

APPENDIX-K
ENVIRONMENT

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APPENDIX - K

ENVIRONMENT

CHAPTER K-1 ADMINISTRATIVE FRAMEWORK ON ENVIRONMENT

K-1.1 Institution and Legislation Related to Environment

In recent decades, Cambodia's environment has deteriorated as a result of conflict, neglect and uncontrolled exploitation. Since RGC recognized the need for effective environmental and resource management, the State Secretariat for Environment, now Ministry of Environment (MOE) was established in 1993. The structure of MOE is shown in Fig. K-1. The organization on technical tasks, renewed in 1996, consists of six (6) departments under its Director General. In twenty-one (21) provinces and three (3) municipalities, Provincial / Municipal Environment Departments are carrying out regional environmental management under the supervision of MOE.

MOE is responsible for promoting the environmental protection and for conserving natural resources in order to improve environmental quality, human health, national culture and socio-economy. In addition, MOE plays a role to involve the various concerned agencies, such as MOWRAM, MAFF, CNMC, and MRC, to facilitate the achievement of environmental maintenance and protection.

RGC established Law on Environmental Protection and Natural Resources Management in 1996, which was a fundamental legislation focusing on protection of environmental quality and human health, and on sustainable use of the country's rich and diverse natural resources. The law stipulates 1) development of national and regional environmental plan, 2) environmental impact assessment, 3) natural resources management, 4) environmental protection, 5) monitoring and inspection, and 6) public participation.

In order to ensure the contents of the law, the following sub-decrees were issued or drafted:

- 1) Sub-decree on Environmental Impact Assessment Process,
- 2) Sub-decree on Water Pollution Control,
- 3) Sub-decree on Solid Waste Management,
- 4) Sub-decree on Air and Noise Pollution Control, and
- 5) Sub-decree on Protected Areas.

Besides, the National Environmental Action Plan for 1998-2002 was prepared by

MOE with assistance of WB, UNDP, FAO, UNESCO, and USAID. The plan provides a strategic framework in the six (6) key areas, namely, 1) forest policy, 2) fisheries and floodplain agriculture in the Tonle Sap region, 3) coastal fisheries, 4) biodiversity and protected areas, 5) energy development and environment, and 6) urban waste management.

K-1.2 Official EIA Procedure

The law on Environmental Protection and Natural Resources Management stipulates that Environmental Impact Assessment (EIA) shall be done for all proposed projects, and be evaluated by MOE prior to the issuance of a decision by RGC. In order to ensure EIA process and to identify the responsibilities of MOE and concerned agencies, Sub-decree on Environmental Impact Assessment (EIA Sub-decree) was enacted in 1999. The procedure mentioned in EIA Sub-decree is shown in Fig. K-2, and the outline of procedure is summarized below:

- 1) The Project's Owner shall investigate the existing environmental condition on physical / ecological / socio-economic resources, and prepare the Initial Environmental Impact Assessment (IEIA) report through identifying the magnitude and extent of environmental impacts.
- 2) The Project's Owner shall submit the IEIA report to MOE. MOE shall review and examine the IEIA report, and notify the Project's Owner of requirement of full Environmental Impact Assessment (EIA) study within thirty (30) days from submission, in case that the significant impacts may occur. No requirement of full EIA from MOE means that the proposed project is applicable to EIA Sub-decree, and that the Project's Owner receives the consent of MOE on implementation of the project.
- 3) The Project's Owner, who is informed of requirement of full EIA from MOE, shall prepare the EIA report, and submit it to MOE. MOE shall review and examine the EIA report, and notify the Project's Owner of a comment or suggestion, if any, within thirty (30) days from submission. The Project's Owner can receive the consent of MOE on implementation of the project after required revision of EIA report.

Article 6 and Appendix of EIA Sub-decree stipulate the project types / activities and their size / capacity, on which an IEIA or EIA is required. Regarding agricultural sector, the project conditions to comply with the procedure as per EIA Sub-decree are shown in Table K-1.

CHAPTER K-2 OVERVIEW OF ENVIRONMENTAL ASPECTS IN AND AROUND THE STUDY AREA

K-2.1 General

The environmental aspects on social condition (demography, land use, economic activities, etc.) and on natural condition (climate, topography, soil, hydrology, water quality, etc.) are described in Chapter II-5 of the main report as 'Site Description' for Initial Environmental Examination (IEE). The remarkable features of environment in and around the Study Area are as follows:

K-2.2 Social Condition

(1) Health

According to interviews to local people, the following water-borne diseases were and are commonly seen in and around the Study Area:

- (a) Typhoid,
- (b) Cholera,
- (c) Malaria, and
- (d) Dysentery.

Malaria seems a common disease especially near the mountain area at the upstream of the Study Area. Besides, bacterial diarrhea is also common.

There are five (5) referral hospitals and seventy (70) health centers in Takeo Province in 1998 (Department of Health, Takeo). At health centers, primary treatment including injection for some diseases, vaccination, and tablets for slight illness are available. For serious diseases or injuries, people go to hospitals in Tram Kak or Takeo town.

(2) Water Use

Table K-2 shows the status on water source of households in Takeo Province. RGC, local government (Department of Rural Development) or NGOs constructed the drilled and pumped wells for drinking water source at some dense settlements in the Study Area. However, the number of these wells and their covering areas are limited. The majority of households in the Study Area mainly fetch water for drinking or miscellaneous use from nearby streams and ponds. During wet season, their main source of water is rainfall.

There is a water supply network only in Takeo town area. Source of the network is Kanlaeng Chak reservoir, and the raw water is treated through the filtration and

chlorination system. Although the number of population / households covered by the network is unclear, about 5,000 m³ per month of treated water is distributed from the treatment plant to the town area on an average.

(3) Energy

Most of the households in Takeo Province use firewood for cooking as shown in Table K-3. The proportion of the households who use charcoals is high in urban area compared to rural area. The common firewood trees raised by local people in the Study Area are listed in Table K-4. There are no available data and information regarding consumption amount of firewood in the Study Area.

The forests of Noreay and Chrok Pdout mountain areas are recognized to be main resources of firewood for local people in the Study Area, as mentioned later.

(4) Land Issues

After the downfall of the Khmer Rouge regime in 1979, the RGC began allocating land with a maximum holding of five (5) ha. Private ownership of land-use rights was legally reintroduced in Cambodia in 1989. It was declared that all Cambodians could own, use, and inherit land-use rights granted by the government. Law on Land, 1992 stipulates that person, who has peacefully occupied the land for five years, can obtain the right of land-use ownership.

However, the progress of land-use ownership titling is poor. Moreover, due to deficiencies of law enforcement, it is alleged that disparities, illegal transactions, and usurpation are seen in Cambodia.

RGC recognized the law as requiring urgent revision and adequate enforcement. Law on Land, 2000 was anew prepared and passed through the National Assembly, and is now awaiting acknowledgement of the Prime Minister. Cadastral and land registration project is in progress under Ministry of Land Management, Urban Planning and Construction, with assistance of Finland. Although Takeo Province is covered by this project, investigated and registered area is only the limited northern part of the province. Most of the land-use ownership in the Study Area has not been legally registered yet.

On the other hand, Law on Water Resources Management stipulates that the beds and banks of rivers, streams, lakes, canals, storage tanks, and reservoirs are owned by the State. This means that, in the Study Area, farming in ruined reservoirs and canals is illegal land use. Chiefs of the communes concerned in the Study Area also raise this illegal background, and suggest that the majority of the farmers who cultivate the beds of canals and reservoirs will consent to evacuate the land occupied illegally.

However, there are some of the socially weak such as widow-headed household who have no choice but to utilize the State-owned land. For those, special consideration is necessary.

In addition, a grave exists inside Kpob Trobek Reservoir area, and will be inundated after the completion of construction. This issue should be coped with adequately by MOWRAM and DWRAM before the commencement of construction works.

K-2.3 Natural Condition

(1) Protected Area and Endangered Species

Decree on Creation and Designation of Protected Areas was issued in 1993. The decree designates country's protected areas under four (4) categories, which correspond to international classification, namely National Park, Wildlife Sanctuaries, Protected Landscapes, and Multiple Use Management Areas.

There are no protected areas in the Study Area. The nearest protected areas around the Study Area are Kirirom National Park and Phnom Bokor National Park. Kirirom park is located at a distance of about 40 km from the northwest boundary of the Study Area, and Phnom Bokor park at a distance of about 40 km from the west boundary of the Study Area. The status of these parks is shown in Table K-5.

Table K-6 shows the species of international conservation significance known to occur in Cambodia. According to the interview to local people, it seems that none of endangered and / or vulnerable species exists in the Study Area, although there are no definite data.

(2) Forest and Vegetation

Land use status in the Study Area is mentioned in Chapter II-1.5 of the main report. Most of the Study Area is covered by paddy field and crop land, and forest area is very limited. A definite forest is recognized at the small mountain (local called Mt. Noreay) located on the west boundary of the Study Area. Although the forest in this range is classified under evergreen broad leafed forest, deciduous forest, and bamboo / secondary forest, according to the Land Use Map of Cambodia prepared in 1999, the extraction by local people caused deforestation and made these forests a kind of dried bush rapidly.

Shrub and abandoned field covered by shrub spread at the foot of Noreay mountain. These types of shrub are observed but limited to O Saray reservoir.

Chrok Pdout mountain area located west outside of the Study Area is still covered by good dense forest. This area is designated as forest concession area for the purpose of

effective use of forest resources and of limitation of exploitation. The forest concession area is shown in Fig. K-3. However, this forest area is also threatened with deforestation, because of illegal logging for timber and firewood by local people for households' consumption or for commercial basis.

Besides, two (2) reforestation projects was recognized in and around the Study Area as shown in Fig. K-3 and Table K-7. These projects are directly managed by Department of Forest and Wildlife (DOFW) of MAFF, or by NGOs or local communities under the instruction of DOFW.

(3) Mammals and Birds

Bio-diversity in the Study Area seems poor. According to the interview to local people, population and species of wildlife were rich several decades ago, for example, large size mammals such as tiger occasionally appeared near the mountain area in the west of the Study Area. However, at present, even monkey, wild pig, and rabbit rarely appear.

According to the interview to local people, mallard, heron, crow, dove, quail, etc. are common birds found in and around the Study Area. Some kinds of birds of prey occasionally appear and pounce on domestic fowls. Besides, the waterfowls raised by local people in the Study Area are listed in Table K-8.

(4) Fish and Fishery

Twenty (20) fishery lots auctioned by a provincial governor exist at the flooded area and swamps in the right bank of the Bassac river in Takeo Province. These lots are managed and inspected by three sectors, namely Kampong Ampel, Angkor Borey, and Kbal Por, as industrial fishery under the fishery office of province. Ankor Borey sector is located in the downstream of the Study Area at about 20 km east of Takeo town. In this sector, more than thirty (30) species of fish are captured. The main species of catch are Chhlang (*Mystus Nemurus*), Chhpin (*Hypsibarbus Malcolmii*), Ros/Ptouk, Krom, etc. as shown in Table K-9.

Four reservoirs, adjacent to the Study Area along the national road No.2, namely Thnot Te, Krachob-Chrouy Samraong, Kanlaeng Chak, and O'Tom, play an important role in small scale fishery for local people, although the reservoirs and surrounding inundation areas are outside the fishing lots. Small swamps, ponds, and streams in the Study Area are also utilized for family fishing by local people. Since some portion of catch is sold in local market, fish is important resource for not only the domestic diet but also income generation. Species of fish raised by local people in and around the Study Area, including the four reservoirs, are shown in Table K-10.

Tables

Table K-1 List of Project Conditions Requiring IEIA or EIA (Agricultural Sector)

Type and Activities of Projects	Size / Capacity
1. Agriculture	
1) Concession forest	10,000 ha
2) Logging	500 ha
3) Land covered by forest	500 ha
4) Agricultural and agro-industrial land	10,000 ha
5) Flooded and coastal forests	All sizes
6) Irrigation systems	5,000 ha
7) Drainage systems	5,000 ha
8) Fishing ports	All sizes
2. Projects Related to Agriculture	
1) Food processing and caned	500 ton/year
2) Rice mill and cereal grains	3,000 ton/year
3) Chemical fertilizer plants	10,000 ton/year
4) Pesticide industry	All sizes
5) Animals food processing	10,000 ton/year

Source: Sub-decree on Environmental Impact Assessment Process, 1999

Table K-2 Status on Water Source in Takeo Province

Main Source	Province		Average
	Urban	Rural	
Water network	0.7	0.5	0.5
Pumped & drilled well	9.4	10.5	10.4
Dug well	7.3	37.1	35.8
River, stream pond, & rain	55.8	49.9	50.2
Purchased water	25.8	0.9	2.0
Others	1.0	1.1	1.1
Total	100	100	100

Source: Development Plan of Takeo Province for 2000

Table K-3 Status on Energy for Cooking in Takeo Province

Items	Province		Average
	Urban	Rural	
Firewood	90.2	96.5	96.2
Charcoals	6.9	0.7	1.0
Petroleum	1.4	1.7	1.7
Gas	1.3	0.3	0.4
Other	0.2	0.8	0.7
Total	100	100	100

Source: Development Plan of Takeo Province for 2000

Table K-4 Trees for Firewood Used by Local People in the Study Area

Khmer name	Scientific name	Existence
Ampil barang		Common
Ampil teuk	<i>Pithecellobium dulce</i>	Common
Anger dey		Rare
Chamneang		Common
Chrey		Common
Daung	<i>Cocos nucifera</i>	Common
Ktom	<i>Stephegyene</i>	Common
Ngongea		Common
Phnom Phneng	<i>Hymenocardia walichii</i>	Common
Reang	<i>Barringtonia micrantha</i>	Common
Sangker	<i>Combretum quadrangulare</i>	Common
Snay	<i>Grewia sinuata</i>	Common
Svay	<i>Mangifera indica</i>	Common
Troas	<i>Combretum trifoliatum</i>	Common
Trosek	<i>Peltophorum ferrugineum</i>	Common

Source: Interview to Local People

Table K-5 Status of Protected Areas around the Study Area

Protected Area	Location	Area(ha)	Characteristics
Kirirom National Park	Koh Kong Province	35,000	High elevation pine forest with large mammals including tiger, banteng, and gaur.
Phnom Bokor National Park	Kampot Province	140,000	High elevation Sphagnum bogs, Podocarpus forest with large mammals including tiger, elephant, sun bear and perhaps Asian black bear.

Source: National Environmental Action Plan, 1998-2002
Environmental Challenges of Cambodia, MOE/JICA, 2000

Table K-6 Species of International Conservation Significance
Known to Occur in Cambodia (1/2)

Common Name	Scientific Name	IUCN Classification
<u>Mammals</u>		
Asian elephant	<i>Elephas maximus</i>	E
Asian golden cat	<i>Catopuma temmincki</i>	I
Asiatic wild dog	<i>Cuon alpinus</i>	V
Banteng	<i>Bos javanicus</i>	V
Black finless porpoise	<i>Neophacaena phocanoides</i>	K
Black gibbon	<i>Hylobates concolor</i>	E
Brown-antlered (Eld's) deer	<i>Cervus eldii</i>	V
Chinese white dolphin	<i>Sotalia chinensis</i>	K
Clouded leopard	<i>Neofelis nebulosa</i>	V
Douc langur	<i>Pygathrix nemaeus</i>	E
Dugong	<i>Dugong dugon</i>	V
Fishing cat	<i>Prionailurus viverrinus</i>	K
Gaur	<i>Bos gaurus</i>	V
Hairy-nosed otter	<i>Lutra sumatrana</i>	K
Irawaddy dolphin	<i>Orcaella brevirostris</i>	K
Javan rhinoceros	<i>Rhinoceros sondaicus</i>	E
Kouprey	<i>Bos sauveli</i>	E
Leopard	<i>Panthera pardus</i>	-
Mainland serow	<i>Capricornis sumatraensis</i>	I
Marbled cat	<i>Felis marmorata</i>	K
Marshall's horseshoe bat	<i>Rhinolophus marshallii</i>	-
Northern smooth-clawed otter	<i>Aonyx cinerea</i>	K
Pileated gibbon	<i>Hylobates pileatus</i>	E
Pygmy loris	<i>Nycticebus pygmaeus</i>	V
Smooth-coated otter	<i>Lutra perspicillata</i>	K
Stump-tailed macaque	<i>Macaca arctoides</i>	K
Sumatran rhinoceros	<i>Rhinoceros sumatrensis</i>	E
Sun bear	<i>Helarctos malayanus</i>	V
Tiger	<i>Panthera tigris</i>	E
Wild buffalo	<i>Bulablis bulabus</i>	-
<u>Reptiles</u>		
Asian giant tortoise	<i>Manouria emys</i>	V
Batahur	<i>Batagur baska</i>	E
Elongated tortoise	<i>Indotestudo elongata</i>	K
Estuarine crocodile	<i>Crocodylus porosus</i>	V
Green turtle	<i>Chelonia mydas</i>	E
Hawksbill turtle	<i>Eretmochelys imbricata</i>	E
Impressed tortoise	<i>Manouria impressa</i>	V
Indian python	<i>Python molurus</i>	V
Siamese crocodile	<i>Crocodyls siamensis</i>	E
<u>Fish</u>		
Asian bony-tongue	<i>Sceropages formosus</i>	K
Giant catfish	<i>Pangasianodon gigas</i>	V
Indochina featherback	<i>Notopterus blanci</i>	R
Pla thepa	<i>Pangasius sanitwongsei</i>	R
Silver shark	<i>Balantiocheilos melanopterus</i>	I
Trey trasac	<i>Probarbus jullieni</i>	K

Table K-6 Species of International Conservation Significance
Known to Occur in Cambodia (2/2)

Common Name	Scientific Name	IUCN Classification	Bird-life International Classification
<u>Birds</u>			
Asian dowitcher	<i>Limnodromus semipalmatus</i>	R	NT
Asian golden weaver	<i>Ploceus hypoxanthus</i>	-	NT
Asian openbill stork	<i>Anastomus oscitans</i>	-	NT
Bar-bellied pitta	<i>Pitta elliotii</i>	R	NT
Bengal florican	<i>Eupodotis bengalensis</i>	E	EN
Black-bellied tern	<i>Sterna acuticauda</i>	-	VU
Black-headed ibis	<i>Threskiornis melanocephalus</i>	-	NT
Black-necked stork	<i>Ephippiorhynchus asiaticus</i>	-	*
Blue-rumped pitta	<i>Pitta soror</i>	-	NT
Chestnut-headed partridge	<i>Arborophila cambodiana</i>	R	VU
Coral-billed ground cuckoo	<i>Carpococcyx renauldi</i>	-	NT
Giant ibis	<i>Pseudibis gigantea</i>	R	CR
Greater adjutant stork	<i>Leptoptilus dubius</i>	E	EN
Greater spotted eagle	<i>Aquila clanga</i>	-	VU
Green peafowl	<i>Pavo muticus</i>	V	VU
Grey-headed fishing eagle	<i>Ichthyophaga ichthyaetus</i>	-	NT
Grey-head lapwing	<i>Vanellus cinereus</i>	-	NT
Indian skinner	<i>Rynchops albicollis</i>	-	VU
Lesser adjutant stork	<i>Leptoptilus javanicus</i>	V	VU
Long-billed vulture	<i>Gyps indicus</i>	-	NT
Masked finfoot	<i>Heliopais personata</i>	V	VU
Milky stork	<i>Mycteria cinerea</i>	V	VU
Nicobar pigeon	<i>Caloenas nicobarica</i>	R	NT
Nordmann's greenshank	<i>Tringa guttifer</i>	I	EN
Oriental darter	<i>Anhinga melanogaster</i>	-	NT
Painted stork	<i>Mycteria cinerea</i>	-	NT
Red-headed vulture	<i>Sarcogyps calvus</i>	-	NT
Rufous-throated fulvetta	<i>Alcippe rufogularis</i>	-	NT
Rufous-winged buzzard	<i>Bustastur liventer</i>	-	NT
Sarus crane	<i>Grus antigone</i>	-	NT
Siamese fireback	<i>Lophura diardi</i>	R	VU
Silver oriole	<i>Oriolus mellianus</i>	-	VU
Spot-bellied eagle owl	<i>Bubo nipalensis</i>	-	NT
Spot-bellied pelican	<i>Pelecanus philippensis</i>	I	VU
White-rumped falcon	<i>Polihierax insignis</i>	-	VU
White-shouldered ibis	<i>Pseudibis davisonii</i>	I	VU
White-winged wood duck	<i>Cairina scutulata</i>	V	EN
Wooly-necked stork	<i>Ciconia episcopus</i>	-	EN

IUCN: International Union for Conservation of Nature and Natural Resources

Source: Environmental Challenges of Cambodia, MOE/JICA, 2000.

IUCN Status Categories

Extinct (Ex) -Species not definitely located in the wild during the past 50 years.

Endangered (E) -Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating.

Vulnerable (V) -Taxa believe likely to move into the "Endangered" category in the near future if the causal factors continue operating.

Rare (R) -Taxa with small world populations that are not present "Endangered" or "Vulnerable" but are risk. These taxa are usually localized within restricted geographical areas or habitats or are thinly scattered over a more extensive range.

Indeterminate (I) -Taxa known to be "Endangered", "Vulnerable" or "Rare" but where there is not enough information to say which of the three categories is appropriate.

Insufficiently Known (K) -Taxa that are suspected but not definitely known to belong to any of the above categories because of lack of information.

Threatened (T) -Threatened is a general term to denote species which are "Endangered", "Vulnerable", "Rare", "Indeterminate", or "Insufficiently Known".

Birdlife International Status Categories

CR=critically endangered; E or EN=endangered; V or VU=vulnerable; I=indeterminate (but at least E, V, or R); K=insufficiently known; NT=near threatened.

[*=E in Asia but not globally because of Australian population.]

Table K-7 Reforestation Project in and around the Study Area

No. in Fig. K-3	No.1	No.2
Location	Sre Nonoung village	Tropeang Thum village
Project Term	1985 ~	1986 ~
Project Area	1,615 ha	1,115 ha
Planted Area	approx. 700 ha	642 ha
Planted Species	- Akasya (<i>Acasia spp.</i>) - Angkagnh (<i>Cassia siamea</i>) - Preng khal (<i>Eucalypyus spp.</i>)	
Planting Density	2,500 trees/ha	2,500 trees/ha

Source: Forestry office, Takeo

Remark: According to chief of forestry office:

1. Management of 500 ha of No.1 project area was transferred to NGOs or local community.
2. About 30 ha of No.1 planted area and 5 ha of No.2 was damaged by illegal extraction.

Table K-8 List of Waterfowl in the Study Area

Khmer Name	Scientific Name	Existence
Krosa prophes	<i>Ardea cinerea</i>	Rare
Kok kron thom	<i>Egretta alda</i>	Common
Kok kron toch	<i>Egretta garzetta</i>	Common
Kok kor	<i>Bubuleus ibis</i>	Common
Proveuk thom	<i>Dandrocynna javanica</i>	Rare
Proveuk toch	<i>Anas crecca</i>	Rare
Proveuk	<i>Nattapus pulchellus</i>	Common
Klom	<i>Fulica atra</i>	Common
Moin teuk thom	<i>Gallicrex cinecea</i>	Common
Moin teuk toch	<i>Porphyrio edwardsi</i>	Common
Krodevich	<i>Sarcofranus indicus</i>	Common
Kvaik	<i>Scolopax rusticola</i>	Common
Aot thom		Common
Aot sbov		Common
Tituy	<i>Bubobubo</i>	Rare
Kleng srak	<i>Strix flammea</i>	Common

Source: Interview to Local People

Table K-9 Fishery Status in Angkor Borey Sector in Takeo Province
(Nov. 1999-Oct. 2000)

Khmer Name	English Name	Scientific Name	Unit: 1000kg	
			Open Season	Closed Season
Chhlang	Yellow Mystus	<i>Mystus Nemurus</i>	151.2	4.5
Chhpin	Goldfin Tinfoil Barb	<i>Hypsibarbus Malcolmii</i>	146.0	21.6
Ros/Ptuok			86.5	12.4
Krom			72.1	3.0
Khman	Eye-spot Barb	<i>Hampala Dispar</i>	71.7	6.0
San Dai	Great White Sheatfish	<i>Wallago Attu</i>	55.6	1.4
Chra Kaeng	Smith Barb	<i>Puntiplites Proctozysson</i>	46.3	3.6
Kaek	Black Sharkminnow	<i>Morulus Chrysophekadion</i>	39.7	1.5
Slat	Bronze Featherback	<i>Notoperus Notopterus</i>	46.1	7.8
Ta Aon	Whisker Sheatfish	<i>Ompok Hypophthalmus</i>	31.3	6.5
Others			284.5	36.5
Total			1031.0	104.8

Open Season: from November to June

Closed Season: from July to October

Source: Fishery office, Takeo

Table K-10 Species of Fish in and around the Study Area

Khmer Name	Scientific Name	Existence
An Daeng Reung	<i>Clarias Batrachus</i>	Common
An Daeng Ton	<i>Clarias Meladerma</i>	Common
An Tung	<i>Ophisternon Bengalense</i>	Common
Chang Va Chhnot	<i>Rasbora Paucisquamis</i>	Common
Chang Va Moul	<i>Rasbora Tornieri</i>	Common
Chhlang	<i>Mystus Nemurus</i>	Common
Chhlang Kra Bei	<i>Bagarius Yarrel</i>	Common
Chhlonh	<i>Macrogathus Siamensis</i>	Common
Chhpin	<i>Hypsibarbus Malcolmi</i>	Common
Chra Kaeng	<i>Puntiplites Proctozyson</i>	Common
Dam Rey	<i>Oxyeleotris Marmorata</i>	Rare
Dieb (Toch)	<i>Channa Micropeltes (Small)</i>	Common
K' Aek	<i>Morulus Chrysophekadion</i>	Common
Kam Phleanh Phluok	<i>Trichogaster Microlepis</i>	Common
Kam Phleanh Srae	<i>Trichogaster Trichopterus</i>	Common
Kanh Chok Kdaong	<i>Heterobagrus Bocourti</i>	Common
Kanh Chon Chei	<i>Channa Lucius</i>	Common
Kan Trab	<i>Pristolepis Fasciata</i>	Common
Khong Veanh	<i>Dangila Lineata</i>	Common
Kranh	<i>Anabas Testudineus</i>	Common
Kros	<i>Osteochilus Hasselti</i>	Common
Ksan	<i>Glossogobius Koragensis</i>	Rare
Linh	<i>Thynnichthys Thynnoides</i>	Rare
Pra	<i>Pangasianodon Hypophthalmus</i>	*1
Praloong (Thum)	<i>Cirrhinus Microlepis</i>	Common
Riel	<i>Hynicorhynchus Caudimaculatus</i>	Common
Roas	<i>Channa Striata</i>	Common
San Dai	<i>Wallago Attu</i>	Rare
Slat	<i>Notoperus Notopterus</i>	Common
Sleuk Reusey	<i>Paralaubuca Harmandi</i>	Common
Ta Aon	<i>Ompok Hypophthalmus</i>	Common

*1: Only 4 Reservoirs east outside of the Study Area

Source: Interview to Local People

Table K-11 Major Environment-related Legislation Referred to or
Based on in the Study

1. Basic Environmental Legislation

- Law on Establishment of Ministry of Environment (1996)
- Sub-decree on Organizations and Functions of Ministry of Environment (1997)
- Law on Environmental Protection and Natural Resources Management (1996)

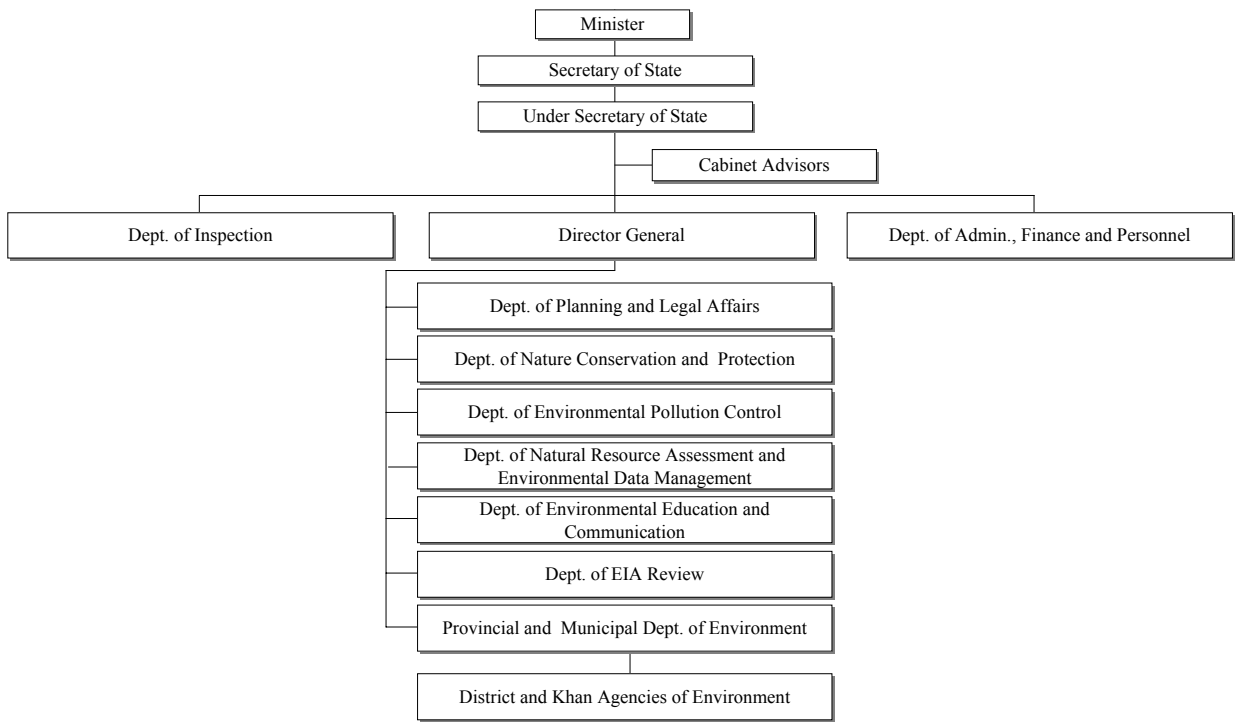
2. Specific Legislation on Environment

- Sub-decree on Environmental Impact Assessment Process (1999)
- Declaration on Guideline for Conducting Environmental Impact Assessment Report (2000)
- Sub-decree on Water Pollution Control (1999)
- Sub-decree on Solid Waste Management (1999)
- Sub-decree on Air and Noise Pollution Control (draft)
- Decree on Creation and Designation of Protected Areas (1993)
- Declaration No.1033 on Protected Areas (1994)

3. Other Legislation Related to Environment

- Law on Land (1992)
- Law on Water Resources Management
- Law on Fishery Management and Administration (1987)
- Law on Forestry Administration (1988)

Figures



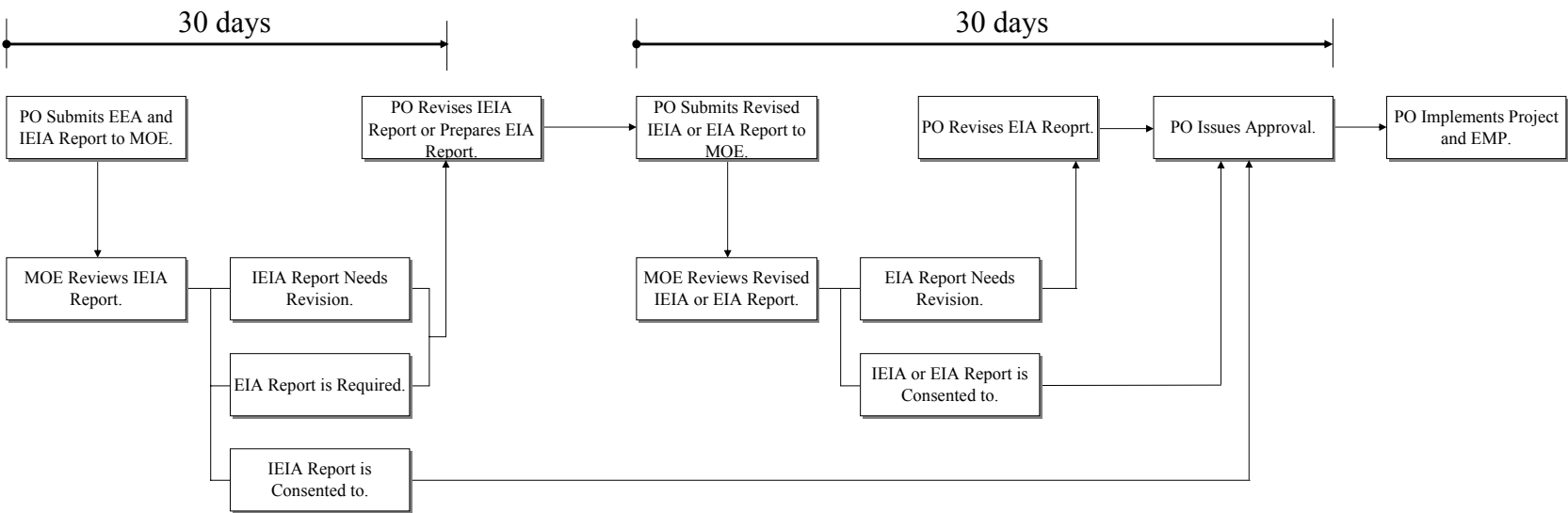
Source: Environmental Challenges of Cambodia, MOE/JICA, March, 2000

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Figure K-1

Ministry of Environment



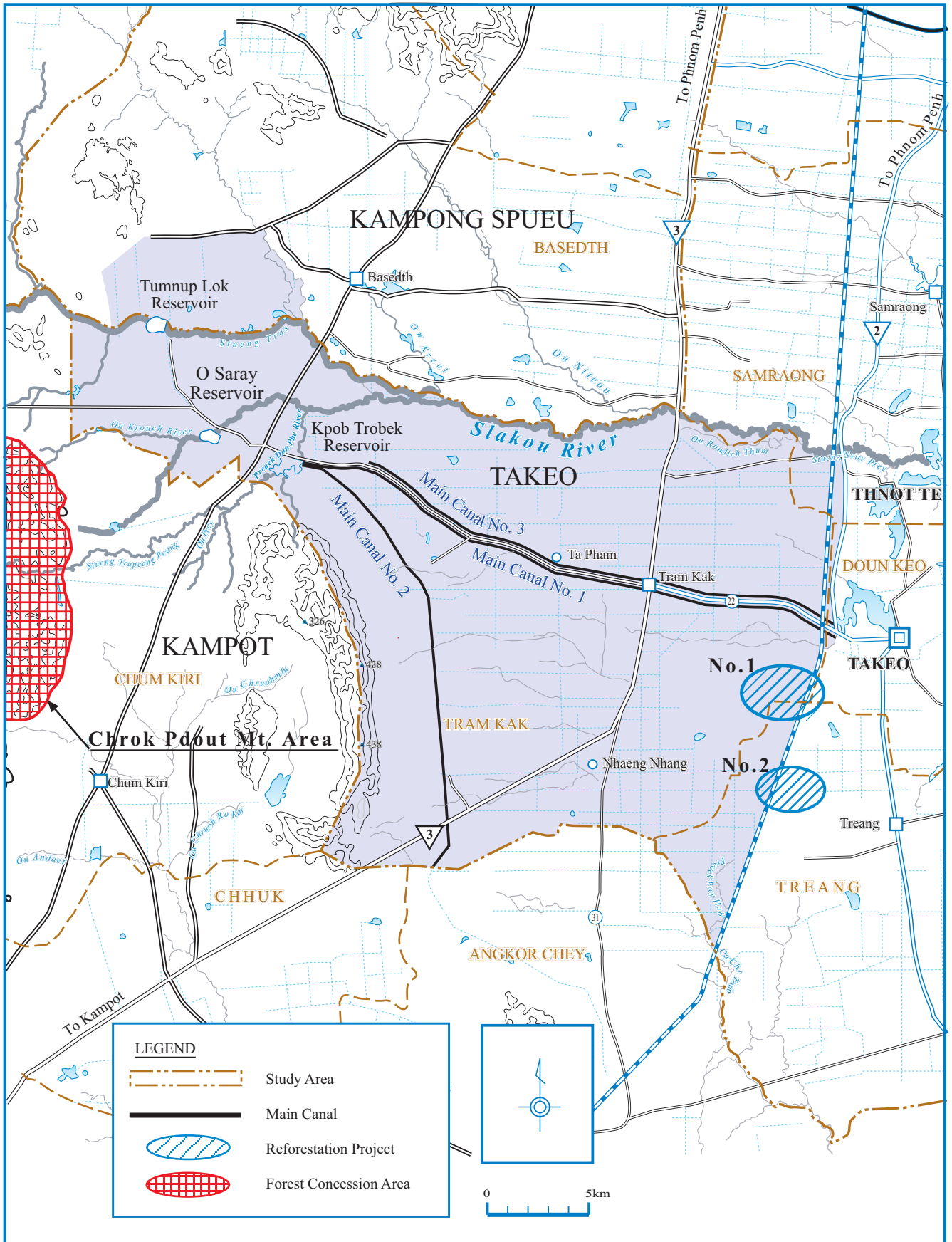
Note:
 PO: Project's Owner
 EIA: Environmental Impact Assessment
 IEIA: Initial Environmental Impact Assessment
 EMP: Environmental Management Plan
 EEA: Environmental Examination Application
 MOE: Ministry of Environment
 Source: Sub-decree on Environmental Impact Assessment Process, 1999

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Figure K-2

EIA Process for Proposed Project
 Approved by Project's Owner as
 Ministry and Institution



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Figure K-3

Reforestation Projects and Forest Concession Area in and around the Study Area