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Cambodia

Environmental Review: Status and Trends in Environmental Management and Options for Future Action

Including

**Interim Environmental Strategic Plan (IESP)
And
FAA 118/119 Assessment**

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Executive Summary

Purpose

This assessment of environment and natural resources (ENR) in Cambodia was conducted for the purposes of:

- **Assessing the status of, and trends in Cambodia’s environment and renewable natural resources**, particularly with respect to forests, inland waters, the coastal zone, and marine waters. These resources were evaluated in terms of their biodiversity, their use for subsistence and commercial purposes, governance issues related to their management, and how natural resources are related to rural livelihoods, poverty, and human rights. Agriculture was also assessed because of its dependence on natural resources and its role in directly supporting the vast majority of the Cambodian people;
- **Describing current and planned activities of donors and nongovernmental organizations (NGOs)** in environment and natural resources management (NRM) while identifying potential USAID programming opportunities;
- **Identifying potential partners for USAID/Cambodia** with respect to possible ENR programming; and
- **Formulating an Intermediate Result (IR)** in the area of improved natural resources governance to be included in the Mission’s Strategic Objective (SO) 1, which is currently under review and will be revised over coming months.

Findings

Biodiversity Status

Cambodia is a country with diverse terrestrial, freshwater and marine habitats supporting a great variety of species, many of which are endangered and threatened regionally or globally. Remaining forest habitats, such as the dry dipterocarp forests in the north, are among the largest remaining expanses of this forest type left in the region and the wetlands within them provide habitat for a diversity of large water birds and mammals. Globally important species including tigers, clouded leopards, elephants, banteng (a type of wild cattle), sarus cranes, Siamese crocodiles and many more still inhabit the wilds of Cambodia. Likewise, the Mekong River and associated systems including the Tonle Sap (Great Lake) contain an abundance of fish and other aquatic species that provide an important food source for most Cambodians. Coastal systems of Cambodia are also diverse, including coral reefs, mangroves, seagrass beds and other biodiverse ecosystems.

Sadly, most of these resources are threatened by various combinations of habitat destruction and targeted persecution of those species with significant economic value. Most natural habitats are being degraded at a rapid rate, and no doubt many species are disappearing. Little data exists on the rate of loss or on the presence or absence of any but the most conspicuous species. Much more work needs to be done quickly to ensure the integrity of Cambodia’s ecosystems and the sustainable use of species that inhabit them.

Natural Resources Use and Management

Cambodia's forest, freshwater, and marine resources are being used in an unsustainable manner. Coherent systems of management either do not exist, are not enforced, or have been subverted by collusion among politicians, government officials, military officers, and businessmen. The rush for forest, fish, and wildlife resources that has accompanied the relative peace and security of the past several years has restricted access to critical natural resources for many rural people, has left forests degraded and fish stocks depleted, and is pushing many valuable wildlife species to the verge of extirpation in Cambodia. The resource extraction crisis is being driven largely by demand from neighboring countries, but also by Cambodia's expanding urban centers. Demobilized soldiers and displaced people are moving to more remote parts of Cambodia in search of land, along with businessmen looking for cheap land on which to establish commercial crop plantations.

The current turmoil over land ownership and resource access causes conflicts on all levels of society. Land and resource use conflicts between communities and business interests often result in violence and displacement of rural people. Natural resource access issues are closely tied with human rights, livelihoods, and poverty in rural Cambodia. The poorest families are most affected when access to forest and fishery resources is restricted, and women, especially those who head households, are disproportionately affected. Improving NRM in Cambodia is closely tied with livelihood and gender issues, human rights, and the strengthening of governance.

Natural Resources Governance

The Royal Government of Cambodia (RGC) is undertaking a major effort to improve governance at all levels by strengthening the legal framework, by reforming government administration and the judiciary, by demobilizing part of the military, and by decentralizing and deconcentrating some government authority and functions. An important focal point of the RGC's governance program is the improvement of governance over land, forests, fisheries, and wildlife and to put more management authority into the hands of communities and local government. A number of key laws that are currently in the final stages of government review will provide a rational legal basis for the management of land and natural resources. Passage of these laws and formulation of implementing regulations will be an important step forward, but resources, knowledge, and political will are needed to enforce provisions that are counter to the interests of powerful figures in Cambodian society. Commune councils, to be elected for the first time in early 2002, will be a logical government level for natural resource management in partnership with communities.

Donor and NGO Activities

Natural resource issues, especially those related to forests and land, have attracted international attention and considerable donor support. The Danish International Development Agency (DANIDA) has just begun a very large five-year Natural Resources and Environment Program that includes a variety of project types as well as capacity building in relevant ministries. A

group of multilateral and bilateral donors have been assisting the RGC to reform its system of production forest management and several donors have been very active in helping to improve land management and allocation. NGOs and some donors have implemented community-based natural resources management (CBNRM) projects directed at forests, fisheries, and coastal resources. Several NGOs are working with the government to control the illegal wildlife trade and to promote environmental education and conservation awareness. A number of NGOs work on natural resources policy advocacy at the national level.

Conclusions

USAID/Cambodia can provide valuable assistance to improve NRM in Cambodia at a critical time when these resources and the people who depend on them are highly at risk. The RGC is taking positive steps in strengthening the framework of natural resources governance that create opportunities for the Mission to make strategic interventions at the community and local government levels to place the control of critical resources into the hands of the communities that use them. This important community and local government-level work can be augmented with policy advocacy at the national level via donor and NGO partners and through carefully selected private sector partnerships.

Recommendations

The ARD assessment team recommends that USAID/Cambodia incorporate Natural Resource Governance as an IR under SO 1 as set forth in Annex 2. The Mission can flexibly develop programming under this IR by selectively choosing activities from one or more of the four proposed points of entry. Activities should be selected to take advantage of synergies with other governance activities under the SO and with the activities of partners. USAID has valuable experience in CBNRM, NRM policy formulation, and NRM governance gained in other countries that can provide lessons to guide the development of this IR. The knowledge and contacts gained through support of the commune council elections can be used as a basis of cooperation with local governments. Funding levels should be high enough to permit the implementation of a suite of activities that will effectively address one or more NRM governance needs in one or more provinces, plus national-level policy interventions by civil society organizations.

Acronyms

ADB	Asian Development Bank
ANE	Asia Near East (USAID)
APIP	Agricultural Production Improvement Project
ASEAN	Association of South East Asian Nations
AusAID	Australian Agency for International Development
BAMS	Bureau of Agricultural Materials and Standards
BSAP	Biodiversity Strategy and Action Plan
CAA	Community Aid Abroad
CARERE	Cambodia Area Rehabilitation and Reconstruction
CBD	Convention on Biological Diversity
CBNRM	Community-Based Natural Resources Management
CCD	Convention to Combat Desertification
CDC	Council for the Development of Cambodia
CDRI	Cambodia Development Resource Institute
CEMP	Cambodia Environmental Management Program (USAID)
CEPA	Cultural and Environmental Preservation Association
CI	Conservation International
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CPP	Cambodian People's Party
CTIA	Cambodia Timber Industry Association
DAALI	Department of Agronomy and Agricultural Land Improvement/MAFF
DANIDA	Danish International Development Assistance
DDT	Dichlorodiphenyltrichloroethane
DFID	Department for International Development (UK)
DFW	Department of Forestry and Wildlife/MAFF
DG	Democracy and Governance
DoF	Department of Fisheries
DoLA	Department of Local Administration/MoI
EAPEI	East Asia and Pacific Environmental Initiative (USAID/ANE)
EIA	Environmental Impact Assessment
ENR	Environment and Natural Resources
ESIA	Environmental and Social Impact Assessment
FAA	Foreign Assistance Act
FAO	Food and Agriculture Organization of the UN
FCMP	Forest Crimes Monitoring Project
FFI	Flora and Fauna International
FINNIDA	Finnish International Development Agency
FUNCINPEC	National Front for an Independent, Neutral, Peaceful, and Cooperative Cambodia
GAP	Governance Action Plan
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GIS	Geographic Information System

GTZ	Gesellschaft für Technische Zusammenarbeit (German Technical Assistance)
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
IDRC	International Development Research Center (Canada)
IESP	Interim Environmental Strategic Plan
IMF	International Monetary Fund
IPM	Integrated Pest Management
IR	Intermediate Result
IRRI	International Rice Research Institute
ITTA	International Tropical Timber Agreement
ITTO	International Tropical Timber Organization
IUCN	World Conservation Union
JICA	Japanese International Cooperative Agency
MAFF	Ministry of Agriculture, Forestry, and Fisheries
MARPOL	International Convention for the Prevention of Pollution by Dumping of Wastes and Other Matter
MLMUPC	Ministry of Land Management, Urban Planning, and Construction
MoE	Ministry of Environment
MoI	Ministry of Interior
MOWRAM	Ministry of Water Resources and Meteorology
MRC	Mekong River Commission
MRD	Ministry of Rural Development
MVWA	Ministry of Veterans and Women's Affairs
NEAP	National Environmental Action Plan
NGO	Nongovernmental Organization
NRM	Natural Resources Management
NTFP	Non-Timber Forest Product
PA	Protected Area
PAM	Protected Areas Management
PAS	Protected Area System
PDR	People's Democratic Republic (Lao PDR)
PLUP	Participatory Land Use Planning
PPC	Program and Policy Coordination
PRDC	Provincial Rural Development Committee
PVO	Private and Voluntary Organizations
RGC	Royal Government of Cambodia
SCSR	Supreme Council for State Reform
SEDP	Socio-Economic Development Plan (2001-2005)
SIDA	Swedish International Development Agency
SO	Strategic Objective
UK	United Kingdom
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
UNTAC	United Nations Transitional Authority in Cambodia

US	United States
USAID	United States Agency for International Development
USFWS	United States Fish and Wildlife Service
USG	United States Government
WCS	Wildlife Conservation Society
WFP	World Food Program
WI	Wetlands International
WPO	Wildlife Protection Office/DFW/MAFF
WWF	Worldwide Fund for Nature/World Wildlife Fund
VDC	Village Development Committee

1. Purpose and Approach

This assessment of environment and natural resources (ENR) in Cambodia was conducted for the purposes of:

- **Assessing the status of, and trends in Cambodia's environment and renewable natural resources**, particularly with respect to forests, inland water bodies, and coastal and marine waters. These resources were evaluated in terms of their biodiversity, their use for subsistence and commercial purposes, governance issues related to their management, and how natural resources are related to rural livelihoods, poverty, and human rights. Agriculture was also assessed because of its dependence on natural resources and its role in directly supporting the vast majority of the Cambodian people;
- **Describing current and planned activities of donors and nongovernmental organizations (NGOs)** in environment and natural resources management (NRM) while identifying potential USAID programming opportunities;
- **Identifying potential partners for USAID/Cambodia** with respect to possible ENR programming; and
- **Formulating an Intermediate Result (IR)** in the area of improved natural resources governance to be included in the Mission's Strategic Objective (SO) 1, which is currently under review and will be revised over coming months.

The assessment was conducted by an ARD team of five people with expertise in biodiversity, forest and fisheries management, natural resources laws and institutions, agriculture, community-based natural resources management (CBNRM), and gender. The Team Leader of the project was Jim Schweithelm, and members included Pat Foster-Turley, Andrew McNaughton, Sri Sugiarti, and Srey Chanthly. The assessment was conducted over a period of six weeks that included consultations with Asia Near East (ANE) and Global Bureau staff in Washington, DC, an intensive period of interviews and document review in Phnom Penh; and field visits to the Tonle Sap, two national parks, and the coast. Additional time was allotted to revising the report. Due to the fact that USAID is currently prohibited from engaging directly with the Royal Government of Cambodia (RGC) at the national level, the team concentrated on programming opportunities at the provincial and lower levels of government, with communities, and via NGOs. Because programming must fit within the Democracy and Governance (DG) SO, the team narrowed its assessment to natural resources governance-related programming opportunities. The commune level of government was of particular interest because of its potentially critical role in decentralized NRM and the fact that the Mission is currently supporting the commune council election process, due to take place in February 2002.

2. The Cambodian Context

2.1 Biophysical

Cambodia is a relatively small tropical Southeast Asian country (181, 035 km²) abutting the Gulf of Thailand to the south and sharing borders with Thailand, Laos, and Vietnam. Except for some mountainous areas on the coast and borders, most of Cambodia consists of wetlands, plains, savannas, and agricultural areas. Cambodia's largely rural human population is located primarily in the lowlands in the center of the country, especially around the Tonle Sap and the Mekong River. The highest upland areas in Cambodia are the Cardamom and Elephant Mountains that form the coastal ranges and part of the border with Thailand to the west. The eastern border of Cambodia includes the Kontoum Plateau extension of the Annamite mountain chain of Vietnam and Laos and the Chhlong Plateau further south. Finally, the steep escarpment of the Dangrek Mountains defines the border with Thailand to the north. The wet and dry forests of the highlands of Cambodia are sparsely populated with humans and contain some of the last remaining habitats for wild ungulate and predator species in Southeast Asia.

It is not the mountains and lowlands that most define Cambodia, but its fresh water resources. The Mekong River and the Tonle Sap dominate central Cambodia and wetlands cover 30 percent of the country, a proportion second in Asia only to Bangladesh. The Mekong River enters Cambodia at the Laotian border to the north and flows through Cambodia in a mostly southerly course to Vietnam. The Tonle Sap is connected to the Mekong River through the Tonle Sap River, which flows northward from the Mekong to flood the Tonle Sap at the start of the rainy season, and southward to drain the lake near the end. When fully flooded, the lake swells to nearly five times its dry season size, and at approximately 10,400 km², forms the largest lake in Southeast Asia and the largest flood plain lake in the world.

Cambodia is also blessed with a diverse coastal zone that includes mangrove forests, seagrass beds, coral reefs and a combination of sandy beaches and rocky shorelines over its 435-km length. There are also more than fifty offshore islands, which are largely wooded with rocky shores and sandy beaches and often ringed by coral reefs. Much of the coastal habitat has been degraded due to a combination of anthropogenic factors, but it still contains large blocks of natural habitats that are among the best preserved in the Gulf of Thailand.

2.2 Socioeconomic

The Cambodia Poverty Assessment of the Ministry of Planning indicated that 36 percent of the Cambodian population had a per capita consumption below the poverty line, as defined by food consumption equivalent to 2,100 calories per day plus a small allowance for non-food consumption, or in monetary terms about 54,000 Cambodian Riels per month, less than US \$0.50 per day per capita. However, a large proportion of the population is clustered around the poverty line, indicating a potential for significant changes in the incidence of poverty from slight changes in the economy, either up or down. Serious flooding in 2000 has had a significant negative impact on poverty in the country.

Close to 8.4 million of Cambodia's more than 11.4 million people live in rural areas. Rural poverty accounts for almost 90 percent of total poverty, where it is more pervasive and more severe than in the capital, Phnom Penh, or the other three urban centers. Estimates of the growth in the labor force range up to 228,000 new entrants into the labor market annually.

Cambodia's Human Development Index in 1998 was 0.512, which placed the country in 136th position out of 174 developing countries. At the time of the *General Population Census of Cambodia 1998*, life expectancy was a low 53.5 years. Infant mortality was a high 89.4 per 1,000 live births. Mortality under the age of five was 115 per 1,000 live births, with 49.3 percent of children in that age category moderately or severely underweight. Maternal mortality was 473 per 100,000. Only 60.3 percent of urban households and 23.7 percent of rural households had access to a safe water supply, 15 percent of households had electricity, and 8.6 percent had toilet facilities within the home. The figures vary greatly between provinces, with no province (outside of Phnom Penh) having sanitation coverage greater than 12 percent. The prevalence of infectious communicable diseases and HIV/AIDS remains high by regional and global standards. The adult literacy rate in 1998 was 67.3 percent, including 79.5 percent for males and 57.0 percent for females. Net primary and lower secondary enrollment rates were 78.0 and 14.2 percent, respectively, reflecting high dropout and repetition rates. The primary school completion rate was 51.0 percent for males and 33.9 percent for females.

For war related and other reasons, Cambodia has a very high proportion of female-headed households. Female participation in the economy is 52 percent as compared to 48 percent for men. In the rural sector, it is over 80 percent for women between the ages of 20 and 54 years. In rural areas, economic participation by female-headed households is almost 90 percent. Sixty-five percent of the farming population is female, and 80 percent of these women are engaged in agriculture. Gender and age distributions of the population are skewed toward female and young, and gender roles in the society are undergoing significant change, with women undertaking new work roles in all sectors.

2.3 Value of Natural Resources to the Nation and Rural People

The monetary value of natural resources to Cambodia is not known with certainty because there has been no attempt at comprehensive national income accounting. Making this calculation would be complicated by the fact that a large proportion of natural resource-based products are used for subsistence purposes or are marketed through informal channels. Also, a significant portion of valuable resources, such as timber, fish, and wildlife, are sold illegally to neighboring countries and are difficult to track. For example, the World Bank-funded Log Monitoring and Logging Control Project estimated that total national timber harvest in the politically turbulent year of 1997 was 3 to 4.3 million m³, but only seven percent of this volume was officially reported to the government. Only \$9 million in timber royalties and other fees were paid in 1997, while illegal payments to local government officials and the military were believed to have exceeded \$150 million. In 1998, by comparison, forestry contributed 6.1 percent to the Gross Domestic Product (GDP) and \$180 million in foreign exchange. The timber industry generates significant employment in rural areas, but it is unclear to what extent local people benefit. A large proportion of the profits of timber concessionaires are moved abroad rather than invested in Cambodia.

Agriculture, broadly defined, contributed about 42 percent of Cambodia's GDP in 1999, down from 52 percent in 1990 due largely to growth in garment manufacturing for export. Of that, about 70 percent is from crops and livestock, 20 percent from fisheries, and 10 percent from forestry. Subsistence rice culture in Cambodia is generally insufficiently productive to supply 100 percent of family food requirements. Rural Cambodians living in or near forests typically depend on non-timber forest products (NTFPs) for food, medicine, building materials, and cash income. A recent study of 46 households in Pursat Province found that on average, almost 47 percent of household income is derived from extraction of forest products, while in 24 percent of the households studied, forest products constituted more than half of their income. An evaluation of a CONCERN community forestry project in Kampong Chhnang Province found that in 1998, the five villages that participated in managing 150 hectares of degraded forest harvested a total of \$10,549 worth of NTFPs from the mixed planted and natural forest. An important social benefit was the strengthening of social structures and development of community institutions needed to manage the forest. An International Development Research Center (IDRC)-funded study of tropical forest land use options in Ratanakiri Province found that the benefits of sustainable community extraction of natural resources exceed the value of commercial timber extraction by at least \$200 per hectare. This study documented 17 productive uses and ecological services of the forest including watershed protection, carbon storage, and biodiversity conservation. One village harvested over \$5,000 worth of fuel wood per year while a family can earn \$370 every seven years from the periodic fruiting of the forest tree that bears the valuable malva nut.

Cambodia's valuable inland fishery has been estimated to produce a catch of between 300,000 and 400,000 tonnes of fish per year with the harvest of edible aquatic animals from rice fields providing another 100,000 tonnes per year. Tonle Sap Lake is estimated to produce 230,000 tonnes of fish per year valued at \$100 million. A significant proportion of the Tonle Sap catch is marketed in Thailand, creating foreign exchange earnings. The total annual average catch from rice field fisheries has been estimated to be 681 kg per family per year valued at \$100 for each family. This is approximately 42 percent of the value of annual household rice production. Fish provide about 70 percent of the protein intake for rural Cambodians and fishing is critical to family survival during the months when rice supplies have been exhausted and the new crop has not been harvested.

3. Status and Trends in Natural Habitats and Agricultural Ecosystems

Cambodia contains a number of diverse natural habitats that are important to maintain existing biodiversity, sustain economically and socially valuable natural resources, and provide an overall healthy environment for the people of Cambodia. Most natural systems have been modified over the centuries by human settlement, agriculture, resource extraction, and other forms of human disturbance. In keeping with the scope of this assessment, the current status and trends in forest, freshwater, and coastal habitats are assessed because they are of primary conservation and development interest. Status and trends in the major types of agricultural ecosystems (agroecosystems) are assessed as a basis for later discussion of livelihood and pesticide issues as well as the potential impact of these trends on natural resources.

The diverse landscapes, ecosystems and species assemblages of Cambodia are interrelated and interdependent. For instance, blocks of terrestrial forest are bisected by rivers and riddled with freshwater swamps, lakes, and ponds. Coastal mangrove forests back up to paperbark swamps which themselves back up to the steep slopes of the Cardamom and Elephant Mountains. Similarly, the inundated forests of the Tonle Sap back up to agricultural land and then to forests. Many plant and animal species depend upon the ecotones between different habitats for their survival. A number of other species require access to a number of different interrelated ecosystems to fulfill their life cycles. No discussion of ENR status and trends is possible without keeping in mind the diversity of these ecological habitats and the myriad of interrelationships between them. Also, habitats and ecosystems are linked by physical, biological, and chemical flows, such as sediment and pesticides entering water bodies from poorly managed agriculture.

3.1 Forests

Cambodia has some of the largest remaining blocks of some types of tropical forests in continental Southeast Asia, a region where unsustainable logging practices and conversion to agriculture have taken their toll. Much forestland in Cambodia was inadvertently spared during many years of war and unrest. Now that the domestic situation has calmed, logging rates are thought to be among the highest in the region. In 1965, forests were estimated to cover 73 percent of Cambodia's land area; most recent estimates indicate that less than 60 percent of Cambodia still remains forested and this percentage continues to shrink. Most forests in timber concessions have already been depleted of commercially valuable timber.

Cambodia still contains a diversity of forest types that have been variously described by different authors. Two very distinctive forest types—coastal mangroves and freshwater flooded forests around the Tonle Sap and the Mekong River corridor—are associated with aquatic ecosystems and provide nursery and breeding grounds supporting Cambodia's critical inland fisheries. Terrestrial forest types include wet evergreen, mixed deciduous, dry dipterocarp, pine montane, savanna, and a number of others that are associated with specific micro-climates, soil conditions, and altitude ranges. For instance, wet evergreen forests are largely found along the south-facing slopes of the Cardamom and Elephant Mountains where rainfall is heaviest. Dry dipterocarp forests are mostly found north of the Tonle Sap floodplain

and east of the Mekong River, in areas of seasonal drought. Anthropogenic factors such as swidden agriculture and increased incidence of wild fires have helped shape the present distribution of different forest types, and continue to do so.

The forests of Cambodia serve a variety of ecological functions including watershed protection, carbon sequestration, and climate modulation. Moreover, Cambodia's forests are a valuable resource and legacy to the people of this nation. An estimated 85 percent of Cambodia's population live in rural areas, most of which are in proximity to forests and forest patches. Most rural people are poor and depend upon firewood and various NTFPs to fulfill many of their nutritional, health, and domestic needs. Additionally, many Cambodian people have spiritual and cultural associations with forests and particular resources therein. The quality of life of most Cambodians in one way or another hinges on forests and the resources and ecological services they provide.

The forests of Cambodia are globally important for the representation they provide of once more widespread natural habitats, and for the remnant populations of a number of species that have disappeared elsewhere. For most taxa, few surveys have been conducted until recently, and little information is available in scientific literature and museum collections. Recent biological surveys conducted in forests in Monduliri and Ratanakiri Provinces in eastern Cambodia and in the Cardamom and Elephant Mountains in the southwest have provided evidence of the existence of mammal and bird species that are globally endangered or threatened and extremely rare in other areas within their range. Tigers and elephants are found in both areas, and the forests of Monduliri are exceptionally rich in wild ungulate species that are exceedingly rare in other Southeast Asian countries. The reptile, amphibian, and fish fauna of Cambodian forests include a few endemic and rare species. Very little is known about the diversity of insects, mollusks and other invertebrate species in Cambodian forests, but the diversity of habitat types most likely means that these taxa are diverse as well. The plant species in Cambodian forests are also extremely diverse and include a number of regionally endemic species with commercial value, such as rattan, and many species which have nutritional, medicinal, cultural, and domestic value to local communities. Further details on the flora and fauna of Cambodian forests are provided in the corollary document, *Tropical Forests (FAA 118) and Biodiversity (FAA 119) Assessment for Cambodia* found in Annex 2.

It is evident that the forests of Cambodia are important for many reasons and on many scales, ranging from global biodiversity conservation perspectives, to that of a villager harvesting forest nuts. Most forests and many forest products in Cambodia are presently under serious threats from various forms of unsustainable use and habitat degradation. Although logging and timber interests attract the greatest attention, forests are also being degraded through firewood extraction and production of charcoal. Authors of the July 2001 *Draft National Biodiversity Strategy and Action Plan* (BSAP [FAO/UNDP/GEF, 2001]) estimate that considering both the commercial extraction of timber and extraction of firewood and wood for charcoal, the current extraction rate is about seven times the sustainable level, and will decimate much of the remaining commercial forests within the next ten years. Although these figures are difficult to prove, there is no doubt that high-value forests are being lost at a rapid rate. Additionally, once valuable timber is removed, many hectares of degraded forestland are being converted to agriculture or otherwise encroached upon. Swidden agriculture and fires account for further

reduction in some forestland. Unsustainable extraction of certain commercially valuable plants such as rattan also leads to further habitat degradation.

Finally, hunting for local consumption and for the wildlife trade is taking its toll on some forest-dwelling species. Various protected species, like tigers and sun bears, have extremely high commercial value in neighboring countries, thus driving a sizeable illegal trade. Some forest species, including many rare ungulates, often find their way to expensive restaurants within Cambodia. Other species are hunted for local use but at unsustainable rates. The combined effects of various forms of habitat destruction and focused hunting of target species threaten the integrity of many Cambodian forest ecosystems and the survival of animal populations within them.

3.2 Freshwater Habitats

Cambodia is a country with globally significant freshwater features, including the Mekong River, the Tonle Sap, a number of smaller rivers and streams, and a preponderance of ecologically important wetlands that encompass about 30 percent of its area. As a result of these ample water resources and habitats, fish are plentiful and locally available for much of the rural population. For many of the rural poor, their primary source of protein is found in the aquatic resources they can harvest themselves. Overall, for the entire Cambodian population, it is estimated that fish and other aquatic species make up at least 70 percent of the protein intake. Ensuring the adequate preservation of freshwater habitats and the sustainable use of the resources found therein is of major importance to the continued well being of Cambodians.

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 Provinces, then westward at Chhlong and south again through Phnom Penh and on to Vietnam where it becomes a delta. Although a number of tributaries enter the Mekong River along its course, up to 90 percent of its flow is thought to originate upstream of Cambodia. The Mekong River in Cambodia is not a uniform habitat, but consists of a number of different ecosystem types. In northern Cambodia, the Mekong River and three tributaries (the Tonle San, Srepok and Kong Rivers) flow in part through nearly intact lowland mosaic forests. These relatively undisturbed riverine habitats harbor endangered giant Asian soft-shell turtles (*Pelochelys cantorii*) and a particularly diverse assemblage of bird species that are rare throughout the rest of the region. The stretch of the Mekong around Kratie is known for the presence of Irrawaddy dolphins (*Orcaella brevirostris*) that are rarely seen in other parts of the Mekong. Similarly the rapids between Khone Falls and Sambor provide an important habitat for a diversity of fish species not found elsewhere. Some fish are even known to make long migrations throughout many stretches of the river. The endangered Mekong giant catfish (*Pangasianodon gigas*), for instance, is known to migrate from Tonle Sap to upper Laos.

The Tonle Sap is part of the Mekong hydrological system and in some ways even more economically and environmentally important to Cambodia than the river itself. The Tonle Sap River flows from the Tonle Sap south to join the Mekong River near Phnom Penh during the dry season, and reverses its flow north from the Mekong back into the Tonle Sap during the wet

season. During its annual peak, the Tonle Sap expands to nearly five times its dry season surface area and nearly three times its dry season average depth, forming a lake that encompasses approximately 10,400 km². The annual cycle of flooding and draining of the Tonle Sap and its surrounding swamp forests and the seasonal infusion of nutrients into the system nurtures Cambodia's major freshwater fishery resource. The swamps and flooded forests around the lake also provide habitat for a number of water birds, turtles, crocodiles, otters, and other species that are otherwise rare in Southeast Asia.

The threats to the Mekong/Tonle Sap hydrological system are many and varied and originate from both local factors and from activities far upstream from Cambodia. Further plans to dam and/or channelize parts of the Mekong in other countries can change water flow patterns, migratory fish spawning grounds, and otherwise impact the distribution and abundance of fishery resources in Cambodia. Logging both within Cambodia and upstream may contribute to increased siltation of the river and lake. Within Cambodia, a cause of particular concern is the continual destruction of the flooded forests around Tonle Sap and along many river and stream margins. It is well recognized that in the wet season, the vast expanses of flooded forests provide food, shelter, and nursery grounds for many economically important fish. As more and more of this natural flooded forest is cut for firewood or converted to agricultural uses, the protective canopy of shade is lost, and the water temperature rises, with deleterious effects upon the fish stocks. In addition, fish catches from Cambodia are beginning to show the classic signs of overfishing, including the disappearance of some commercially valuable species and decreasing size of others. The synergistic effects of overfishing, both legally and illegally, and destruction of fish nursery and feeding habitats can be devastating to the economy of Cambodia unless care is taken now. Other species are also suffering the combined effects of habitat destruction and hunting. Wild crocodiles have all but disappeared due to harvest for their skins and as brood stock for crocodile farms. Freshwater turtles have become exceedingly rare. Various water snake species, although still common, are now being harvested in vast numbers as food for captive crocodiles, and for people who have recently acquired a taste for them when other more expensive food fish are beyond their reach.

On a more positive note, pollution of the aquatic food chain by pesticides in Cambodia does not yet seem to be a serious problem. One recent study indicates that persistent organochlorine levels in Cambodian fish are very low compared to other countries in the region. This study noted, however, that the freshwater fish sampled around in the Mekong watershed had more DDT residues than the marine fish, implying that the sources of these pesticides were from agricultural activities in the region. Vigilance and appropriate practices regarding pesticide use are needed before the situation worsens.

Freshwater habitats in Cambodia extend well beyond the Mekong River, the Tonle Sap, and other conspicuous features most evident on a map. A number of rivers and streams drain the southern slopes of the Cardamom Mountains to the coast, providing rich nutrients to enhance the mangroves and mudflats that in turn nurture marine fish and macrocrustacean populations. Within most forest types are pockets of permanent and seasonal wetlands, ponds, and streams that are exceptionally important to forest dwelling species, and in some cases, migratory birds. Peat swamps that are found in some areas in Cambodia are especially important to the diversity of fish species in the country. Throughout the country, the myriad of large and small water

bodies provide fish and other aquatic food sources for the many Cambodian people who cannot afford to purchase them. Logging, agricultural expansion, and all of types of land degradation greatly impact these resources and all the species, including man, that depend on them.

3.3 Coastal and Marine Habitats

Cambodia has a 435-km long coastline with a diverse variety of habitats ranging from coastal forests, beaches, and rocky shores to coral reefs, seagrass beds, and mangrove forests. There are more than fifty islands off the Cambodian coast, mostly uninhabited, which contain a representative sampling of all of these habitat types. Much of the coastal mainland and island natural habitats have been heavily utilized by humans, but compared to other countries in the region, much natural habitat and significant biodiversity still remains in Cambodia. Sadly, this situation is rapidly changing.

Beaches are found in many spots along the Cambodian coastline and in some cases, these provide nesting habitats for sea turtles. Although there is much domestic tourism to these beaches, they are not yet attracting many international tourists. Unfortunately the beaches are often heavily littered with trash and waste, and in some areas, also subject to heavy erosion.

Much of Cambodia's coastline is rocky and there are few significant estuaries so the development of extensive mangrove forests is limited to only a few areas. Mangroves cover about 85,000 hectares of the coastline and are particularly prevalent in the Koh Kong area where a significant tract has been declared a Ramsar site for its ecological importance to Cambodia. This designation sadly has not deterred the removal of mangroves for firewood and charcoal production by both small and large interests alike in this area. Mangroves are also found around Kompong Som Bay, in Ream National Park and in a few other locations along the coast. The mangroves of Cambodia include a few species and are in some locations backed up by a unique scrub habitat known as "rear mangrove paperbark swamps". It is well known that mangrove habitats provide important spawning and feeding grounds for a number of species including some economically important fish and shellfish. Unfortunately, for the most part, the mangrove habitats in Cambodia all suffer different degrees of degradation from human influences. Threats to mangroves include cutting for fuel wood and charcoal production, land clearing for shrimp farming and crab-fattening operations, the establishment of salt evaporation pans and various other factors related to human development. As the mangroves become converted to such uses, the fishery resources that depend upon them will most likely decline as well.

Like mangrove forests, seagrass beds provide an important habitat, breeding and feeding grounds for a variety of economically important fish and invertebrate species. Seagrass beds also provide a major component of the diet of dugongs (*Dugong dugong*), a marine mammal similar to a manatee, and green sea turtles (*Chelonia mydas*). Both of these species are rare in Cambodian waters partly due to the loss of this habitat but no doubt exacerbated by targeted hunting efforts on these species as food items and for the trade value of their bones, shells and other hard parts.

Different types of seagrasses are typical of various water and substrate conditions in different parts of the Cambodian coast. Although these various seagrass habitats were once much more widespread, healthy stands of different forms now occur only in pockets along the Cambodian coast and nearby islands. The threats to seagrass beds stem from two main sources: degradation of water quality and destructive fishing techniques. Changes in water quality are attributed to many anthropogenic factors, including increased siltation from logging efforts, increased use of fertilizers and pesticides in coastal agricultural areas, and outflows of a variety of municipal and industrial wastes. Destructive fishing practices are largely illegal, but there is no enforcement. Techniques such as trawling in nearshore waters and the use of push nets and other devices tear up the bottom substrate and destroy seagrass beds and all the species that they harbor.

Coral reefs are found on rocky substrates along much of the coastline and around many islands in Cambodia. Due to the presence of siltation from terrestrial sources, those reefs closer to shore typically have fewer species of coral and other biodiversity than those in clearer water further offshore. There is little actual data on the condition of Cambodian reefs, but reports indicate that many of them have been heavily degraded. Anecdotal accounts and site-specific surveys for the most part show a low level of species diversity in Cambodian reef species, a lack of large fish, and evidence of crown-of-thorn starfish blooms and coral bleaching, all signs of an unhealthy reef system. Main continued threats to coral reef habitats include a number of factors such as overfishing and the use of dynamite and other destructive fishing practices, the harvest of corals for trade, and degradation of water quality due to a variety of anthropogenic factors that also impact seagrass beds. No doubt the effects of these various disturbances have synergistic deleterious effects on the remaining coral reefs of Cambodia.

Despite the many threats, the coastal and marine habitats of Cambodia still contain a diversity of species and an abundance of some of them. Marine biological studies of the waters in the Gulf of Thailand show seasonally strong currents that influence dispersal patterns for a number of marine species that spawn and feed within Cambodian waters. Thus, the loss and degradation of these habitats are of importance not only to fisherfolk of Cambodia but also those in neighboring countries. More work needs to be done to sustainably manage these important ecosystems in Cambodia for the benefit of the entire region.

3.4 Agroecosystems

Agroecosystems differ from natural ecosystems in that humans have shaped their structure and function to provide desired goods and services. Agroecosystems are important for this assessment in terms of the relationship between resource access and livelihoods, the environmental and human impacts of improper pesticide use, and the importance of agricultural biodiversity. The majority of Cambodians engage in farming at the subsistence level and their welfare is closely tied to the performance of the agroecosystem upon which they depend. Agroecosystems may fail to meet household needs for a variety of agronomic reasons, but also as the result of governance practices that unjustly deny poor people access to land and natural resources. The improper use of agricultural chemicals may be harmful to humans and to the natural environment. Finally, the degree of genetic diversity in crops is an important aspect of biological diversity and can be an important factor in household and national food security.

Cambodia has about two million farm households with an average land holding of about one hectare. Less than one quarter of the land area of the nation is currently used for agriculture and most agricultural land is concentrated in the low-lying Central Plains. The predominant agroecosystem in Cambodia is rainfed lowland rice, which is characterized by low productivity, high genetic diversity, and important by-products of fish and aquatic organisms. Households typically cannot produce enough rice to feed themselves throughout the year. Shrinking land holdings, insecure land tenure, lack of access to irrigation, and improper use of pesticides are important issues in lowland rice production. Most households depend on fishing, wage labor, and NTFP collection for part of their needs. The area under rice cultivation will increase as population increases and people continue to move to remote and recently de-mined areas.

Shifting cultivation is practiced in upland areas, particularly in the northeastern part of the country. Plots are normally planted for one to five years before clearing new plots in secondary forests. Upland rice is the primary crop in these agroecosystems with a diverse mixture of other food crops interspersed. Shortened rotation periods, soil erosion, forest degradation, and competition with timber concessions and lowland immigrants for land and resources are important issues in shifting cultivation. Most households depend on NTFP collection and hunting to supplement agricultural production.

Commercial monocultures are agroecosystems designed to supply urban and commodity markets with a large volume of specific products. Vegetables, tobacco, cotton, sugarcane, pineapple, and banana are important commercial field crops in Cambodia. Perennial crop agroecosystems include rubber, oil palm, coconuts, tea, citrus, and fruit trees. The area devoted to commercial field crops and plantations is likely to increase, and may do so rapidly if land concessions continue to be awarded for this purpose. This may accelerate the process of forest clearance as described in Section 5.7. Conflict over the land and resource use rights of local people is a common problem as is soil erosion if plantations occur on steep slopes. Appropriation of smallholder plots and improper use of fertilizer and pesticides are key issues related to field crops and plantations. Both types of commercial agriculture are likely to expand as Cambodia increasingly enters the regional economy.

4. ENR Planning and Management Framework

The management and use of Cambodia's natural resources are determined by a number of factors that include formal laws, policies, and government institutions that comprise the system of governance, the provisions of international conventions, and informal rural institutions and societal norms including gender roles. Cambodia's formal legal and institutional framework for NRM is currently weak, incomplete, and open to manipulation by powerful people inside and outside government. The RGC is taking important steps to strengthen the legal framework, but much remains to be done with respect to implementing laws and bringing natural resource allocation and access under the control of government or communities.

4.1 Government Institutions

Cambodia's current political environment and overall institutional structure provide important context for understanding the nation's NRM institutions. Under the Constitution adopted at the end of the United Nations Transitional Authority in Cambodia (UNTAC) period in 1992, Cambodia became a constitutional monarchy with three branches: an executive (Council of Ministers); a bicameral representative body consisting of an elected National Assembly and an appointed Senate; and a judiciary governed by a Supreme Council of the Magistracy. Provincial governors, holding considerable power, are appointed by the Council of Ministers and report through the Ministry of Interior (MoI). District and commune officials are currently appointed by provincial governors, although commune/sangkat councils are scheduled to be elected in February 2002. The word "commune" no longer refers to a collective as it did during past socialist governments. The commune, and its urban counterpart the sangkat, play the role of a subdistrict and may in time replace the district level as decentralization efforts continue.

The incumbent RGC is a coalition between the two dominant and rival parties: Cambodian People's Party (CPP), led by the Prime Minister Samdech Hun Sen, and the National Front for an Independent, Neutral, Peaceful, and Cooperative Cambodia (FUNCINPEC) led by Prince Norodom Rannaridh, Chair of the National Assembly. While the political violence of 1997 and the election of 1998 have resulted in an accommodation between the parties, the CPP is clearly dominant. The coalition is dynamic and power is shared by careful distribution of political assets, especially ministerial positions and second tier (Secretaries of State) and lower level positions within ministries and departments. While a spirit of cooperation is definitely emerging, competition between parties remains a strong determinant of the evolution of ministries and their mandates. The following ministries are key for NRM and all have a CPP minister: Agriculture, Forestry, and Fisheries (MAFF); Water Resources and Meteorology (MOWRAM); Land Management, Urban Planning, and Construction (MLMUPC); Environment (MoE); and the Council for the Development of Cambodia (CDC), which coordinates investment and donor assistance. The Ministry of Rural Development (MRD), created in 1993 in response to FUNCINPEC's demand to have a presence in the countryside, has not played a strong role in NRM or other aspects of rural development, in part because of the dominance of MAFF and MoE, both in the countryside and at the Council of Ministers table.

Considerations of institutional “turf” are not limited to inter-party rivalry. The MoE was created in 1993 in response to pressure from the international community, and remains politically and functionally weak, notwithstanding its CPP minister and considerable inputs from donors. In practice, MAFF exerts central- and provincial-level control over natural resource exploitation through granting and management of concessions, awarding of licenses, and monopolistic “distributorships” as in the fish marketing system, and (decreasingly) through control of state enterprises as in rubber and agricultural input supplies. For example, the Environment Law and Environmental Impact Assessment (EIA) Sub-Decree stipulate that MoE approval of EIA is required on all investments meeting specified criteria. The MAFF Department of Forestry and Wildlife (DFW) has required that, as a condition of renewal of forest concession contracts, environmental and social impact assessment (ESIA) reports be submitted to DFW for review, partly to keep control and partly in recognition of the present functional incapacity of MoE to carry out such a review. The present compromise is that concession ESIA reports will be submitted first to MoE, but that final approval rests with DFW and MAFF. In another instance of institutional inconsistency, the Environment Law places protected areas (PAs) under MoE jurisdiction, but protecting the wildlife within them is the responsibility of the Wildlife Protection Office (WPO) within DFW. The draft Forestry Law adds to the confusion by giving MAFF the authority to establish its own PAs.

The policy shift toward decentralization and participatory processes is the second major dimension of institutional development that affects the future of NRM. Cambodian provinces have until recently been the fiefdoms of the appointed Governors, appointments whose primary criteria have been political. The Seila (the Khmer word for “foundation stone”) experiment in provincial and village capacity building has contributed significantly toward effective management at provincial levels, through its support to Provincial Rural Development Committees (PRDCs), which are in effect the cabinet of the provincial governor. Representation on the PRDC is by the directors of the provincial departments, including Agriculture, Forestry and Wildlife, Environment, Rural Development (usually the PRDC Secretary), Land Management, Women’s Associations, and others. Seila began as the United Nations Development Program (UNDP)-funded Cambodia Area Rehabilitation and Reconstruction (CAREERE) project, and has developed into the RGC’s primary programmatic approach to supporting and integrating local government institutions. The election of commune councils in February 2001 will add an additional dimension to decentralized NRM as these bodies will have an as yet unspecified role in the management of natural resources.

There are tensions between the central and provincial levels of government that derive largely from reporting relationships, wherein provincial officials on the one hand owe their appointments to the governors (who report to the Prime Minister via the MoI) but on the other hand report formally to their sectoral line ministry. In its attempt to bring “anarchic and illegal logging” under control, DFW finds itself in the awkward position of having to swim against the tide of decentralization, attempting to establish a direct chain of command from the DFW to the provincial forestry departments. Forest crimes continue, in part, because the DFW is as yet unable to provide its provincial personnel with the authority and material resources necessary to bring criminals under control. Similar problems beset the attempt of the Department of Fisheries (DoF) to cancel fishing lot concessions and bring the resource under some form of co-managed community control.

At the lowest level of government in Cambodia are the community organizations, the village chief and the village development committee (VDC), the Wat (pagoda) committees, and the local NGOs. The Seila program has provided a strong element of empowerment at the village level, including provision of village development funds to the VDCs for community infrastructure including wells, culverts, and schools. The soon-to-be elected commune councils may be able to play a key role in land use planning and NRM if they are given a strong mandate backed up by training and resources. Unfortunately, the Law on Commune/Sangkat Administration does not make provision for proportional distribution of representation on the commune councils. Villages that are more remote from the commune center may be under-represented at this critical level of governance.

Local NGOs concerned with NRM have been emerging in the past few years, some of which are described in Section 7 and the Interim Environmental Strategic Plan (IESP). While local environmental/NRM NGOs remain small and patchy in their coverage, international conservation NGOs have a strong presence in the country and have been playing major roles in biodiversity conservation, CBNRM, and policy advocacy, especially in forestry.

The private sector plays a key role in NRM management in Cambodia simply because the control of large tracts of forests and fishing grounds have been put into their hands. Timber concessionaires and other large investors in Cambodian natural resources extraction tend to be looking for short-term profits at the expense of sustainability. As all types of concessions come under tighter government control, with greater participation of affected communities, one may reasonably hope for more responsible behavior on the part of concessionaires. Moreover, as the rural economy develops, there will hopefully be a flowering of local entrepreneurship, including wood and other forest product processing, rural electricity production including micro-hydro and possibly biomass, domestic and agricultural water supply enterprises, and agro-industrial product processing. Such development is the focus of the “pro-poor trade development strategy” of the Ministry of Commerce. These kinds of enterprises provide both the need for local NRM, and the creation of a “yeoman peasantry” and the rural middle class who will be the strongest participants in local democratic governance including NRM.

In general, the political culture continues to reflect the feudal and colonial ideas of Cambodia’s more distant past (importance of personalities and kinship; vertical, patron-client vs. institutional relations, cronyism), and the far from complete transition from a command and control system into a democratic and fundamentally market-driven economy. A major need in the evolution of democratic governance in Cambodia is to change the mind set and behavior of officials at all levels from that of an authority giving orders and demanding compliance, to an orientation of service provision. This is particularly true in the NRM domain, but similarly in water supply and sanitation, rural roads, education, and other components of the social and economic landscape. The success of decentralization and deconcentration will depend significantly on this change. Realistic salaries, extensive training in modern management methods, and a culture of apolitical professionalism are required in the civil service. The RGC’s effort at administrative reform is in part an attempt to address this need.

4.2 Policy and Law

Cambodian national policy on NRM is not given in any single policy statement, and must be construed from various sources, including especially the second five-year Socio-Economic Development Plan (SEDP) 2001-2005, the Poverty Reduction Strategy Paper, and the Governance Action Plan (GAP). Cambodian NRM policy can be said to have three major themes, under the overarching national objectives of poverty reduction, transparency, and responsiveness of administration, and sustainable economic growth. The three NRM themes are:

- promoting exploitation of forests, fisheries, and agriculture as large-scale commercial components of the economy, and as sources of revenue for the treasury through license fees, royalties, and taxation;
- promoting food security and local economic development in the countryside through sustainable management, increasingly decentralized to the local level, and through increased value-added processing of a diversifying range of primary products; and
- conservation of critical environmental components (e.g., upper watersheds), and of relatively pristine habitats with their biodiversity and potential for ecotourism and other values.

The legal framework for NRM is at present largely based on laws established in the 1980s and later under UNTAC in 1992. It is now in a period of very rapid change as new laws, which have been under development since the beginning of the second mandate of the present government (September 1998), are coming into force or are in the final stages of development. Laws, Sub-Decrees, and guidelines governing land tenure, decentralized local government, forestry, concession management, community forestry, fisheries management, environmental impact assessment, protected areas management (PAM), and biodiversity conservation, have been enacted in the past three years or are likely to be enacted within the year. The following table presents a list of key pieces of legislation and regulation, presented according to responsible ministry

Table 4.1. Key Legislation and Regulations, by Ministry

MINISTRY	LAWS and KEY SUBDECREEES
MoE	Law on Environmental Protection and NRM Environmental Impact Assessment Sub-Decree Water Pollution Control Sub-Decree Royal Decree on Creation and Designation of PAs Declaration on the Organization and Functions of the Provincial Environment Departments
MAFF	Forest Law (in draft) Sub-Decree on Concession Management Sub-Decree on Community Forestry (in draft) Fishery Conservation, Management and Development Law Wildlife Law (in draft) CITES Scientific and Management Authority Sub-Decree
MOWRAM	Law on Water Resources Management

MINISTRY	LAWS and KEY SUBDECREES
MLMUPC	Law on Immovable Property (Land Law) -- 2001 Sub-Decree on Reduction of Agricultural Concessions over 10,000 Hectares Sub-Decree on Industrial Agricultural Exploitation Concessions Sub-Decree on Social Concessions Sub-Decree On The Recognition of the Legal Personality of Indigenous Communities Law on the Management of State Property Procedures for a Unified Land Dispute Resolution System outside of the Court System
Mol	Law on Commune/Sangkat Administrative Management Sub-Decree on Powers and Functions of Communes/Sangkats
MRD	(Seila Program)
CDC	Investment Law

Of these, two of the new laws are of particular importance for their crosscutting impact. The **Land Law** will provide the legal basis to improve security of tenure (ownership and use rights) over land, and will enable transparent processes for the transfer of such assets. This is a fundamental requirement for good governance, and for the development of a market economy. Successful application of the Land Law at local level will require considerable capacity building among provincial and commune administrations, as the implications for tenure rights of indigenous peoples with respect to PAs and concessions will be complex. Secondly, the **Law on Commune/Sangkat Administration** provides the context and structure for the development of local government institutions, on which the whole decentralization experiment critically depends

The National Environmental Action Plan (NEAP) 1998-2002 and the soon-to-be-completed BSAP are important cross-sectoral statements of ENR policy as well as guidelines for planning and action. The process of formulating the BSAP has provided an important opportunity for involving a wide range of stakeholders from government and civil society.

Sectorally important new legislation includes:

- the **Forestry Law**, and Sub-Decrees pursuant to it on Concession Management and on Community Forestry. In terms of governance, the latter provides the basis for community forest agreements between local communities and the DFW;
- the **Wildlife Law** establishes roles and functions of government agencies with respect to wildlife, defines prohibited and permitted activities, implements the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) provisions including lists of endangered and vulnerable species, and promotes public education on wildlife issues;
- the **Law on Water Resources Management** covers utilization, monitoring and protection of lakes, rivers, and streams including authority to control pesticide use in priority watersheds; and
- the **Fishery Conservation, Management and Development Law** covers management of fisheries in coastal, marine, and freshwater habitats. The Sub-Decree on Community Fisheries provides the legal basis for community management of fish resources.

Two aspects of the emerging framework are noteworthy in the context of democratization of the governance of NRM. Firstly, it is increasingly acknowledged that harmonization of legal development by individual ministries has been lacking. For example, as noted above, there is a disparity between the EIA Sub-Decree and the Forestry Law, and some provisions of the Water Law overlap with the Environment Law. The elaboration of Sub-Decrees and the many supporting forms of regulation can provide the necessary opportunity to deal with some of the gaps and overlaps, if appropriate support is given to overcome the competition for turf among ministries. Secondly, the RGC has made considerable progress in opening the process of development of laws and regulations to the participation of all stakeholders. The further establishment of norms for stakeholder participation in regulatory impact assessment would be a significant advance.

4.3 Cambodia's Involvement in International Conservation Conventions

Cambodia is a party to a number of international conservation conventions but its compliance with these agreements varies greatly in effort and effectiveness. The NGO and donor community is playing an expanding role in helping Cambodia fulfill the international mandates it has agreed upon in a number of the agreements listed here.

Cambodia ratified the **Convention on Wetlands of International Importance (Ramsar Convention)** in 1999 and has so far listed three Ramsar sites in Cambodia: Boeng Chhmar on the Tonle Sap Lake, Koh Kapik/Koh Kong and surrounding areas along the coast and parts of the middle stretch of the Mekong River north of Stung Treng. Work is now being done to develop management plans for these areas. Cambodia also protects the Angkor Wat area and is considering the inclusion of other areas under its involvement in the **UN World Heritage Convention**, which it signed in 1992.

Cambodia became a signatory to the **Convention on Biological Diversity (CBD)** in 1997 and work required under this agreement is progressing in Cambodia, with the preparation of the Biodiversity Prospectus in 1997 and the nearly completed efforts to prepare a BSAP that are being undertaken for the government of Cambodia with support from the Food and Agriculture Organization (FAO). Although Cambodia has been a party to **CITES** since 1997 there is a great need for further capacity building before it can effectively be applied in this country. Recent regional discussions with Laos and Vietnam are a good step in the right direction.

Cambodia has been a signatory to the **United Nations Framework Convention on Climate Change (UNFCCC)** since 1996 and has been involved in preparing greenhouse gas inventories and other requirements of this convention under the Global Environmental Facility (GEF)-funded Climate Change Enabling Activity Project. It also became a party to the **International Tropical Timber Agreement (ITTA)** in 1995 and is involved in the regional tree seed project and other tasks under this agreement.

Cambodia also became a party to the **Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin** and is the current home of the Mekong River Commission (MRC) Secretariat.

Cambodia is also a signatory to other conventions, including **the International Convention for the Prevention of Pollution by Dumping of Wastes and Other Matter (MARPOL)**, the **International Convention to Combat Desertification (CCD)**, and the **United Nations Convention on the Law of the Sea (UNCLOS)**.

The RGC is not a member of the **World Conservation Union (IUCN)** and does not participate officially in the important general assemblies and other activities of this global organization. However, a number of international NGOs including the Worldwide Fund for Nature (WWF), Flora and Fauna International (FFI), Wetlands International (WI), and Conservation International (CI) are members of the IUCN and can help carry Cambodian conservation matters forward.

4.4 Rural Communities and Minority Ethnic Groups

Daily NRM decisions relating to forests, fisheries, and coastal resources are made by Cambodia's rural people, often in ignorance of relevant laws and sometimes in conflict with government agencies and private sector firms. Households and communities are typically the most important agents of NRM except when local people are excluded from timber and fishing concessions. Community-level institutions for NRM are frequently weak or nonexistent due to the social disruption of the Khmer Rouge period and the large-scale internal migration resulting from improved security in rural areas. NGOs have been successful in building the social structure and community institutions needed to manage resources at the community level, but they have only worked in a limited number of areas. Legal authority for CBNRM will be articulated in the forthcoming Community Forestry and Community Fisheries Sub-Decrees and the Sub-Decree on the Powers and Functions of Communes/Sangkats will provide an institutional basis.

Minority groups, which comprise less than 10 percent of Cambodia's predominately Khmer and Sino-Khmer society, play important roles in the management of forests in the hilly and mountainous areas in the northern and northeastern parts of the country. These hill peoples are more likely than Khmers to rely on swidden agriculture, NTFP collection, and hunting for their livelihoods and CBNRM is part of their cultural heritage. Hill folk are often looked down upon by lowlanders as being backward, and are set apart from Khmer society by language and culture. Lao-speaking and other groups in the north have strong affinities with ethnic kin in Lao People's Democratic Republic (PDR) and Vietnam. Minority groups are especially likely to lose their land to timber concessions and land grabbing by wealthy lowlanders. NGOs and the CAREERE II Project in Ratanakiri Province have worked to document and gain government recognition for traditional land and resource uses of minority groups. The new Land Law and its Sub-Decrees provide legal authority for recognizing the land rights of traditional users of the forest.

4.5 Gender Roles in NRM

In Cambodia, as is the case in most agrarian societies, there are established gender roles with respect to livelihood tasks and the management of natural resources. Cambodian women play

important roles in NRM, but women are currently constrained by societal norms and restricted access to education and politics from playing a wider role in managing and harvesting resources.

Women in Cambodia do not enjoy equal access to the resources and benefits of development. They have less access to education, especially at the higher levels; less access to paid employment, especially well-paid jobs; less access to land ownership and other property rights because of inheritance customs; and fewer opportunities to ensure their views are included in political processes (e.g., only 10 of the 122-member National Assembly are women). The general lack of health services in rural areas has a greater impact on women than men because of the health risks associated with pregnancy and maternity. Under these circumstances, women are particularly vulnerable to poverty, and are constrained from participating effectively in contemporary society. It is women who are often the managers of family finances, the entrepreneurs in petty trade, and the heads of a disproportionate number of Cambodian households (25.7 percent), yet traditional attitudes of domestic orientation and obedience to husbands make women's participation in political life more difficult. These facts of life will require special attention as local governance of natural resources is strengthened.

Women currently represent seven percent of the decision-makers at the national level in Cambodia. At the district level and department and office level, the figure is less than three percent. In February 2002, Cambodia will hold its first ever elections for commune councils. The 1,623 communes will elect five to eleven members each. The Ministry of Veterans and Women's Affairs (MVWA) and some NGOs advocated for a quota to increase women's representation on the councils, but this was judged to be unconstitutional. The MVWA then went to each of the political leaders asking that they increase women's involvement in each party. Currently it is believed that about 10 percent of the candidates for commune councils will be women, however, this may not reflect actual representation, as the elections are based on proportional representation and it is feared that most parties will put women at the bottom of their list, where they are unlikely to gain a seat.

4.5.1 Agriculture

Men, women, and children participate in livelihood activities depending on strength, mobility, and skills. Both men and women do cultivate rice and fish for home consumption. Men are responsible for making fishing equipment and for raising cattle. Men are predominantly responsible for gathering forest resources in lowland agricultural areas because the forests are normally far away, and collecting trips deep into distant forests may require two to three days. Among the NTFPs normally collected are vines, rattan, fuel wood, resin, turtles, frogs, bamboo shoots, and mushrooms. Women and children are involved in collecting aquatic plants and animals in rice fields, making charcoal, processing palm sugar, and producing rice wine. Women mainly do marketing of vegetables and forest products.

Both men and women undertake off-farm activities. Women earn a regular income through wage labor, exchange labor, petty trade and handicrafts. Men derive income from agricultural and migrant labor, fishing, and some handicrafts. Men's off-farm cash income is often seasonal.

4.5.2 Freshwater Fisheries

Women are very involved in small-scale subsistence fishing in the Tonle Sap, rivers, flooded forest, canals and small ponds. Men do most of the large- and medium-scale commercial fishing. In lowland areas near freshwater fisheries, the collection of firewood is the domain of men and boys (in contrast to the practice in other areas). Men also have primary responsibility for house and boat maintenance. Men, women and children all chop firewood and repair nets. Women tend domestic animals, raising chickens, pigs, and sometimes crocodiles. Women also weave fish traps and barriers. Women and children collect or gather other aquatic resources, such as water lilies, morning glories, small fish, lotus, water beetles, and shells for home consumption and for sale. For many women and landless families, aquatic resource gathering is their main source of income.

Women are actively involved in processing of fish. Sun drying, salting, smoking and preparing fish and fish derived food such as fish sauce and fermented fish, is done by women either in cottage industries or as wage laborers. They subsequently sell the fish products. Additional family income in fishing communities comes from renting boats, selling cash crops such as rice and mung beans, and selling fuel wood by both men and women. Other income generation such as making rice porridge, making rice cakes, tailoring, and hairdressing are done only by women. Normally, women keep the income from these activities for family consumption and to meet unexpected expenses.

4.5.3 Coastal Areas

In coastal areas, men are primarily responsible for fishing in the open ocean, while women undertake fishing activities closer to home as well as process and market food. In family fishing businesses, women sometimes manage the business and market the catch. These women are relatively powerful and may have more influence or rights in decision making than their husbands. Even in poorer families, women help their husbands by picking crabs from the net, processing fish products, repairing nets, and painting boats. During the dry season, the most productive season for coastal people, fisher women often work more than 10 hours per day, excluding household work. For women-headed households the work is even harder, as they must also look after children, conduct small businesses, maintain the home, collect firewood, cook, and collect crabs for neighbors.

4.5.4 Minority Upland Groups

Minority upland groups have traditional methods of NRM integrated into their way of life. Shifting cultivation is the most common subsistence strategy practiced by these groups in northeast Cambodia. The livelihood system among indigenous groups is heavily reliant on the inputs of female labor. Women collect forest fruits, honey, bamboo, medicinal plants, small animals, firewood, water, and vegetables. Men collect resin, rattan, bamboo, house construction materials, and wild game. Men and women decide what crops to plant in swidden fields, however women have more say, with women selecting the seeds. Women also have an important role in marketing the family produce in the forms of crops, domestic animal

products, handicrafts, and NTFPs. Men normally sell large animals such as cows or buffaloes because women do not know how to count large sums of money.

4.5.5 *Hunting Wildlife*

Small-scale hunting and marketing of wildlife products, whether for subsistence or for sale, is primarily the preserve of men. In large-scale illegal hunting efforts that are carried out by men, women are often involved in networking for marketing and managing transport of the animals.

5. Issues in Cambodia's ENR Management and Governance

5.1 Land

The allocation and management of land is the most fundamental natural resources issue in Cambodia and has important implications for the growth of the national economy and the welfare of rural people. The Statement of the RGC on Land Policy states that the RGC is “endeavoring to implement a coordinated set of laws, programs of work, and institutional arrangements regarding land which are directed toward enabling the achievement of national goals of economic development, poverty reduction, and good governance, as described in the Socio-Economic Development Plan, Interim Poverty Reduction Strategy, and Governance Action Plan.” The objectives of the RGC's land initiatives are to:

- strengthen land tenure security and land markets, and prevent or resolve land disputes;
- manage land and natural resources in an equitable, sustainable, and efficient manner; and
- promote land distribution with equity.

Rural people are faced with the following land-related problems:

- uneven land ownership distribution, with wealthier households owning proportionally much more land than poorer households;
- increasing landlessness due to forced land sales, land grabbing by powerful individual or groups, population increases, and land speculation (A 1999 WFP study found that landlessness exceeded 20 percent in eight of twenty communes surveyed.);
- lack of availability of enough agricultural land in some areas;
- lack of secure land tenure and difficulty in obtaining secure title;
- poorly functioning land markets;
- unequal access to land by female-headed households;
- rural livelihoods are severely constrained by the small size of land holdings and low productivity of agricultural systems coupled with restricted access to common property natural resources; and
- large areas of agricultural land are contaminated with mines or unexploded ordinance.

From the viewpoint of public land policy, the following issues are currently preventing the rational allocation and use of land:

- Lands are assigned to various uses on an ad hoc basis by a variety of government actors because there has been no nationwide, systematic attempt to classify land into various use categories based on the characteristics of the land, current use, and the needs of Cambodian society.

- Until the present time, the legal framework for land management has been weak, often contradicting laws in related sectors, and providing virtually no rights for community use of land.
- Land use planning has not been implemented in most parts of the country. It is needed at provincial and lower levels of government.
- The management of public land and the administration of land titling has been very inefficient and characterized by corruption.
- There has been no rapid and publicly acceptable means to resolve land conflicts, although non-judicial conflict resolution mechanisms are being piloted in some provinces. Land disputes constitute the second largest case category in the Cambodian court system.

5.2 Forests

5.2.1 Concession Forestry

The major issues concerning commercial concession forestry relate to state revenues, the transparency and legality of concession awards, the implementation of sustainable forest management, and conflicts with the land and resource uses of communities. Governments normally establish a system of private sector forest concessions to obtain a stream of revenue from the forest estate. National forest concession systems must be underpinned by a strong legal framework and a professional forest service to ensure that forests are managed sustainably and that the state receives the revenues to which it is entitled. Under the political conditions of the 1990s in Cambodia, concessions were granted to cronies of senior officials (or via such cronies to international firms) in exchange for large bribes, which constituted a cost of doing business for the company and a corresponding reduction in revenues potentially available to the national treasury. In the climate of political and military insecurity of those times, vast amounts of timber were harvested and exported to neighboring countries with little revenue capture by the concessionaires, let alone any significant returns to the treasury. It has been estimated that up to 40 percent of the country's timber resource standing in 1993 has now been lost in this way. Few remaining operators are estimated to have more than 10 years of commercially viable harvest remaining in their concession areas. The forests were once thought to be able to produce 0.5 to 1 million m³ of timber but annual production rates of 4.0 million m³ in the 1990s make it unlikely that a production level of 0.5 million m³ could now be sustained.

Concessions were granted with only a cursory timber inventory based on Landsat imagery and often with no knowledge of current uses by communities. Realistic field-based inventories of timber stocks within concessions are only now becoming available. Under these circumstances, the establishment of timber royalty rates presents some difficulties, with the government, international financial institutions (notably the International Monetary Fund (IMF) and the World Bank) and the Cambodia Timber Industry Association (CTIA) taking widely differing positions. The CTIA commissioned a study by an international accounting firm in an attempt to provide a starting point for negotiations, but its preliminary results were equivocal and its final report is not yet available.

Donors, particularly the World Bank and the Asian Development Bank (ADB), have been supporting a process of forest policy and concession management reform, of which the draft Forest Law and the Concession and Community Forestry Sub-Decrees are important outputs. As a result of a DFW/ADB assessment of concession contract compliance and remaining timber stocks made in 1999-2000, several concessions have already been cancelled outright, and a requirement for renegotiation of remaining contracts based on sustainable forest management plans has been put in place. Of the 17 extant concessions, 11 are known to be making good progress on the resource inventories and ESIA's that are the basis of the management plans, and which will be primary considerations for contract negotiation. The MAFF/DFW will soon have to decide which concession contracts will be renewed and which will face cancellation. The deadline for contract renegotiation has been set for 30 September 2001, although there is a distinct possibility that it will slide a few months to allow the World Bank to field legal advisors to the DFW.

It remains to be seen to what extent the political connections of nonperforming concessionaires will protect them from contract cancellation, and it is not clear what sort of management regime will be substituted in cancelled forest concession areas. The open access and often murderously violent regime that has ensued in the Tonle Sap fishery after the recent cancellation of a number of fishing lot concessions is a fearsome prospect. Cancelled concessions could be invaded by wildcat loggers or grabbed by businessmen for plantations if government control is not maintained. A nontransparent transfer of concession forests to other concessionaires, as has already happened recently, would simply perpetuate the current system. Turning over former concession forests to community management is a good option if communities are capable of discharging this responsibility.

5.2.2 Community Forestry

Community forestry is an attractive option for management of much of the forest estate, either as community-held commercial concessions, or through more integrated management approaches at the local level. The new Forest Law makes provision for community forestry, and as noted the Land Law enables indigenous community ownership of land in perpetuity. Nontraditional communities may acquire management rights over forest, however the 15-year duration of management agreements gives communities little incentive to manage forests for long-term sustainability. Guidelines for community forestry were developed under the ADB Sustainable Forestry Project and MAFF has incorporated this material into the Community Forestry Sub-Decree, which is now under participatory review by an interministerial task force chaired by the DFW and involving representatives of all stakeholders. A draft is expected to go to the Council of Ministers before the end of 2001. Issues being addressed include control of land grabbing, the role of commune councils and VDCs in community forestry planning, the applicability of Seila mechanisms, the role of the DFW, and community/government revenue sharing.

WWF and the IDRC have initiated a case study review of CBNRM and community forestry projects to draw lessons from the many activities being undertaken in Cambodia. Probably the most significant impediments to the development of community forestry in Cambodia are the lack of trained practitioners at both the institutional and community levels, and similarly a lack

of knowledge about the new legal framework, and the opportunities and constraints it presents. Putting forest management rights into the hands of communities is being contemplated at a critical time when many logged over forests are being returned to government control and there is great pressure to convert forest to commercial and subsistence agriculture. The success of community forestry may well determine the ultimate fate of many of Cambodia's forests.

5.2.3 Forest Conservation

Cambodia's protected areas system (PAS) was established by Royal Decree in 1993 covering about 18 percent of the nation's land area, and mostly in forested areas. The PAS is under the jurisdiction of the MoE, which lacks the manpower, financial resources, and political power to protect most units of the PAS, except in cases where there has been significant donor or NGO support (e.g., the Cardamom Mountains and Virachey National Park). The 1993 delineation of PAs was done by drawing lines on a 1:50,000 scale topographic map, without benefit of biodiversity and community field surveys and land use planning analysis. There is an urgent need to revisit those delineations and establish boundaries on the ground, within the context of an overall national forest estate and PA planning exercise, and in careful participatory processes with concerned communities and local governments. The MAFF has begun to establish its own system of protected forests parallel to the MoE PAS, which could complicate the planning process by adding to the already serious turf battle between the two agencies. Several methods to fund PAS management have been discussed, including carbon credits, debt for nature swaps, and private fund endowments, but nothing has materialized to date.

5.2.4 Watershed Management

Cambodia is largely flat with mountains in the northeast and the Cardamom Mountains in the southwest and hilly regions and low mountains in other parts of the country. The need for watershed management is often cited as a necessary countermeasure to the negative environmental impacts of shifting cultivation, especially in the northeast. Experience in other countries indicates that upland forestland use practices associated with improper logging techniques and land clearance for commercial tree plantations are more likely to lead to serious soil erosion and sedimentation of water bodies. Swidden fields tend to be too small and scattered to have a similar effect. Logging and land clearance impacts are better addressed through enforcement of the logging code of practice and land use planning that prohibits plantations on steep slopes. Shifting cultivation is best kept within sustainable limits through community-level land use planning and management with oversight by commune councils. Watershed management as a separate activity is a relatively low NRM priority in Cambodia, but watershed protection should be built into land use planning and forest management.

5.3 Harvest and Trade of Wildlife

Cambodia's forests and water bodies once abounded with a number of plant and animal species that are increasingly rare elsewhere. Unfortunately, the illegal harvest and trade of many species in Cambodia and the unsustainable harvest of legal species is reaching epidemic proportions. A number of synergistic issues need to be addressed before the situation can be

positively resolved. Some issues are outlined here, and a further more detailed assessment of this sector will be forthcoming from the USAID/PPC perspective.

The money to be made from the trade in illegal wildlife is astronomical and tempting to many who live close to Cambodia's natural areas. Cambodia's forests abound with displaced military personnel, who often supplement their meager government income with illegal hunting and capture of prohibited species. Often these animals, and in some cases, plants, are illegally exported to neighboring countries through a widespread network of middlemen and dealers. Concessionaires are often similarly involved in illegal extraction of wildlife and forest products. Poverty makes illegal wildlife trade an attractive option for rural Cambodians. Overharvesting of some species for food and other local consumptive uses, both by military personnel and by other more traditional communities is also an issue in some areas. Until the economic factors driving these extractive forces are resolved, and excess military units are demobilized, these problems will continue.

Another major issue is the lack of enforcement of wildlife laws at all levels. At the international level, although Cambodia is a signatory to CITES, there has so far been little implementation of its guidelines. A draft Wildlife Law, currently under review, contains provisions to give the WPO within MAAF greater power to control the wildlife trade and implement CITES. Recent steps to translate the CITES handbook into Khmer are a much needed initiative, as are training courses and workshops for CITES officials. However, even with further training, the resources required to adequately patrol borders and enforce international wildlife trade are lacking in Cambodia. Similarly, there is a general lack of a government enforcement presence due to lack of capacity and resources in the many areas on the ground where wildlife is being illegally extracted. Finally, even when communities are legally empowered and motivated to protect their own areas, soldiers and business interests will still present a poaching threat that villagers cannot control.

A third issue is the lack of knowledge on the distribution and populations of remaining wild stocks of even the most key species. Some surveys have been conducted in a few natural areas, but many more are needed before the situation can be adequately assessed. Unfortunately, the time needed to perform research and monitoring is not available given the current pressure on wildlife. To preserve viable populations of remaining wildlife species of global interest, conservationists must be action-oriented first, and scientists second.

5.4 Fisheries

The fisheries industry in Cambodia includes both freshwater and marine resources, with somewhat different issues and constraints in each sector. Both areas, however, are seeing a decline in size and abundance of key fish species, a widespread amount of illegal and unsustainable fishing, and a lack of enforcement of existing laws and regulations.

One issue common to both freshwater and marine fisheries is the overall lack of knowledge about the fishery resources. Little is known about the habitat requirements, distribution and key life-cycle factors for even the most important commercial fish and macro-invertebrate species. Even the statistics on fish catches in both freshwater and marine areas are extremely

variable and unreliable. Relevant information such as the size of the available fishing stock, location and seasonality of fish spawning grounds, and other ecological requirements of various species are needed before realistic fishing regulations can be formulated. At present, MAFF and the DoF do not have the capacity and resources to remedy these information gaps. In many cases there is also a lack of environmental knowledge and understanding of sustainable use concepts among many fishery resource users.

Enforcement of existing rules and guidelines is seriously lacking in both freshwater and coastal habitats. The DoF has a limited budget and staff for enforcement at both national and provincial levels and there is an overriding lack of on-the-water enforcement presence in fishing areas. The use of illegal fishing techniques such as electrofishing, dynamiting, small-mesh size nets, etc. is prevalent in freshwater areas. Similarly, the use of large trawls and push nets in near shore waters, and dynamiting of reefs wrecks havoc on coastal fishery resources and habitats.

The lack of enforcement of regulations has led to serious conflicts among small fisherfolk and larger commercial entities plying the same waters. In the Tonle Sap there are ever-present conflicts between lot owners and communities. In coastal areas the conflicts between small-scale fisherfolk and commercial trawlers and push-netters that are fishing illegally (and destructively) in coastal areas are a constant and growing issue. Conflicts also arise between commercial aquaculture projects, such as shrimp ponds and seaweed farms, and local fisherfolk. The influx of foreign fishermen from nearby Thailand is also exacerbating these conflicts. Conflict resolution is a serious need throughout the fishery sector.

A major issue in both coastal and freshwater fisheries is the necessity to further empower local communities with access rights to appropriate fishing grounds and the tools and knowledge to sustainably manage them. As the Fishery Law and the Community Fishery Sub-Decree are passed and implemented, it is important that communities understand them, and have the knowledge and abilities to look out for their own interests. At present, there is little relevant knowledge at the community level and a great need for more.

A final key issue and constraint in the fishery sector is the lack of attention to the importance of small streams, ponds, ditches, rice fields, etc. as fishery resources for the rural poor. Catches from these sources are significant as discussed in Section 2.3, and the aquatic food items obtained from these sources are often critical to the majority of rural people who depend upon them. These small-scale resources need to be taken into account and access to them preserved when irrigation schemes and agriculture and development projects are designed.

5.5 Biodiversity

Cambodia is now a party to the CBD and significant efforts are underway to prepare and circulate a BSAP. This is a much-needed initial step towards biodiversity conservation planning. Most of the biodiversity-related attention is not on the maintenance of biodiversity as such, but only on a few species with economic or global conservation value. While conservationists scramble to save remaining small populations of tigers, elephants and

crocodiles, many other species are quietly disappearing. Well-meaning development programs are in some cases helping speed these extinctions.

For instance, in the aquatic sector, the thrust of attention to fisheries issues and fish is not the numbers of fish species, and how many of these have become extinct, but only on the number of kg of harvestable fish are brought to market. This focus has led to the expansion of some development programs that are actually counter to maintaining biological diversity. One such program is the continued and expanding introduction of non-native tilapia (*Oreochromis niloticus*) into pond aquaculture programs around Siem Reap. These hardy, opportunistic, rapid growing, quick-breeding fish easily escape from ponds through drainage ditches and water overflows, and, in many other parts of the world, have displaced native fish. If previous experience elsewhere is relevant, the biodiversity of fish and even the fish catches of some species in Tonle Sap can be jeopardized by such introductions. The fairly recent introduction of non-native water hyacinths (*Eichhornia crassipes*) into the Tonle Sap environment presents similar problems. Presently the people of the region benefit from water hyacinths and harvest them for food and fiber. Quite possibly the annual cycle of flooding and recession of the lake may flush them downstream and out into the South China Sea so they do not become established and a nuisance in the lake. If not, however, before long navigational passages will be disrupted, benthic native plants will be shaded and die, and many former niches for native biodiversity will be lost. Quite possibly such changes will also impact commercial fisheries stocks and not only biodiversity.

Biodiversity has been given little consideration in natural resources extraction and development programs in Cambodia's forests. Attempts to increase production of commercial crops can lead to further encroachment of natural habitats, water pollution, and less access for rural people to the forest biological resources that they have long depended on. Although a number of donors and NGOs are looking at the impacts of the harvest and trade of wildlife, for the most part this only includes a number of large, charismatic species. The maintenance of Cambodia's biodiversity also involves less obvious species and the habitats they depend on. Except for a few NGOs working to protect key forest and mountain habitats, the less charismatic species seem largely forgotten.

5.6 Pesticide Use

The RGC Sub-Decree on Standards and Management of Agricultural Materials was promulgated in 1998, but is not fully enforced. Pesticides, fertilizers, and other agricultural chemicals are available on the market, including banned substances. The sub-decree requires that manufacturers, importers, and sellers of agricultural chemicals register their products with MAFF. Only six international firms have registered while no domestic firms have done so. The volume of pesticides available on the markets is far more than is officially reported. The Bureau of Agricultural Materials and Standards (BAMS) of MAFF estimated that at least 80 percent of pesticides available on Cambodian markets are smuggled across from Thailand and Vietnam and are sold under more than one hundred trade names. Extremely hazardous pesticides, which are banned or restricted in other countries, are available in Cambodia. A comprehensive study conducted in 1996 showed that the most toxic category of pesticides make up 70 percent of those sold in Cambodia. As little as two percent of the pesticide

products in Cambodia carry labels in Khmer language. Usually labels are in Thai, Vietnamese, English, or French.

Two major concerns are associated with the utilization of pesticides, namely human health and environmental risks. Cambodian farmers unfortunately prefer extremely hazardous pesticides since they have immediate effect on insects and other pests. While applying these chemicals, most farmers do not wear protective clothing, and have almost no knowledge of the impacts of the chemicals on their health, on consumers, or on the environment. In most cases, pesticides are misused or overused. Some farmers even mix different pesticides together in the belief that the resulting mixture will be more effective. After use, pesticide containers are utilized for other purposes including drinking water containers or are disposed of in the open within reach of children.

BAMS believes that cash crops farmers are more likely to be able to afford pesticides than subsistence farmers and that commercial farms are more likely to use more dangerous pesticides. Despite the high likelihood of pesticides entering natural water bodies, the presence of residual chemicals in the flesh of fish is substantially lower than is the case in neighboring countries. This probably reflects the fact that agricultural intensity is relatively low in Cambodia meaning that the total volume of pesticide use is still low in comparison with the intense agriculture practiced in Vietnam and Thailand. The misuse of pesticides is a serious public health problem that affects rural people and consumers and is likely to cause environmental damage over time.

5.7 Agriculture and Rural Livelihoods

Cambodia is primarily an agricultural country, with rice the single dominant crop. Crop, livestock, and poultry production was officially reported as only 25.5 percent of GDP in 1999. This low figure reflects serious underreporting of the subsistence and unmarketed products upon which most rural Cambodians depend. Currently, land under rice totals 2.16 million hectares. The vast majority of rice is grown in rain-fed paddies. Rice yields are very low by regional standards because farmers are not able to control water levels in their paddies, cannot afford sufficient fertilizer, and tend to use traditional, rather than high-yielding varieties. The vast majority of farmers do not grow enough rice to feed their families year-round.

Environmental impacts from agriculture are low compared with other countries of the region, largely because of its low intensity. Low education levels and lack of information, skills, resources, and agricultural support services render Cambodian farmers unable to increase yields and diversify to other crops. These constraints also prevent them from understanding and avoiding potential environmental impacts.

5.7.1 *Shifting Cultivation*

Government officials often express concern over the impacts of the swidden agriculture practiced by upland communities, particularly the perceived destruction of forests and in some cases soil erosion. Official assessments of these practices often fail to recognize differences between swidden systems that have long-term ecological stability, and those that do not. This misperception is also due partly to cultural chauvinism on the part of lowlanders toward

highlanders. It is also frequently a case of “blaming the victim” for deforestation caused by illegal logging activities. When practiced in a sustainable manner, shifting agriculture is a stable livelihood strategy on poor upland soils in forest areas.

5.7.2 Fertilization

In the past, Cambodian farmers employed compost and animal manures to improve and maintain soil fertility. Since the late 1980s, inorganic fertilizers have been used to achieve food security. In 1996, FAO estimated that 250,000 metric tons of fertilizers would be required annually in Cambodia to simply maintain soil fertility. The actual amount sold is far lower than this. However, the Department of Agronomy and Agricultural Land Improvement (DAALI) is encouraging farmers to revive the use of compost, organic fertilizers, and manures to maintain soil fertility while avoiding the eutrophication of water bodies caused by excessive application of chemical fertilizers.

5.7.3 Exotic Species

Fish is the major source of protein for Cambodians, with per capita fish consumption between 20 and 87 kg per annum. In an attempt to achieve food security, some government, donor, and NGO projects have introduced aquaculture and rice/fish culture. Exotic species have often been introduced, the most common being tilapia (*Tilapia nilotica*). Introduced fish species can migrate freely from ponds and rice fields during the rainy season. The likelihood that they will find their way into natural water bodies is very high. The impact of these exotic species on the natural aquatic ecosystem and indigenous species has not been studied in Cambodia, but evidence from elsewhere indicates that they range from serious to catastrophic.

5.7.4 Agricultural Biodiversity

During the Khmer Rouge period, many rice varieties were completely abandoned, including the formerly common floating rice. Many households depended on traditional floating rice varieties that can withstand the swift annual rise of the Mekong and the Tonle Sap, but the seeds of these varieties are no longer available, resulting in the threat of food shortages each year. Some agricultural firms have introduced hybrid high-yielding rice imported from China. However, DAALI is very concerned about the loss of indigenous rice varieties adapted to local conditions and which tend to require less labor and fewer inputs than hybrid varieties.

5.7.5 Lack of Water for Irrigation

Only 16 percent of the land under rice cultivation is irrigated. One rice crop per year can be grown under rain fed conditions, and there is often not adequate water for even that one crop. Lack of water is a major reason why rice farmers produce an average of only 1.6 metric tons per hectare. There are many remnants of small- and large-scale irrigation systems constructed in the past, but due to warfare, inappropriate technical design, and lack of maintenance these systems are in disrepair and are out of use.

5.7.6 *Small Land Holdings*

The average family holding of rice land before the war was 2.2 hectares. During the Khmer Rouge period, land ownership titles were destroyed. The current land holding by a household is less than one hectare, while landlessness ranges from 11 to 30 percent, and the majority of rural households do not have land title certificates. As roads are rehabilitated and security improves, land speculation gives rise to land disputes and seizure of land by powerful people. A study by the World Food Program (WFP) found that three percent of households surveyed lost their land through forced seizure in 1998. This is an important land management, human rights, and poverty alleviation issue.

5.7.7 *Lack of Access to Forest and Fisheries/Aquatic Resources*

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 NTFPs 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. Many forest concessions, PAs, and national parks restrict access by local communities to NTFPs upon which they have always depended.

The rights of local communities to common fishing grounds were denied for many years by the issuance of fishing concessions to powerful people. The boundaries of fishing lots expanded and shrank with water level. Recently, as part of the reform program and decentralization process, the government declared that 56 percent of commercial fishing lots had to be handed over to local communities for management. The DoF was unprepared for this rapid change in policy. Local communities, which were not yet organized to manage the fishery, began fishing in an unsustainable manner. The poorest people do not benefit from this shift in management because they are not able to afford more expensive fishing gear. Conflicts among community members may arise because institutions and capacity for management are not developed.

5.7.8 *Commercial Agriculture as a Threat to Forests*

After the massive logging of recent years, a large proportion of the nation's forests have suffered some level of degradation. With the current RGC policy to give land concessions for plantation establishment, these degraded forests are at risk of conversion to agriculture simply because they are not capable of producing timber commercially at this point in time. There is a critical need for a national-level land allocation exercise to establish a permanent forest estate that will be managed for forest products and to identify those forests upon which communities depend before allocating land for plantations. Even degraded forests provide valuable environmental services including habitat for wildlife and wild plants as well as providing

communities with products they need for survival. If properly managed and protected, these forests can produce a stream of economic benefits in the forms of timber and NTFPs.

5.8 Regional and Transboundary Dimensions

Cambodia's history has been shaped to a large extent by the fact that it shares borders with three neighboring countries, two of which are now much larger and more economically developed. This spatial and economic relationship with neighbors also has an enormous influence on NRM and demand in Cambodia. Water flows, ecological processes, fish and animal migrations, wild fires, and exotic species infestations do not stop at international borders, creating a complex web of ecological relationships with neighbors. Ecoregions, comprised of vast interrelated landscapes that provide habitat for large mammals, almost always straddle international borders.

The fact that Cambodia is at the lower end of the Mekong River dictates that water management decisions made upstream in China, Thailand, and Lao PDR will affect Cambodia through its heavy reliance on the Mekong and its fisheries. Cambodia's fisheries can be adversely affected by upstream dams, manipulation of the river profile and flow, irrigation withdrawals, and industrial and urban pollution. Any blockage in fish migration or changes in inundation patterns could negatively affect the critical Tonle Sap fishery. Cambodia has already suffered serious impacts from a dam built in Vietnam on the Yali River that causes unpredictable floods in Ratanakiri Province, resulting in death and loss of property.

Another major transboundary natural resources problem is the virtually uncontrolled flow of illegally harvested logs and wildlife, primarily to Vietnam and Thailand. This results from the collusion of corrupt Cambodian and neighboring country officials with logging companies compounded by the lack of cooperation of border authorities in neighboring countries to stem the flow of logs and wildlife. Senior MAFF officials report that high-level officials of both neighboring countries have pledged cooperation on illegal natural resources trade at periodic Association of South East Asian Nations (ASEAN) environment meetings but that this has not translated into cooperation at the border.

A final transboundary dimension of NRM is the negative impact of the effort to link the countries of the lower Mekong region with a high quality road network with bridge crossings of the major rivers. These roads facilitate the ease with which logs and wildlife can be moved across borders and also create increased demand for land on which to grow commercial crops. This puts the onus on the RGC to control illegal natural resources trade and land use rather than implying that development of Cambodia's transport system should be halted.

5.9 Gender

Women are more involved and dependent on collecting and gathering for their livelihoods. Degradation of the environment, through logging, pollution, overfishing, or denying access to traditionally common resources hurts women and especially women-headed households the most. When they cannot ensure food security for the family, many have to migrate from their villages to find jobs in the city, often in factories. Although the Land Law does not

discriminate against women, in practice most land is generally registered in the husband's name only. Both men and women are involved in communal labor such as building schools and repairing roads, but they have less of a role in village governance institutions.

Economic development and the transition from a subsistence to a market economy also affects men and women differently. The market economy favors those with some education, who can speak Khmer, and have literacy and numeracy skills. In an indigenous society that means men. Poorly planned development interventions—for example, training activities that take place at night, or in the meeting hall of a village—often reach only men, thus empowering men at the expense of women. Cash crops are men's domain and the income from selling cash crops is normally kept and controlled by men. Through the transition to cash mono-crops, women's indigenous knowledge and stocks of seed varieties will also be lost, diminishing biodiversity. Women are also more negatively impacted by the use of hazardous pesticides, since they are often illiterate and cannot read even properly labeled containers. If sickened from pesticides their health is often a lower priority than that of others in their family

5.9.1 Forest Resources

For security reasons, collecting in lowland areas is primarily men's work because collecting valuable products may require journeys of two or three days into the forest and few women can leave home for so long, or would feel safe alone in the forest.

Among shifting cultivators, illegal logging has a negative impact on women because they must walk further to collect NTFPs and fuel wood, while men's workloads may be reduced, as a major part of their work is clearing the forest for cultivation. Forest resources provide an important "safety net" for forest-dwelling groups, particularly women-headed households. Forest resources supplement their livelihood, making up deficits in crop production. A study conducted in late 2000 by the NGO Forum and other groups in 20 provinces found that the economic benefits derived from the collection of NTFPs are greater than previously thought. In upland areas, the collection of NTFPs is primarily done by women, and forest products play a significant role in balancing the economic contributions of men and women. When access to NTFPs is restricted or closed, the economic balance between men and women is upset, and women lose decision-making power in the family.

5.9.2 Fisheries and Coastal Resources

Improved fishing gear and increased catches can increase the post-harvest workload of women. This extra burden is often undertaken without a raise in pay and at the expense of other income-generating activities. If a fisheries activity is enlarged or mechanized, it often becomes the domain of men. When workshops on managing coastal resources have been held in provincial towns, many village women have been reluctant to participate because of the distance from home. Mangrove degradation affects members of the household differently. Women are forced to spend more time wading to collect oysters, whereas men are forced to fish further away from home. Small-scale aquaculture activities, while initially taking more of men's time for cage construction and trials, tend to place more burdens on women over the long term as they are responsible for feeding, monitoring, and harvesting the fish.

6. Priority Actions to Improve ENR Management and Governance

Cambodia clearly must address a wide range of issues in order to improve environment and NRM in the country. This section does not address all needs, but rather those of greatest importance and those that are particularly pertinent to the scope of this assessment or the potential natural resources governance programming opportunities for USAID/Cambodia.

6.1 Laws and Institutions

6.1.1 Land Law

The MLMUPC is developing sub-decrees and regulations under the Land Law with legal assistance from the ADB and technical assistance from GTZ. Support is required to assist community groups and local governments to participate in the process and for their effective implementation of legal provisions.

6.1.2 Law on Commune/Sangkat Administration

The sub-decree on the powers and responsibilities of commune councils is now under discussion and needs to be brought into force before the February 2002 commune elections. The Department of Local Administration (DoLA) in the MoI should proceed quickly in preparing commune clerks for their roles, and in providing materials to educate new commune councilors on their roles and responsibilities. Longer-term priorities include the redefinition of commune boundaries, and the integration of the Seila methodology into commune administration nationwide.

6.1.3 Forest Law

A joint MAFF/donor/NGO group is working to revise the Community Forestry Sub-Decree. The RGC should be encouraged to issue the sub-decree within the agreed timeframe. Donor support to CBNRM and particularly community forestry will be an urgent priority after the expected cancellation of a number of concession contracts later this year.

6.1.4 Environment Law

Action is required to develop the national PAM framework and to build the capacity of the MoE to administer it, in collaboration with DFW and with local government and community organizations. The MoE has not been able to implement the provisions of the EIA Sub-Decree. Support is required to overcome this stall, as MoE will soon have to review forest concession ESIA's, and other investment projects will be in need of review. Support is needed for provincial departments of environment, in order to strengthen their delivery of services to communes.

6.1.5 Fishery Law

The draft Fisheries Law and the Community Fisheries Sub-Decree are being developed under the leadership of MAFF's DoF. Consultations with stakeholders are underway, and support is required to empower local communities to participate in this process and in the community fishery management that is currently being developed in an ad hoc manner.

6.1.6 Wildlife Law

A new Wildlife Law has been drafted with funding from the UK's Department for International Development (DFID) and legal/technical assistance from WCS. The law is currently being reviewed by the Department of Forests and Wildlife in consultation with stakeholders. The WPO of DFW has already begun an enforcement effort against the wildlife trade, complemented with a public awareness campaign. More support is needed for this work, especially active enforcement of the provisions of the new law.

6.2 Improved Natural Resources and Land Governance

There are two aspects to improved natural resources governance in Cambodia. The first involves improving the transparency of procedures and the accountability of politicians and government officials in managing natural resources that are the property of the entire nation, such as the national forest estate, marine fisheries, and the fisheries of Tonle Sap and the Mekong system. Many of these national resources are being used unsustainably to the benefit of powerful people in government and in the military rather than providing income for national economic development. The second type of improved natural resources governance involves the ability of the government to fairly and equitably allocate land and resources to individual citizens and communities who depend on them for their livelihoods.

Improving national natural resources and land governance at the national level requires:

- strengthening of the legal framework for management of land, forests, fisheries, and wildlife;
- administrative reform to make resource management agencies more effective, more transparent, and more cooperative with related agencies and local government;
- judicial reform to make courts more accountable and transparent;
- military demobilization to reduce the role of military units in illegal natural resources extraction and trade;
- improved enforcement of laws through more, better trained, and equipped field staff of NRM agencies;
- integration of NRM into decentralization procedures and establishment of specific roles for each level of government;
- oversight by civil society groups and international watchdogs; and

- cooperation with the governments of neighboring countries to prevent or mitigate transboundary infrastructure impacts and to control the illegal trade in forest and wildlife products.

Allocating land and resources to individuals and communities requires the same steps just described plus:

- decentralization of some NRM authority and resources to lower levels of government;
- laws and implementing regulations that empower communities to manage resources;
- knowledge of the provisions of relevant laws by local government officials and communities;
- technical resource management skills by communities and local officials; and
- mechanisms to resolve conflicts within communities, among communities, and with outsiders.

The following actions apply specifically to land management:

- The Council for Land Policy, under the Supreme Council for State Reform (SCSR), must take an active role in coordinating and monitoring the implementation of the Land Law and its coordination with provisions of other relevant laws.
- Land use planning and NRM should be coordinated at provincial and lower levels.
- Strengthen the capacity of the recently created MLMUPC to play its intended role in coordinating land allocation and planning.

6.3 CBNRM

CBNRM provides natural resource-dependent communities with rights and responsibilities for managing or co-managing the resources upon which they depend. In order for CBNRM to work, communities must have legal rights over the resource, appropriate internal management institutions, technical skills, and incentives for management. Forests and fisheries are the resources most commonly managed by communities. Management approaches depend on the legal framework, the characteristics of the resource, the characteristics of the community, and their management objectives. A number of CBNRM approaches have been developed in Nepal, India, the Philippines, and Indonesia. All approaches require participatory means to identify, map, and sometimes value resources used by the community and to develop a plan for their management that includes mechanisms for enforcement and conflict resolution.

NGOs and International Organizations have implemented a number of successful community forestry and community fishery projects in Cambodia in recent years, learning valuable lessons in the process. The following priority actions are needed to make CBNRM a tool to both improve NRM and to secure community livelihoods in rural Cambodia:

- Legal: Pass the new Forestry Law and Fishery Law along with the Community Forestry Sub-Decree and the Community Fishery Sub-Decree. Develop implementing regulations and harmonize them with relevant regulations developed under the new Land Law. Implement the procedures articulated in the Community Forestry Guidelines of June 2000. Make communities aware of their rights under the new laws and educate local government officials and concession owners about their responsibilities.
- Implementation: Document lessons learned through CBNRM implementation in Cambodia, disseminate this information, and strengthen the network of groups working on CBNRM. WWF is currently working on these tasks with a grant from IDRC. Seek donor assistance to scale up CBNRM activities through support to NGOs and local government. Standardize administrative procedures and technical approaches.

6.4 Protected Area System

Cambodia currently has 23 PAs, covering about 3.3 million hectares (18.23 percent of nation's total area) and including seven national parks, ten wildlife sanctuaries, three protected landscapes, and three multiple use areas. Tonle Sap is a Biosphere Reserve and there are three wetlands of international importance (Ramsar sites). The Cardamom Mountains are being reviewed for nomination as a World Heritage Site and there are seven PAs adjacent to areas protected in neighboring countries that could be managed through transboundary cooperation. Funding for one such project is currently under review by the International Tropical Timber Organization (ITTO). Virachey National Park in the northeast, Cambodia's largest PA at 332,500 hectares, abuts PAs in both Vietnam and Lao PDR, creating an opportunity for a very large protected landscape at the juncture of these three countries.

Preliminary priority setting for PAM has been conducted by the MoE, the agency responsible for managing the PAS. The MoE has limited field staff and resources to manage PAs and illegal extraction of resources is common throughout the system. The Department of Forestry within the Ministry of Agriculture, Forestry and Fisheries (MAFF) is in the process of establishing three PAs under its jurisdiction within the national forest estate.

There are a large number of issues related to the improved management of Cambodia's PAS. Among the most important are:

- Legal and Institutional: The respective roles of MoE and MAFF in PAM and in wildlife/timber crimes enforcement must be harmonized to allow cooperative effort between the two ministries. PA boundaries must be rationalized to reflect biodiversity values and current land use. Cambodia, in cooperation with partners, must develop a long-term funding mechanism (such as a Trust Fund) for managing the PAS.
- Implementation: MoE needs additional technical and financial support to 1) increase the number and skill of its field staff; 2) increase scientific knowledge to support management; 3) demarcate boundaries and delineate management zones; 4) identify and combat threats from commercial activities, infrastructure development, hunting, and

forest product extraction; 5) develop management plans; 6) identify additional areas that must be protected to ensure that the system is representative of the biodiversity found in Cambodia; and 7) engage communities living in and around PAs as partners in conservation.

6.5 Environmental Education and Awareness

The public education system of Cambodia is severely underfunded with too few trained teachers, a scarcity of educational materials and overall limited capacity to fulfill even the most basic educational needs of the populace. In a country where the literacy rates are among the lowest in the world, there is much scope for improvement in all aspects of this sector. The paucity of environmental education materials in the public schools is only a small part of the overall problem. Although a few environmental organizations have begun implementing environmental education elements in various public schools, most of this work is in the “nonformal” sectors and takes into account low literacy rates, and limited access to formal educational systems.

Environmental education activities are needed at all levels from primary schools, to higher education facilities, from community programs to those for the national government. Topics needed include basic conservation and environmental concepts of sustainable use adjusted for particular audiences and resources. Other subject areas where further education is needed at all levels include information about the content and applicability of laws and policies, conflict resolution methods, and other relevant areas that can help improve the role of civil society in NRM in Cambodia.

Literacy is a particular problem in Cambodia and any environmental and awareness programs planned as part of development efforts need to take this into consideration. The continued publication of written materials, even if translated into Khmer, will have little impact on the vast majority of people. Programs need to be developed in other media, such as radio, television and videotapes and in person-to-person discussions, where possible, to enable them to reach targeted audiences with any level of effectiveness.

6.6 Forest and Wildlife Law Enforcement

6.6.1 Forests

Illegal harvest and export of timber is the NRM issue that has attracted the most international attention to Cambodia. The scale and openness of illegal logging have caused international observers and even senior RGC officials to refer to the situation as forest anarchy. Beginning in the late 1990s, the World Bank and the IMF made further structural adjustment loans contingent upon reduction in illegal logging. The Prime Minister issued a declaration in January 1999 in which he ordered, among other things, a complete crackdown on the illegal log trade and directed MAFF and MoE to establish a system for monitoring timber harvest and trade. This led to the establishment of Forest Crimes Monitoring Units in both Ministries with the support of the FAO-implemented Forest Crimes Monitoring Project (FCMP). Global

Witness, a UK-based NGO, was invited by the Prime Minister to play an independent watchdog role over forest crimes, reporting directly to the Council of Ministers.

The FCMP and its counterparts in MAFF and MoE have established systems for reporting and in some cases investigating and prosecuting forest crimes. These efforts are hindered by staff and funding limitations, vague laws, a judiciary that can't be relied upon to make impartial judgments and collusion between government officials at all levels with forest criminals. The FCMP recently suffered a six-month funding hiatus that limited its operations during the dry season harvesting season. Global Witness periodically issues reports on forest crimes that draw considerable media and political attention both inside and outside Cambodia. Illegal timber harvest dropped significantly in 1999 due to political pressure, but rebounded in the 2000/2001 dry season as concessionaires attempted to maximize cuts prior to possible loss of their concession under a newly mandated system of concession management planning. Small-scale illegal loggers operating outside the concession system are particularly difficult to bring to justice. As the number of timber concessions drops due to regulatory pressure, more effort will be needed to investigate crimes by small-scale loggers whose operations are dispersed and difficult to track.

Priority actions by the RGC are:

- passing of the Forestry Law and the Forest Concession Management Sub-Decree,
- continuing the effort to eliminate poorly performing concessions and bring the remainder into conformance with international forestry standards, and
- politically and financially supporting forest crimes monitoring and enforcement.

Donor support is needed to maintain the political momentum behind forest crimes monitoring. NGOs, commune councils, and communities are needed to play a watchdog role in reporting crimes as the MAFF and MoE field staff are spread too thin to do this without help.

6.6.2 Wildlife

The need to enforce laws against the illegal harvest and trade of wildlife is arguably more critical from a biodiversity viewpoint than illegal logging since the numbers of critically endangered species, such as tigers, are very low and hunting pressure is high. The WPO within the DFW is primarily responsible for enforcing wildlife laws but is hindered by lack of field staff and financing as well as weak law enforcement skills. Since wild animals and wildlife products are valuable and are relatively easy to transport compared with logs, much of the trade goes unnoticed through remote border check posts or with the collusion of border guards. Most of the hunters are men from remote villages who see hunting as a means to augment their livelihoods. The legal underpinnings of wildlife enforcement are currently weak, but will be strengthened by the passage of a new Wildlife Law that is currently in draft. Beyond the legal framework is the perhaps more serious problem of lack of awareness among the Cambodian public that the wildlife trade is illegal. Until recently, it has been transacted in one of the largest markets in Phnom Penh and meat and products from endangered animals have been

available openly in city restaurants. Recent efforts by the MAFF WPO are now being initiated to stem this problem.

The FCMP has a mandate to enforce wildlife laws and has made some notable seizures, but is generally focused primarily on logging. The US-based NGO, Wild Aid, is assisting the WPO to build enforcement capacity as is the US Fish and Wildlife Service (USFWS). WWF and WCS have conducted studies of the trade and the international NGO, TRAFFIC, recently opened an office in Phnom Penh as part of a regional effort to reduce the trade.

Given the gravity of the wildlife trade, serious efforts at control would require an effort on the scale of the program to control illegal logging, although such a political and financial commitment from the RGC and donors seems unlikely. Donor and NGO pressure is needed to send necessary signals to the RGC and the governments of Thailand and Vietnam, who are the recipients of the illegal trade. The RGC, donors, and NGOs should agree on enforcement priorities to ensure that meager resources are used as effectively as possible.

6.7 Private Sector

As described in Section 4.1, the private sector is a key component of civil society, the engine of growth in a market economy, and in a largely rural economy plays a major role in NRM decision making. Growth of the private sector in rural areas will contribute tax revenues to local government. In particular, the development of small- and medium-scale rural enterprises requires support from the RGC. The current programs of MAFF in agricultural extension, and of the Ministry of Commerce in promoting pro-poor trade policies are valuable but very much underresourced at present. Community groups such as associations of farmers and of rural entrepreneurs (e.g., the Rice Millers Association) will become important civil society components interacting at local and national levels. Some support to their development is being provided by the Ministry of Commerce and by the NGO, Enterprise Development Cambodia, but more effort in this direction is required.

As noted in the IESP, support via Seila or otherwise to local government and community groups for resource assessments, land use planning, EIA, and related NRM technical inputs will create effective demand for Cambodian firms to provide consulting services. This will strengthen the NRM capacity of communities and local government.

Timber concessionaires directly affect communities in terms of access to natural resources. One concessionaire is encouragingly proactive in partnering with WCS to work with local government and communities on issues of wildlife conservation and of management of traditional community use areas. Other concessions are being legally compelled to recognize the traditional use rights of communities. Concessionaires could be encouraged to help communities to manage and market NTFPs, including tree resins, medicinal plants and forest honey, perhaps with some economic incentives worked into the structure of royalty payments. Forest management certification programs rate concessionaires on their recognition and support of community land and resource use rights, providing a market incentive for concessions to work with communities as well as improve other aspects of their operations.

6.8 Ecotourism

Tourism development is high on the RGC's priorities, although little has been done officially to promote ecotourism. Ecotourism is usually developed for one or more of the following purposes: 1) to generate income for local communities while giving them an incentive to support conservation; 2) to stimulate growth in the local economy; and 3) to contribute to national economic growth and foreign exchange earnings. Developing ecotourism sites in a manner that is environmentally and culturally sensitive and is also commercially viable takes considerable skill and financial support. Most ecotourists are demanding in terms of the quality of the attraction and accommodations.

Cambodia has a number of potential ecotourism destinations, but none are fully developed. One example of interest is Riem National Park, where the local community is engaged by the MoE, with UNDP and Danish International Development Assistance (DANIDA) support, to manage and protect the coastal mangrove forest. Although visitors can and do take ranger-led boat trips into the park, the fees that are charged go to the MoE and do not bring any tourism money to the communities. Prek Toal Wildlife Sanctuary at the northern end of the Tonle Sap is another area where ecotourism may be further developed. Most visitors to Cambodia visit nearby Angkor Wat from a base at Siem Reap and it is estimated that 10 percent of these tourists also visit Tonle Sap during their stay. An NGO, Osmose, collaborates with the MoE to bring tourists by boat to Prek Toal to see the flooded forest and the seasonally nesting water birds. This enterprise brings tourist fees to the MoE, but it is uncertain if these funds are used for the protection of the sanctuary.

Throughout Southeast Asia there are many well-developed sites where visitors can enjoy coral reefs, tropical forests, and other natural habitats. Cambodia's ecotourism attractions are undeveloped and are unlikely to be competitive enough to bring in large numbers of tourists, although opportunities for small-scale development do exist. Cambodia's ecotourism do not justify the cost to develop them in relation to other potential NRM investments. In terms of the entry points identified for this IR, ecotourism development is not considered a priority for USAID support.

6.9 Agriculture and Pest Management

The three aspects of agriculture in Cambodia that are within the scope of this report are 1) reducing the impact of agricultural development on natural resources and biodiversity; 2) maintaining agricultural biodiversity; and 3) reducing the negative environmental impacts of pesticide use. Expansion of both commercial and subsistence agriculture is a clear trend in Cambodia. The RGC must allocate land to these uses through a formal, consultative process rather than ad hoc conversion of forest as is currently the case. Raising the productivity of existing agriculture would make it possible to produce more crops on less land, thereby reducing the need to clear additional land. Using hybrid, high-yielding seeds is one means to achieve increased yields, but this increases the need for labor, fertilizer, pesticides, and irrigation. Also, traditional varieties should continue to be grown to avoid a loss of agricultural biodiversity that could endanger the food security.

The improper control and use of pesticides is a public health and environmental issue that needs to be approached in several ways. There is a very obvious need for the RGC to enforce laws relating to importation and sale of pesticides as well as to educate farmers about their proper use and handling. Integrated pest management (IPM) provides a means to reduce pesticide use, educate farmers to use pesticides safely, and build community capacity to manage agroecosystems and natural resources. IPM training and community organization can be applied to agricultural landscapes including community forests and wetlands, fisheries, and water resources. The Cambodian national IPM program is well established in MAFF's Department of Agronomy, with links to the extension service, and funding from several donors. The program should be expanded both geographically and in terms of crop focus, with NRM more explicitly integrated into the methodology to make it more complementary to CBNRM.

7. Current Donor and PVO Activities in Relevant Programming Areas

7.1 Sustainable Forest Management and Conservation

The lead donors in forest sector reform in Cambodia are the **World Bank** and the **ADB**, who have been alternately supporting the **DFW** to strengthen forest concession management and government oversight. A joint study with UNDP/FAO in 1997 led to a major, multi-consultant review, funded by the World Bank and covering concession management, law and contract review, log monitoring and control, and forest policy reform. The study was completed in 1998.

The **ADB** followed up with a review of the concession system, completed in May of 2000—the conclusions of which had a major impact on the reform process. The project addressed concession performance, guidelines for sustainable forest management planning in concessions, guidelines for community forestry, an initial draft of the Forest Law, and the preparation of a draft model concession agreement. The conclusions of the **ADB** project prompted the RGC to cancel three concessions judged to have managed their concessions unsustainably and set the current agenda for sustainable forest management planning and renegotiation of contracts.

DFID provided a Facilitator for the Joint Working Group on Forest Concession Management, a forum between the **DFW** and the **CTIA**, which negotiated and finalized the Sustainable Forest Management Planning Guidelines and the Model Concession Agreement.

At present, the **World Bank** is providing a “learning and innovation loan” to build the operational capacity of **DFW**, and to support collaboration with the timber industry as new concession contracts are negotiated and sustainable forest management plans are approved and implemented. The **IMF** has played a key role in maintaining momentum, by tying the disbursement of macroeconomic support to performance on the agreed timetable for forest management reform.

Other donors are making important contributions. The **UK-DFID**, **DANIDA**, and **UNDP/FAO** support of the **Forest Crime Monitoring Unit** in **DFW** and **MoE** has had a major impact on development of the forest monitoring function. **GTZ** is supporting the Cambodia-German Forestry project, piloting **CBNRM** activity in **Kampot Province**, and the Sustainable Management of Natural Resources in the Lower Mekong project, with the **MRC**.

In terms of forest conservation, the **World Bank** has provided a Learning and Innovation Loan to assist the **MoE** to manage **Virachey National Park** and increase their technical capacity in **PAM**. **WWF** has provided considerable assistance to **MoE** in **Virachey** and is now beginning the process of applying for a **GEF** grant to assist with the management of the dry forests in **Mondulkiri Province**. **FFI** and **CI** are providing assistance to the **MoE** and **MAFF**, respectively, to protect the **Cardamom Mountains**. **FFI** expects to receive a **GEF** grant soon to support their work. **WCS** is working on the conservation of forests and biodiversity resources in **Mondulkiri** and is designing a project to begin conservation work in the northern plains provinces. A partnership of **ICEM**, **IUCN**, **WWF**, and **Birdlife** will soon undertake a review of

the PAS in the four countries of the Lower Mekong River Region (i.e., Cambodia, Lao PDR, Thailand and Vietnam).

7.2 Freshwater and Fisheries

A number of donors, multilaterals, and NGOs are active in supporting and carrying out various initiatives within the freshwater fishery sector and/or with related wetlands conservation efforts. These activities widely range from regional initiatives to those focused on the needs of particular communities, PAs or resources. Some of the key freshwater programs are presented here but a full description of all of these projects is beyond the scope of this report.

Among the donors most active in fishery and wetland issues are **UNDP** through the **GEF** mechanism. Various freshwater-related GEF initiatives include large-scale programs such as Integrated Resource Management and Development in the Tonle Sap Region, and the Mekong River Basin Wetland Biodiversity Conservation and Sustainable Use Program, with others presently being proposed.

The **FAO** supports a diverse program centered in Siem Reap on the north side of Tonle Sap in collaboration with the Provincial Office of Fisheries. This project (Participatory Natural Resource Management in the Tonle Sap Region) includes a number of fisheries-related components, including work with local fishing communities, aquaculture projects, environmental education and various other approaches.

The **ADB**, with UNDP-GEF, is financing the Tonle Sap Biodiversity Conservation project, and in association with Japan and Finland, is funding a regional freshwater project—Protection and Management of Critical Wetlands in Lower Mekong Basin. The World Bank also supports some work in the freshwater sector within its Agriculture Productivity Improvement Project - Fisheries Component. Various bilateral donors, including GTZ, DANIDA, the Australian Agency for International Development (AusAID), the Japanese International Cooperative Agency (JICA), and a number of others also support programs with fisheries and freshwater components.

UNDP, **DANIDA** and a number of other donors provide funding to the **MRC** for regional watershed wide economic and conservation-based actions within four countries—Cambodia, Vietnam, Thailand and Laos, but unfortunately not China, which also has a large interest and effect upon the overall Mekong River system. The MRC has a number of projects in collaboration with Cambodia's DoF, including the Project for the Management of the Freshwater Capture Fisheries of Cambodia, Management of the Reservoir Fisheries in the Mekong Basin, Rural Extension for Aquaculture Development, the Inventory and Management of Cambodian Wetlands Project, and some others.

Although the donor support base in freshwater fisheries and wetlands is large and widespread, there are few NGOs in Cambodia that primarily engage in such work. One of the most visible NGOs in this sector is **WI** which currently receives limited donor support (more proposals are in the works) to conduct wetlands surveys, training courses, and community based conservation work, to develop management plans for PAs and various other conservation projects.

Oxfam Great Britain (Oxfam GB) has done considerable work investigating and reporting on inland aquatic resources and livelihoods in various communities within Cambodia. Various international NGOs with a Cambodian presence such as **WWF** and **Wildlife Conservation Society (WCS)** address freshwater fish, fisheries, and related habitats in their site-specific programs when these components are relevant. A number of other NGOs work at the local level with fishing communities in various sites around Cambodia. For instance, one such organization, the **Community Capacities for Development** is conducting advocacy activities and training communities in techniques of active nonviolence in the Kampong Chhnang area that address inequities in fishing rights and access. The **NGO Forum** in Phnom Penh has a fisheries specialist and a working group on fisheries that helps in information coordination and dissemination in this sector. Although there are already many fishery and wetlands programs underway throughout Cambodia, there is still a need for more activity to enable assurances that the fishery stocks and habitats will be used sustainably for future generations of Cambodians.

7.3 Coastal and Marine

The coastal and marine sector in Cambodia has received relatively little support compared to the freshwater fisheries and wetlands initiatives, although the issues facing these habitats and resources are similarly severe.

One large project, the **ADB**-funded Coastal and Marine Environmental Management in the South China Sea, Phase 2, has recently concluded and the final report is available on CD-ROM for all interested parties. In Cambodia, this project worked with MAFF, MoE, and other government agencies and with NGO partners including **WWF** and **WI**. Principle achievements of this work include the development of a national strategic plan for coastal and marine management and a PA plan for particular areas. The development of these plans involved community and natural resources surveys, the establishment of a coastal and marine database, and a demonstration project in fishing communities of Ream National Park.

The **DANIDA**-supported project, Environmental Management of the Coastal Zone - Cambodia, is being undertaken in collaboration with the MoE. The first and second phases of this program resulted in the production of ten case history studies of various coastal and marine resources and issues, established a Geographic Information System (GIS) facility within MoE, and worked on other capacity-building efforts and continued community level work in and around Ream National Park in conjunction with **WI**. Although the funding has stopped, the pilot communities are said to be continuing on in these community-based coastal management efforts on their own. Five pilot projects were also established, including two in Koh Kong area in association with the **IDRC** that involve communities in such activities as “crab-fattening” and alternative livelihoods such as chicken raising. Another related **IDRC** project in this region is the Participatory Management of Mangrove Resources, underway since 1997.

WI remains engaged in coastal activities even now that their ADB funding has expired. Their existing coastal projects include the identification of possible new coastal Ramsar sites, training on coral reefs and seagrass surveys and identification, and other initiatives. **CI** programs focusing on the coastal Cardamom and Elephant Mountains might also have relevance to

coastal conservation efforts. **WCS** has conducted surveys of marine mammals and may continue to include coastal species within their sights.

A number of regional initiatives also involve Cambodian waters. The Integrated Coastal Management Project - Sihanoukville focuses on training and other ways of developing strengthened institutional arrangements for integrated coastal management in Cambodia as one part of a regional study and is funded by the **International Maritime Organization** and **GEF**. The **ADB** supports regional coastal initiatives in Southeast Asia and China, which may involve Cambodia. The **IUCN** in Cambodia is also presently developing a concept paper on regional coastal activities including Cambodia. Various research projects of universities and other institutes might also involve the flora, fauna, and coastal habitats of Cambodia. Despite all of this potential interest, the coastal problems Cambodia faces are progressing rapidly towards continued degradation. There is still a need for many more conservation activities in this sector in Cambodia before its habitats rivals the degradation seen in its neighboring countries.

7.4 CBNRM

Donors and NGOs have been very active in supporting CBNRM projects in recent years, often in cooperation with DFW, MoE, and local government. A recent survey of CBNRM in Cambodia by **WWF** found that there are currently 16 ongoing projects, some of which operate at multiple sites. All projects share the objectives of securing community access to natural resources and helping communities manage their resources sustainably. Community forestry is the most common project type, although there are projects directed at inland fisheries and coastal resources. Some projects work in and around national parks as a means to involve communities in conservation. It should be noted that even with this large number of projects, the actual number of communities that have been helped is small compared with those that need assistance to manage their resources. Community use provisions of the new laws on Land, Forestry, and Fisheries, plus the Sub-Decrees on Community Fisheries and Community Forestry, will create a firm legal basis and increased demand for CBNRM.

Projects that serve as examples of donor/NGO activity in CBNRM are:

- The **FAO** Participatory Natural Resource Management in Tonle Sap which has implemented CBNRM for both flooded forest and upland forest.
- **Concern Worldwide** has a long running Community Forestry Programme, funded by DANIDA, operating in a total of 23 villages in Pursat and Kampong Chhang Provinces.
- **Community Aid Abroad (CAA)** and the **Cultural and Environmental Preservation Association (CEPA)** conduct community fishery projects in seven villages of Stung Treng Province in the north.
- The **NTFPs** project is a long-running and well-publicized attempt to assist hill tribe communities in Ratanakiri Province to secure their land rights, plan land use, and manage forest resources.

- **IDRC** works with MoE to assist coastal communities living in and near the Peam Krasop Wildlife Sanctuary of Koh Kong Province to manage mangroves and related fisheries.

Practitioners of CBNRM in Cambodia have developed mechanisms to share knowledge and work together on policy advocacy through the **Community Forestry Working Group**. This group meets regularly and provided input into MAFF's **Community Forestry Guidelines**, developed last year with **ADB** funding. A **Task Force to Revise the Draft Sub-Decree on Community Forestry** is currently spearheading efforts to revise that critical implementing regulation. Training support for community forestry is provided by **CAMCOFTT**, a group of professional trainers that travel around the country training officials and communities. The **Community Forestry Research Project**, funded by **IDRC** and technically supported by **RECOFTC**, strengthens CBNRM capacity among government agencies, NGOs, and communities and has field sites in Kampot, Siem Reap, and Koh Kong Provinces. **Community Forestry International, Inc.** has funding from USAID's **East Asia and Pacific Environmental Initiative (EAPEI)** to support community forestry networking in Southeast Asia including Cambodia.

7.5 Land

Donor and NGO efforts to improve land allocation and management are addressed at improving the legal framework, documenting the extent and causes of landlessness, assisting the RGC with land-related governance, developing procedures for land use planning at provincial and village levels, assisting communities to gain legal recognition of their land rights, and land titling.

The **ADB** has provided technical assistance to the RGC to draft the Land Law and will provide continuing assistance to draft implementing regulations. **Oxfam GB** has done extensive fieldwork to document the extent of landlessness in the country and to determine how it is related to other factors. The **WFP** has also done surveys to determine the relationships between land holdings and poverty. The **GTZ**-funded Land Management Project assists the MLMUPC with land titling, land use planning, and institutional strengthening. The **World Bank** will soon appraise a large land management project that will work on land titling in 11 provinces with technical assistance from **GTZ** and the **Finnish International Development Agency (FINNIDA)**. The **MRC/GTZ** Sustainable Management of Resources in the Lower Mekong Basin Project is assisting the RGC to develop a system of Participatory Land Use Planning (PLUP) that can be used at local levels of government. The **Seila/CARERE II Project**, implemented by **UNDP**, piloted techniques for land use planning in Ratanakiri Province and similar work will continue under a **Swedish International Development Agency (SIDA)** grant.

7.6 NRM Governance, Laws, and Institutions

Institutional strengthening of MLMUPC and support to the development of the Land Law and its Sub-Decrees and regulations, is coming principally from the **World Bank**, **GTZ** and the

Government of Finland. **Oxfam GB** and the **NGO Forum** have been first among the NGOs participating on the civil society side.

The **MoI** is receiving support for capacity building in the administration of the Law on Commune/Sangkat Administration, principally from the **ADB** and **GTZ**. The Commune Council Support Project with funds from **DFID** and **AusAID**, is working on the civil society side, via a consortium of NGOs.

Development of the Forest law has been prepared with support from both the **ADB** and the **World Bank**, with significant input from the NGO community, in particular the **NGO Forum**. The Wildlife law was developed with support from **DFID** and assistance from **WCS** and **WWF**.

UNDP support to Seila in Ratanakiri province has made important contributions to the development of local governance of natural resources, in partnership with **SIDA**, the **IDRC**, and **Oxfam's** NTFP.

The Environment Law and the sub-decrees were produced with technical assistance from **UNDP** and the **ADB**.

The **ADB** is preparing a support program for **MOWRAM**, building on previous work supported by the **World Bank** and by the **Government of Japan**.

7.7 Environmental Education and Awareness

A number of NGOs are dedicated primarily to developing and implementing environmental education and awareness programs in Cambodia. **Save Cambodia's Wildlife** is active in the production of wildlife-related educational materials in both English and Khmer and distributing these throughout Cambodia. It is also instrumental in providing interpretive materials and programs for school children at the government-run Phnom Tamao Wildlife Rescue Center outside Phnom Penh in conjunction with **Mlup Baitong** (green shade). **Mlup Baitong** began as an offshoot of Global Witness but is now independent of this parent organization with its own local board of directors. The main focus of this group is community-level education and alternative livelihoods work around Kirirom National Park; ranger, monk and teacher training; developing interpretive materials within the park; and providing educational programs for school children that they bring to the park. They also work at the national level, and are soon beginning to develop and broadcast an environmental radio program, the first in the country. **Wild Aid** helps support some of these educational initiatives and also works directly with the government agencies involved on various wildlife awareness activities. A recent Wild Aid/MAFF initiative is the environmental banners in Khmer and English that were displayed prominently in Phnom Penh during this consultancy period. The **Buddhism for Development** initiative has also been instrumental in developing and translating environmental educational materials into Khmer and training monks to use these in their teaching activities.

Some Cambodian environmental education activities are more locally focused. For instance, **CEPA** has a strong education and advocacy role in Stung Treng targeting community fisheries

representatives. The **FAO** Participatory Natural Resource Management in the Tonle Sap Region project has spawned the development of the **Gecko Environmental Center** and related programs for school children and others in the region. The **Osmose** nature tour program in the same region fulfills a similar role for tourists and other visitors to the Prek Toal Biosphere Reserve. A partnership between FAO, Osmose and the **WCS** also plays a significant education and awareness role through the publication and dissemination of the journal, *Cambodia Bird News*, which details new conservation findings and initiatives.

Environmental education also plays a role in the activities of more widely focused NGOs and donors working in the natural resources sector in Cambodia. Some focus on particular target groups, like rangers and government officials. Others integrate environmental activities within their other community-level programs. As with other conservation approaches in Cambodia, even with this diversity of players, much work still remains to be done.

7.8 Wildlife Harvest and Trade

The problems of illegal wildlife trade in Cambodia have garnered a lot of attention and attracted some NGO efforts to work towards stemming it. In addition to some of the environmental education and awareness efforts listed in the previous section, some NGOs have taken even more direct approaches to stemming this trade.

One organization of note in this regard is **Wild Aid** with its global presence and an organizational mandate to help government entities enforce existing wildlife laws, and protect existing national parks and PAs. In Cambodia these efforts include the establishment of a “Department of Forestry and Wildlife/Wild Aid Wilderness Protection Mobil Unit,” which enforces wildlife laws in the field using two 4-wheel-drives, four motorbikes and a staff of twelve originating from DFW and the military. Other Wild Aid initiatives include ranger training courses, provision of equipment to rangers working in key national parks, and posting letters signed by the Minister of the Agriculture that publicize the use of prohibited species in 100 restaurants in Phnom Penh.

TRAFFIC is a global NGO that works to monitor and decrease the illegal international trade in endangered species. An office has recently opened in Phnom Penh, but most efforts are coordinated from a regional office in Vietnam. Aside from anecdotal accounts, however, very little information and data currently exists on the extent of the illegal wildlife trade stemming from Cambodia.

Another key component helping track and enforce wildlife trade issues in Cambodia is the **FAO Forest Crime Monitoring Unit** and **Global Witness** that work together and in association with MAFF and MoE. Additionally, the **USFWS** has been involved in training rangers in some PAs in Cambodia, and in other initiatives focusing on target species of global concern, such as tigers and elephants. Finally, wildlife trade and monitoring programs are often integrated into other conservation activities of various NGOs working in particular locations within the country.

7.9 Integrated Pest Management

The Cambodian National IPM Program was established by the **MAFF** in 1993, with support from **IDRC**, **FAO**, and the Cambodia-International Rice Research Institute (IRRI)-Australia Project funded by **AusAID**. **USAID** made an important contribution through the pesticide work of the Cambodia Environmental Management Program (CEMP) project. Core support to the program now comes from **DANIDA**, a **World Bank** loan (Agricultural Production Improvement Project [APIP]), the **FAO**, and **World Education**. Other donor and NGO projects utilize the IPM program's trainers to train farmers in their own project areas. **FAO** is presently assisting the national program to set up a foundation to be called The Field Alliance, which will become the focal point for IPM work, especially as it pertains to issues of local governance in NRM.

Appendices

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Appendix C. Description of Field Visits

Field Visit 1: Tonle Sap and Vicinity (August 15-20, 2001)

The ARD assessment team, minus the institutions specialist, and accompanied by Dr. Mary Melnyck of the Asia Near East (ANE) Bureau, visited the Tonle Sap area during the period 15 to 20 August 2001. The team was hosted by the FAO-implemented project Participatory Natural Resource Management in the Tonle Sap Region and was based in the provincial capital of Siem Reap during the visit.

The purposes of the visit were to:

- gain insight into the status of aquatic resources in the lake and surrounding flooded forests as well as the status of upland forest resources;
- visit communities and observe CBNRM activities in flooded and upland forests;
- observe livelihood activities related to aquaculture;
- discuss issues related to fishery and forestry CBNRM with government officials and FAO project staff;
- meet with local government officials at the province, district, commune, and village levels;
- visit the Gecko Environment Center to understand its role in environmental education;
- visit the Prek Toal Wildlife Sanctuary to gain insight into management issues and ecotourism potential.

Highlights and learning points of the trip were:

- a visit to the community-managed flooded forests of Kampong Phluk Village and discussions with the village forest management committee about both forest and fisheries management;
- boat trips on the great lake that helped the team understand the size and importance of this resource;
- discussions with senior officials in the provincial fisheries office regarding challenges to implementing community fisheries in Tonle Sap; and
- a discussion with the Governor of Siem Reap Province who explained the challenges of NRM from his perspective and the need for technical assistance to implement decentralized NRM governance at the province and commune levels.

Field Visit 2: Kirirom and Ream National Parks (August 30-31, 2001)

Field visit overview: Three team members, Sri Sugiarti, Srey Chantey, and Pat Foster-Turley joined the staff of Mlup Baitong at Kirirom National Park for a look at the new environmental education center, and some of the CBNRM efforts in surrounding villages. Some of the CBNRM activities observed included chicken-raising and crafts production as new sources of income for women and a primary school nature club where children were rehearsing their nature play for presentation to the community. Plans were also underway to initiate ecotourism

activities in various villages near the national park. Two team members continued from Kirirom National Park to the coast to talk with regional fisheries officials in Sihanoukville and to tour the mangrove areas of Ream National Park. Major findings are summarized here.

Key Findings:

- Both Kirirom and Ream National Parks showed heavy signs of disturbance, including very visible logging efforts at Kirirom Park and eroded logged-out hillsides at Ream National Park. Although both national parks had very little environmental educational material, efforts of Mlup Baitong are underway to enhance this feature in Kirirom National Park. In Ream National Park, a knowledgeable ranger on the boat enhanced the educational experience. Both parks seem to be a good step in the right direction, but more work is needed before they can fully achieve their mission.
- Within Ream National Park there is a widely touted successful community-based fishery supported in the past in part by DANIDA, the United Nations Environment Program (UNEP) and WI but now self-sustaining. The fishing communities have banded together to enforce fishing regulations in their areas and to collaborate on other conservation efforts. Despite this work, however, there is a large commercial “crab-fattening” operation within the park near these communities that has converted many hectares of mangrove to this purpose, and that uses fine-mesh nets to capture tons of fish fry to feed the crabs. Dealing effectively with large commercial ventures such as this is beyond the scope of the communities.

Meetings with fishery officials Buoy Roitana and Sin Sotharath at the regional fisheries office in Sihanoukville were enlightening, but depressing as well. Although the problems facing fishery resources such as illegal fishing, destruction of habitat, and pollution are well known to these people, there is nothing in their power to prevent it. With no functioning boat, and little authority, it is impossible for them to patrol the 119 km of coastline in their domain, or to contend with the large-scale industrial fishing that is decimating the fish populations. The situation for effective conservation of fishery resources under the present conditions seems hopeless.

Cambodia Environmental Review: Status and Trends in Environmental Management and Options for Future Action¹

I. Introduction

The Indochina region of mainland Southeast Asia contains globally significant tropical forests, biodiversity, and water systems that provide a valuable range of environmental goods and services. Three principal biomes make up the region: (1) Cambodia and the neighboring areas of Laos and Vietnam possess the largest remaining contiguous area of tropical and mixed forest cover in east Asia, which provides habitat for a large and varied diversity of plant and animal species; (2) Cambodia and Vietnam possess extensive coastal and marine habitats, including the mangroves and wetlands of the Mekong and Red River deltas; and (3) the lower Mekong River Basin, including Cambodia's great lake, the Tonle Sap, constitutes one of the most productive freshwater fisheries in the world. Cambodia's Cardamom Mountains contain unique and endangered species thought to be near-extinction or extinct in other parts of SE Asia.

Decades of civil conflict and turmoil, combined with economic stagnation and isolation of the region's governments, have retarded development and resulted in extensive disturbance of environmental systems in many parts of the region. More recently, the gradual opening of the region to foreign investment has accelerated the exploitation of natural resources through unregulated timber and fuel wood harvesting, mining, unregulated hydropower development, conversion of uplands and wetlands for agricultural and fisheries production, and the use of destructive harvesting methods in inland and offshore fisheries. As a result, the international environmental community has raised concerns over the pace, and the extent to which, the region's natural resource base has come under the threat of degradation. At the same time, the international donor community has come to recognize that sustainable economic and social development of Cambodia and the rest of the Indochina region is, in significant part, dependent on the sound and disciplined management of the natural resource base. Conservation and sound management of the region's natural patrimony is a matter of urgency.

II. Background

Cambodia currently possesses a wealth of natural resources, but these resources are increasingly at risk, unless more appropriate policies, strengthened institutions, and improved management practices are put into place.

¹ Sections 118 (Tropical Forests) & 119 (Endangered Species) of the Foreign Assistance Act specifies: "COUNTRY ANALYSIS REQUIREMENTS – Each country development strategy statement or other country strategic plan prepared by the Agency shall include an ANALYSIS OF [1] the actions necessary in that country to achieve conservation and sustainable management of tropical forests and conserve biological diversity, and [2] the extent to which the actions proposed for support by the Agency meet the needs thus identified."

Cambodia hosts a rich biodiversity including a variety of rare and endangered species. Of particular concern are the Kouprey, endemic wild cattle believed to survive solely in remaining undisturbed Cambodian forest. More than 850 species of fish have been recorded from the lower Mekong River and Tonle Sap Lake. Cambodia’s extensive wetlands and lands provide habitat for migratory birds, including a large flock of rare Sarus Cranes. The forests of Cambodia contain the region’s last significant populations of tigers, elephants, and other rare endemic species.

The biodiversity of Cambodia is rich but very poorly inventoried. The Annamite Mountains along the eastern border are considered a globally important biodiversity area. The Annamites have high levels of species richness and endemism in both flora and fauna and are home to several only recently discovered species of large mammals. This extraordinary circumstance, in and of itself, makes this region an area of critical global biodiversity importance.

Category	Total known species	Endemic species	Threatened & endangered
Plants	7,571	1,175	No data
Birds	307	0	18
Reptiles	82	1	9
Amphibians	28	0	0
Freshwater Fishes	300	No data	5
Mammals	123	0	23

Although Cambodian law forbids the hunting and export of most wildlife (fishes excluded), Cambodia is intimately involved in Indochina’s thriving regional trade in wildlife and wildlife products. The trade in wildlife products is a well-organized, large-scale artisanal and commercial industry that involves numerous rare and endangered species of plants and animals and operates more-or-less freely within and among most countries within Indochina. Populations of elephant and tiger appear to be smaller than previously thought and may be severely threatened by the burgeoning trade in wildlife products. Steps are needed to protect Cambodia’s natural heritage, which has important economic and development potential in terms of medicinal usage, tourism, and other forms of sustainable use.

Protected Areas and Forest Reserves

Prior to 1957, approximately one-third of Cambodia had been inventoried and classified into 173 forest reserves (3.9 million ha) and six wildlife protection areas (92.2 million ha), including an 11,000 hectare forest area within a National Park established at Angkor Wat. Cambodia reaffirmed its interest and commitment to the development of protected areas under the Paris Peace Accords that established the current government of the Kingdom of Cambodia. Although about 20 percent of Cambodia’s land area is still nominally under some form of legal conservation protection, there is currently no protected areas legislation and extremely limited management capacity.

Wildlife reserves established during the French colonial period are still recognized by the current government, but they are not properly demarcated, protected or actively managed. There are currently 172 production forest reserves covering 3,875,000 ha, six forest reserves for wildlife protection, and a single national park of 10,717ha. In addition, there are 1,080 designated historical sites encircling ancient monuments whose management status is not yet clearly defined.

Forest cover declined from 75% in 1969 to 58% in 2000. There was a decline of almost 10% in forest cover from 1990 – 2000. State forestlands include 80% of all Cambodia's remaining forests. The southern and central parts of the country have been largely deforested for agriculture, and now face major shortages of wood products, particularly fuel wood. Illegal logging has had major impacts in recent years in the coastal province of Koh Kong and the areas along Cambodia's international borders. Illegal logging and cross-border log smuggling to Thailand, Laos, and Vietnam are significant problems for Cambodia. Forests currently cover an area of approximately 93,350 km². Current rates of commercial logging, most of it illegal, are unsustainable. Logging was so severe in 1997-1998 that World Bank estimates indicated a total exhaustion of commercial timber could occur within three to five years.

Illegal Logging

Although the Royal Government of Cambodia is attempting to exert greater control over the forestry sector, recent reports indicate resurgence in illegal logging during late 2000. The RGC is being deprived of valuable revenues from logging, either through fraud or chronically poor record keeping by timber concessionaires. Global Witness estimated revenue losses from illegal logging from just one compartment of one concession (coupe 2 of the Everbright Kratie concession) at over US\$250,000. The World Bank estimated total revenue losses from illegal logging in 1997 at over US\$60M, equivalent to two percent of Cambodia's GDP. The bulk of the illegal logging is attributed to unregulated timber harvest and export by legal concessionaires, with the collusion of powerful elements within the Cambodian military, Forestry Department, Ministry of Agriculture, other government agencies, and court officials. Cambodia's forests are central to the livelihood of its people and represent Cambodia's main natural resource.

From 1993-1997, 4 million cubic meters of timber were extracted from the seven million hectares of land allocated to logging concessions. If timber concessionaires return to 1998 levels of cutting, Cambodia's forests could be approaching commercial extinction within two to four years. Government officials have failed to report the large-scale illegal activities documented by outside investigators. Timber concessionaires appear to be returning to large-scale illegal logging after a comparative lull in the 1999/2000 dry season that coincided with the ADB concession review. Despite all efforts by many parties to reform the forestry sector, the concessionaires operate today as they have always done and continue to enjoy complete impunity. It is possible that many concessionaires, fearing concession cancellation or harvesting restrictions ahead of the implementation of the new management plans in 2001, are attempting to harvest as much timber as possible under existing regulations.

Combating this problem will require action at the local, national, and regional level. Despite the establishment of the Forestry Crime Monitoring Program (FCMP) and its case tracking system, there is no comprehensive forestry monitoring system in place. With its current lack of resources and capacity, the Royal Government of Cambodia is powerless to control illegal logging in Cambodia at this time. This is one example of where the DHR and the CER would benefit from working together to devise a common interim strategy.

Actions Needed For Conservation

Greater cooperation from Cambodia's neighbors will be needed to effectively curb illegal logging. There is currently no multilateral cooperation on illegal logging and there are continued large-scale

exports of illegal logs to Thailand, Laos, and Vietnam. Donor leverage and assistance stimulated RGC reform of the timber sector between 1997-1999. Multilateral donors are working with RGC Forestry and Agriculture ministries through a UNDP-administered Forestry Crime Monitoring Project. Management and monitoring capabilities are perhaps improving, but the RGC still lacks the capacity to effectively regulate—much less manage—its tropical forestry sector assets and biodiversity resources at the present time.

For the past decade, local communities have been competing with transnational timber corporations for access to forest lands and natural resources. Many local communities have lost access to, or have been dispossessed, from forestlands they have used or inhabited for generations. Community-based forest management may provide a more ecologically and economically sustainable alternative to current industrial timber harvesting regimes.

The Tonle Sap, Cambodia's great lake, plays an important role in the hydrology of the Mekong River. In addition, together with the flooded forest surrounding it, the Tonle Sap represents the heart of Cambodia's fisheries resources, accounting for 60% of commercial inland fish production. Fish and other aquatic life are extremely important in Cambodia, providing around 90% of the protein for the Cambodian people.

Once one of the richest inland fishing lakes in the world, the Tonle Sap is now under serious ecological threat. Sediment caused by deforestation of the upper reaches of the Tonle Sap watershed and by unregulated development of the Mekong system threatens its integrity, adversely affecting its capacity to act as a buffer during the wet season and as the main source of fish for the country. The cutting down of the flooded forests of the Tonle Sap has led to the destruction of critical habitat that serves as a nursery for aquatic life inhabiting the lake itself, as well as the Mekong River and the offshore fishing areas of Cambodia and Vietnam.

Cambodia's future depends, in important part, on how well it can sustainably manage its natural resource base. Although currently well endowed with natural resources, efforts to effectively manage these resources may be thwarted by inappropriate policies and institutional weaknesses. Cambodia's needs are great, while the financial and human resources available to address these concerns are limited.

To ensure that USAID's resources are strategically targeted, the Cambodia environmental review will assess the current status and trends in environmental protection and management in Cambodia, and present options to USAID for engaging in environmental conservation and management. In the past, the USAID Mission has been reluctant to invest in the protection of these environmental resources because of the misconception that Congressional restrictions restrict USAID programs to support for humanitarian, democracy and governance activities. However, recent experience in other countries has shown that some of the best grassroots democracy and governance activities undertaken by USAID have been through advocacy by environmental NGOs.

III. Critical Assumptions

Relationship with the Royal Government of Cambodia (RGC)

Since the resumption of humanitarian assistance to Cambodian non-Communist groups in the country's northwest in 1986 up to the present day, all USAID programs have been and continue to be funded to and implemented by private, non-governmental organizations (NGOs) through grants and contracts. This was true prior to current legislative and policy restrictions which has constrained the scope of USAID's program and prohibits direct assistance to the central government, and if restrictions were lifted, funds would still be directed to private organizations and not directly to the government.

We are at a point where re-engagement in key areas with reform minded professionals in the government will promote U.S. national interests to bring about a more democratic and just Cambodia. The Mission believes we will miss a unique opportunity to transfer skills and methods that our NGO programs have fielded and fine-tuned. If restrictions are not eased to enable them to work directly with the civil servants in central ministries, these ministries can not benefit from the lessons we have learned and investments we have made as they embark upon nationwide programs funded by other donors. USAID's current efforts to promote human rights, end the prevailing climate of impunity, establish a rule of law and strengthen the judiciary are greatly diminished if the Mission can not engage with judges and legislators.

Given the extent of rural poverty and the overwhelming importance of forest products in the lives of rural communities, the forestry sector is a critically important part of the development equation in Cambodia. USAID's extensive experience in Community-Based Natural Resources Management could be used to improve capacity for community-based management of biodiversity and tropical resources in Cambodia. USAID Cambodia could make a significant contribution to improved protection of biodiversity and tropical forest resources in Cambodia by incorporating an IR for Community-Based Management of Natural Resources under its Democracy and Governance SO.

If USAID/Cambodia were once again authorized to work with the RGC, we envision providing support to a number of activities in democracy, human rights, governance and environment and natural resources management. However, since it is likely that work with the RGC will resume at some point in the future, an interim strategy should be developed, not to exceed three years. The [interim](#) strategy should also identify any triggers that might expedite or hasten a transition from one scenario to another. The strategy should also specify how these triggers would be monitored.

Department of Forestry and Wildlife

The Department of Forestry and Wildlife includes divisions of conservation, silviculture, reforestation and plantations, forest management, timber technology and forest research. However, the number of professional staff in all fields, including forestry, was severely depleted during the 1975-1979 Pol Pot regime. The Directorate of Forests and Hunting (Direction des Forêts et Chasse) was not operationally effective during the initial post-war reorganization due to lack of management, training, and support staff.

The principal activities of the Directorate of Forests and Hunting are

- the management and control of forests;
- operation of industrial saw mills for export,
- smaller sawmills at the craft level for local consumption,
- transport of wood and wood products; and
- reforestation in the security zones of non-forested provinces with the establishment of experimental nurseries for forest plants.

Rampant corruption and the lack of trained professional staff have severely handicapped the forestry and conservation functions of the DFW. In recent years, however, accelerated training of new staff, promotion of forest officers, and forest-hunting staff have brought the number of personnel to 235. In addition to professional staff, local labor is used for maintaining tree nurseries and plantations.

IV. Objective

The purpose of this task order will be to review the principal environmental and natural resources conditions and trends in Cambodia and to assess the prospects for more environmentally sound development. This review will:

- (1) provide USAID/Cambodia and the ANE Bureau with an updated analysis of the status and trends in natural resource availability, management, and use/abuse in Cambodia and the Mekong sub-region²,
- (2) identifying the socio-economic, policy, and institutional factors affecting these trends;
- (3) review current and planned donor-supported environmental activities in Cambodia and related activities in Laos, Vietnam, and Thailand;
- (4) identify and assess the capacity of partner organizations that can support the implementation of potential USAID-funded environment activities in Cambodia; and
- (5) document and make recommendations (issues and opportunities) on future environmental improvements and investments based on this analysis.

V. Team Composition and Experience

The Contractor shall propose a team with the skills and experience to effectively achieve the objective of this task order. All team members should possess superior written and verbal communication skills. Fluency in Khmer is desirable, but not required. The assessment team selected by the contractor shall possess at a minimum the following characteristics:

- (1) A professional background in developmental work, especially in environmental programming, with a focus on support of NGOs in transitional, post-communist settings.
- (2) Previous experience in working on environmental sector/strategy assessments/designs for USAID is desirable.
- (3) Strong and recent experience and background knowledge of the region.

² The six countries of the Greater Mekong Subregion are Cambodia, Laos, Myanmar, Thailand, Vietnam, and the Yunnan Province of China. For this study, the consultants will focus on Cambodia and its neighboring countries of Laos, Thailand, and Vietnam.

The Contractor will guarantee that substitutions of team members will not be made for individuals selected without the approval of the USAID/Cambodia.

The Contractor will also ensure that the approved team members will be available for the full period of the assessment.

VI. Methodology

(1) Contractor shall review background documents, including:

- Environment: Concepts and Issues: A Focus on Cambodia, UNDP/ETAP Reference Guide Book, January 1999
- An in-depth study of the structures of governance, key issues and case studies of reforms, conducted by the Cambodia Resource Development Institute, published in October 2000.
- Environmental Profile: Cambodia, prepared by DAI for USAID February 1, 1995. (Contract No. 410-0004-C-00-3483, Regional Support Mission for East Asia; Bangkok, Thailand).
- Cambodia: An Environmental and Agricultural Overview and Sustainable Development Strategy, Michael D. Benge, USAID, November 20, 1991).
- USAID/CAMBODIA Result Review and Resource Request (R4) April 2001.
- USAID/CAMBODIA Concept Paper, Building the Foundation for Participatory Democracy and Sustainable Development in Cambodia.
- Relevant sections of the ADS Series 200 Programming Policy that illustrate current USAID policy for the presentation and write up of the document (i.e. ADS 201.3.4.10 Results Framework).
- Recent and ongoing donor projects (enclosed at the end of the SOW).

(2) The Contractor shall conduct interviews with appropriate USAID staff of the ANE and Global Bureaus in Washington. The team will also communicate before departure with USAID/Cambodia for advice on whom to interview in the field, and for help in scheduling appointments.

(2) The Contractor will request country clearances for the team from USAID/Cambodia.

VII. Statement of Work

The environmental review team shall carry out the following tasks:

Task 1: Prepare an overview and assessment of environmental and natural resource conditions and trends for Cambodia and its neighboring countries in the Mekong region. Identify environmental planning and management priorities for Cambodia, with appropriate attention to regional actions necessary to accomplish environmental objectives in Cambodia.

The overview of environmental conditions and trends will focus on the status of the natural resource base in Cambodia, particularly forests, biodiversity, agriculture (particularly the use and abuse of pesticides) and water resources, and review current management and governance systems affecting natural resource management. Other trends, such as urbanization, industrialization, changes in patterns of energy use are to be considered primarily as they affect management of Cambodia's natural resources or otherwise threaten to impact on Cambodia's social and economic development.

To develop this overview, the consultants will draw on secondary data sources such as national environmental action plans, relevant national analyses and strategies, and donor investment strategies to the extent possible. The contractors will also interview national and international specialists familiar with environmental policy and practice in Cambodia and its neighboring countries.

Task 2: Prepare a synopsis of current donor-supported environmental activities in Cambodia, and for the region as a whole, focusing attention on areas identified as priorities in Task 1.

The contractor shall develop a synopsis of current donor-supported environmental activities in Cambodia to identify programming gaps in current donor activities, and to identify options for appropriate USAID-funded interventions. The synopsis will be included in the final report as an annex.

Note: The Asia Forest Network has established Community Forestry Working Groups in the region, with active groups in Cambodia and Vietnam, and a dormant one in Laos. The Asia Forest Network (through its companion NGO, Community Forestry International) will receive funding from the Department of State/USAID's East Asia and Pacific Environmental Initiative.

Also it is worth noting that Conservation International has offered the government \$500,000 a year to halt logging contracts and create a wildlife sanctuary in the 6,000 sq. mile Cardamom Mountains. Since Cambodia is predominantly a Buddhist country, the activity initiated before the '97 coup on the translation and putting into a Cambodian context of the publication, "A Cry from the Forest: Buddhist Perception of Nature," should be revisited to determine its relevancy to present conditions in Cambodia. The training of Monks in community forestry should also be revisited as well.

Task 3: Identify and assess the capacity of partner organizations that can support the implementation of USAID-funded environment and natural resources management activities in Cambodia as well as elsewhere in the Mekong region.

The contractors will interview appropriate public and private sector representatives responsible for the management of environmental and natural resources in Cambodia, including forest management, watershed and river basin management, tourism, wildlife protection, parks, protected areas management and environmental health specialists.

The team will assess the capacity of these organizations, both public and private, to support potential USAID-funded environmental activities with their own technical and human resources adequate to achieve the objectives of these activities. Specifically, the viability of the following types of organizations will be addressed:

- Organizations or groups successfully promoting national identity and environmental awareness.
- Organized and progressive elements/groups that are pressing for environmental reform.
- Organizations or groups capacity to monitor government implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Organizations or groups able to assure government compliance with the rule of law, i.e., watchdogs, ombudsman organizations, media.
- Organizations or groups able to contribute to local and national decision-making.
- Important advocacy groups in the area of human/environmental including women's, youth, agriculture, environment and natural resources management and health groups.
- Civil Society organizations that advocate for increased transparency, accountability and participation related to environmental and natural resources issues.
- Business associations or other civil society organizations that not only focus on the Environment but Human Rights and Economic Growth issues as well.

Task 4: Prepare a report that incorporates the findings of tasks 1-3 above and an interim environmental strategic plan that provides programming options and recommendations through FY 2005.

The consultants shall prepare a report that summarizes the status and trends on Cambodia's environment and natural resources, identifies constraints to appropriate action. Examples should include inappropriate policies and subsidies, economic forces, institutional weaknesses, and lack of public participation in environmental decision-making.

The consultants shall provide programming options for USAID/Cambodia and its neighboring countries in Indochina that are consistent with the Missions' and the ANE Bureau's overall economic and social development objectives in the Mekong sub-region. The report will highlight programming opportunities that are complementary with other donor initiatives to develop the potential for leveraging technical and financial resources so as to maximize the Agency's investments at the country and regional level.

The consultants shall coordinate closely with the Democracy and Human Rights (DHR) Interim Strategy Design Team that will arrive in Cambodia just prior to the departure of the CERT. The consultants shall provide program/project recommendations into the overall interim strategic plan.

Additional Mandatory Technical Requirements to be included in the report.

Conflict Prevention Analysis

The team should prepare as part of the environmental assessment: (1) an appropriate vulnerability analysis that addresses the potential for conflict; (2) summarize the findings of such analyses in the strategy document; and (3) specifically indicate when and how these findings affect the proposed strategy. For example, the team should examine conflict over access to resource land use, as well as how this impacts the poor versus the rich. This requirement applies only to situations where clear potential for conflict exists. It is not intended for resolving, mitigating, or planning the recovery from current or past conflicts. There is no standard scope or methodology for the type of analysis that is most appropriate.

Gender Analysis

The environmental assessment must reflect attention to gender concerns. Unlike other technical analysis, gender is not a separate topic to be analyzed and reported on in isolation. Instead, USAID's gender mainstreaming approach requires that appropriate gender analysis be applied to the range of technical issues that are considered in the development of a given Strategic Plan. Analytical work performed in the planning and development of Results Frameworks should address at least two questions: 1) how will gender relations affect the achievement of sustainable results; and 2) how will proposed results affect the relative status of women? Addressing these questions involves taking into account not only the different roles of men and women, but also the relationship and balance between them and the institutional structures that support them.

VIII. Deliverables

To ensure that USAID's resources are strategically targeted, the Contractor will assess the current status and trends in environmental protection and management in Cambodia, and present options to USAID for engaging in environmental conservation and management.

The Contractor shall provide to the Cognizant Technical Officer (CTO) the following deliverables:

- (1) An assessment of the Cambodia Environmental Sector
- (2) An interim environmental strategic plan for assisting in the development of this sector.
- (3) Incorporate the interim environmental strategic plan into USAID/Cambodia's overall new three-year Interim Strategic Plan. The team shall to produce a "partial results package" detailing formal strategic objectives and intermediate results, as well as provide an overall assessment and program recommendations. This "partial results package" will incorporated into the Mission's overall three-year country interim strategy document.

Considering the importance of Cambodia’s environmental resources to its economy, results of the environmental analysis should be considered in designing civil society elements of the strategy. As a result, the team shall collaborate closely with the DHR Interim Strategy Design Team in recommending and designing civil society elements for the interim strategy. To the extent practicable, the team should examine and review those organizations that advocate increased transparency, accountability and participation related to environmental issues.

The final environmental sector assessment report shall include the following:

- (1) An executive summary, not to exceed three single-spaced pages, shall list in order of priority, the major findings, and conclusions, lessons learned and recommendations.
- (2) Body of the assessment report and interim strategic plan (preferably not to exceed 50 pages including all charts, graphics and tables).
- (3) A Biodiversity/Tropical Forest Annex which complies with the requirements of Sections 118 & 119 of the FAA.
- (4) Generally, the assessment report should be organized into “Findings, Conclusions, Lessons Learned and Recommendations.” The strategic plan should follow the ADS 200 for guidance when writing the final draft of the report.
- (5) The suggested programs should include clear statements of the overall objectives along with realistic expectations of what may reasonably be achieved.

Annexes

Additional material should be submitted as Annexes, as appropriate (e.g. Scope of Work, bibliography of documents reviewed, list of agencies and persons interviewed, list of sites visited, synopsis of current donor-supported environmental activities in Cambodia, etc.)

Draft Report

A copy of the draft report will be left with USAID/Cambodia at the out briefing prior to departure from Cambodia, in electronic as well as hard copy. The designated CTO for this activity in USAID/Cambodia shall provide its comments within ten (10) calendar days after receipt of the draft report.

Final Report

Once the team receives all written comments from USAID/Cambodia on the draft report, Contractor will have 15 days to finalize and submit the final report, incorporating responses to any and all comments. The final report shall be submitted to USAID/Cambodia (an electronic copy as well as 10 hardbound copies of the final assessment and strategic plan).

Electronic copies of the drafts and final assessments and plans will be presented on a diskette in the format "MSWord 6.0 for Windows." The report is the property of USAID, not the consultants or contractors, and any use of material in the report shall require the prior written approval of USAID.

IX. Technical Direction

Technical directions during the performance of this task order will be provided by: Dr. Kevin A. Rushing, DVM, Chief Office of General Development, USAID/Cambodia.

X. Terms of Performance

Work on this task order shall commence o/a July 2001 and be completed by no later than 65 calendar days after the effective date of the task order (including submission of the final report).

XI. Access to Classified Information

The contractor shall not have access to classified information.

XII. Logistical Support

The contractor shall be responsible for all logistic support needed to successfully complete the contract.

XIII. Workweek

The contractor is authorized up to a five-day workweek in the U.S. and a six-day workweek in the field with no premium pay.

Submitted to the United States Agency for International Development

Cambodia

**Interim Environmental
Strategic Plan**

Annex 1
to the
**Environmental Review: Status and Trends in Environmental
Management and Options for Future Action**

USAID Contract No. LAG-I-00-99-00013-00, Task Order No. 805

Submitted by:

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Acronyms

ADB	Asian Development Bank
ANE	Asia Near East (USAID)
AusAID	Australian Agency for International Development
CAA	Community Aid Abroad
CBNRM	Community-Based Natural Resources Management
CCSP	Commune Council Support Project
CDC	Council for the Development of Cambodia
CEDAC	Centre D’etude et de Developpement Agricole Cambodgien
CEMP	Cambodia Environmental Management Program (USAID)
CEPA	Cultural and Environmental Preservation Association
CFI	Community Forestry International
CI	Conservation International
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DANIDA	Danish International Development Assistance
DFID	Department for International Development (UK)
DFW	Department of Forestry and Wildlife/MAFF
DG	Democracy and Governance
DoLA	Department of Local Administration/MoI
EAPEI	East Asia and Pacific Environmental Initiative (USAID/ANE)
ENR	Environment and Natural Resources
ENRM	Environment and Natural Resources Management
FAA	Foreign Assistance Act
FAO	Food and Agriculture Organization of the UN
FFI	Flora and Fauna International
FY	Fiscal Year
GAP	Governance Action Plan
GEF	Global Environmental Facility
G/ENV	Global Environmental Bureau (USAID)
GIS	Geographic Information System
GTZ	Gesellschaft für Technische Zusammenarbeit (German Technical Assistance)
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
HR/DG	Human Rights/Democracy and Governance
IDRC	International Development Research Center (Canada)
IESP	Interim Environmental Strategic Plan
IPM	Integrated Pest Management
IQC	Indefinite Quantity Contract
IR	Intermediate Result
MAFF	Ministry of Agriculture, Forestry, and Fisheries
MLMUPC	Ministry of Land Management, Urban Planning, and Construction
MoE	Ministry of Environment
NCSC	National Council for Support to Communes/Sangkats

NEAP	National Environmental Action Plan
NGO	Nongovernmental Organization
NRE	Natural Resources and the Environment
NRM	Natural Resources Management
NTFP	Non-Timber Forest Product
PVO	Private and Voluntary Organization
RFP	Request for Proposals
RGC	Royal Government of Cambodia
SADP	Southeast Asia Development Program
SCSR	Supreme Council for State Reform
SIDA	Swedish International Development Agency
SO	Strategic Objective
STF	Seila Task Force
TA	Technical Assistance
TAF	The Asia Foundation
TFCA	Tropical Forestry Conservation Act
UK	United Kingdom
UNDP	United Nations Development Program
UNOPS	United Nations Office for Project Services
US	United States
US-AEP	United States-Asia Environmental Partnership
USAID	United States Agency for International Development
USFWS	United States Fish and Wildlife Service
USG	United States Government
WCS	Wildlife Conservation Society
WI	Wetlands International
WPO	Wildlife Protection Office/DFW/MAFF
WWF	Worldwide Fund for Nature/World Wildlife Fund

1. The Current USAID/Cambodia Program

USAID/Cambodia's program for FY 2001 is focused on democracy and human rights, reproductive and child health, HIV/AIDS prevention, assistance for war and mine victims, and microfinance. The present position of the US government towards assistance to Cambodia prohibits direct technical assistance to the Royal Government of Cambodia (RGC) but allows assistance to nongovernmental organizations (NGOs) and local government. If the US government changes its position and allows engagement with the central government, this will allow more scope for governance strengthening. The proposed Interim Environmental Strategic Plan (IESP) for USAID/Cambodia is designed to be integrated into the new Strategic Objective (SO) 1 that will result from the results of this assessment and a democracy and governance (DG) assessment to follow. The present SO 1, "strengthened democratic processes and respect for human rights," presents a clear vehicle to incorporate natural resources governance programming at the Intermediate Result (IR) level. The Mission's support for commune council elections to be held in February 2002 provides an excellent foundation for such assistance. At present, much of the conflict and human rights abuses in Cambodia reflect disputes over access to and control over land and natural resources. New laws and decentralization initiatives provide a legal and institutional basis for putting more control over land and resources into the hands of communities and local government.

USAID/Cambodia was formerly an important donor in environment and natural resources (ENR) through the Cambodia Environmental Management Program (CEMP) that was begun in 1996 and terminated in July 1997 as a result of the political conflict at that time. CEMP supported activities in environmental policy, applied environmental management, strategic planning, biodiversity conservation, environmental constituency building, and information management implemented through four US-based private and voluntary organizations (PVOs) and the International Development Research Institute (IDRC) of Canada.

2. USAID ENR Policies and Programs

For maximum synergy, the IESP for USAID/Cambodia should dovetail with the environmental policies and programs of the Asia Near East (ANE) Bureau, the Center for the Environment, the Center for Democracy and Governance and other Washington-based divisions of USAID. The IESP proposed here closely aligns with the ANE Bureau's environmental strategies of policy reform, capacity building, and increasing public involvement in governance and decision making. Moreover, the IESP clearly supports the USAID Center for the Environment's first SO: "increased and improved protection and sustainable use of natural resources, principally forests, biodiversity, and freshwater and coastal ecosystems." As the Center for Democracy and Governance continues to investigate correlations between democracy and the environment, further synergies are also likely at this strategic junction. The Administrator has recently instructed the Agency to articulate new environmental initiatives and the ANE Bureau will explore several programming areas including improved forest governance.

On a programmatic level, a number of activities that might be supported through this IESP will also enhance and benefit from various USAID regional initiatives. For instance, the East Asia and Pacific Environmental Initiative (EAPEI) of the ANE Bureau provides a mechanism for support of community protection of wildlife, community-based natural resources management (CBNRM), and related policy level work in select locations in the region including two activities in Cambodia. When the results from the EAPEI request for proposals (RFP) for 2002 are determined there may be other Cambodian programs as well. Another ANE Bureau program, the US-Asia Environmental Partnership (US-AEP), focuses primarily on "brown" issues, but some funding for collaborative "green" activities might be possible under the new US-AEP Environment and Civil Society Partnership program. G/ENV has Leader with Associates cooperative agreements with six partner conservation NGOs. This program is currently funding some Worldwide Fund for Nature (WWF) activities in the Lower Mekong including Cambodia. The USAID Secretariat for Implementation of Tropical Forestry Conservation Act (TFCA) facilitates payment of US government debt towards forest conservation activities that might be employed in Cambodia in the future. Cambodia has \$216 million in PL-480 debt to the United States but it is presently classified as "politically unlikely" of being eligible for debt-for-nature swaps. If this situation changes, TFCA may open up further conservation funding in Cambodia. Other programmatic linkages are also possible through the international work of other US government agencies such as the US Fish and Wildlife Service's (USFWS's) programs for tiger, rhino, and elephant conservation.

3. Proposed ENR IR Under SO 1

The following text is proposed for integration into the introductory statement of SO 1 as it is revised based on this assessment and the forthcoming DG assessment:

Governance of Natural Resources in Cambodia

Cambodia's rich endowment in forest, fish, and wildlife resources are on a downward trajectory of degradation and depletion that is adversely affecting the livelihoods of the rural poor and could gravely diminish the ability of natural habitats to support rare plants, animals, and aquatic organisms, many of which have already been lost in other countries of the region. Most rural Cambodians are below or at the poverty line and are exceptionally dependent on forests and inland waters for protein, nutritional supplements to household rice production, and cash income. Improved rural security in recent years has attracted international private sector interest to Cambodia's still relatively abundant timber and fish resources. A weak legal and institutional framework for managing natural resources combined with a chaotic and corrupt political environment resulted in illegal and unsustainable logging on a massive scale. Communities were displaced from traditionally owned lands and denied access to forest resources by powerful business and military interests. Businessmen were also given exclusive rights over rich inland fisheries upon which locally communities were dependent. Wildlife is unsustainably and illegally exploited to supply domestic markets, neighboring countries, and northeast Asia.

The Royal Government of Cambodia (RGC) has acknowledged that the ad hoc allocation of concessions and the unmanaged exploitation of forest, fish, and wildlife resources is a serious political, social, and economic problem for the country and has begun to see its solution in terms of improved natural resources management (NRM) governance, with more control over natural resources vested in communities and local government. The RGC has embarked on an ambitious program to improve governance and strengthen democracy at all levels. The Supreme Council for State Reform (SCSR), headed by the Prime Minister and supported by six reform councils, guides the DG reform process. The government is strongly encouraged and supported to implement DG reform by citizens, civil society, and donors. The RGC issued a Governance Action Plan (GAP) in January 2001 that describes specific governance improvement actions within a strategic framework in the following seven key areas: 1) legal and judicial reform, 2) civil service reform and decentralization, 3) public finance reform, 4) anti-corruption, 5) gender equity, 6) armed services reform, and 7) natural resources management.

The GAP states that fair resolution of NRM conflicts in the areas of lands, forests, and fisheries is essential to social peace and environmental stability, which are fundamental to poverty alleviation and economic development. The resolution of land use conflicts is seen by the government as critical to basic human rights and the development of a positive investment climate. The RGC recognizes that access to land as well as forest and fishery resources by the rural poor is necessary to ensure sustainable livelihoods and to alleviate poverty. In order to achieve more equitable and transparent NRM, the RGC has made a commitment to improved governance by strengthening the legal framework for land and NRM supported by

complementary measures to deconcentrate government functions and decentralize political authority.

The election of commune councils, scheduled for February 2002 and supported by the Mission under this SO, is a significant practical and symbolic step towards decentralizing authority to the level immediately above the community. The Commune Administration Law empowers elected commune councils to manage and use natural resources in a sustainable manner, although the councils do not have management authority over lands and resources within the national forest estate. The RGC has stated its commitment to building institutional capacity at the province, district, and commune levels of government while also creating a coherent and clear legal framework for local governance. The RGC recognizes that local government is best positioned to resolve the increasing number of land disputes and to counter the trend of growing landlessness among the rural poor.

Rural people need secure tenure to agricultural land and access to forest and fishery resources. The government recognizes that the livelihoods of rural communities are jeopardized by timber and fishery concessions and has taken initial steps to redress this problem through community use provisions in drafts of the Fishery Law and the Forestry Law. Large areas of inland waters formerly under concession have been turned over to community control and timber concessionaires must now allow community access to forest resources. The RGC recognizes that the degradation of forest and fisheries resources through unsustainable management will have a direct negative effect on rural livelihoods and that loss of associated royalties will further limit the government's ability to fund poverty alleviation programs.

The RGC created the Seila Program as a framework for deconcentration and decentralization reforms. Reforms under the current phase of Seila are focused at the province/district and commune/village levels to build capacity and strengthen administrative, finance and planning procedures. Development committees are being created at all levels from the province to the village to provide an institution for coordination, planning, and participation in development. Crosscutting themes of the program are gender, NRM, and poverty alleviation. Seila has done pioneering work in integrating NRM into all levels of development planning in Ratanakiri Province and plans to develop a strategy for replicating this approach throughout the country. Donor support for natural resources training and capacity building is needed at the province, commune, and community levels in order to apply this approach and tailor it to local natural resources and biodiversity values.

Proposed IR: Strengthened local governance of natural resources to secure community control over resources critical to rural livelihoods

Rationale and Approach

Support for community and local government control over land and critical natural resources strengthens governance at the grassroots level, improves the sustainability of NRM, promotes livelihood security and poverty alleviation, reduces natural resource-related conflict and human rights abuses, and has the potential to improve biodiversity conservation. USAID experience in other Asian countries indicates that community-based natural resources management (CBNRM) and strengthened local government NRM capacity often provide an important first

step toward democracy and gives local government the skills and confidence needed to promote civil society participation and transparency in other areas of public life. Experience indicates that good natural resources governance leads to general improvements in governance.

Cambodia is currently revising its entire legal framework for land and NRM to provide more use rights for rural people and more control by local government. At the same time, the RGC is increasing the scope of its Seila decentralization program to cover most provinces while focusing on local-level NRM procedures and capacity as a key element of the program. The next several years will be a critical period for USAID support of strengthened and decentralized natural resources governance.

On the human level, Cambodian farmers typically cannot grow enough rice to feed their families throughout the year and rely on access to natural resources in the forms of fish and non-timber forest products (NTFPs) during shortfall periods. Secure natural resource access is an important step toward household food security and poverty alleviation. In recent years, Cambodians have been displaced and deprived of the natural resource-derived portion of their livelihoods through allocation of timber, fishing, and land concessions. These appropriations, often illegal or quasi-legal, have led to violence and murder, which is probably a more significant source of conflict in Cambodia than political rivalry. Appropriation of traditionally owned land and resources deepens the poverty of rural families and may lead to starvation, especially when other factors are also contributing to increased landlessness. Violence resulting from natural resource conflicts and deprivation of access to natural resources critical for survival constitute important human rights abuses in Cambodia.

The Mission will build on the experience, goodwill, and relationships gained through its support of the commune council elections to nurture the development of NRM governance capacity at the commune as well as district and provincial levels of government. The mission's support of NGO efforts to expose politically motivated human rights abuses can form the basis of efforts to identify and curb human rights abuses resulting from NRM conflicts. Corruption is the root cause of many land and resource conflicts as well as the illegal harvest of wildlife and timber. Support of improved NRM governance provides the Mission with a point of entry to identify and counter corrupt practices in both of these areas.

Communities in many Asian countries have proven to be good stewards of forest and fishery resources when they have secure tenure over the resources along with appropriate institutions, legal support, and incentives for management. Under these conditions, resource management is often more sustainable than it would have been under government agencies or the private sector. Sustainable management not only ensures community incomes and livelihoods, but can also protect critical natural habitat and conserve the animals that depend on it. Communities often need awareness training, technical support, and additional incentives to pursue biodiversity conservation as part of their system of land and resource management.

The Mission will achieve this IR through entry points at the community level, at the commune and other local government levels, by influencing the development of national NRM policy and implementing regulations, and by influencing the behavior of the private sector towards communities. The bulk of resources will be invested at the community and local government

levels through several possible mechanisms. This multi-level approach will allow the Mission to promote information flow and discussion among the levels of government as well as take advantage of synergies with other IRs within SO 1. The four points of entry for this IR are described below along with a brief rationale and illustrative activities.

1. Community-Level Entry Point: Improved community control over management and conservation of forest and fishery resources.

There are a number of examples of successful CBNRM activities supported by NGOs and donors in various parts of Cambodia involving forest, fishery and coastal resources. These activities cover a limited number of communities and there is a critical need to introduce CBNRM to other resource-dependent communities incorporating lessons that USAID has learned through successful activities in Nepal, the Philippines, and Indonesia. The approach developed by USAID/Cambodia at the community level can then be introduced more broadly into the government decentralization program.

Illustrative Activities

- Assist communities to develop institutions to manage resources under their control.
- Assist communities to identify, value, map, and plan the management of their resources.
- Strengthen the capacity of communities to advocate for their resource use rights to government and the private sector.

2. Local Government Entry Point: Strengthened ability of commune councils and other levels of local government to implement new land and natural resource management laws and to reduce natural resource-related conflict and human rights abuses.

Upon election, commune councils will have a general mandate to implement NRM laws but no capacity or procedures to do so. In order for decentralized NRM governance to work at the commune level, significant capacity building will be required. Initially, commune councils will have meager financial resources and little experience relevant to NRM. During their first five years of existence, the commune councils are expected to play an important role in channeling local concerns over NRM issues to higher levels of government and in assisting communities with land and NRM planning. The ability of commune councils to access required technical and administrative knowledge will largely determine their ability to perform their intended roles and their effectiveness will significantly influence the pace and direction of decentralization and particularly local-level control over land and resources. Their ability to manage natural resources fairly and transparently will be one of the foremost governance issues at the commune level. Provincial and district levels are also limited in their ability to manage land and natural resources by weak or absent procedures and capacity for land use planning and limited means to identify and value land and resources used by local people.

Illustrative Activities

- Provide commune councils with legal and technical training that will allow them to play their intended role in NRM.

- Educate communities and resource users about their rights under new land and NRM laws and how to effectively advocate for recognition of their rights.
- Facilitate cooperation and joint activities between human rights/democracy and governance (HR/DG) and conservation/environmental NGOs and other civil society organizations.
- Assistance to establish land and natural resource conflict prevention and resolution mechanisms to be implemented at the commune and province levels.
- Support NGOs to investigate and publicize natural resource-related human rights abuses.
- Develop and foster mechanisms for inter-level and interagency cooperation with respect to NRM and land use planning at provincial and lower levels.
- Support conservation NGOs, in cooperation with the USFWS, to strengthen the ability of provincial-level government agencies to control the illegal harvest and trade of wildlife and timber.

3. Legal Framework Entry Point: Support civil society to participate in the process of national-level consultations to refine and monitor the implementation of the legal framework for land and natural resource management as they relate to CBNRM and NRM governance at provincial and lower levels.

The Mission is currently prevented from direct engagement with national-level agencies responsible for NRM and biodiversity conservation but lessons learned from implementation of CBNRM activities and local-level NRM governance can enter into national-level policy dialogue via NGO, international organization, and donor partners. USAID can also seek to influence policy through public awareness campaigns and support of civil society organizations to participate in NRM-related political dialogue. Drafting of regulations to implement the Forestry, Fishery, and Land Laws will present important opportunities to affect policy over the next year or two.

Illustrative Activities

- Disseminate to donors and NGOs lessons learned from natural resources DG activities at the community and local government levels and support NGOs to advocate the incorporation of these lessons into government policy.
- Support NGOs to participate in the process of consultation and review of implementing regulations for soon-to-be approved Land, Forestry, and Fishery Laws.
- Support NGOs to identify illegal activities and corruption related to NRM and bring their findings to the attention of the government and the public.
- Provide public awareness and environmental education to help citizens participate in the political dialogue about NRM and biodiversity conservation.
- Encourage NGOs to develop mechanisms for ENR conflict prevention and resolution.
- Support NGOs to monitor the enforcement of ENR laws.

4. Private Sector Entry Point: Facilitate improved natural resources management by the private sector through recognition of community rights and innovative partnerships with communities and communes.

Domestic and international firms involved in natural resources extraction in Cambodia have long been considered a major part of the problem of poor NRM as well as the driving force behind corruption and many human rights abuses. Current efforts by the RGC to cancel poorly performing forest concessions and the vast reduction in the number of fisheries concessions provide an opportunity to assist those private sector firms who are interested in playing by the new rules of natural resource governance as articulated in the new Land, Forestry, and Fisheries Laws. Decentralization of NRM authority to the community and commune levels may also provide an opportunity to nurture the development of small businesses to support land and natural resources planning and impact assessment.

Illustrative Activities

- Devise and demonstrate incentives and approaches for the private sector to partner with communities and communes to manage and market natural resources.
- Support NGOs to establish forest certification in Cambodia as a private sector-driven means to improve forest management, and in the context of this IR to use certification as a leverage point to gain recognition of community resource use rights by concessionaires.
- Create the opportunity for the growth of small, knowledge-based businesses by giving communities funds and guidance to hire local firms to assist them with natural resources and land use planning as well as environmental and social impact assessment, if warranted. This would create 1) an incentive for the private sector to offer services usually provided by government or NGOs, 2) a new business niche in rural areas, and 3) employment for university graduates in natural resources and agriculture.

4. Programming Approaches, Costs, and Design Issues

4.1 Approaches and Costs

The programming options and illustrative activities presented in Section 3 can be used to selectively build a natural resource governance IR for USAID/Cambodia at various funding levels. The program design will take advantage of synergies with other SO 1 programming that will emerge from the upcoming DG Assessment. The natural resources governance needs identified in the IESP are significant and worthy of USAID assistance. Most of these needs are amenable to effective and useful interventions at various levels of funding. The presence of a large and diverse group of international and domestic NGOs operating in both ENR and DG provide a wide variety of partnership and programming options in addition to direct technical assistance. The following general approaches to implementation of the IESP correspond with the indicated levels of annual funding commitment over the coming three fiscal years:

Basic Programming (\$1 to 1.5 million): This approach would generally rely on implementation of activities by NGO partners with a relatively narrow programming and spatial focus. Indefinite Quantity Contracts (IQCs) could be employed to assist with detailed program design as well as provide carefully targeted technical assistance. Buy-ins to existing global and ANE programs would be an option at this programming level.

Intermediate Programming (\$2 to 3 million): This approach would provide enough funds to allow the implementation of a relatively broad programming package directed at a suite of related issues in one or two target provinces with supporting national-level NGO advocacy. A mix of mutually supporting technical assistance (TA) and NGO programs could be designed, with IQCs or other contracting mechanisms providing longer term or more comprehensive TA.

Comprehensive Programming (\$4 to 5 million): This approach would broaden the intermediate programming approach to comprehensively address a suite of related issues, bring in more partners, and possibly work in additional provinces. This approach could be built around a long-term technical assistance contract or a number of shorter contracts. A year or more would be required to establish a program that could absorb this level of funding.

USAID funding of an ENR IR at either the intermediate or comprehensive programming level would allow the Mission to make a significant contribution towards solving one or more of the pressing natural resources governance challenges identified in the IESP and thereby also have a positive effect on poverty alleviation, the growth of civil society, and biodiversity conservation. Cambodia's success at overcoming major challenges in managing its land and natural resources will have an enormous effect on the lives of rural people and economic development at all levels.

4.2 Design Issues

Adaptive Planning: NRM is evolving rapidly in Cambodia as the legal framework is strengthened, government NRM authority is decentralized, and donors launch new projects and programs to assist the RGC and local government during this period of rapid change. Planning and programming must keep pace with new developments in this rapidly changing environment. Despite the growth in ENR donor assistance, many needs remain unfilled in terms of 1) local and community-level natural resource governance and planning, 2) innovative conflict resolution mechanisms, 3) assistance to provinces and districts not being reached by other donors, and 4) engagement of the private sector. Specific NRM governance assistance needs, especially with respect to commune councils, will become clearer as implementing regulations of the Commune Administration Law are promulgated and donor/NGO studies of commune council support needs are finished. A general guideline on commune land use planning is currently being formulated. Seila is currently developing a strategy, due to be finalized in November, that will provide a road map for mainstreaming NRM at provincial and lower levels of government. This strategy will identify specific assistance needs.

Donor Coordination: When funding levels for the proposed ENR IR are known and areas of interest have been chosen from among the illustrative activities in the IESP, the Mission should coordinate programming carefully with other donors to avoid duplication of effort and to ensure the most effective use of USAID funds. All of the bilateral and multilateral donors interviewed during the ENR assessment welcomed USAID's participation in natural resources governance and felt that additional donor assistance is clearly needed given the magnitude of the task. The DANIDA Natural Resources and Environment Programme Manager specifically recommended that donor coordination occur through the Council for the Development of Cambodia (CDC) as informal coordination is unlikely to be successful. A number of donors pointed out that all donors working with local governments should use the RGC's Seila decentralization program as a framework for assistance. Funds can be channeled directly to the provincial level under Seila or parallel to Seila funding channels and managed through separate bank accounts. Implementation under Seila is flexible, the most obvious options being partnership with the United Nations Office for Project Services (UNOPS), partnership with another donor, through NGOs, or by contracting the services of a consulting firm.

5. Potential Partners

Potential partners for USAID programming within the four entry points of the new IR include local and international NGOs, local government, central agencies, other donor programs, and the private sector.

5.1 PVOs

PVOs concerned with NRM issues in Cambodia fall into three categories: 1) local grassroots NGOs working on local issues, often with support from an international partner or “parent” organization; 2) Cambodian national NGOs with a broader thematic focus, again often with external mentoring and support; and 3) international NGOs, which have considerable technical and management capability and are building capacity among their local colleagues. Few local or national NGOs are fully capable of independent programming, with almost all relying on an expatriate organization for leadership and financial support. USAID programming should focus on the leading PVO players, strengthening their ability to build capacity among Cambodian NGOs.

The Asia Foundation (TAF): Programming in Cambodia is focused on human rights and governance issues. Recognizing that human rights violations are at present less frequently political and more frequently to do with control over natural resource access, the Foundation has begun to examine which NGOs are best positioned to work in the NRM area, what are their strengths, and how to develop supporting partnership relations with them. Their program will attempt to reduce community-level conflict and rights violations over natural resources through supporting community organizations, will seek to educate citizens on their rights relating to natural resources, and support their participation in the development of government legislative and policy. The Foundation intends to organize a Conference on Democracy and Natural Resources Management, which would begin with sessions at the provincial level, culminating in a national conference in Phnom Penh. TAF can be expected to play an effective leadership and coordination role in NRM governance.

NGO Forum on Cambodia: NGO Forum is a membership organization made up of over 60 Cambodian and international NGOs. The forestry subprogram has been effective in its interventions at the national level of debate on forest management, and is now broadening its focus to strengthen local communities in protecting their rights of access to forest resources. NGO Forum is currently circulating a project proposal to *Promote Good Governance and Democracy Building in the Forestry Sector*. The objectives of this project are to build a nationwide grassroots network to empower communities to protect their rights to natural resources access and to contribute to improved governance by strengthening civil society input into government decision making.

Wildlife Conservation Society (WCS): WCS is a US-based international NGO with a history of conservation activity in Cambodia going back to the 1950s (then as the New York Zoological Society). Activities include the dialogue between the Department of Forestry and Wildlife (DFW), the timber industry, and the NGO community; working directly with one of the forest concessionaires (SL International – Samling) to conserve wildlife in the concession;

and developing a proposal for establishing a conservation area through landscape management in the northern plains region, an area of considerable importance for biodiversity conservation (Prey Vihear and neighboring provinces).

CONCERN Worldwide: CONCERN focuses on community forestry, conflict resolution between local communities and forest and agricultural concessionaires, and at the policy level on providing inputs to the drafting of the Community Forestry Sub-Decree. Training of trainers for community forestry and participatory land use planning is through CONCERN's support to the Cambodia Community Forestry Training Center.

Worldwide Fund for Nature (WWF): WWF is an international NGO based in Switzerland. The Cambodia program is strongly supported by the US WWF affiliate. The program focuses on ecoregion-based conservation planning, protected areas management, biological and ecological assessments, CBNRM, the wildlife trade, and sustainable forest management. WWF is undertaking a geographic information system (GIS)-based study of poverty impacts of forest concessions on neighboring communities. WWF's ongoing project, Dry Forest Landscape Conservation Initiative - Resource Rights and Planning, which is strongly oriented toward improved NRM governance and CBNRM, has been supported by USAID funds via TAF.

Community Forestry International (CFI): CFI is a US-based organization collaborating regionally with the Asia Community Forest Network to support the development of policies and procedures to enable communities to participate effectively in forest management. A proposal to this end has been submitted to EAPEI this year.

Wetlands International (WI): WI, an international NGO, has been doing CBNRM in coastal and other areas in Cambodia, in particular in the communities dependant on the mangrove ecosystem at Ream Park on the Gulf of Thailand coast. Funding to WI for this work has been on a project basis, from several donors especially the Asian Development Bank (ADB) and DANIDA.

Conservation International (CI): This US-based NGO has recently begun a program to support DFW to conserve a large tract of forest between two protected areas in the Cardamom Mountains. Their current efforts are directed primarily towards protection and enforcement, but they plan to develop community-based activities. These two organizations are collaborating in and around the Cardamom Mountain area on a number of wildlife protection and protected areas initiatives. Although their focus is not now at the community level, it may become more so in the future.

Flora and Fauna International (FFI): FFI is a UK-based NGO that has been instrumental in calling international attention to the biodiversity value of the Cardamom Mountains and will soon begin to implement an Global Environmental Facility (GEF)-funded project there that will include involvement of local government in conservation planning.

Oxfam: Oxfam Great Britain (Oxfam GB) has conducted a series of studies on landlessness and has explored the relationships between natural resources and livelihoods. Oxfam GB and

Oxfam US are both building CBNRM into their projects and working to empower communities to manage their natural resources.

CARE: CARE was one of the principal partners in the former CEMP Program (see Section 6), but its portfolio does not currently contain any activities that are explicitly oriented toward NRM. CARE mission management expressed an interest in re-engaging in CBNRM.

Community Aid Abroad (CAA), and Cultural and Environmental Preservation Association (CEPA): This partnership of an international and a Cambodian NGO has been working successfully with fishing communities on CBNRM in Steung Treng province, as well as on policy development at the national level.

Mlup Baitong (Green Shade) and Southeast Asia Development Program (SADP): These two NGOs have been working primarily in the Kirirom National Park, with support for community education and organization in the buffer zone, ranger training, alternative livelihood development, and an environment program for national radio broadcast.

Save Cambodia's Wildlife (Sandkrohs Satprey): Save Cambodia's Wildlife works with the Wildlife Protection Office of the DFW, and with the Ministry of Education, Youth, and Sport in carrying out educational programs on wildlife conservation, mostly in Prey Vihear Province in the northwest. Some funding for staff training has been provided by TAF.

Centre D'étude et de Developpement Agricole Cambodgien (CEDAC): CEDAC works mainly in the provinces of Kandal, Kampong Chhnang and Prey Veng on CBNRM, sustainable agriculture, training farmers, field research, integrated pest management (IPM), organic agriculture, and training of rural youth.

Commune Council Support Project (CCSP): CCSP is a joint project of several NGOs working to build capacity of commune councils with support from GTZ and AusAID as described in Section 8. Could be a vehicle to support NRM at the commune level.

5.2 The Private Sector

Large private enterprises are perceived as among the leading villains in the NRM sector, especially in forestry. This is largely a fair assessment. However, the present attempt by the RGC to implement a new and sustainable management regime in the forest sector offers an opportunity to build bridges with those private sector players who are willing to behave more responsibly once the rogues' concessions have been cancelled. Improvement has already begun in some cases. Forest certification, currently supported by WWF, offers economic incentives for improved forest management on the part of concessionaires.

Land use planning and environmental impact assessment at the local level present an opportunity for encouraging the growth of Cambodian professional services firms in the area of NRM. Effective demand on the part of provincial and commune administrations for technical services in these aspects of NRM will trigger a supply response in the development of Cambodian consulting firms perhaps with international partners (e.g., Ta Prohm Environment

Ltd.) and private sector-oriented NGOs (e.g., Enterprise Development Cambodia). Some of these services are being delivered by NGOs, but the need is much greater. There is also potential for concessionaires to work directly with local communities as described in the illustrative private sector activities in Section 3.

5.3 Donors

Donor programming in NRM in Cambodia is growing and coordination is needed. Informal coordination is provided by the Donor Working Group on Natural Resources Management, co-chaired by ADB and the Food and Agriculture Organization (FAO). However, this body tends to be issue focused rather than concerned with broader programming. In the longer term, the appropriate body for donor coordination in NRM and other domains is the CDC, and new programming in NRM should be done in consultation with that body. It is worth noting that one of the problems of institutional development in Cambodia is the history of project-centered assistance from donors, at the expense of more institutionally integrated support. The USAID CEMP project was a welcome if only partial exception, and program coordination via the CDC would contribute to strategic integration.

At present the major donors in NRM and related governance work are the World Bank, ADB, DANIDA, United Nations Development Program (UNDP), UK Department for International Development (DFID), Swedish International Development Agency (SIDA), and FAO, in approximately descending order of size of contribution.

5.4 Government

Identification of potential partners in the central level of the Royal Government, and a strategy for engaging with them, is provided in Section 6. That strategy is partly premised on the emerging structural and functional relations between central agencies and local government institutions, which are themselves evolving rapidly. At local level, the soon-to-be-established commune councils offer an attractive opportunity to support a democratically elected grassroots-level institution that has an important, if currently ill-defined, mandate for NRM. Support of provincial governments is an important option as more power is being deconcentrated to this level and provincial governors have the full spectrum of sectoral technical agencies at their command. Provinces also have the power and capability to address large-scale land use issues like forest conversion to agriculture. The results of current decentralization initiatives should make local government partnership options clearer by early 2002.

6. Strategic Approach to the Royal Government

The Ministry of Agriculture, Forestry, and Fisheries (MAFF) and the Ministry of Environment (MoE) are the obvious government recipients of donor support in the NRM sector. The DFW within MAFF has considerable donor support with respect to forest management and limited support with respect to wildlife management. DFW is an important potential partner because it manages the national forest estate, but the department suffers from internal conflicts resulting from its dual roles in conservation and timber production. The Department of Fisheries is the key player in fisheries management and will be the leading force behind the shift toward more community involvement in fisheries management under the leadership of its proactive Director General.

The MoE has had little donor support since the closure in 1997 of the USAID-led, multidonor project, CEMP. The design of that project was very sound, including donor coordination in partnership with senior ministerial officials, and a broad scope of capacity building in the various departments. Protected areas management, IPM and pesticide use regulation, and the preparation of the National Environmental Action Plan (NEAP), all figured prominently in the scope of work. A resumption of support to MoE in a comprehensive institutional capacity-building mode like the CEMP project presents an attractive (but by no means simple) programming opportunity given the institutional weaknesses of MoE. A recently initiated World Bank project is providing some support for protected areas management and the DANIDA Natural Resources and Environment (NRE) Program will provide capacity-building assistance. The NEAP is now overdue for evaluation and a second iteration.

The Ministry of Land Management, Urban Planning, and Construction (MLMUPC) is relatively new but is quickly moving to play an active role in land use planning and titling with assistance from several donors. Given the relatively technical nature of its work, MLMUPC would have to be considered a secondary partner for USAID programming in the area of improved natural resources governance.

More generally, a strategy for engagement with the RGC in the domain of NRM would have two major aspects, which share the property of responding to the Royal Government's expressed commitments to democratic reforms, especially of decentralization and deconcentration, transparency, and public participation, by

- contributing to the development of capacity at local government levels and in those units of the national government which relate directly to and support them; and
- focusing particularly on those aspects of institutional development where democratic processes of public stakeholder consultation have been mandated and begun, but where resources are lacking to carry out such processes on a broad scale.

Some examples:

- i) National Council for Support to Communes/Sangkats (NCSC). The initial mission report of the GTZ/ADB Decentralization Roadmap Study (18 August 2001) suggests three components of support for the commune councils: 1) strengthen the operating capacity of the Department of Local Administration (DoLA) in the Ministry of Interior and of the NCSC which it serves, 2) train local councils to learn how to play their roles and discharge their responsibilities, and 3) implement the intended review of commune boundaries (to make boundaries more rational and reduce the number of communes).

Support to DoLA itself is likely to come from GTZ and other donors, with whom the proposed program could partner to provide support to the commune councils. The GTZ/ADB mission report states the council support needs:

“Commune/Sangkat councils’ role in service provision will be very limited in the first mandate [after the commune elections of 03 February 2002]. They will take over civil registration functions from commune chiefs, and most rural councils will be involved in rural development planning through Seila. However the Commune/Sangkat representative role – linkages between the council and villages, channelling local concerns over natural resources management issues, lobbying districts and provinces about quality and transparency of service delivery etc. is appropriate for all councils, and, whatever the outcome of the boundary review, will be a core role of the future. Strengthening commune/sangkat capacity to better perform this representative function might be a second objective of the first mandate. However with over 1800 commune/sangkat, district and provincial administrations, any NCSC actions in relation to systems development, promulgation of materials and training will be expensive, and current budgets are minimal.”

Preparation of a sub-decree under the Commune Administration Law is now underway, and the Royal Government has mandated the DoLA to engage a public and participatory process in its development, to be completed before the elections. Elaborating regulations under the sub-decree will be an on-going process, and NRM issues will be a key component.

- ii) Review of commune boundaries. Present commune/sangkat boundaries require redefinition, as there are too many and some are too small to be viable democratic governance units (larger communes would have greater capacity and revenue, enabling them to take on more decentralized functions). Optimal size and actual boundaries will be complex issues concerning local revenue, NRM and land use planning, and the structure of government *vis-à-vis* services/authority of line ministries. It will be important that technical assistance be made available as soon as possible after the elections, so that changes can be determined well in advance of the beginning of the second commune/sangkat mandate, in about 2007. Clearly this represents a strategic programming opportunity in a technical and political process involving central and local participants.

Engagement over a five-year period would be required with the NCSC and the DoLA in the Ministry of Interior, either directly, through civil society partners, or in a donor consortium.

- iii) Seila. While not all observers are equally satisfied that the Seila program represents the best or only approach to implementing rural development programs through local governance structures, it is clear that the Royal Government's commitment to it is very firm. The GTZ/ADB report points out that the functional relationship between the Seila Task Force (STF) and the NCSC is a complementary one, Seila being concerned with implementation and NCSC being concerned with the legal and procedural framework. Support to equitable management of natural resources through the Seila structure offers several advantages to a donor concerned with democratic change on the one hand, and with carefully circumscribed engagement with the central government on the other.

Funds supplied via Seila are managed in a very transparent and accountable manner, financial procedures at local level being a key component of the capacity-building work of the program. Accounting at the national level with the STF provides means for earmarking funds to particular places and functions, or for contribution to core Seila requirements. Seila funds are playing and will increasingly play a critical role in enabling local government units to undertake key rural infrastructure projects in response to local demand as articulated in the development committees in the villages and in the commune councils. Water supplies, and tertiary roads supplying access to services, markets, and patches of natural resources, will be fundamental assets for viable communities, and the community-based management of such infrastructure is a key function of local government. In themselves, they are tangible outputs to which a donor can point as evidence of impact. More importantly, contributions to building local capacity for their sustainable management will help build the rural economy, on which Cambodian democracy must depend. Seila is now in an expansion phase after some years of experimental development, and resources are urgently needed for its full deployment to all provinces.

- iv) CDC. Finally, given the multifaceted and multi-institutional aspect of NRM, it can be argued that the institutional high ground for donor support in the sector is in fact at the CDC, which has a mandate for the coordination of all donor support to the RGC. While the CDC may have been a weak and possibly dysfunctional institution prior to 1997, it has since then emerged as a serious component of the public and private investment planning process. The government recently appointed the rather dynamic Minister of Commerce as the Vice Chair of the CDC, recognizing the important linkages between investment and international trade. Taking into account that the government's "Pro-Poor Trade Development Strategy" includes the diversification and commercialization of agriculture as a key component, and that such a policy has obvious NRM implications, it would appear that CDC itself will have an important high-level role in NRM. The CDC's position as coordinator has prompted DANIDA to use the CDC as a counterpart for its very large intervention in the NRM sector.

7. Relationship of the IESP to the Recommendations in the Tropical Forest and Biodiversity Annex

7.1 Overall Recommendations for Further Biodiversity and Tropical Forest Conservation Actions

The Tropical Forest and Biodiversity assessment prepared to fulfill FAA Regulations 118 and 119 was researched and written in parallel to this parent ENR report. The full assessment is attached as Annex 2 to the main report, and its principal recommendations are summarized here. This chapter serves to show how well the overall recommendations presented in this IESP relate to the recommendations contained in the 118/119 assessment. The recommendations included in the biodiversity annex are:

- 1. Local government agencies at the provincial level need to be strengthened in their efforts to understand and enforce existing natural resources laws and regulations.**

The present situation in Cambodia is one of a near total lack of enforcement of laws relating to fisheries, wildlife and forests. Even in cases where the will exists, relevant agencies and authorities at the provincial level do not have the equipment or expertise to effectively enforce these laws. Providing appropriate tools and training to provincial fishery and forestry departments could have a strong and noticeable impact towards safeguarding key natural resources in these areas.

- 2. New policies and laws need to be developed that provide a better framework for conservation and sustainable use of forests and biodiversity.**

In many cases the existing natural resources policies and laws are not biologically sound, do not ensure community access to land and natural resources, and do not appropriately handle the necessary role of communities in managing resources at the local level. While important new laws are being finalized, support is still needed to strengthen civil society to advocate development and implementation of appropriate implementing regulations.

- 3. Communities need to be strengthened in their understanding and capacity to sustainably manage the natural resources within their domain.**

In some cases, communities already have access to land and natural resources but could benefit from an increased understanding and better tools to use these in a more sustainable manner. Under a new Community Fisheries Sub-Decree, communities are being given access to resources that have formerly been in private hands. In both cases capacity-building efforts are needed at the community level to ensure their understanding of relevant policies and to help them sustainably use and manage these resources.

- 4. Appropriate management plans need to be developed and implemented for important protected areas and key resources.**

Protected areas in Cambodia have largely been set up without a clear understanding of the biodiversity and natural resources contained therein. The entire protected area system in Cambodia needs a full review to ensure that it contains areas that contain a representative sample of the nation's biodiversity. Each protected area needs a well thought out management plan and the capacity to enforce it. Strong consideration must also be given to the sustainable use of key natural resources by communities that have traditionally depended on them.

5. CITES efforts need to be strengthened and the trafficking of wildlife species needs to be curtailed.

Although Cambodia is a party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), it has so far not been strong in implementing actions to reduce the trade of wildlife and natural products across its borders. The role of NGOs in monitoring CITES compliance needs to be strengthened along with the relevant government entities charged with enforcement. The provisions of a new Wildlife Law, currently in draft, will give the DFW greater legal authority to control the wildlife trade.

6. The management rights of private sector timber concessionaires and commercial fishing block holders must be appropriately defined and enforced to reduce conflicts with local communities and to avoid unsustainable extraction of Cambodia's natural resources.

Within Cambodia, many large blocks of natural resources are allocated to timber and fishery concessionaires. Regulations regarding management of these resources and giving appropriate access to communities must be strengthened; sustainable management plans must be developed; and the concessionaires' compliance with these plans must be enforced. The RGC is revising the legal framework and has begun to take steps to meet these requirements.

7. Capacity-building efforts are needed to strengthen the knowledge base of natural resources managers in government agencies and NGOs and to strengthen Cambodian institutes of higher education to produce graduates with such knowledge.

Cambodia lacks educated and trained individuals in positions of responsibility and authority within its government agencies at all levels, and within the NGO and university communities. More students need to receive training in areas of NRM and conservation so that they can fill some of these gaps. In addition, the national university system requires institutional strengthening to enable it to fulfill its role in educating the future generation of natural resource managers in Cambodia.

8. More information, environmental education and awareness programs about forests and biodiversity are needed in Cambodia at all levels.

Among the Cambodian public, there is limited awareness of the nation's biodiversity riches and conservation needs. More education and awareness programs need to be developed and implemented for targeted audiences ranging from school children, to community groups, to the

general public. These efforts need to include all media, such as radio, videos, billboards and in-person discussions in order to have maximum effectiveness in this largely illiterate country.

9. A database of information on species and their occurrence in Cambodia needs to be established and the relevant data collected from the field to enable effective management of biodiversity resources.

At present there is a scarcity of information about the presence, distribution and life history information for most species within Cambodia. As part of institutional strengthening programs, a database of species information needs to be set up and data needs to be collected from the field before Cambodia's biodiversity can be effectively managed and conserved.

10. Geographical focus: Local and provincial level biodiversity and forest conservation activities are especially scarce but critically needed in the dry dipterocarp forests and associated wetlands and river stretches of the northern plains and adjacent highlands.

The northern plains of Cambodia and adjacent highland areas stand out for the convergence of rivers with diverse fish species with some of the largest remaining tracts of dry dipterocarp forests in mainland Southeast Asia. Within these forests are small wetlands that support sizeable populations of large and elsewhere rare waterbirds and large mammals such as wild cattle, elephants, and tigers. This area has not yet attracted much donor attention and needs to be recognized and supported soon before key resources are lost. Community-level work in these areas would have the greatest impact on conservation of globally important biodiversity and important forest habitats. If funding for community- and provincial-level work is limited, it is suggested that it be focused here first.

7.2 Analysis of Relationship between the Proposed IR and the 118/119 Assessment

The points of entry and illustrative activities suggested in this IESP are closely related to a number of the overall tropical forest and biodiversity conservation recommendations presented in this report. Some of the most salient overlaps are considered here.

The proposed community entry point 1 clearly corresponds to biodiversity recommendations 3 and 8 that involve empowering local people to manage their own resources and providing them with knowledge about them. Community control over their resources is also a factor that can be addressed through policy changes described in recommendations 2, 4, and 6.

Entry point 2, local governments, just as clearly responds to biodiversity recommendations 1 and 7 and to some degree with recommendations 2, 4, 6, and 8 as well. In all of these recommendations, it is important that the local government entities be strengthened, empowered, and educated to perform their natural resource-related responsibilities effectively.

Similarly, entry point 3, concerning legal frameworks, closely dovetails with biodiversity recommendations 2, 4, 5, 6, 7, and 8 which all involve civil society to one degree or another in efforts to learn more about and monitor the enforcement of existing laws and to work on the development of new and more effective ones.

The private sector entry point 4 also closely corresponds to biodiversity recommendation 6 with overlaps in other recommendations as well. Although presently in Cambodia the private sector presents some of the greatest impediments to biodiversity conservation, this could turn around, and more appropriate involvement of the private sector could be an asset.

If the local- and provincial-level work outlined in all the entry points focuses on the northern plains and associated wetlands and river stretches then biodiversity recommendation 10 will be addressed as well.

The only biodiversity recommendation not covered in some way in the proposed IESP is Number 9, which requires a scientific perspective most likely beyond the purview of USAID programming. Although implementing recommendation 9 will have long-term positive effects, right now the threats to forests and biodiversity in Cambodia are immediate and severe. Addressing items 1 through 8, with a focus on geographical recommendation 10, will go a long way towards facilitating the more immediate and necessary actions.

7.3 Conclusions

As can be seen in this section, the points of entry suggested in the IESP strongly overlap a number of the tropical forest and biodiversity recommendations suggested in this section. If any of the illustrative actions are funded in support of these points, then they will also help address the loss of natural resources and biodiversity. The present situation in Cambodia is putting undue stress on remaining natural forests, wetlands, and aquatic ecosystems and to the fish, wildlife, and plant species that live within them. Any and all actions that are funded by USAID to address this situation are sure to help the people of Cambodia who depend upon these resources and will in turn greatly aid international biodiversity conservation efforts.

8. Natural Resource Conflict Prevention Analysis

Cambodia's widespread conflicts over natural resource ownership and management are even more pronounced than in most developing countries, largely as a result of the political chaos and wars that have shaped Cambodian society over the last three decades. Villagers, displaced persons looking for a place to live, and private sector firms eager to gain access to land and resources are the key actors in the conflicts. Conflict is expressed in a range of ways from smoldering resentment to armed violence that often results in death, usually of villagers at the hands of guards hired by concession owners. Important underlying causes of natural resources conflict in Cambodia are the lack of a clear private and state property rights regime and the absence of legally guaranteed access to the natural resources on which people depend for survival. Most rural Cambodians are engaged in subsistence farming and rely on access to natural resources and land for their livelihood and for whom this access is a basic human right.

Land and resource grabbing by powerful individuals and firms is the most visible cause of conflict. Forest concessions covering 40 percent of the nation's land have been granted to well-connected foreigners and local elites under discretionary authority of self-interested civil and military officials. This was done without public process or consideration of the customary use rights of local populations to timber and NTFPs that they rely on for subsistence and cash income. Large areas are now being allocated to agricultural concessions that will clear the remaining forest and thereby completely eliminate community access to forest products. Cambodia's extensive freshwater fishery resources are mismanaged in much the same way. The result is extensive and sometimes violent confrontation between local communities and the armed guards of the concession holders. "Land grabbing" is not the only factor that limits people's rights to subsistence and other economic use of natural resources. A large proportion of the population is clustered around the poverty line, and misfortunes such as an illness in the family push many poor families into landlessness. These families then become more reliant on gathering of "common property" resources including illegal hunting, or perhaps worse yet are forced to put their children into exploitative wage labor including the commercial sex industry.

Conflict over natural resources will be reduced by 1) the implementation of a legal regime which defines the property and access rights of the citizenry and their communities, and the responsibilities of all levels of government in ensuring them; 2) the building of capacity in national and local government to plan and manage land use wisely, and to mediate conflict effectively, and 3) the empowering of civil society to organize, collect, and share information, and to assist individuals and communities in the political process of ensuring equitable access to the means of a decent life. The RGC has already begun putting in place a legal framework and other governance actions that provide a basis for achieving these objectives, but political will, resources, and support/pressure from civil society and the international community will be needed to ensure that progress continues toward meeting the objectives. Development of locally effective means of conflict mediation and resolution will take time, given the mistrust of authority and mistrust within communities engendered by the Khmer Rouge social experiment, the Vietnam-controlled regime which followed, and the rampant corruption which has ensued over the past decade.

Two top priorities for conflict resolution are a legal means to assign private property rights under the new Land Law and means to assign management rights to communities under the new laws on Land, Forestry, and Fisheries. With multidonor support, MLMUPC has begun the systematic registration of land titles at village and commune levels in two provinces. Systematic registration includes survey, public display of survey results, and a socially transparent process of adjudication administered by local officials. GTZ pilot work confirms that these processes effectively ensure minimum conflict over the “natural justice” of who has title to what in Cambodia’s previously confused land tenure regime. With over 13,000 villages in the 1,600 communes of Cambodia’s 230 districts and 24 provinces, this primary task is an enormous one. The planned program covers only 11 provinces over 10 years, and additional donor support will be needed to extend the program to the rest of the country in reasonable time. Community based management of natural resources is supported by provisions of the new Land Law and draft Forestry Law as well as more detailed implementing regulations in draft sub-decrees on community forestry and community fisheries. NGOs have begun to assist communities to assert these rights, but much more assistance is needed to overcome ignorance and willful obstruction by government officials and the private sector.

Conflict prevention will also depend on the capacity and willingness of stakeholders to effectively play their roles in the NRM process. Commune councils will be key NRM players, as the Law on Commune Administration (*Kum/Sangkat*) specifies. Considerable training and technical support will be needed to allow the councils to understand and play their NRM role. Communities must also be trained to understand their land and NRM rights and obligations under the new laws. Government resource managers and private sector resource extraction firms must understand the new rules of the game and be willing to abide by them. Considerable training is needed at all levels of government to alter the current paternalistic mindset of officials to one of serving the public and working collaboratively with communities. An example of the type of support needed is the Commune Council Support Project, an activity supported by several NGOs, and designed among other things to 1) disseminate information to commune councils via a newsletter in English and Khmer, 2) engage commune officials and local communities, and 3) identify local NGOs concerned with local governance and assess their needs.

9. Gender Analysis

Men and women often have different responses to outside interventions, and these interventions often have a different impact on men and women. Many well-meaning projects have unknowingly contributed to the disempowerment of women. There is no general gender approach to project design that can be applied in every case. A needs analysis or study with a gender perspective should be conducted before any program or projects are implemented.

With peace has come rapid internal migration and rapid and unsustainable exploitation of resources in upland areas. These developments mean the traditional subsistence livelihood system is becoming increasingly insecure. To help indigenous women maintain their status and power in a rapidly changing environment, it will be important for aid providers to recognize the special roles women play in society, and ensure that development assistance is appropriate. For example, projects that increase the marketing potential of local products (NTFP or handicrafts) gathered or produced by women will help to address the deepening power imbalance. Proper and appropriate management of conservation, NRM, and development projects will benefit both men and women. Women should receive training in Khmer, English, numeracy, and business to be able to take advantage of opportunities related to ecotourism.

Education – Developers of environmental and NRM education programs should recognize the following constraints:

- Knowledge of Khmer language is limited among women indigenous groups.
- Across all ethnic groups women have lower literacy than men.
- Women have less access to training and education than men.
- Women’s movements are more restricted than men’s, because of cultural constraints and their role in caring for children and other household duties

To be effective in reaching program objectives for the participation and empowerment of women, project designers will need to address these constraints. Training programs will need to be conducted at the village level, rather than a central location, in an appropriate language. Remedial adult education for women should focus on literacy, numeracy, and business. Education on the environment and NRM should be provided in an accessible format, usually verbally (in-person or by radio) rather than as printed materials.

Often projects are implemented through local officials and opinion leaders, or village headman. Almost all are male, and look at problems and solutions from male perspective. Environment and natural resources management (ENRM) projects need to involve women at every stage of development and implementation to ensure that the different gender impacts are understood and taken into account.

Small-scale marketing is a woman’s domain in Cambodian society. Women do most of the selling of agriculture produce, fish, aquatic plants, forest products, etc. Projects that aim to shift marketing to a larger scale, like shrimp farms or agricultural cooperative, may negatively impact women. On the other hand, projects aimed at improving women’s marketing skills

could increase their income and status. By working in the marketing sector you can reach women.

Recommendations

There have been few studies on gender perspectives for marine and freshwater fisheries. More research needs to be done in this area. There is a need to identify better ways to address issues of access and equity in resource use and management.

Women should be given the opportunity to acquire appropriate technologies that will enable them to contribute effectively to sustained fisheries development and growth. It is therefore essential to increase women's participation and decision making in fisheries development efforts.

Women (particularly women-headed households) and the landless poor rely heavily on the commons for income and as a safety net. Access to common resources (aquatic and forests) should be available to anyone free of charge regardless of ownership, land, and capital. They can therefore be regarded as an important resource for livelihood support.

To inform the development of environmental and NRM projects, USAID, its grantees and sub-grantees should:

- collect gender-disaggregated local data on NRM practices and livelihoods,
- formulate gender-sensitive policies and plans based on a gender-disaggregated needs assessment, and
- formulate policies and plans to improve women's access to resources.

USAID programs should:

- train field staff in gender-sensitive and participatory planning and program implementation;
- acknowledge women as directly involved in NRM, rather than as merely wives;
- support women's efforts in marketing and processing natural resources;
- conduct adult education to improve women's literacy, and access to appropriate information on resource management;
- provide legal education and support to women in order to improve their access to and control over natural resources;
- pay attention to health issues related to the environment, including waterborne diseases and safe pesticide use;
- ensure that resource programs benefit local communities, especially women who rely on these resources to meet their livelihood requirements;
- monitor the equitable access to benefits of projects addressing food insecurity and poverty for poor and food insecure women, particularly in women-headed households; and
- involve women more in planning and decision making.

Submitted to the United States Agency for International Development

Cambodia

**Tropical Forests (FAA 118)
and Biodiversity (FAA 119)
Assessment**

Annex 2
to the
**Environmental Review: Status and Trends in Environmental
Management and Options for Future Action**

USAID Contract No. LAG-I-00-99-00013-00, Task Order No. 805

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Acronyms

CBD	Convention on Biological Diversity
CBNRM	Community-Based Natural Resources Management
CCD	Convention to Combat Desertification
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DANIDA	Danish International Development Assistance
DG	Democracy and Governance
FAA	Foreign Assistance Act
FAO	Food and Agriculture Organization of the UN
GB	Great Britain
GEF	Global Environmental Facility
HR/DG	Human Rights/Democracy and Governance
IESP	Interim Environmental Strategic Plan
IR	Intermediate Result
ITTA	International Tropical Timber Agreement
IUCN	World Conservation Union
MAFF	Ministry of Agriculture, Forestry, and Fisheries
MARPOL	International Convention for the Prevention of Pollution by Dumping of Wastes and Other Matter
MoE	Ministry of Environment
MRC	Cooperation for the Sustainable Development of the Mekong River Basin
NGO	Nongovernmental Organization
NRM	Natural Resources Management
PDR	People's Democratic Republic (Lao PDR)
RGC	Royal Government of Cambodia
SO	Strategic Objective
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
USAID	United States Agency for International Development
USFWS	United States Fish and Wildlife Service

1. Background

This assessment of tropical forests and biodiversity in Cambodia was conducted for USAID/Cambodia in fulfillment of Sections 118 and 119 of the Foreign Assistance Act (FAA) guidelines for US government agencies working abroad. The tropical forest and biodiversity assessment was prepared for USAID/Cambodia under contract with ARD, Inc. as part of an overall natural resources assessment for Cambodia during August and September, 2001.

Dr. Jim Schweithelm, who also served as natural resource management specialist and CBNRM advisor, led the ARD natural resources assessment team. Other members of the ARD team included biodiversity specialist Dr. Pat Foster-Turley and in-country specialists Andrew McNaughton, Srey Chanthy and Sri Sugiarti. Information for this biodiversity annex and for the full report was compiled by the team from an analysis of existing documents, interviews with relevant government and nongovernmental organization (NGO) officials and specialists, and two field trips, to Siem Reap and the northern Tonle Sap region and to Sihanoukville and the coast.

Dr. Pat Foster-Turley was largely responsible for producing this biodiversity assessment as one part of the overall natural resources management (NRM) report. An attempt was made to present this biodiversity assessment as a self-contained document, but much of the relevant information is covered in more detail in the parent document, *Cambodia Environmental Review: Status and Trends in Environmental Management and Options for Future Action*, and to avoid redundancy, is only summarized here. Likewise, some sections of the parent report contain summarizations of the material presented in this biodiversity document. It is suggested that these two documents be read in synchrony to obtain the fullest picture of NRM and conservation efforts in Cambodia.

2. Executive Summary

Cambodia contains some significant large tracts of forests, among the greatest expanses of some of these habitats in mainland Southeast Asia. In addition to forests, which are the focus of the 118 part of this assessment, there are other significant habitats in Cambodia including the large Tonle Sap lake, stretches of the Mekong River and associated streams, major wetlands of critical importance and coastal mangroves, coral reefs, and seagrass beds. All of these habitats and associated flora and fauna add to the exceptional biodiversity found in Cambodia. Various types of forests and different schemes for managing them are described in this report. Major taxa of plants and animals are also described, along with the fact that in Cambodia, much information on biodiversity is lacking.

Threats to the forests and biodiversity of Cambodia are many and varied, and synergistically impact upon one another. Habitat destruction is a major threat and is manifested in many ways including unsustainable logging, excessive conversion of land to agricultural uses, destructive fishing techniques such as dynamiting reefs, and various other factors. Various species with high economic value are also directly targeted, leading to the purported declines in populations of such globally significant species as tigers, primates, bears and crocodiles, and many others. Fish are a primary source of food for most Cambodians, but overfishing, the use of harmful fishing devices and habitat destruction of major spawning and feeding areas is reducing both catch sizes, and the size of individual fish and in some cases even leading to the disappearance of once common species. In Cambodia these threats are exacerbated by ineffective and often corrupt NRM practices. The policy and management frameworks for natural resources conservation efforts are sorely deficient, although a few relevant natural resources policies have been rewritten and are passing through the adoption process. The government, however, lacks the capacity and/or political will to enforce natural resources laws and regulations. Widespread corruption has led to the misuse of natural resources by large private sector entities that are often from other countries with no long-term commitment to the natural environment of Cambodia. Not only is biodiversity being lost in this way, but so is the quality of life of many poor Cambodians who rely on sustainable natural resources for their own continued survival.

Many donors, NGOs and concerned government officials are working together in Cambodia to correct some of these wrongs. Various approaches being used include developing management plans for protected areas, providing better capacity and tools for law enforcement efforts, the establishment of community-based conservation efforts in various areas, the development and dissemination of environmental education programs and materials, and other initiatives. Based on an analysis of the status and trends in forests and biodiversity conservation, the organizations with a role to play and the actions they are taking to address these threats, a number of recommendations are made in this report. It is hoped that even if only a few of these strategies can be funded, the situation for forests and biodiversity conservation will be improved now and for future years.

3. Major Natural Habitats of Cambodia

3.1 Terrestrial and Aquatic Habitats of Cambodia

Cambodia is a relatively small Southeast Asian country (181,035 km²) abutting the Gulf of Thailand to the south and sharing borders with Thailand, Laos and Vietnam. Cambodia largely consists of lowland areas, including extensive alluvial plains around the Mekong River and the Tonle Sap (Great Lake), even more extensive sandstone plains in the north and northeast, fertile soils of the Battambang plain, and a few other lowland land types. Savannas and savanna woodlands, wetlands and agricultural areas make up much of Cambodia's central plains. Except for the southeast area, where the Mekong River splits into a delta, the lowland heart of Cambodia is surrounded by mountainous areas or plateaus. The Cardamom and Elephant Mountains forming the coastal ranges include the largest upland areas of the country. The eastern border of Cambodia includes the Kontoum Plateau extension of the Annamite mountain chain of Vietnam and Laos and the Chhlong Plateau further south. Finally, the steep escarpment of the Dangrek Mountains defines the border with Thailand to the north. The mountainous areas of Cambodia are sparsely populated with humans and contain some of the last remaining habitats for wild ungulate and predator species.

It is not the mountains and plains that most define Cambodia, however. Most of all, it is distinctive for its water resources, the Mekong River and the Tonle Sap (Great Lake), which together dominate much of central Cambodia. 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 its flow 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. When fully flooded during this season, the lake swells to nearly five times its dry season size, and at approximately 10,400 km², forms the largest lake in Southeast Asia and the largest floodplain lake in the world.

Cambodia's largely rural human population is located primarily in the plains in the center of the country and around the Tonle Sap Lake and the Mekong River. Much of the natural vegetation of these parts of Cambodia has been modified for agriculture. Other heavily farmed areas include the Battambang plains and the basalts of the Kompong Cham area. The primary crop in Cambodia is rice, and paddy is estimated to comprise about 90 percent of the agricultural land. Most of the rice crop is rainfed, with little irrigation infrastructure. Other major crops include maize, soybeans, mung beans, vegetables, groundnuts and sesame. Industrial crops such as sugar palm, sugarcane, jute and tobacco are also grown in various regions.

Wetlands cover 30 percent of the country of Cambodia, a proportion second in Asia only to Bangladesh. Much of this wetland area meets internationally accepted standards for wetlands of international importance, and this comprises over five percent of the internationally

important wetlands in Asia. Largely due to this preponderance of aquatic habitats, fish and other aquatic resources provide an estimated 70 percent of the protein for the human population.

Cambodia is also blessed with a diverse coastal zone that includes mangrove forests, seagrass beds, coral reefs and a combination of sandy beaches and rocky shorelines over its 435-km length. A number of rivers flow to the Gulf of Thailand and form estuaries at the coast. There are also more than fifty offshore islands, which are largely wooded with rocky shores and sandy beaches and often ringed by coral reefs. Much of the coastal habitat has been degraded due to a combination of anthropogenic factors, but it still contains large blocks of natural habitats that are among the best preserved in the Gulf of Thailand.

Like everywhere in the world, all of the ecosystems of Cambodia are interrelated and interdependent. Blocks of terrestrial forest areas are bisected by rivers and riddled with freshwater swamps, lakes, and ponds. Coastal mangrove forests back up to paperbark swamps which themselves back up to the steep slopes of the Cardamom and Elephant Mountains. Similarly, the inundated forests of the Tonle Sap back up to agricultural land and then to forests. The fauna of Cambodia often requires access to a number of interrelated ecosystems to fulfill their life cycles. No discussion of biodiversity is possible without considering the diversity of these ecological habitats and the myriad of interrelationships between them.

3.2 Habitats of Global and Regional Significance

Cambodia contains a number of protected areas and other sites that have received global attention. As more attention is paid to the various natural habitats within Cambodia, it is likely that more sites of international importance will be added to this list.

At present there is one **World Heritage Site** in Cambodia, the temples of Angkor Wat and the surrounding area, which has been designated for its cultural significance. Other World Heritage sites, such as the area including the Cardamom and Elephant Mountains are in the works and expected to be officially declared within the year.

A **United Nations Educational, Scientific, and Cultural Organization (UNESCO) Biosphere Reserve** has been declared on Tonle Sap Lake with three core areas: Prek Toal, on the north side of the lake; Moat Klah/Boeung Chhmar on the east side; and Stoeng Sen, a bit further to the south. Management plans are underway for these areas. Prek Toal, near the Siem Reap gateway to the Angkor Wat temples, is already the focus of considerable tourism activity, particularly in the dry season when bird populations are at their peak.

Three **wetlands of international importance (Ramsar sites)** have been designated in Cambodia. Boeung Chhmar has double billing as both a Ramsar site, and a core area of the Tonle Sap Biosphere Reserve. Two other Ramsar sites are Koh Kapik/Koh Kong and surrounding areas along the coast and parts of the middle stretch of the Mekong River north of Stung Treng.

One **globally important species-specific site**, the Sarus Crane Reserve at Ang Tropeang Thmor, was declared by Royal Decree in February 2000. This area is one of the last reserves for large populations of these endangered Southeast Asian cranes. Other sites of major global importance to particular species might similarly be located and declared for protection in Cambodia in the future.

Recent **WWF ecoregional assessments** of habitats in Cambodia, Laos, and Vietnam have determined a handful of priority ecoregions that are found partially within the borders of Cambodia. These include the Cardamom Mountains (already being considered for World Heritage status) and parts of the Mekong River and Tonle Sap floodplains (parts are already included as Ramsar sites). Other priority ecoregion areas in Cambodia that are not covered by other global agreements include the dry forests (deciduous dipterocarp and semi-evergreen forests) found east and west of the Mekong River in Cambodia, and the Annamites, which only marginally enter Cambodia.

Finally, Cambodia also is part of a number of **transboundary natural areas** that may eventually attain global conservation priority status. One of these areas, Virachey National Park in northeastern Cambodia, is currently being investigated as part of a trans-frontier reserve in connection with the proposed Dong Ampham National Park in Lao People's Democratic Republic (PDR) and the Mom Ray National Park in Vietnam. Other initiatives in other parts of Cambodia may follow.

4. Tropical Forests of Cambodia

4.1 Importance of Cambodian Forests

The forests of Cambodia, as elsewhere, serve a variety of ecological and environmental functions including watershed protection, carbon sequestration, and climate modulation. Moreover, Cambodia's forests are a valuable resource and legacy to the people of this nation. An estimated 85 percent of Cambodia's population live in rural areas, most of which are in proximity to forests and forest patches. Most rural people are poor, and depend upon firewood, and various non-timber products they can extract from the forests to fulfill some of their nutritional, health, and domestic needs. Additionally, many Cambodian people have spiritual associations with forests and particular resources therein.

Cambodian forests also have great regional importance. The diverse and extensive forests of Cambodia are presently some of the largest natural tracts remaining in the region. Other neighboring countries have greatly decimated their own forests to the point where a number of forest dwelling animals and plants have virtually disappeared. Some of these species that are extinct elsewhere, such as the kouprey and wild buffalo may still be harbored in Cambodia. The biodiversity associated with tropical forests is covered in this section.

4.2 Forest Types in Cambodia

An estimated 60 percent of Cambodia is covered with forest and woodlands and these natural forests may include some of the largest remaining tracts in continental Southeast Asia. A good detailed review of the many different graduations of forest type throughout Cambodia can be found in Rundel's (1999) *Forest Habitats and Flora in Lao PDR, Cambodia and Vietnam*, prepared for World Wildlife Fund's Indochina Program Office. Some of the major forest types of Cambodia are summarized here.

Wet evergreen forests in Cambodia are primarily found on the south facing slopes of the Cardamom and Elephant Mountains where there is an abundance of rainfall. Historically this forest type extended from the coast up to 700 m in elevation. 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 subtypes 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 are similar to wet evergreen forests and found in areas with less rainfall that is more seasonal. 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 are found where there is seasonally high rainfall over 1,500 mm annually followed by a five to six month drought season. 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, 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 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 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, often called **seasonally inundated forests** in Cambodia, 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 providing recruits for the extensive fishery of the Tonle Sap. Much of this forest type has been degraded to low shrubby growth by anthropogenic activities.

Mangrove forests cover 85,100 hectares of Cambodia and are found in all coastal provinces, although the primarily rocky coastline and lack of major estuaries limits its distribution. The most pristine mangrove forests remaining are found in Koh Kong Province and also in Ream National Park, and between Kampot town and Kep municipality.

4.3 Management of Cambodian Forests

Although the data keeps changing, there is presently thought to be approximately 11 hectares of forests of various types in Cambodia. Much of this forestland is already degraded to varying degrees. During the many years of war and instability, much of this forestland was preserved from large-scale destruction. In recent years, however, increased domestic stability has precipitated an escalation in both legal and illegal logging practices.

The management of most of the remaining forest land falls with the jurisdiction of the Ministry of the Environment (MoE) in some cases and the Ministry of Agriculture, Forestry, and Fisheries (MAFF) in others. Five basic types of forestland management categories can be discriminated based on a combination of socioeconomic and ecological parameters (Thomas, 2000), as follows.

4.3.1 Concession Forests

The Royal Government of Cambodia (RGC) has allocated nearly half of the forestland in Cambodia to commercial timber concessions, most often representing large firms from throughout Southeast Asia. High-value tree species are logged from these blocks of land, often in an unsustainable manner. Up until now, the use of sustainable logging practices by concessionaires has rarely been enforced by MAFF. Some of the concessions have already been depleted of key economic species and the degraded land is on its way towards agriculturization. A new management plan system for concessions is now in place, and during September 2001 initial 25-year plans for sustainability will be submitted by all concessionaires and evaluated by a panel of experts overseen by MAFF before new concession leases will be granted.

Community access to concessions varies from concessionaire to concessionaire. Although in theory they have the right to enter the forests to extract non-timber forest products, conflicts often arise. To date, there are inadequate measures in place to ensure community access to these resources that they have traditionally depended on.

4.3.2 Protected Areas

As much as 3.3 million hectares are classified as protected under one of a number of different protected area categories managed either by the MoE (i.e., National Parks) or MAFF (i.e., Protected Forests). The location of these protected areas often stems from historical reasons, and does not correspond to exceptionally high biodiversity or conservation value. Most often there are no protective measures actually in place on the ground, and some of these areas are already heavily degraded with little forestland remaining. Work is being done to develop appropriate management and protection plans for some of these areas and to help ensure appropriate legal access of communities to extract various non-timber forest products from them.

4.3.3 Non-Concession Forests

Some forestland with few commercially valuable trees and little conservation potential falls within the public domain. Communities can and do extract resources from these forests, both for their own use and for sale. Although some communities practice sustainable management techniques, this is not usually the case. In many of these areas, overharvest of key species has led to further degradation. There is a great need to work with communities in some of these areas to ensure sustainability and to slow the degradation.

4.3.4 Flooded Forests and Mangroves

Seasonally inundated forest around Tonle Sap and the Mekong River and coastal mangroves are managed by the MAFF Department of Fisheries for their value as key habitats for the perpetuation of fishery resources. These forests represent a small proportion of the total forestland in Cambodia, only about 85,100 hectares. Although theoretically it is illegal to cut down these forests for firewood, timber or other uses, these rules are rarely enforced. In addition, much of the freshwater flooded forestland has been converted to rice planting and

other agricultural uses. Similarly, many hectares of mangroves have been removed for the establishment of shrimp farms and other commercial uses.

4.3.5 Non-Forest Areas

In addition to the major blocks of forest management types, there are other small pockets of trees and shrubs found within communities, around pagodas, schools, waterways, etc. This land defies large-scale mapping, but is very important to the surrounding communities who often extract firewood and other products on a limited basis for home use. Some of these areas are also socially and culturally important to the communities. Community forestry practices, including tree planting and protection of these resources are sometimes in place.

4.4 Threats to Forests

The basic threats to natural forests in Cambodia stem from three interrelated problems: unsustainable logging practices (both legal and illegal); escalating rates of land conversion; and inadequate policies, laws, and enforcement practices. These problems are exacerbated by the poor state of knowledge and awareness at all levels about the status and trends in forest resource management in Cambodia, and the outside economic factors driving increased timber production. Some specific threats include:

1. Weakness of existing forestry policies and laws

The current system of allocation of timber lands to private concessions come with few regulations concerning sustainable timber extraction. Existing forestry policies and regulations also do not adequately acknowledge the role of communities in maintaining, using, and conserving forest resources. Although a new forestry policy is in the works, it is still weak in these areas. Appropriate rules and regulations are still to come.

2. Illegal logging: lack of enforcement of existing laws

Where appropriate laws do exist, they are rarely enforced. Much logging still occurs outside of approved concession areas, both by concessionaires and by other entities. Logging and unsustainable use of other forest resources also occurs within designated protected areas. There is little or no presence on the ground to enforce existing laws.

3. Legal, but unsustainable logging practices

Short-term economic goals, and not long-term sustainability of natural resources most often drive concessionaires. With few controls on their activities, most are logging at a high rate for immediate profit, then most likely moving on when the forests are depleted of key economic species.

4. Overharvesting of wood for fuel and charcoal production and various non-timber forest products

Communities are usually dependent upon certain forest resources for their domestic use and also, in some cases, for their market value. Increasing human populations in some areas are leading to unsustainable extraction rates for fuel wood and various non-timber forest products. In addition, particular species such as “yellow vine” may be overextracted and processed with chemicals such as sulfuric acid on site, leading to further destruction of the forest habitat.

5. Conversion of logged land to plantations and other agricultural practices

Once a timber concession becomes depleted of key timber species and no longer protected there is much scope for opportunities to convert the logged land to monoculture plantations and other agricultural enterprises. Such activities lead to increased land conversion rates and overall loss of natural forest cover.

6. Swidden (slash and burn) agricultural practices

Swidden agricultural techniques have long been practiced in some areas of Cambodia. The use of fire to clear land is usually a part of this process, leading to degradation of some forest types to savanna land.

7. Development of roads that provide increased access to forested areas

In some cases, the development of logging roads have provided easy access to people who seek to extract other products from the forests, set up villages and agricultural areas.

8. Poor knowledge of status and trends of forest production

Education and awareness programs are lacking in most sectors of Cambodian society. There is an overall poor state of knowledge about forest trends and ecological issues at most levels within Cambodia. The universities are just now regrouping from the dissolution caused by recent historical disturbances. At the primary school levels, little environmental education is taught to students.

A history of war and unstable conditions in Cambodia has helped preserve the forests of Cambodia, not the enforcement of sound forest policies. Now that the domestic situation has calmed, the policy base and legal enforcement capabilities must be strengthened before Cambodia’s forests become as degraded as its neighbor’s. A number of donors are working with the government and NGOs to help speed the process towards sustainable use of forest and forest products in Cambodia. Various NGO and donor actions to address the loss of forests and biodiversity are described in Section 5.

5. Biodiversity of Cambodia

Biodiversity is most often described at the ecosystem, species, and genetic levels, and all told covers all of the diversity within the biological world. The focus of this section of the report is biodiversity at the species level.

Species diversity is in large part dependent upon the integrity and diversity of the natural ecosystems they occupy. In the previous section on tropical forests, the diversity of various forest ecosystems are covered in further depth for the purposes of the FAA 118 portion of this assessment. Cambodia also contains a number of other ecosystems, including such diverse habitats as wetlands, coral reefs, and montane areas. These habitats are discussed further in the parent document, *Cambodia Environmental Review: Status and Trends in Environmental Management and Options for Future Action* and not repeated here.

A third way of viewing biodiversity is to look at the genetic level by considering sub-populations of various species and, on an even finer scale, to consider the diversity of genes within these populations. Such an approach at this time is inappropriate for a discussion of biodiversity within Cambodia. Genetic biodiversity is not well known for most species in Cambodia, a country where even the existence of certain species is problematic, let alone questions of the subspecies and population level differences between them.

The plants and animals described herein occur in a variety of habitats throughout Cambodia, and the conservation threats to them cover both habitat-related issues and those that are more species-specific. As seen below, the main importance of Cambodia to biodiversity conservation efforts is the presence of relatively large tracts of natural forest, wetlands and coastal areas harboring populations of species that have dwindled or even disappeared elsewhere in Southeast Asia, where habitat destruction has progressed to a much larger extent. Added to this are problems of overextraction of particular species with economic importance, and other direct and targeted effects on particular species. Together these problems are tough ones that Cambodia will need to face soon in order to conserve the natural resources that remain.

5.1 Mammals and Birds

As with other parts of the world, in Cambodia the mammal and bird species are the best known of the country's many species. Birds and mammals have much importance for many Cambodians, as sources of food and revenue and in some cases hold great spiritual value as well. These species are often are of great interest to many people outside the borders of the country and also among the most attractive for ecotourism efforts. For these reasons, although mammals and birds make up only a very small part of the species diversity in the world, they have been the most thoroughly studied, and have attracted the most conservation attention.

More than one hundred species of wild mammals (excluding domesticated forms) have been recorded from Cambodia, but there are likely to be more species recorded, particularly of bats, when further surveys are conducted in key areas. Although the World Conservation Union (IUCN) Red List shows 49 mammal species of conservation note in Cambodia, only 35 of these

have actually been found in this country to date. Two species that are included, the Javan rhinoceros (*Rhinoceros sondaicus*) and the kouprey (*Bos sauveli*) are quite possibly extinct in Cambodia at this time. Another species, the Khting Vor (*Pseudonovibos spiralis*), is known only from horns and may not be a true species. A few other mammal species that are listed for Cambodia have not yet even been discovered here although they are found in surrounding countries. 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 Monduliri Province (21 Red List species); the southern Annamites (19 Red List species); and the Cardamom Mountains (18 Red List species). Additionally, a number of rare and little known mammals, such as dugongs (*Dugong dugon*) and Indo-Pacific humpback dolphins (*Sousa chinensis*) are found in Cambodia's coastal and offshore waters.

Cambodia's bird fauna is also fairly well known and of widespread importance. There are reported to be more than 500 bird species in Cambodia, but this number continues to increase as more birdwatchers and ornithologists begin to look harder in different areas of the country. Of these, Birdlife International considers 39 species to be globally threatened or globally near threatened. Most of these birds are dependent on the large wetland habitats, especially around the Tonle Sap and also the smaller wetland patches within the northern dipterocarp forest plains. 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. Although a few important bird species are also found in the coastal areas, the southern Annamite Mountains, and the Cardamom Mountains, these areas are not exceptionally important for bird diversity in Cambodia, or of similar global importance for bird conservation efforts.

Among the bird and mammals species in Cambodia are a number of "flagship" species that capture the world's attention to appropriate conservation action to preserve them and their habitats. Tigers (*Panthera tigris*) and elephants (*Elephas maximus*) are among the most loved animals in many Western zoos, and similarly their conservation as flagship species in Cambodia has much attention, despite the fact that remnant populations of each still remain in the country. Cranes also command worldwide attention and stand as a symbol of wetlands conservation efforts. Although the population of cranes in Cambodia is centered on a single reserve north of Tonle Sap, the numbers are viable and the remaining animals are being protected. The use of charismatic animals like tigers and cranes is universally recognized as one way to protect habitats and this approach should continue to be encouraged in Cambodia.

5.2 Fish, Reptiles and Amphibians

Despite the fact that fish have great economic importance in Cambodia, there is a relative scarcity of information on the diversity of fish species and the life histories of even the most important ones. It is presently estimated that there are upwards of 1000 fish species, although the Fishbase estimates list only 486 for freshwater and 357 for brackish and saltwater habitats. For the most part, the only areas where the freshwater fish have been studied are flooded areas around the Tonle Sap and the Mekong River, both habitats that support an abundance of fish, but not many species. Primarily only the larger economic species have been considered. Little attention has been diverted to other freshwater areas, or to surveys of smaller fish with little if

any economic importance. As more studies are done of the fish species found in areas with known biodiversity such as rapids and riffles on streams and the middle reaches of the Mekong River, and in various small streams and wetlands, many more species are expected. Similarly, although the coastal areas of Cambodia include a number of habitats that most likely support a great diversity of fish species, the appropriate studies remain to be done. A few fish in Cambodia have received international attention however. One of these, the giant Mekong catfish (*Pangasianodon gigas*) with its long known migration along the Mekong River has even been proposed as a flagship species to divert conservation attention to the entire system.

Reptiles and amphibian in Cambodia are even less well known than fish, and surveys on these species are few and include largely old historical records and a scattering of recent surveys in a few protected areas. At present there are 28 species of reptiles on the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) list, however, which shows that even if this taxa is not well known in Cambodia, certain species have economic value and are being traded into rarity. Most well-known reptiles include the Siamese crocodile like the Siamese crocodile (*Crocodylus siamensis*) which is raised in crocodile farms and the mangrove terrapin (*Batagur baska*), which are also called “royal turtles” in Cambodia because they were once considered to be the exclusive property of the royal family. A few endemic reptiles and amphibians are also known to be found in Cambodia but much more work still needs to be done to get a better picture of the biodiversity of these animals in the country.

5.3 Invertebrates

Very little is known about non-vertebrate fauna of Cambodia, although as elsewhere these species make up most of the species diversity of life. Many “shellfish” including crustaceans like shrimp and crabs, clams, oysters, and other mollusks and many other aquatic species are harvested commercially, but are not well studied. Those mollusks, crustaceans, insects, worms, corals, and a myriad of other invertebrate taxa with little economic value have been virtually unstudied. No estimates exist on the biodiversity of these species in Cambodia, but due to the diversity of habitats they are found in, it can be assumed to be very diverse.

5.4 Plants

The plants of Cambodia have been poorly studied and no accurate assessment of the diversity of Cambodian plants is presently available. Although one widely quoted author suggests that there are 2308 vascular plants in Cambodia, other experts claim that the numbers most likely will exceed 3,000 species or maybe even as many as 15,000. It is expected that a number of endemic species of plants exist in areas that are isolated patches of habitats with special environmental conditions, such as high mountains areas, isolated limestone outcrops, peat swamps, and other unique habitats. Obviously much more information is still needed to understand the diversity of plants in Cambodia.

5.5 Significance of Cambodia’s Biodiversity

Cambodia’s great biodiverse resources hold great economic, nutritional, domestic, and social value for the people of this country. Most of Cambodia’s population is rural and poor, and the

vast majority depends wholly or supplementarily on natural resources for their survival. Other species have great cultural or social value to many Cambodians. Still others are harvested for economic gain. All of these factors are considered at length in the parent document entitled *Cambodia Environmental Review: Status and Trends in Environmental Management and Options for Future Action*. The importance of biodiversity to the well being of Cambodians is the principle reason to conserve it.

A number of species in Cambodia have also received international attention. The online 2000 IUCN Red List of Threatened Species (www.redlist.org) lists 149 species that are thought to be endangered, threatened, or otherwise rare enough or suitably unknown to require international attention for conservation efforts. The species listed in the Red List are those that are best known and of most interest to most people, and include primarily mammals, birds, reptiles, some fish, and a few economically important plants. Most of the diversity of species on earth have not been adequately studied and considered in such listings. No doubt Cambodia also harbors a myriad of other species such as insects, mollusks, corals, worms, vascular plants, fungi, etc. that might also be threatened with global extinction and should be listed, if and when such survey efforts are completed and enough data exists to include them.

Since most of Cambodia's key habitats are shared with its neighboring countries there are relatively few species that are considered to be "endemic" and only found in this country. Such species include more than 200 plants, and a few animals such as the Cardamom gecko (*Cyrtodactylus intermedius*), the Tonle Sap watersnake (*Enhydris longicauda*) and a handful of others. More endemic species of plants, small vertebrates, and especially, invertebrates such as terrestrial mollusks and insects, will most likely be found if appropriate studies are ever organized in various limestone outcrops and higher elevation areas where some geographic isolation exists. There are, however, many other regionally endemic plant and animal species in Cambodia that are only found in the geographic area shared with parts of Thailand, Laos, and Vietnam, including some genera and a few families of plants, a number of vertebrate species and subspecies and most likely many more invertebrates as well.

Cambodia's primary importance to biodiversity conservation efforts is not on the national scale focusing on the few endemic species, but instead for the habitat it still contains that harbor a number of species that have disappeared or become exceptionally rare elsewhere in the region. The remaining populations of some bird species in Cambodia are of particular globally significance. The abundance and species diversity of waterbirds that breed and feed in the Tonle Sap area during the dry season forms the largest such aggregation in mainland Southeast Asia and some rare birds, like the Sarus crane (*Grus antigone*) have some of their remaining largest breeding grounds within Cambodia. Cambodia still contains populations of tiger, elephants, wild cattle, otters, dhole and other mammal species and a number of reptiles, like the Siamese crocodile and the mangrove terrapine that are of worldwide interest. A number of economically important freshwater fish require the intact flooded forests of the Tonle Sap or the freshwater riffles of the middle reaches of the Mekong River to feed and spawn. Some of these fish are important long distance migrators travelling to other countries north of Cambodia. Similarly the coastal waters of Cambodia also provide habitat for a number of economically important fish and invertebrate species that populate the fishing nets of fishermen throughout the Gulf of Thailand. The habitats of Cambodia and the wealth of species that live

within them are thus not only a legacy to all Cambodians but also an important contribution to the diversity of the region and the world.

5.6 Threats to Biodiversity

The threats to biodiversity in Cambodia can be considered from both the ecological and from the administrative perspective, and in both views the threats to biodiversity and natural resources in Cambodia are severe. Specific threats to forests that encompass both biological and management factors are provided in Section 4 as part of the “tropical forest assessment” section of this paper. Both of these types of threats are also detailed in the parent document *Cambodia Environmental Review: Status and Trends in Environmental Management and Options for Future Action*. To avoid duplication only the major threats of both types—biological and management—are summarized here.

5.6.1 Habitat Destruction and Unsustainable Use of Key Species

When looked at purely biologically, the two main types of threats include 1) habitat destruction and degradation, and 2) targeted unsustainable use of particular plant and animal species. Both categories of threat are widespread and increasingly leading to loss of animal and plant populations and habitats in Cambodia. Factors leading to habitat degradation and destruction are as varied as the habitats themselves and all stem primarily from various anthropogenic factors. For instance, most terrestrial forested land is subject to logging and large-scale removal of trees, timber, and other forest products. As this land is logged and degraded, some of it is further degraded into agricultural land and village settlement. Similar, mangrove forests are heavily used for firewood collection and charcoal making, and large sections of natural forest have also been converted to other uses such as shrimp farms and salt evaporation pans. Coral reefs and seagrass beds are also faced with a variety of factors that are degrading them and decreasing their biodiversity. Increased sedimentation from logging and agricultural and industrial run-off from coastal areas are contributing to declines in water quality, which in turn have negative impacts on the coral and seagrass habitats and the species who rely upon them. Further outright destruction is caused by harmful fishing practices such as the use of dynamite and the use of bottom-destroying trawlers and large-scale push nets in shallow, fragile waters. Freshwater habitats face their own set of similar problems, which also include the use of destructive fishing gear and the conversion of fish feeding grounds in the flooded forests to other uses. Another potential threat to freshwater biodiversity is beginning to occur with the introduction of exotic species such as water hyacinths (*Eichhornia crassipes*) and tilapia (*Oreochromis niloticus*) fish, which become established in natural areas by displacing other native, but less hardy, species. Although as of yet the increased use of pesticides in agricultural areas surrounding Tonle Sap have not taken a great toll on biodiversity, this undoubtedly will happen if the use increases without appropriate safeguards. These various threats are detailed for different habitats in Section 3 of the parent document.

The second category of biological threat is the direct and unsustainable use and removal of targeted species. Commercial logging targets particular tree species that are rapidly disappearing in Cambodia. Collection of firewood beyond sustainable levels in some areas destroys these target species as well. Even the extraction of some non-timber forest products like yellow vine and rattan has taken its toll in some areas. Hunting and fishing also has a large

impact on the biodiversity of Cambodia. There has been considerable attention paid to the illegal removal of charismatic species like tigers and bears from the forests of Cambodia leading to the disappearance of these species in many areas where they once were present. In some cases, overhunting of food species like various deer wild cattle not only results in the decline of these target species, but also lowers the prey base for the predators that depend upon them. The fishery sector in both freshwater and marine areas also has its overfishing issues, with the stock and fish size showing marked declines and a number of species becoming rarer and rarer. This decline in sought after species has further impact on other species that then become the new fishery targets. Right now, for instance, there is a boom in the collection of water snakes in the Tonle Sap, for export, for feeding to captive crocodiles, and for local consumption by people who can no longer find other fish they can afford to eat. The tonnage of snakes captured in the Tonle Sap is estimated to be the highest extraction of snakes anywhere in the world. Who knows what impact this, too, will eventually have on the biodiversity of the lake.

5.6.2 Administrative and Management Threats

The threats to biodiversity in Cambodia can be viewed from a NRM perspective and not just a biological one. In fact, it is the lack of good management practices within Cambodia that is driving the loss of the diverse and abundant flora and fauna of this once richly endowed nation. These threats encompass five main areas that are somewhat interrelated. These include 1) uncertain land tenure arrangements, 2) a lack of information and awareness about conservation and sustainable use at all levels, 3) a lack of well-founded laws and policies, 4) inadequate enforcement of those laws already in place, and 5) widespread corruption in the use and benefits derived from natural resources. To avoid duplication, details of these basic threats are given in the parent document and only summarized here.

Access to land, fishing grounds, and other natural resources is presently a muddy issue in Cambodia. Large blocks of habitat have been allocated to commercial timber concessions, usually with international interests, and access to communities and other local people is variously restricted. Similarly the best fishing grounds in many freshwater areas have been given to commercial fishing interests with little concern for local fishermen. In coastal areas, although communities have the purported rights to fish in nearshore waters, these waters are increasingly invaded by large commercial fishing boats using destructive fishing practices. For the most part, these large commercial interests in all sectors are not looking towards sustainable management of natural resources, but instead, towards extraction of as much as possible before moving on. The local communities who stand to gain from sustainable use of these resources are left with nearly nothing. Gradually the government policies towards concessionaires and other commercial interests seems to be changing, but it is not likely that this will happen completely until most of the most valuable resources have been extracted.

The lack of information of biological diversity, ecological integrity and conservation practices like sustainable use is also evident in Cambodia. Little information exists at the national level on even the presence of some species, and rarely are life history factors known enough to adequately manage existing stocks of timber, fish, and wildlife. There is also a widespread lack of knowledgeable experts working within the government at all levels, a lack of good public education programs, and a lack of strong institutes of higher learning that could produce such

specialists. Similarly, although much local knowledge traditionally exists in many parts of Cambodia, this information is not enough. The continued presence of military regiments in some areas and the influx of other non-natives to other areas have diluted this knowledge base in many areas where it should be important.

This lack of information and human resources have been factors contributing to the lack of well-founded laws and policies in most natural resources sectors in Cambodia. Other factors include the recent recovery of Cambodia from war and civil unrest that has diverted policy attention to other areas and the lack of political will to make policy changes that might have a negative impact to some in power. This situation is changing now with the drafting of new policies in Wildlife, Fisheries and Land Tenure, etc. Once these policies are approved there is still much work to be done to develop appropriate rules and regulations stemming from them. Without such laws and regulations, biodiversity remains at risk.

Even where there are appropriate laws in place, however, these are rarely enforced. This is largely due to the lack of capacity in both staff and equipment at all levels, and especially in the provincial districts and on-the-ground where most enforcement efforts need to be conducted. Without vehicles and radios, who can patrol the forests? Without boats and motors, who can patrol the waterways? And, when government salary levels are generally \$30/month or lower, who can afford the time?

Finally, one of the most overriding administrative concerns in the management of natural resources in Cambodia is the often silent but usually deadly issue of corruption at all levels of government. If someone is only paid \$30/month, not enough to feed a family, why not look the other way for money if this is offered? And, if someone is in power at higher government levels, why not take some money from a rich international concessionaire in exchange for good fishing grounds or timber lots? Until such rampant practices are revealed and dealt with appropriately, the situation for conservation of biodiversity and natural resources in Cambodia will not be a good one.

6. Tropical Forests and Biodiversity Conservation Efforts in Cambodia

Despite the grim review of threats to Cambodian forests and biodiversity the situation is not completely hopeless. A number of efforts are being taken by a variety of donors, NGOs, and government officials at many levels. Cambodia is a signatory to a number of global conservation conventions and is gradually beginning to fulfill some of the related requirements at an international level. Within the country, too, a solid core of concerned citizens and local initiatives are forming alliances with international organizations and finding resources and impetus for their conservation activities. A fuller account of all of these efforts and all of the players in various natural resources sectors is given in the parent document *Cambodia Environmental Review: Status and Trends in Environmental Management and Options for Future Action*, and only summarized here. But even in this summary, it is evident that in some sectors, at some levels of government, in some geographical areas, the positive impact of various approaches may one day become evident.

6.1 Organizations Playing a Role in Cambodian Conservation Efforts

A variety of organizations and entities are involved in conservation responsibilities and actions within Cambodia and only some of the key ones are listed here. On the government side, biodiversity and tropical forest management matters reside largely within the MoE, which among other things, oversees protected areas, and with MAFF with its related Department of Fisheries, and Department of Forestry and Wildlife, which oversee various natural resources country-wide. Both ministries operate at both the national and provincial levels, with offices and operations in Phnom Penh and out in the provinces. There is a known overlap of responsibilities between these two ministries that sometimes causes conflict between various departments at both national and regional levels. Other ministries and government departments also have some responsibilities relevant to natural resource protection and conservation efforts.

Various donors and multilateral organizations also play a large role in supporting Cambodian conservation efforts. Cambodia receives funding for natural resources conservation efforts from many developed countries including Denmark, Finland, Germany, Great Britain, Japan, the United States, and others. In addition to these bilateral donors, there are a number of multilaterals with interests in various aspects of the environment in Cambodia. These include the World Bank, the Asian Development Bank and various United Nations (UN) organizations such as the UN Environment Program (UNEP), UN Development Program (UNDP), and Food and Agriculture Organization (FAO). Because of the notable biodiversity and other natural resources within Cambodia, there are also a number of Global Environment Facility (GEF) conservation projects within the country and the region. The Mekong River Commission has its regional headquarters in Phnom Penh and supports some projects within Cambodia along with other initiatives within the four countries within its jurisdiction. For the most part, these donors and multilateral organizations have carved out various niches for themselves within the environmental sectors, although there are some overlaps and some donor coordination needs have yet to be addressed.

There are many international, national and local NGOs actively working in various biodiversity and natural resources sectors. Among the most visible international conservation NGOs in Cambodia are the Wildlife Conservation Society, World Wildlife Fund, Wetlands International, Flora and Fauna International, Conservation International, the International Crane Foundation, WildAid, IUCN, Traffic, and some others. A number of national NGOs including Save Cambodia's Wildlife, Mlup Baitong, Osmose, Culture and Environment Protection Organization, and the NGO Forum focus on conservation education, awareness, and networking projects in Cambodia. Finally, many other NGOs work at the provincial and community levels throughout the country. More details on the activities of many of these organizations within a number of natural resources sectors are presented in the parent report to this assessment.

6.2 Cambodia's Involvement in International Conservation Agreements

Cambodia is a party to a number of international conservation conventions but its compliance with these agreements varies greatly in effort and effectiveness. The NGO and donor community in Cambodia is playing an increasingly expanding role in helping Cambodia fulfill the international mandates it has agreed upon in various agreements. A few select examples follow.

Cambodia has ratified the Convention on Wetlands of International Importance (Ramsar Convention) in 1999 and with help from Wetlands International and support from the Asian Development Bank and other donors, has so far officially listed three Ramsar sites in Cambodia. Work is now being done to develop management plans for these areas. Cambodia also protects the Angkor Wat area under the UN World Heritage Convention and is considering the inclusion of other areas, such as the Cardamom Mountains, with help of Conservation International.

Cambodia became a signatory to the Convention on Biological Diversity (CBD) in 1997 and work required under this agreement is progressing in Cambodia, with the preparation of the Biodiversity Prospectus in 1997, and the nearly completed efforts to prepare a Biodiversity Action Plan and Strategy that are being undertaken for the government of Cambodia with support from FAO. Cambodia has been a party to CITES since 1997 but has done little to implement it. Help in this regard should soon be underway now that Traffic has opened an office in Phnom Penh.

Cambodia also became a party to the Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin (MRC) and is now the current home of the MRC Secretariat, which is supported in part by the Danish International Development Agency (DANIDA) and UNDP. Cambodia is also a signatory to other conventions, including the International Convention for the Prevention of Pollution by Dumping of Wastes and Other Matter (MARPOL), the International Convention to Combat Desertification (CCD), the United Nations Convention on the Law of the Sea (UNCLOS), the Framework Convention of Climate Change (UNFCCC), the International Tropical Timber Agreement (ITTA), and others. Various donors and NGOs also are helping to play a role with some of these conventions but much more work is still needed.

One important conservation organization that the RGC, unfortunately, is not a member of is IUCN. Until this situation changes, Cambodia's visibility and role in the important triennial General Assemblies remains limited to the country offices of NGOs like World Wildlife Fund, Flora and Fauna International, Wetlands International, Conservation International and others who are international NGO members of the IUCN.

6.3 Conservation Approaches in Cambodia

Donors, NGOs, and governmental agencies within Cambodia are supporting a number of different approaches to stem the loss of biodiversity and tropical forests. Some of these approaches and representative examples are described here but much more information on this topic is presented in the parent document.

One area that is getting some much-needed attention in Cambodia is that of capacity building within various branches of the government. Different donors are supporting the work of some government-based initiatives such as the MoE Environmental Management of the Coastal Zone project that is supported by DANIDA, and the World Bank Forest Concession Management and Control Pilot Project situated within the MAFF Department of Forestry and Wildlife. Many more such examples exist within appropriate departments and sectors of the national and provincial government. Some NGOs, including the Wildlife Conservation Society, Wetlands International, the NGO Forum are similarly working with government counterparts in the formulation of new Fisheries, Forestry, and Land Laws and are closely watching the progress of these laws through the adoption process. Other conservation organizations in Cambodia have focused on the formulation of various decrees that impact particular species or geographic areas. One example of this approach is the International Crane Foundation's success in spearheading a royal decree that gave official status to the Ang Trapeang Thmor Sarus Crane Conservation Area. Government agencies responsible for enforcement of existing wildlife and forestry laws are also getting some NGO and donor assistance. The Forest Crime Monitoring Unit, in both MoE and MAFF, is variously funded by a handful of donors and works in synchrony with the Global Witness, WildAid, and other NGOs in carrying out its mission. Local law enforcement activities in and around the Cardamom Mountains is similarly supported through efforts of Conservation International and other such activities are no doubt occurring elsewhere in the country.

Another biodiversity and forest-related area that is receiving NGO attention is the design and management of protected areas. Wetlands International is active in developing management plans for the three Ramsar sites within Cambodia and has also worked with DANIDA to develop a better management arrangement for Ream National Park on the coast. Conservation International and Flora and Fauna International are supporting work towards establishment of a Biosphere Reserve in and around the Cardamom Mountains. The Wildlife Conservation Society and World Wildlife Fund are similarly working in northern and eastern areas of Cambodia in various protected areas and reserves. These organizations are also conducting wildlife survey and monitoring studies both within their areas of concern, and in some cases, more widely.

Many of these same organizations and more are working in community-based NRM (CBNRM) in and around the protected areas they are involved in. World Wildlife Fund, for instance, has a community-based conservation program in and around Virachey National Park and in other areas in eastern Cambodia. Wetlands International has been instrumental in setting up a community fisheries organization in Ream National Park. Other organizations also engage in community-based work around the country. Some examples include the work of FAO around Siem Reap, the work of Mlup Baitong around Kirirom National Park, and the work of the Culture and Environment Protection Organization around Stung Treng. Oxfam Great Britain (Oxfam GB), Oxfam US, a number of missionary groups, and many other organizations also work around the country on various community-level projects that have a NRM slant.

The development and facilitation of education and awareness programs also has received support from a number of NGOs throughout Cambodia. Although most international NGOs include some variety of education or awareness activities within their programs, this is an area where national NGOs seem to particularly excel. Mlup Baitong provides educational programs for communities around Kirirom National Park and also collaborates with Save Cambodia's Wildlife in delivering interpretive and educational activities at the Phnom Tamao Zoo outside Phnom Penh. FAO's Gecko Center is another environmental education facility that provides programs for children and teachers in the Siem Reap area. A unique approach to environmental education in Cambodia involves providing monks with a Khmer translation of the Thai *A Cry in the Forest* to enable them to use Buddha's teachings to teach their constituents about environmental concepts. Similarly a Khmer children's book depicting a monk's journey, *A Walk through the Forest*, has been developed by Save Cambodia's Wildlife and widely distributed. Finally, there are also some awareness programs just begun that use different media. WildAid has recently put up wildlife-related banners in English and Khmer throughout Phnom Penh. Mlup Baitong is beginning a radio show with an environmental theme, and initiative are also underway to present relevant material in videos and on television. In this country with poor literacy rates, such use of other media is especially important.

Some other approaches to biodiversity conservation efforts that are often used elsewhere as yet have little applicability to Cambodia. For instance, *ex situ* conservation programs involving zoos and botanical gardens are in their infancy in this country, and such efforts should not be encouraged until upgraded facilities and human capacity are present. Although the government-run zoo outside Phnom Penh provides adequate housing for confiscated species, it presently has no resources or emphasis on research efforts. Aside from this zoo, the situation for the rest of the captive animals in Cambodia is dismal. At present there are also no botanic gardens within Cambodia although one initiative is being considered for the future. Another often mentioned approach elsewhere, that of ecotourism, is not at present a likely candidate for much further support. Few tourists travel to Cambodia as of yet to enjoy the wildlife and parks, since better facilities and opportunities for wildlife viewing and coral reef diving exist elsewhere in the region. One possible area where increased ecotourism might have a role, however, is in Siem Reap, where most tourists to Cambodia pass through on their way to Angkor Wat. An estimated 10 percent of these tourists also visit Tonle Sap. One budding ecotourism program, Osmose, operates boat trips to Prek Toal Biosphere Reserve in this area, and quite possibly these efforts might increase in the years to come, thus providing some private sector revenue for related conservation efforts in this area.

7. Overall Recommendations for Further Biodiversity and Tropical Forest Conservation Actions

Based on the information and analysis in this report and in the parent document, which covers NRM issues more broadly, there are a number of recommended actions that would help to address the loss of forests and biodiversity in Cambodia. Some conditions, including the widespread corruption within relevant government agencies and the economic forces driving the destruction of wildlife and habitats are beyond the role of USAID to address at this time. Similarly, with current congressional restrictions on using USAID funds to provide direct assistance to governmental agencies at the national level, there are other approaches that can not be taken. Despite these limitations there is still much room for USAID to actively address the threats to biodiversity and forests and to have a role in some of the solutions. Some key recommendations are given here for USAID and for other donors. Although it is expected that not all of these can be addressed under the current mission strategy, any attempts to tackle any of these recommendations should have a positive impact on the future of natural resources and biodiversity of Cambodia.

1. Local government agencies at the provincial level need to be strengthened in their efforts to understand and enforce existing natural resources laws and regulations.

The present situation in Cambodia is one of a near total lack of enforcement of laws relating to fisheries, wildlife, and forests. Even in cases where the will exists, relevant agencies and authorities at the provincial level do not have the equipment or expertise to effectively enforce these laws. Providing appropriate tools and training to select provincial fishery and forestry departments could have a strong and noticeable impact towards safeguarding key natural resources in these areas.

2. New policies and laws need to be developed that provide a better framework for conservation and sustainable use of forests and biodiversity.

In many cases the existing natural resources policies and laws are not biologically sound, do not ensure community access to land and natural resources and do not appropriately handle the necessary role of communities in managing resources at the local level. Work needs to be done to strengthen civil society in advocating for changes in these laws and in developing appropriate alternatives.

3. Communities need to be strengthened in their understanding and capacity to sustainably manage the natural resources within their domain.

In some cases, communities already have access to land and natural resources but could benefit from an increased understanding and better tools to use these in a more sustainable manner. In other cases, for instance, in changes in the new fisheries policy, communities are being given access to resources that have formerly been in private hands. In both cases, capacity-building efforts are needed at the community level to ensure their understanding of relevant policies and to help them sustainably use and manage these resources.

4. Appropriate management plans need to be developed and implemented for important protected areas and key resources.

Protected areas in Cambodia have largely been set up for historical reasons and not with a clear understanding of the biodiversity and natural resources contained therein. The entire protected area system in Cambodia needs a full review to ensure that it contains areas that are necessarily rich in biodiversity and natural resources. Particular protected areas also need well thought out management plans and the capacity to enforce them. Strong consideration must also be given to the sustainable use of key natural resources by surrounding communities who have long been dependent on them.

5. CITES efforts need to be strengthened and the trafficking of wildlife species needs to be curtailed.

Although Cambodia is a party to CITES, it has so far not been strong in implementing actions to reduce the trade of wildlife and natural products across its borders. The role of NGOs in monitoring CITES compliance needs to be strengthened along with the relevant government entities charged with enforcement.

6. The management rights of private sector timber concessionaires and commercial fishing block holders must be appropriately defined and enforced to reduce conflicts with local communities and to avoid unsustainable extraction of Cambodia's natural resources.

Within Cambodia, many large blocks of natural resources are allocated to timber and fishery concessionaires. Regulations regarding their management of these resources and giving appropriate access to communities need to be strengthened; sustainable management plans need to be developed; and the concessionaires' compliance with these plans need to be enforced.

7. Capacity-building efforts are needed to strengthen the knowledge base of natural resources managers in government agencies and NGOs and to strengthen Cambodian institutes of higher education to produce graduates with such knowledge.

Cambodia lacks educated and trained individuals in positions of responsibility and authority within its government agencies at all levels, and within the NGO and university communities. More students need to receive training in areas of NRM and conservation so that they can fill some of these gaps. In addition, the national university system requires institutional strengthening to enable it to fulfill its role in educating the future generation of natural resource managers in Cambodia.

8. More information, environmental education and awareness programs about forests and biodiversity are needed in Cambodia at all levels.

Among the Cambodian public, there is limited awareness of the nation's biodiversity riches and conservation needs. More education and awareness programs need to be developed and implemented for targeted audiences ranging from school children, to community groups, to the general public. These efforts need to include all media, such as radio, videos, billboards and in-person discussions in order to have maximum effectiveness in this largely illiterate country.

9. A database of information on species and their occurrence in Cambodia needs to be established and the relevant data collected from the field to enable effective management of biodiversity resources.

At present there is a scarcity of information about the presence, distribution, and life history for many species within Cambodia. As part of institutional strengthening programs, a database of species information needs to be set up and data needs to be collected from the field before Cambodia's biodiversity can be effectively managed and conserved.

10. Geographical focus: Local and provincial level biodiversity and forest conservation activities are especially scarce but critically needed in the dry dipterocarp forests and associated wetlands and river stretches in the northern plains and adjacent highlands.

The northern plains of Cambodia and adjacent highland areas stand out for the convergence of rivers with diverse fish species with some of the largest remaining tracts of dry dipterocarp forests in mainland Southeast Asia. Within these forests are small wetlands that support sizeable populations of large and elsewhere rare waterbirds and large mammals such as wild cattle, elephants, and tigers. This area has not yet attracted much donor attention and needs to be recognized and supported soon before key resources are lost. Community-level work in these areas would have the greatest impact on conservation of globally important biodiversity and important forest habitats. If funding for community- and provincial-level work is limited, it is suggested that it be focused here first.

8. Recommended Actions in USAID/Cambodia IESP: Relationship to Biodiversity and Tropical Forest Conservation

A parallel project to the production of this Tropical Forests and Biodiversity Assessment has been the production of a proposed Interim Environmental Strategic Plan (IESP) for USAID/Cambodia. In this section, in accordance with the clauses of FAA Sections 118 (tropical forests) and 119 (biodiversity) the “extent to which the actions proposed for support by the Agency meet the needs thus identified” is addressed.

The full IESP appears in Annex 1 to the parent document and only the recommendations are repeated here for this analysis. The IESP recommends an Intermediate Result (IR) to be incorporated with the Democracy and Governance (DG) Strategic Objective (SO) 1 with an example of various illustrative activities.

8.1 Proposed IR: Strengthened Local Governance of Natural Resources to Secure Community Control over Resources Critical to Rural Livelihoods

Four “points of entry,” or sub-IRs are suggested, including:

1. **Community-Level Entry Point: Improved community control over management and conservation of forest and fishery resources.**

Illustrative Activities

- Assist communities to develop institutions to manage resources under their control.
- Assist communities to identify, value, map, and plan the management of their resources.
- Strengthen the capacity of communities to advocate for their resource use rights to government and the private sector.

2. **Local Government Entry Point: Strengthened ability of commune councils and other levels of local government to implement new land and natural resource management laws and to reduce natural resource-related conflict and human rights abuses.**

Illustrative Activities

- Provide commune councils with legal and technical training that will allow them to play their intended role in NRM.
- Educate communities and resource users about their rights under new land and NRM laws and how to effectively advocate for recognition of their rights.
- Facilitate cooperation and joint activities between HR/DG and conservation/environmental NGOs and other civil society organizations.
- Assistance to establish land and natural resource conflict prevention and resolution mechanisms to be implemented at the commune and province levels.
- Support NGOs to investigate and publicize natural resource-related human rights abuses.

- Develop and foster mechanisms for inter-level and interagency cooperation with respect to NRM and land use planning.
- Support conservation NGOs, in cooperation with the USFWS, to strengthen the ability of provincial-level government agencies to control the illegal harvest and trade of wildlife and timber.

3. Legal Framework Entry Point: Support civil society to participate in the process of national level consultations to refine and monitor the implementation of the legal framework for land and natural resource management as they relate to CBNRM and NRM governance at provincial and lower levels.

Illustrative Activities

- Disseminate to donors and NGOs lessons learned from natural resources DG activities at the community and local government levels and support NGOs to advocate the incorporation of these lessons into government policy.
- Support NGOs to participate in the process of consultation and review of implementing regulations for soon-to-be approved Land, Forestry, and Fishery Laws.
- Support NGOs to identify illegal activities and corruption related to NRM and bring their findings to the attention of the government and the public.
- Provide public awareness and environmental education to help citizens participate in the political dialogue about NRM and biodiversity conservation.
- Encourage NGOs to develop mechanisms for ENR conflict prevention and resolution.
- Support NGOs to monitor the enforcement of ENR laws.

4. Private Sector Entry Point: Facilitate improved natural resources management by the private sector through recognition of community rights and innovative partnerships with communities and communes.

Illustrative Activities

- Devise and demonstrate incentives and approaches for the private sector to partner with communities and communes to manage and market natural resources.
- Support NGOs to establish forest certification in Cambodia as a private sector-driven means to improve forest management, and in the context of this IR to use certification as a leverage point to gain recognition of community resource use rights by concessionaires.
- Create the opportunity for the growth of small, knowledge-based businesses by giving communities funds and guidance to hire local firms to assist them with natural resources and land use planning as well as environmental and social impact assessment, if warranted. This would create 1) an incentive for the private sector to offer services usually provided by government or NGOs, 2) a new business niche in rural areas, and 3) employment for university graduates in natural resources and agriculture.

8.2 Analysis of Relationship between the Proposed IR and the 118/119 Assessment

The points of entry and illustrative activities suggested in the IESP are closely related to a number of the overall tropical forest and biodiversity conservation recommendations presented in this report. Some of the most salient overlaps are considered here.

The proposed community entry point 1 clearly corresponds to biodiversity recommendations 3 and 8 that involve empowering local people to manage their own resources and providing them with knowledge about them. Community control over their resources is also a factor that can be addressed through policy changes described in recommendations 2, 4, and 6.

Entry point 2, local governments, just as clearly overlaps with biodiversity recommendations 1 and 7 and to some degree with recommendations 2, 4, 6, and 8 as well. In all of these recommendations, it is important that the local government entities be strengthened, empowered, and educated to perform their natural resource-related responsibilities effectively.

Similarly, entry point 3, concerning legal frameworks, closely dovetails with biodiversity recommendations 2, 4, 5, 6, 7, and 8 which all could involve civil society to one degree or another in efforts to learn more about and monitor the enforcement of existing laws and to work on the development of new and more effective ones.

The private sector entry point 4 also closely corresponds to biodiversity recommendation 6 with overlaps in other recommendations as well. Although presently in Cambodia, the private sector presents some of the greatest impediments to biodiversity conservation, this could turn around, and more appropriate involvement of the private sector could be an asset.

If the local- and provincial-level work outlined in all the entry points focus efforts in parts of the northern plains then biodiversity recommendation 10 will be addressed as well.

The only biodiversity recommendation not covered in some way in the proposed IESP is number 9, which requires a scientific perspective most likely beyond the purview of USAID programming. Although implementing recommendation 9 will have long-term positive effects, right now the threats to forests and biodiversity in Cambodia are immediate and severe. Addressing items 1 through 8, with a geographical focus suggested in 10 will go a long way towards facilitating the more immediate and necessary actions.

8.3 Conclusions

As can be seen in this section, the points of entry suggested in the IESP strongly overlap a number of the tropical forest and biodiversity recommendations suggested in Section 7 of this assessment. If any of the illustrative actions are funded in support of these points, then they will also help address the loss of natural resources and biodiversity. The present situation in Cambodia is putting undue stress on remaining natural forests, wetlands, and aquatic ecosystems and to the fish, wildlife and plant species that live within them. Any and all actions funded by USAID to address this situation is sure to help the people of Cambodia who depend upon these resources and will in turn aid international biodiversity conservation efforts.