. This flow pattern of water and sediments defines the unique character of the Tonle Sap, and provides the basis for Cambodia's major fishery resource. The flooding also deposits nutrients for agriculture. When fully flooded during this season, the lake swells to nearly five times its dry season size, and, at approximately 10,400 sq. km., forms the largest lake in Southeast Asia and the largest flood plain lake in the world.

Marine and Coastal Ecosystems

In addition to mangrove forests described above, marine and coastal ecosystems include sea grass beds and coral reefs. Sea grass beds provide important breeding and fishing grounds for many species, including dugong (*Dugong dugong*) and green sea turtles (*Chelonia mydas*). Only a few healthy pockets of seagrass beds remain. Coral reefs are found on rocky substrates along much of the coastline and around the many small islands.

Little data on their condition are available but anecdotal reports indicate that reefs are degraded, with low level of species diversity, few large fish, and coral bleaching.

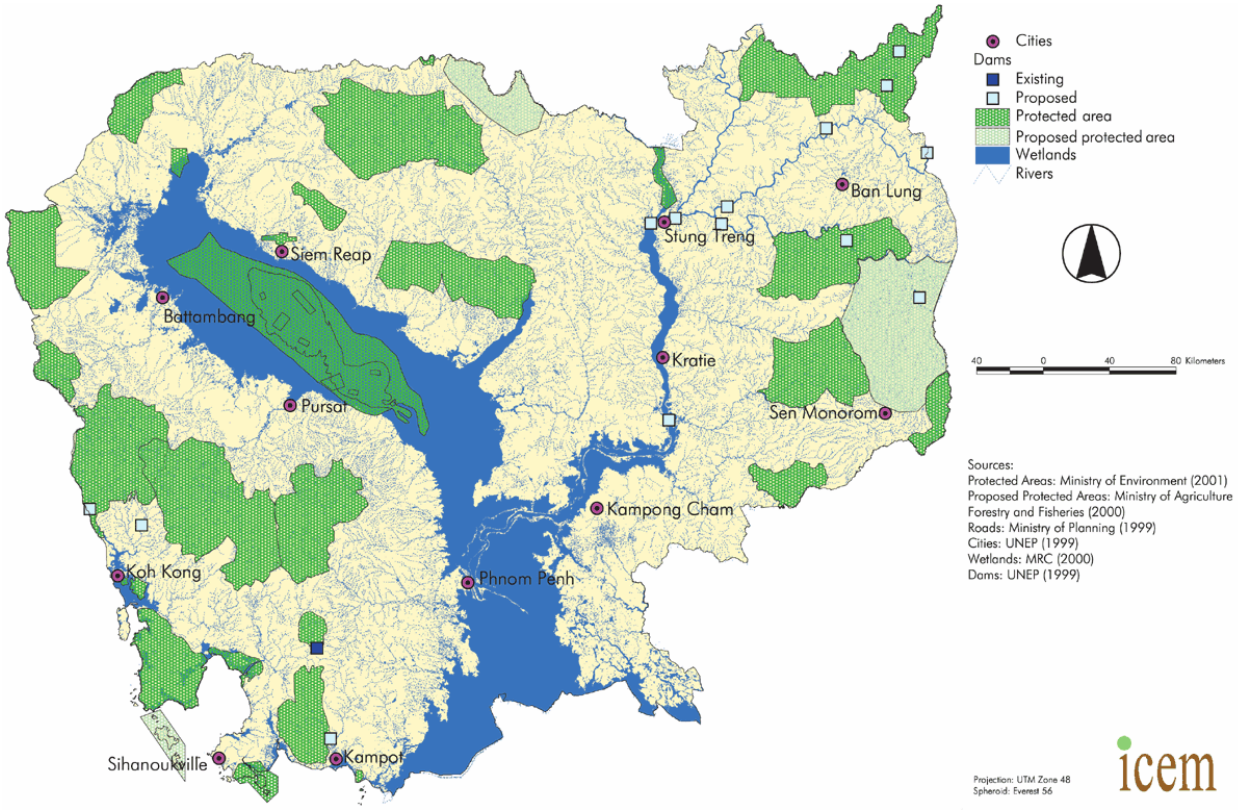

Figure 3: Wetlands of Cambodia. From Cambodia National Report on Protected Areas and Development 2003, p. 25.

D. CURRENT STATUS OF TROPICAL FORESTS AND BIODIVERSITY

Tropical Forest Status and Management

Logging was conducted during the mid-1990s on a massive scale, with little concern for sustainable management or impacts on the environment and local communities. The Cambodian government received very little direct revenue from this mining of the nation's wealth as most of the logs were exported illegally to Thailand and Vietnam. In 1994, the RGC gave control over timber exports to the Ministry of National Defense to provide funds for the Royal Cambodian Army to wage war with the Khmer Rouge. This formalized the military's already substantial role in logging. Forests along the Thai border were logged by the military through the 1980s and 1990s as the Khmer Rouge and Cambodian armies relied on timber as a means to fund their military operations (ARD, 2004).

The forest concessions had an enormous impact on the lives and livelihoods of people living in or near them. The concessionaires viewed the forest resources within the concessions as their property and in most cases excluded local people from the concessions. They did not negotiate ground rules for community access to forest resources in the concession areas. Communities were affected even after logging was halted because important resources, particularly resin trees, were lost and the overall quality of the forest was degraded. Roads cut into the forest for log extraction provide continuing access for illegal loggers and agricultural settlers into the forest, both of which continue to threaten the livelihoods of local people.

According to the World Bank Environment Monitor (2003), between 70,000 and 100,000 hectares of forest are lost every year due to poor management policies, lack of technical and infrastructural support for sustainable harvesting regimes, increasing domestic timber and fuelwood demand, and land clearing for settlement and agriculture. Lack of a formal forest inventory makes exact statistics difficult to obtain. Management of Cambodia's forest concession system has been severely criticized by donors and NGOs, and specific issues include lack of transparency, the need for improved forest management planning, absence of consultation with local communities and consequent conflicts over access and benefits, and the unsustainable scale of forest exploitation. There is a consensus that the Government does not receive the royalties that properly managed forest resources would generate for the nation. A recent Independent Forest Sector Review, carried out under the Donor/Government Technical Working Group, called for the cancellation of the entire forest concession system (Independent Forest Sector Review 2004). Donors supported the drafting of the new forest law and subdecrees on forest concession management and community forestry. Some forest concessions have been canceled after closer scrutiny.

Forest managers have tended to overlook the value of NTFPs, which are perhaps more important to rural livelihoods than timber. Food, medicine, fodder, and construction materials are all harvested from forests, but access to these resources has become a flashpoint for conflict (World Bank, 2003: 5). Community Forestry regimes based on the knowledge and experience of local peoples can manage forests for timber and non-wood resources alike.

An estimated 90-95% of Cambodia's population uses wood or charcoal as a source of fuel (World Bank 2003: 5). Poorer households are more likely to rely on fuelwood than better-off households. Fuelwood is a primary cooking fuel but is linked to poor indoor air quality and associated health problems. Aside from domestic usage, industry relies upon these sources as well. It is estimated that 80% of Cambodia's national energy supply comes from wood or charcoal (World Bank 2003: 5). As population increases and industry grows, demand will continue to rise. Alternative energy sources have not been identified as national priorities.

Forest management priorities include conservation of forests within existing protected areas, inclusion of under-represented forest ecosystems within the protected area system; creation of buffer zones within concessions adjacent to protected areas; and the use of community forestry in sustainable forest use (National Report on Protected Areas and Development 2003:15).

Biodiversity Status and Management

Cambodia's protected area system was established by Royal Decree in 1993 (Figure 4). In 2003, there were 23 protected areas covering over 21% of the country managed by the Ministry of Environment; several fish sanctuaries covering 24,392 hectares managed by the Department of Fisheries; and several new or proposed protected forests, a new category of protection under the administration of the Ministry of Agriculture, Forests, and Fisheries (National Report 2003). The nation has expressed a goal of expanding the system to cover 25% by 2005. In 1997, as part of the national biodiversity planning process, three eco-regions were identified as the highest priority for conservation actions (National Report 2003:29). These are the Southwest coastal ranges, including the Cardamom and Elephant Mountains; the Northeast forests of Ratanakiri and Mondulkiri; and the central floodplain of the Tonle Sap. The 2002 National Biodiversity Action Plan, identified the northern plains as an additional priority region.

Unfortunately, the 1993 Royal Decree established a system without regard to biodiversity values or land use assessments. Some remote areas may not need heavy protection (for example, a ban on roads may be enough to protect them) while other areas of high conservation value have been left unprotected. Furthermore, the boundaries were drawn on maps without an on-the-ground survey leading to conflict with existing land uses and disagreements over the exact borders.

Terrestrial Biodiversity

No comprehensive inventory of Cambodia's biodiversity has been compiled but the 1998 National Environmental Action Plan estimated that the country has 15,000 species of plants, 720 bird species, 240 species of reptiles, and 212 mammal species, 100 of which are terrestrial (World Bank 2003: 8). At least one-third of plant species are endemic, making Cambodia, with 2,300 species of vascular plants, one of the richest countries in terms of plant biodiversity. Fauna are less diverse and feature lower levels of endemism.

IUCN (2000) lists 49 mammals as threatened, near-threatened or data deficient. Of these, 17 have not been recorded in the country, and 3 additional species have recently been added (Walston, undated). The kouprey (*Bos sauveli*) may be globally extinct and the Javan Rhinoceros (*Rhinocerous sondaicus*) appears to be extinct within Cambodia. The four areas of Cambodia with most importance for the conservation of rare mammals include the northern plains west of the Mekong River and north and east of Tonle Sap (24 Red List species), the eastern plains in and around Mondulkiri Province (21 Red List species), the southern Annamites (19 Red List species) and, lastly, the Cardamom Mountains (18 Red List species) (Table 1). The greatest threat to the mammals of global significance is hunting (both commercial and subsistence), which has severely impacted ungulates, tiger, elephant, and cattle. The opening of forest areas for logging concessions and associated roads exacerbates the pressure.

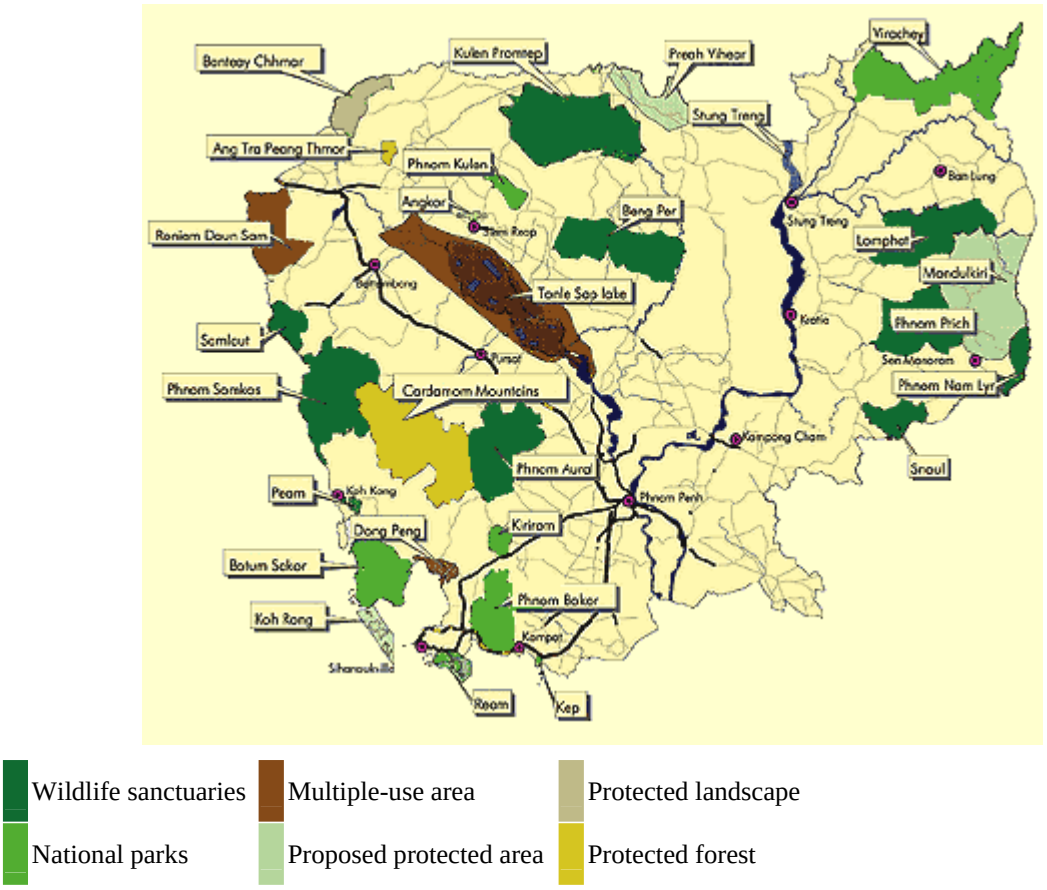

Figure 4: Cambodia's Protected Areas System
(Source: http://www.mekong-protected-areas.org/cambodia/pa-map.htm)

Cambodia's mammals are probably less species rich and diverse than that of neighboring countries but several large mammals survive in the country that are extinct in the rest of their range (Walston, undated). This makes the country an important site for global mammal biodiversity, and among these animals are a number of "flagship" species that capture the world's attention to support conservation action to preserve them and their habitats. Examples include tigers (*Panthera tigris*) and elephants (*Elephas maximus*), which are reported for Mondulkiri and Ratanakiri provinces in the east. The Northeastern regions of Cambodia are also important regions for bats, lorises, dogs, cats, cattle, civets, monkeys, pigs, and deer, and Mondulkiri is also reportedly a center of high diversity of ungulates. Bear are also reported in the province. Recent surveys in the Cardamom and Elephant mountains in the Southwest report elephants and important populations of deer, but these mountains appear not to feature the mammal diversity of the Northeastern provinces.

Table 1. Global conservation status of mammals recorded for each faunal area

FAUNAL AREA	Critical	Endangered	Vulnerable	Near-threatened	Data Deficient	Total
Northern Plains	2	3	8	5	6	24
Eastern Plains	1	4	7	4	5	21
Southern Annamites		4	8	3	4	19
Cardamoms		2	5	7	4	18

From Mammals of Cambodia, Joe Walston, WCS, undated.

IUCN, WWF, and WCS have conducted recent fieldwork on the birds of Cambodia following several decades when such research was not possible. The Tonle Sap Lake, its flooded forest region, and the associated Mekong River floodplain provide feeding and breeding areas for many species, especially waterbirds such as ducks, jacanas, bustards, rails, herons, egrets, cormorants, ibises, pelicans, and storks (Poole, undated). The large aggregations of waterbirds that collect in these areas during the dry season are among the largest groups of such birds still found in mainland Southeast Asia (ARD, 2001). Coastal mangroves and estuaries are important locations for migratory shorebirds such as waders, plovers, and terns who pass through or over-winter in Cambodia. Mangroves and offshore islands are also important habitat for resident birdlife such as storks, pigeons, kingfishers and sunbirds. Recent research in Virachey National Park in Mondulkiri indicates that it is likely to be the most important mountainous area for bird species diversity. The dry dipterocarp plains of the Mondulkiri and Preah Vihear regions support a unique bird fauna including pheasants, woodpeckers, parakeets, pigeons, cranes, various raptors, ibises, and storks. The plains are critical crane breeding habitat, and there is a crane reserve north of the Tonle Sap (ARD, 2001). Cranes command worldwide attention as a symbol of wetlands conservation efforts.

Birdlife International (2000) lists 39 bird species that are globally threatened or near-threatened. Of these, 25 are wetlands birds dependent on the large wetland habitats around the Tonle Sap, and the smaller wetland patches within the northern dipterocarp forest plains. The Tonle Sap and its inundation zone and the dry forests of the northern plains are therefore the most critical habitats for bird conservation (Table 2). The greatest threat to bird species is from hunting and egg collection, primarily for food but also for international trade, traditional medicine, pets, ornamentation, or use in prayer ceremonies (Poole, undated). Habitat loss is a secondary threat affecting wetlands, wet grasslands and large trees used as nest sites. An additional threat is dam construction which affects river systems, creates unnatural water flows, and alters the level of water in dry season refuges (Poole, undated).

Table 2. Global conservation status of birds recorded for each faunal area

FAUNAL AREA	Critical	Endangered	Vulnerable	Near-threatened	Total
'Dry' Forests	4	2	5	7	**18**
Tonle Sap	1	2	7	6	**16**
Mekong River			2	4	**6**
Coastal		1	2	2	**5**
S. Annamites			2	3	**5**
Cardamoms		1	2	3	**5**

From Birds of Cambodia, Colin Poole. WCS report, undated.

There have been few rigorous taxonomic studies of reptiles and amphibians, with most knowledge gleaned from historical sources. WCS and Fauna and Flora International conducted some surveys and collections in 1999 and 2000 of frogs, toads, caecilians (an order of amphibian), turtles, crocodiles, snakes and lizards (Amphibians and Reptiles of Cambodia:1). Two species (one snake and one frog) are endemic. Reptiles, especially turtles, snakes, and monitor lizards, are heavily hunted for food and medicine and are traded to Vietnam and China. These activities threaten the survival of many populations. 28 reptile species are on the CITES list.

Aquatic Biodiversity

Marine habitats support 435 fish species, 14 hard coral and 14 soft coral species and globally endangered marine mammals, such as dugongs (*Dugong dugong*) and Indo-Pacific humpback dolphins (*Sousa chinensis*) (World Bank, 2003: 9). Freshwater fish estimates are 850-1200 species, with Fishbase listing 486 freshwater and 357 marine/brackish species in Cambodia. Other marine species include shrimp, squid, crab, and clam, while freshwater aquatic life includes eels, frogs, turtles, mollusks, and shrimp. Shellfish have not been studied systematically. The Tonle Sap alone provides habitat for 500 species of freshwater fish, including endemic and endangered species such as the giant Mekong catfish (*Pangasianodom gigas*). The flooded forests of the Tonle Sap system provide refuges for fish, birds, turtles and other wetland species and are important spawning grounds and nurseries. Little known about aquatic species distribution and life cycles, and fish catch statistics are unreliable. However, fish provide as much as 75% of animal protein consumption. Inland fisheries are estimated by Department of Fisheries to produce 290,000-430,000 tonnes of fish per year, worth $150-$200 million (CBNRM 2004, Chapter 5).

The Mekong River Irrawaddy Dolphin Project began in 2001 in cooperation with WCS and the Department of Fisheries. A draft conservation strategy 2005-2010 was presented at a workshop in September, 2004. Irrawaddy dolphins (*Orcaella brevirostris*) were common in the Cambodian portion of the Mekong River and in the Tonle Sap in past decades, but the species has declined greatly due to deliberate killings during the Khmer Rouge regime and more recent threats, including entanglement in fishing nets, illegal fishing techniques (dynamite and electric), collision with boats, environmental degradation, poisoning from toxic chemicals used in gold mining, and dam construction. Research along the Mekong since 2001 identifies only 80-100 surviving individuals, most on the section of river

between Kratie and Khone Falls (Cambodia Mekong Dolphin Conservation Strategy). This area of the river is adversely affected by the uncontrolled establishment of new villages, clearance of gallery forests, and unsustainable fishing intensity and techniques (Timmins 2003:5). In 2003, 14 dolphin carcasses were recovered and by September 2004, 12 more had been recovered, an unsustainable rate of loss. The species is now listed on CITES Appendix 1. A Royal Decree will declare nine dolphin conservation areas. In late 2004, the rate of loss slowed as conservationists identified the cause of the high mortality rate. The draft dolphin conservation strategy calls for conservation activities, education and awareness-raising, research, and regional coordination.

E. ASSESSMENT OF THREATS TO TROPICAL FORESTS AND BIODIVERSITY

Poor Governance

Poor governance including corruption is the fundamental threat to the conservation of Cambodia's forests and biodiversity. Recent incidents of poor governance have allowed the establishment of at least 3 major plantations in areas of natural forests. For many in Cambodia, these plantations violate existing laws as the definition of "State land" is murky. Poor governance is also demonstrated by the lack of clarity and decisions regarding the administration of public lands and land titling in general. Of the laws that do existing protecting the environment, there is little, if any, enforcement.

There is little civil society participation in decision-making regarding the management of forests and biodiversity yet, the majority of Cambodians depend on these resources. Lack of access to forest resources and land leads to the exacerbation of poverty which causes more land and forest encroachment as well as illegal logging. An example of this is that the Tumring rubber plantation, a commercial concession, pushed off many rural poor from their lands. These poor are then forced to move and farm in other areas usually through forest clearance.

Economic Land Concessions

Granting of land concessions is among the most serious threats to forests and biodiversity as clear-felling of large swaths of forests is occurring. Commercial agricultural concessions are classified under the 2001 Land Law as "land concessions for economic purposes " and are granted on up to 10,000 hectares for up to 99 years in exchange for royalties (UNHCHR 2004: 3). However, many concessions are much larger, covering tens and hundreds of thousands of hectares. There is clearly a distinction however between the the Agricultural-Economic concessions covered in the Land Law with Forest Plantations that are covered by the Forestry Law. Agricultural-Economic Concessions can only occur on State Private Land (things like oil palm plantations). Many of the new concessions are on State Public Property, specifically areas of the Permanent Forest Reserve, which can be used for the purpose of forest plantations (acacia, teak, pine, etc.), and to which the 10,000 Ha limit in the Land Law does not apply. The subsidiary legislation for forest plantations under the Forestry Law has not been enacted yet, so there is a bit of a legal vacuum operating.

In addition, there is still no legislation that clarifies what to do with Ag-Econ concessions granted before the new Land Law that exceed 10,000 hectares, therefore they are not necessarily illegal, rather just in a state of legal limbo. There will be legislation on Agricultural-Economic concessions which should clarify this. In addition, there is still no legislation in place on State Land Management, which should cover both State Public and State Private land.. In short, the lack of a legal framework and unclear and conflicting restrictions are causing the loss and degradation of thousands of hectares of forest.
.
Several of the largest concessions were granted in the year 2000, prior to the Land Law, to the logging company Pheapimex for eucalyptus plantations covering over 300,000 hectares in Pursat and Kompong Chhang Provinces to supply a pulp mill (UNHCHR 2004: 16). Even after the Land Law, Green Sea Industrial Co. received 100,852 hectares for a teak plantation in Stung Treng province, and Green Rich Company was granted 60,200 hectares for an acacia plantation inside protected areas in Koh Kong Province . As of August 2004, the Government had approved in principle a 199,999 hectare concession to Wuzhishan L.S. Group for pine plantations in Mondulkiri province (UNHCHR 2004: 24).

Although the question of their legality is still an issue, concessions have failed to generate the major benefits that underlie their rationale, including stimulation of private enterprise, production of state revenue, reduction of rural poverty, and generation of jobs (UNHCHR 2004: 5). Rather, concession activities have dispossessed local people, failed to pay required fees and royalties to the state, failed to employ significant numbers of local people, and led to considerable conflict between concession personnel, who are sometimes armed, and local residents. Moreover, because little has actually been planted on most concessions, and the valuable timber covering the lands has been logged and sold off, they can be interpreted as attempts to avoid the more stringent requirements for forest concessions and the current ban on logging (UNHCHR 2004: 21; Independent Forest Sector Review 2004:Chapter 3.6.4; Calavan et al. 2004: 6). A recent review of the concession system (UNHCHR 2004) called for a reconsideration of the entire system and stressed the need for public disclosure of concession contracts and company shareholder information. There appears to be some support for this view in government; on October 18, 2004 at a National Land Forum, the Prime Minister announced the suspension of new contracts for economic land concessions until the necessary legal framework is in place. Recognizing that land grabbing and speculation is occurring, he also asked the relevant authorities to review existing contracts.

Illegal Logging

Another major driver of deforestation is the illegal harvest and export of timber, which continues despite the moratorium on logging in forest concessions. Illegal logging often occurs with the involvement of government, military and police personnel. Logging drastically affects rural livelihoods. Despite a prohibition against it, many of the trees cut for timber are resin trees on which local people rely for income generation. The current independent forest monitor has been widely criticized for ignoring evidence of widespread government collusion and involvement in the illegal trade and for blaming evidence of

illegal logging on smallholders. At the December 2004 Consultative Group meeting, an agreement on allowing transport of already-harvested logs was reached between government and donor representatives. It is believed that lifting the ban would provide opportunities for "laundering" of newly cut timber through a system that will be very hard to monitor. It is also possible that some plantation clearing is used as a means of extracting logs. There are new proposals for a coupe system based on annual plans, but their sustainable management is met with similar skepticism as the former concession system.

Land speculation and grabbing

A third threat to forests is large-scale clearance of land by migrating populations and powerful people. Given the heavy reliance of Cambodia's rural populations on natural resources, this continued trend of privatization of lands that are state assets threatens livelihoods in several ways. Local residents are ordered off land on which they may have lived for years, contributing to increased landlessness and internal migration. In addition, the privatization of these lands preclude rural people from making use of the resources on which they depend, driving them deeper into poverty. Third, conflicts between powerful new landowners and local residents can turn violent, and in any event are almost never won by the disenfranchised.

Conflict

Plantation establishment, illegal logging and land grabbing culminate into conflicts at various levels and include the community level as well as military forces.. Actual conflict over forest resources and forestlands are increasing and will accelerate over the next several years unless steps are taken to reduce the underlying causes (ARD, 2004). Again, these conflicts arise from an overall lack of governance in land administration. Under the current situation, most communities are not able to exercise their rights to protect forests from those exploiting them nor do they have access to any forms of dispute resolution. Therefore, conflicts can erupt. There is the additional consequence that as there is little opportunity for communities to claim rights to the forests and thereby protect them, they see no alternative but to clear the forest before others do. This is occurring along the newly built road in Mondulkiri.

Lack of Definition and Delineation of "Forests" and "Protected Areas"

Exacerbating the deforestation as noted above is the lack of a clear definition of what constitutes a forest or the delineation of its boundaries, that is the permanent forest estate. This vagueness has several negative implications. First, certain forest types such as dry forests or grasslands with low tree density may be classified as non-forest, allowing them to be labeled as degraded lands and sold off as concessions. Second, upland areas settled predominantly by non-Khmer ethnic minorities often feature forests at various stages of clearance and regrowth, as is typical in a swidden cultivation system. Such lands may not be considered by the government as truly forested, and thus given away to wealthy outsiders to "develop." Conversely, such lands may also be considered to be forested but

underutilized or mismanaged by the indigenous land use system, and taken away under the guise of a need for better forest management.

The protected area system needs to be consolidated, as well as the oversight of the two ministries is not coordinated. The Draft Protected Areas legislation was recently fast tracked through the Council of Ministers and with strong support from the Prime Minister will be passed by the end of the year.

Other Threats

Other threats that are either less severe or harm only certain types of forest include burning, both intentionally for land clearing and accidentally; over-harvesting of flood forests and mangroves for fuelwood and charcoal production; and clearing of new lands (for subsistence agriculture, settlement, fuelwood, charcoal, or hunting) as people migrate to areas that have only recently become safe for occupation.

Wildlife Trafficking

The primary threat to animal biodiversity is wildlife trafficking. Trade in wildlife is much harder to track than the timber trade but there is little government capacity for patrols or law enforcement. Wildlife poaching and trafficking occurs at all levels of society but wildlife poaching in the Cardamom Mountains is led by the military (Calavan et al. 2004:6). Wildlife poaching for trade is a much more severe problem than subsistence hunting and fishing, although the combination of both pressures is seriously depleting forests and water bodies. Elephant and tiger populations in both the Northeast and Southwest of Cambodia have been severely decimated. Most of the trade for food, traditional medicine, and pet or aquarium use seems destined for countries such as Vietnam and China (Figure 5). Awareness raising about wild meat consumption within Cambodia has reduced this use but there is little awareness within the country that wildlife trafficking is actually illegal. Timber harvesting, land clearance, burning, and fuelwood harvesting all destroy or degrade habitats and adversely affect fauna.

Over-fishing

Threats to aquatic biodiversity include over-fishing, habitat loss, agricultural runoff, conflict over fishing lots, population increase, illegal catch methods, expansion of fishing lots into public access areas, urban waste, and upstream land clearing and development. The sudden release in 2001 of 56% of commercial fishing lots to local fishers nationwide resulted in vast over-fishing attributable both to lack of government oversight and lack of community capacity to manage the fisheries. Over-fishing of commercial lots and unregulated harvest of marine resources by Thai and Vietnamese boats lead to unsustainable use, evidenced by reduced catch size, alteration in species consumption patterns, and smaller fish size. Turtles, snakes, and crocodiles are also over-harvested for food and trade. Illegal fishing techniques use electric current, dynamite or cyanide, small

mesh nets, large trawls and pushnets in marine areas. Conflicts between local fishers and commercial fishers are serious, especially around the Tonle Sap Lake and along the coast.

Figure 5: Wildlife Trade Routes
Source: http://www.mekong-protected-areas.org/mekong/maps/wildlife.gif

Destruction of Aquatic Habitats

The cutting of flooded forests and mangroves contributes to habitat depletion and affects breeding and feeding grounds in particular. Threats to seagrass beds are degraded water quality because of siltation, agricultural runoff, and municipal waste, and destructive fishing practices such as trawling and use of push nets that damage seagrass beds. Potential threats to coral reefs include over-fishing, dynamite fishing, coral harvest for trade, and water quality degradation. Fish catches are declining and the size of those caught is declining, adversely affecting livelihoods.

Dams

An additional threat to aquatic biodiversity, especially in the Tonle Sap Lake and Mekong River system are dams constructed or planned in neighboring countries. The threat is that dams will alter the flow regime in the system, preventing the regular rise of the Tonle Sap, the annual flooding of the surrounding forests, and the deposit of sediments that supplies the system with nutrients.

Pollution

A further threat is the pollution of water bodies from agricultural runoff. Despite a government sub-decree on standards for agricultural materials, many banned chemicals are easily available. Up to 80% of pesticides sold in Cambodia are smuggled from Thailand and Vietnam, and these are rarely labeled in Khmer. Several chemicals that are restricted in other countries because of their danger are widely available in Cambodia. The environmental impact of such uses is not as great as would be expected, because of generally low agricultural productivity and the lack of chemical use in rainfed rice systems, but the risk is greater to water bodies and fish. There is also a potential impact on human health because the agricultural chemicals are applied without protective clothing, and are misused or overused.

Economic Corridors and Roads

The ADB's Regional Cooperation Strategy and Program plans to increase development within the Greater Mekong Subregion (GMS) through regional economic corridors that will include the establishment of road networks between countries in the region. Many of these roads will be transiting through or near protected areas and forests. Therefore, there is concern that increasing development activities in the economic corridors may adversely affect critical ecosystems and high value biodiversity areas resulting in fragmentation of natural landscapes. This would undermine the functioning and performance of the region's ecosystems, thereby threatening long-term socio-economic development and environmental security of the sub-region.

Cambodia is also increasing its road network. One such road has been opened recently in Mondulkiri Province. During 2004, it has been reported that land grabbing along the road

has increased by three-fold. Without a clear development plan or methods of titling land, especially those of communities, the land speculation along the road escalates.

Impacts From Current Events

The garment industry is currently valued at $1.5 billion. If the industry declines due to changes in the World Trade Organization's quota system; then the livelihoods of 250,000 women and their families (potentially totaling 3 million people) that depend upon them will become uncertain. The garment workers make $45-60 per month and send approximately 30% of this income to their families living in rural provinces. If there are no job opportunities in urban areas, although it is unlikely, one fallback will be more intensive agriculture cultivation.

Mining

Forests and biodiversity are also affected by Cambodia's growing gold mining industry. While the sector is still small, with 19 known deposits, it now employs several thousand miners. All mining activities require a government permit (2001 Law on Management and Exploitation of Mineral Resources) and some previously open-access deposits have now become mineral concessions controlled by businesses. Chemical extraction methods using mercury and cyanide are becoming more common. The environmental impacts of these practices have included surface and groundwater pollution from leaching, spillage and inappropriate disposal of tailings, fish and other animal kills, deforestation for mining area clearing and infrastructure construction, and increased hunting activity. Lack of training and government oversight exacerbate these and related human health and safety problems (Oxfam America 2004).

F. ACTIONS NECESSARY TO CONSERVE AND SUSTAINABLY MANAGE TROPICAL FORESTS AND BIOLOGICAL DIVERSITY

This section (F) will describe "(1) the actions necessary in Cambodia to conserve tropical forests and biological diversity" as stated in Sections 118 and 119 of the Foreign Assistance Act. These are actions in general that need to be taken. Section H will then work from this list to make specific recommendations for the new country strategy in keeping with the second requirement of section 118 and 119, to describe "(2) the extent to which the actions proposed for support by the Agency meet the needs thus identified." Preceding Section H and as background information is Section G which describes what USAID is currently doing in Cambodia for conservation.

Government and Donor Action Plans

Analyses and plans by the Royal Government of Cambodia (RGC) and international donors describe actions needed for conservation. In 2002, the Ministry of Environment (MOE) approved the National Biodiversity Strategy and Action Plan, which lays out government priorities in resource management and biodiversity conservation. The plan establishes a

vision of "equitable economic prosperity and improved quality of life through sustainable use, protection and management of biological resources" (Ministry of Environment, 2002). Priority actions identified include 1) awareness raising and capacity building of both the government and communities; 2) community-based natural resource management; and 3) ministerial clarification and coordination.

Similarly, the Forestry Administration under the Ministry of Agriculture, Forests and Fisheries and the Ministry of the Environment along with the technical working group on forest and environment have developed a work plan for 2005 that lists actions needed for the conservation of tropical forests and biodiversity. The policy statement of this workplan is that the "RGC is promoting the sustainable forest management and conservation for the socio-economic benefit of the Cambodian people". The benchmarks of the workplan are:

"1. Major part of the natural forests rationalized, reclassified and dedicated to their ecosystems protection and biological conservation functions.
2. Benefits to local people from the use and management of forest resources optimized via implementation of forestry and wildlife management concepts based on the participation of local populations.
3. Use, processing and marketing of forest products optimized through private and the public participation in processing and tree planting as a means of releasing pressure on the natural forest."

Legal Framework for Resource Management

As poor governance is a fundamental threat to forests and biodiversity, activities are needed to support the rule of law such as finalizing the national legal and spatial planning framework for allocating forest resource, land use and tenure rights. It is absolutely critical that forestland be comprehensively and rationally allocated in order to create a spatial framework within which to allocate forestland for community forestry, timber production, protection, conversion to other uses, and smallholder settlement (ARD, 2004). With the cancellation of forest concessions, the fate of these areas has not yet been determined. Also, with the passage of the new Land and Forestry Laws, definitions of the different areas and how they will be administered are an ongoing process. The World Bank's LMAP and LASED projects are addressing these aspects; however, how forests and community forests are harmonized between the two laws is not yet clear. Definitions of land uses and their physical delineation are parts of the critical foundation to allow the effective enforcement of laws. It appears that data from remote sensing and aerial photography are available to be used to delineate forest and other land uses boundaries.

As a part of the classification of forests, there will be a void as to how to manage forests as the current forest concession system is likely to be canceled completely. This alternative system should be able to meet growing domestic demands for timber in a legal manner. Community forestry will likely be one part of the new system; yet, there is little data of the area of forests currently managed by communities. Smallholder or out-grower schemes may be possible. The Forestry Administration is proposing an annual coupe system to

replace concessions but there is a possibility that this might lead to unsustainable levels of one-off harvesting.

In order to improve protected areas management, clear boundary demarcation, land use zoning, and management planning are necessary. In addition to consolidation of the system, a clear set of criteria for prioritizing work in protected areas is needed. Such criteria would probably include: 1) critical species; 2) environmental functions; and 3) community use of forest resources. Other needs include increased field staff capacity, better scientific knowledge, systematic threat identification (infrastructure development, commercial activities), management plan development, identification of additional areas for protection, environmental education and outreach, work with communities as conservation partners, and long term funding for the environment (such as a trust fund).

In addition to defining and delineating protected areas and forests, support for a complete legal framework with necessary sub-decrees and guidelines for resource management are needed. Civil society participation should be incorporated throughout the process. Promoting transparency and accountability of the management of these state assets, including concession contracts, and protected area boundaries, state public versus private lands will work to minimize misuse of natural resources.. To improve natural resource governance at the province, district, and commune levels, an emerging and effective tool is detailed land use planning at the village and commune levels (ARD, 2004).

Community-Based Natural Resource Management

Land titling and land registration, including forests, for communities is a key action to conserve forests and biodiversity and to reduce conflict over them. Mechanisms and procedures for conferring tenure rights need to be put into place and are currently being developed, One such excellent example is a participatory land-use planning methodology currently supported by many donors. A number of NGOs are helping communities to improve their capacity to understand and demand their forest use rights through education, empowerment, organization, networking, advocacy, and training. As noted above, communities can play a vital role in managing former concession areas; however, establishing community forests in areas of natural forests, not just on degraded lands should also be advanced. In addition to tenure rights, communities will need tools and incentives for conservation. Furthermore, management and protection should not become an exclusive responsibility of communities because government still has a role to play in enforcing community rights to these resources.

Monitoring and Enforcement

The Government of Cambodia currently has an official monitor of forest crimes, although many argue that the contractor is ineffective and reacts slowly to alleged violations of the Forest Law. Future monitoring and enforcement will be needed to stop illegal logging, land grabbing and encroachment. A monitoring system would take the form of a database and use Internet, publications and other fora for information dissemination. It should serve as a

tool and common resource for monitoring and transparency to advocate good governance and reduce conflict. Community-level systems could be set up to monitor and report forest crimes. The Forest Network, comprised of local NGOs and forest communities and facilitated by the NGO Forum, acts as a mechanism for communities to report forest crimes and conflict, and coordinate with each other (ARD, 2004). There is also the need to increase capacity for effective enforcement of protected areas . Models utilizing communities to assist in protection are currently under discussion among some NGOs.

Awareness Raising

The transparency and accountability of the government for resource management can be promoted through people's access to information. This information would include explanation of laws, rights and responsibilities of stakeholders, and environmental education. Any campaigns should be linked to a reform effort so that the awareness feeds into a process for change.

Conflict Mitigation

There is a vast need to resolve the numerous disputes over claims to forests and lands. The 2001 Land Law allows for the establishment of a cadastral commission to provide for alternative dispute resolution in cases where land is not registered. This commission has been set up under the LMAP project, sponsored by the World Bank. Work on resource conflict dispute resolution at the community level and through participatory land use planning is also needed. Another approach to deter land grabbing is taking high profile land conflict cases through the judicial process- an approach that USAID is already taking through its Public Interest Law Advocacy Project.

Alternative Livelihoods and Income Generation

Over 80% of Cambodians are dependent upon subsistence agriculture. Many are unable to produce sufficient rice for their families. As a result, they often turn to forest resources for their survival. To reduce pressure on forests, fisheries and other wildlife, while reducing poverty, alternatives for income generation, including the promotion of sustainable agricultural practices should be explored. Potential products include non-timber forest products, high value on-farm products and financial compensation for environmental services. Such activities would require analyses of products best adapted to the biophysical environment, capacity building of smallholders for production and marketing and an investigation of marketing opportunities and access to micro-credit.

Research

A variety of research related to the threats and actions is needed. For example, no hard data is available on the economic, including environmental, costs and benefits of land concessions versus other forms of land/forest management such as community-based management. Research on species and their habitats also will be important to identify appropriate methods and locations for conservation. In relation to development projects

such as dams and economic corridors, research could monitor, for example, the effects on Tonle Sap-Mekong River system, forests and the livelihoods of resident people.

Fisheries Management

Priorities for fisheries management include creation of areas for both aquatic species protection (especially of breeding grounds) and sustainable production; and regulations and incentives for the sustainable management of the national fisheries sector (National Report 2003). Such management strategies should include participation by local communities, management planning, zonation, and enforcement, and payment of licenses and fees to support protection. Other priorities include creating alternative livelihood options to limit pressure on fish resources, increasing community and institutional capacity to manage fisheries, and harmonizing fisheries policies with those of related sectors, such as forestry and water management (Policy Reform Impact Assessment 2004:xii).

G. USAID'S CURRENT ACTIVITIES MEETING CONSERVATION NEEDS

Rule of Law and Conflict Mitigation

The Human Rights in Cambodia Project (East-West Management Institute/American Bar Association) pursues "impact litigation" cases focusing on forest or land conflicts to raise the level of compliance with the rule of law. They also train people in legal advocacy, using the media and lobbying. These high-impact legal cases are aimed to provide precedent in the legal system to deter corruption and human rights abuses including those related to people's rights to their lands and natural resources. One such case is that in which a local government official illegally seized the land of indigenous peoples.

USAID sponsored a Workshop on Community Level Impacts of Forest and Land Conflicts in Mondulkiri in 2004. The objectives of the workshop were to give forest communities the opportunity to discuss their experiences with forest conflict, learn their forest and land rights, and to develop a preliminary action agenda to be carried out by the communities, NGOs, and local government. The workshop participants developed an action plan to avoid and mitigate forest and land conflict in the province, which prioritized several follow-on activities including the need to educate indigenous communities about their forest and land rights and to help them to organize to protect these rights.

Community-Based Natural Resource Management

The Community Forestry Alliance for Cambodia (CFAC) is designed to support the development of community forestry in Cambodia by contributing to the improvement and implementation of national policies and field programs. CFAC aspires to build the capacity of Cambodia's rural communities to manage forest lands. It channels flexible funding to innovative Cambodia NGOs that are engaged in community forest policy

development, extension and training, and field project implementation. CFAC is also accelerating the development of community forest programs in the field by facilitating exchanges between policy makers, donors, NGOs, and local government, and rural communities. Community Forestry Training through several sub-grants by the Community Forestry Alliance for Cambodia has occurred in 83 villages benefiting over 9,000 families.

The MOSAIC (Management of Strategic Areas for Integrated Conservation) Project of the World Wildlife Fund-Cambodia has been working in central and northern Mondulkiri for three years, initially doing research and now promoting participatory land use planning (PLUP) and community based natural resource management (CBNRM) in some of the most remote indigenous communities in Cambodia. The MOSAIC team's experience in local awareness-raising and facilitation among Phnong communities will implement fieldwork concentrating on Pu Chri commune, with the goal of reducing the extent and intensity of land and forest use conflicts between immigrants and indigenous Phnong.

The Agri-Business Institute Cambodia (ABiC) and the community forest network in Snuol District of Kratie Province are promoting and strengthening legal rights of the forest/indigenous communities based on the land and forestry laws of the Kingdom of Cambodia.

Monitoring and Enforcement

Global Witness is drawing national and international attention to forest crimes and the degree of government enforcement of forest and environmental laws. In one example, a 300,000 hectare plantation to be established by Asia Pulp and Paper in Botum Sakor National Park was at the time of this writing halted due to the direct action of NGOs, including a letter from Global Witness to the Minister of the Environment.

USAID has helped create and implement forest and wildlife protection programs with WildAID that involve the use of rangers, both foreign and Cambodian; zoning and demarcation of protected areas; new community livelihood programs; and wildlife and illegal monitoring and reporting. In the first year, this creative approach to enforcement reduced forest fires from 35-40 per day to 1-4 per week and reduced land encroachment cases from 401 to 137, a decline of nearly 300 percent. Rangers also reduced tiger and elephant deaths: 12 tigers and 36 elephants were killed in the 18 months preceding the new enforcement program; in contrast, only one elephant and two tigers were killed in the first year of this new initiative. WildAid has trained 55 forest rangers to protect the wildlife sanctuary in the Cardamom Mountains region.

Awareness Raising

USAID provided training to some 59 commune councils raising their awareness of land rights and the need to protect natural resources. The use of an intense participatory style encouraged members of the councils to work together, regardless of party affiliation. USAID and its partners also promoted civil and political rights through 52 public forums across the country involving approximately 30,000 participants. These forums were

broadcast through the Voice of Democracy Radio program, reaching several hundred thousand other Cambodians.

Alternative Livelihoods and Income Generation

Wild Aid promotes community agriculture development as a means of reducing the illegal trafficking of forest and wildlife products. Alternative livelihood opportunities are benefiting over 180 families formerly dependent upon destructive and unsustainable utilization of the forest to survive.

H. ACTIONS PROPOSED FOR SUPPORT TO MEET CONSERVATION NEEDS IDENTIFIED

Current USAID activities in Cambodia in support of the environment and community rights provide the essential building blocks to further develop actions to conserve and sustainably manage tropical forests and biodiversity in the new country strategy. Furthermore, as poor governance is the major cause of forest and biodiversity loss and a critical impediment to Cambodia's development, actions to improve conservation fit within a governance Strategic Objective. . In Cambodia, illegal and improper use of land and degradation of the natural resource base is the most pressing governance issue facing the country today.

Administration of Public Forests and Land

Although there is a Forest Law, forests are not demarcated. Furthermore, decisions regarding the allocation of public lands under the Land Law are proceeding at a rapid pace, contributing to deforestation and complicating the process of forest zoning. There also is uncertainty as to how former timber concessions will be administered. Fundamental to the proper administration and management of protected areas and forested areas (including the designation of community forests) is the establishment of boundaries. This can be done through remote sensing with ground truthing. The World Bank has some imagery of the land that can assist with the definition of public lands and those which can be given titles. USAID could coordinate with the World Bank and others on the forest information that would eventually define the permanent forest estate and community forests. USAID's role could be working from the ground up by documenting community forests for their inclusion in planning and zoning. This ground-truthing utilizing remote sensing would map existing farms and community forests. This would fulfill two important goals: the first, providing the information needed for a community to gain rights to forest as stated in the community forest sub-decree; and the second, establishing evidence of community possession of areas to gain compensation if they are pushed off their lands by speculators. The assistance of legal experts will also be needed to incorporate the data on community-managed areas into the appropriate laws and even to ensure consistency between the Land and Forest laws. This mapping of community areas can be combined with the participatory land use planning to gain community rights. Mapping of community forest lands will contribute to gaining their rights as described in the next action proposed on community-based natural resource management.

Community-Based Natural Resource Management

A key recommended action to conserve forests and biodiversity is to empower communities who live closest to and are most dependent upon these resources. Forests and biodiversity are the assets of the poor and the poor themselves are assets for conservation. Communities have the most to gain from sound management or to lose from mismanagement. Achieving community management will be the embodiment of democracy giving communities a voice and choice of how their resources are utilized and cared for.

Clarifying management rights and the promotion of environmental stewardship will help curb illegal activities and reduce resource-based conflict. Incentives for communities to conserve include tenure rights to manage resources and rights to freely trade products of these resources. Another incentive is the access to health care through an integrated program of conservation and health. Further descriptions of establishing these incentives are found below.

To achieve the vision of greater community rights, pilots of community-based natural resource management (CBNRM) should be scaled up and the process of gaining rights needs to be streamlined. Emphasis should also be placed on community rights to areas of natural forests as opposed to degraded areas. Currently, there are numerous donor programs and NGO activities supporting community rights. One methodology used by NGOs to assist communities in gaining their rights is through Participatory Land-Use Planning (PLUP). As referenced in the first proposed action above on the administration of public lands There is a need to move quickly to give communities rights to these areas are urgently needed before they are further cleared of their forests. The first step would be mapping the overlay of communities' traditional areas of forest management within forested areas in general as well as the specific sites of former concessions. Opportunities for which communities could not only conserve forests, but also manage them to fulfill demand for local timber supplies is needed, if communities so choose. Furthermore, more legal support to communities is necessary to resolve disputes over forest and land areas.

Efforts to promote community rights can be linked to other efforts within the governance SO that focus on decentralization and local government strengthening. Furthermore, the use of information technology can play a role in streamlining processes and even to establish registries of titles to land and forests.

Product and Market Development

Natural resources management by the communities should also have the added incentive of providing a cash income for communities. Ideally, alliances could be built with the private sector to assist communities with management, business skills, marketing and pricing. Training in sustainable agriculture utilizing high value agricultural or forest products may also provide income for laid-off garment workers. Post-harvest processing with access to micro-credit would further support community enterprises with the overall goal of forest

and biodiversity conservation. A potential opportunity is collaboration with the International Finance Corporation's (IFC) Mekong Project Development Facility (MPDF) which is establishing an investment fund for small-medium enterprises in the Mekong region. Among the areas that it is focusing are agro-processing and high-value exports.

Information technology can also collect information on crops and their harvesting. National and regional market pricing of products could also be made available to farmers and communities through affordable and available technology such as cell phones and "SMS" text messaging. Additionally, information technology can track the supply chain need for some forms of agriculture certification such as organic certification.

Community Health Care as a Conservation Incentive

Health care is among the greatest needs that communities face in rural areas. In development appraisals of community priorities, health will always be among the top three. There is a real opportunity for USAID to assist in the integration of health services within conservation programs as an incentive for conservation. There are a variety of ways in which this integration can be carried out (Melnyk, 2001). One way is clarifying the links between healthy forests and health communities as forests are sources of food, medicines and clean water. Another way takes into account that conservation staff frequently visit remote communities there may be an opportunity to train these staff in providing some basic health care services. It is crucial that the communities understand that the provision of services is related to the need to conserving the environment for their well-being.

Strengthening Awareness Of Laws And Rights

Although laws exist with respect to conservation and community rights, a lack of information of these laws and illegal actions allows perpetrators to act with impunity. Communications at the local, national and international levels that highlight events and crimes has been an effective tool to protect the environment. Furthermore, the communication of existing laws (e.g. that of the land and forestry laws) allows the public to hold accountable government officials for their actions related to resource distribution and enforcement against forest and wildlife crimes.

Past approaches that USAID/Cambodia has supported provide examples of the types of actions needed to conserve the environment for the new country strategy. For example, as a result of NGOs highlighting of crimes and corruption, the government has taken some form of action to halt deforestation and the destruction of biodiversity. USAID's support of high-impact legal cases are providing precedent in the legal system to deter corruption and human rights abuses including those related to people's rights to their lands and natural resources.

Developing a communications strategy to disseminate information on forests and land laws will work to reduce land grabbing and encroachment, and build people's ability to participate in decision-making regarding forests and biodiversity. Communications should be linked to reform efforts so that the public has an outlet to use the information for

change. Knowledge will empower rural villagers to hold their officials accountable for the proper management of resources according to existing laws. In one example, the distribution of information over the laws has caused a local government official to reduce the number of permissions to clear forests. As a result land grabbing and the consequent conflict over the land and forests has been reduced by nearly 75%. Information and demonstration of how communities can gain rights to land by way of videos, radios and even t-shirts can expand the number of communities able to act on their rights while reducing conflicts among stakeholders over those rights. In addition to communities, commune councils should also be a target audience for information on laws in local languages and methods of participatory land-use planning and alternative dispute resolution.

Communications and media campaigns can be linked to radio programs that promote democratic participation. Media outreach could also be developed around the high-impact cases. Communications should reach beyond the local media to international media, the donor community and the NGO community. Such communications will be vital for increased pressure for accountability and conditionality to counter the widespread greed and corruption in Cambodia.

Monitoring And Enforcement

Monitoring and enforcement are needed for both protected areas management and forest conservation. Existing efforts with NGOs to improve park management, reduce encroachment and wildlife poaching should be continued. Such efforts should be expanded to include communities as partners in protected areas management especially based on their presence in buffer zones. These efforts will remain critical in conserving forests and biodiversity inside and outside of protected areas.

Information technology is a critical tool for monitoring and enforcement of physical areas of forests and protected areas and of governance. New and established information technology (IT) tools enable conservation and support biodiversity due to their cost-effectiveness and inclusiveness, ability to disseminate large-quantities of data, and support monitoring of scarce resources.

Establishing systems of remote sensing of forest and land uses will serve to monitor illegal logging and clearing. Such evidence would contribute to enforcement against illegal activities and provide the evidence to hold individuals accountable for their actions. IT could also be used to monitor forest and land-related conflicts. Such information would document the scale of conflict over environment and its impacts. A monitoring system would take the form of a database and use the Internet, publications and other fora for information dissemination. It should serve as a tool and common resource for monitoring and transparency to advocate good governance and reduce conflict. Groups served would include:

- Conservation organizations identifying threats to biodiversity through conflict in key habitats.
- Political analysts tracking trends in decentralization

- Environmental programs and projects
- Governance and transparency initiatives cross cutting different sectors

Additionally, as steps to gain community rights to lands and forests proceed, communities will be confronted with encroachment and land grabbing by others, sometimes at a large-scale. As these cases arise, a hotline could be established for communities where they could report the conflict and access help.

Women as Partners in the Sound Governance of Forests and Biodiversity

Examples abound throughout Cambodia where it is the women who are standing up and championing the environment. This valuable role should be recognized and strengthened in the design of activities. USAID should adopt new methodologies which will allow the full participation of women in activities and in resolving the forest and biodiversity crisis in Cambodia. As a first step, female development/conservation staff should be the point of contact for women in rural communities. Meetings with women villagers should be arranged at times convenient for women in relation to their household duties rather than times convenient for the development/conservation staff person. The obstacles that women face and the impacts that deforestation has on them need to be assessed as a component of implementing community management and community mapping of forest resources. Women should also play a role in dispute resolution and/or negotiation. An explicit emphasis on women and conservation has been lacking and should now be firmly established. Women must be given the opportunity to participate in the sound governance of natural resources and to become agents of change.

Donor Coordination

Given the challenges in the sector, it is very important that donors continue to work together to encourage a greater effort for accountability and conditionality from the RGC. In addition, there are several opportunities to build synergies with donors and lending institutions. The World Bank's efforts in land management and emerging efforts in community forests provide an opportunity to work jointly in harmonizing and institutionalizing legal frameworks that recognize both forest and land issues. Other areas in common with donors are dispute resolution and cadastral commissions. FAO is interested in working with the Peace Corps and carrying out joint programs in agriculture and sustainability. FAO has already piloted many activities on community-based natural resource management which USAID could build upon.

I. BIBLIOGRAPHY

ADB Newsletter. April 2003. Future Solutions Now: The Tonle Sap Initiative.

Amphibians and Reptiles of Cambodia. Bryan Stuart. Undated report, WCS.

Associates in Rural Development. 2001. Tropical Forests (FAA 118) and Biodiversity (FAA 119) Assessment for Cambodia.

Associates in Rural Development (ARD). 2001. Cambodia Environment and Natural Resources Assessment.

Blatzer, M., Dao, N.T., Shore, R.G. (eds). 2001. Towards a Vision for Biodiversity Conservation in the Forests of the Lower Mekong Ecoregion Complex. World Wildlife Fund.

Birds of Cambodia. Colin Poole. Undated report, WCS.

Calavan, Michael M., Sergio Diaz Briquets, and Jerald O'Brien. May-June 2004. Cambodia Corruption Assessment. Prepared for USAID/Cambodia.

Cambodia: A Country Study. 1990. Library of Congress area handbook series. (based on 1987 data).

Cambodia Mekong Dolphin Conservation Strategy 2005-1010. Draft conservation strategy for the Mekong River Irrawaddy Dolphin. Ministry of Agriculture, Forestry and Fisheries, Department of Fisheries, undated.

Cambodia National Report on Protected Areas and Development. Review of Protected Areas and Development in the Lower Mekong River Region. 2003. Ministry of Economics and Finance and Ministry of Environment.

CBNRM Learning Institute, 2004. The Development of Community Based Natural Resource Management (CBNRM) in Cambodia. Selected Papers on Concepts and Experiences.

Community Fisheries Development Office, Department of Fisheries. 2004. Policy Reform Impact Assessment, Cambodia. Impacts of the Fisheries Policy Reforms in Kampong Cham, Pursat, and Takeo Provinces.

Evans, P.T., Marschke, M. and Paudyal, K. 2004. Flood Forests, Fish, and Fishing Villages: Tonle Sap, Cambodia. A Collaborative Study by the Food and Agricultural Organization of the United Nations, Siem Reap, and Asia Forest Network

FAO. 2005. Participatory Natural Resource Management in the Tonle Sap Region. Project Information Sheet, January 2005.

Global Witness. 2002. Deforestation without limits: How the Cambodian government failed to tackle the untouchables.

Global Witness. 2002. Reform of the Forest Crime Monitoring and Reporting Project. March 2002.

Global Witness. 2004. Taking a Cut: Institutionalised Corruption and Illegal Logging in Cambodia's Aural Wildife Sanctuary – a Case Study.

Independent Forest Sector Review: The forest sector in Cambodia. 2004. Part 1. Product of Joint Coordinating Committee (6 ministries and 6 donors) under chairmanship of Director of Forestry Administration and Working Group on Natural Resources Management.

McKenney, B. Chea, Y., Tola, P., and Evans, T. 2004. Focusing on Cambodia's High Value Forests: Livelihoods and Management. Wildlife Conservation Society.

Melnyk, M. 2001. Community Health and Conservation: A Review of Projects. Washington, DC: Biodiversity Support Program.

Oxfam America. 2004. Small-scale gold mining in Cambodia: a situation assessment.

Royal Government of Cambodia, Ministry of Environment. 2002. National Biodiversity Strategy and Action Plan.

SGS. 2004. Independent Monitor: Forest Crime Monitoring and Reporting. April 2004. SGS First Quarter 2004 report.

Timmins, R. J. 2003.The Conservation Significance of the Mekong River Between Kratie and Stung Treng for Birds and Large Mammals. WWF Indochina.

United Nations Cambodia Office of the High Commissioner for Human Rights. 2004. Land Concessions for Economic Purposes in Cambodia: a human rights perspective.

USAID/Cambodia Interim Environment Strategic Plan, September 2001.

USAID/Cambodia Interim Strategic Plan 2002-2005. February 2002.

Walston, J. undated. Mammals of Cambodia. Wildlife Conservation Society.

WildAid. 2003. Cambodia Conservation Program Annual Report.

WildAid. 2004. Community Agriculture Development Project (CADP) Agriculture Development for Protection of the Southwest Elephant Corridor, Koh Kong Province, Cambodia. WildAID final report to USAID.

World Bank. 2003. Cambodia Environment Monitor. (in collaboration with Ministry of Environment.