



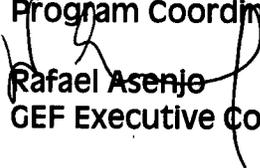
**United Nations Development Programme**  
GLOBAL ENVIRONMENT FACILITY



Date: 26 April 2001

**To:** Mr. Kenneth King  
Assistant CEO

**Attention:** Program Coordination

**From:**   
Rafael Asenjo  
GEF Executive Coordinator

**Subject:** **Submission of Medium Size Project Brief for Cambodia :  
Developing an integrated protected area system for the  
Cardamom Mountains**

Enclosed is a project brief for "Developing an integrated protected area system for the Cardamom Mountains" submitted to UNDP by : Fauna & Flora International (FFI). Please note that the project has been endorsed by the GEF national operational focal point in Cambodia.

In accordance with the operational guidance for the preparation and approval of medium-sized projects, we are submitting this to the GEF Secretariat for action by the Chief Executive Office (CEO). We understand that the Secretariat will recommend to the CEO that the project be submitted to the Council for approval, that it be returned for revision or that it not be developed further.

We are simultaneously circulating copies to UNEP/GEF, World Bank/GEF, STAP and the Biodiversity Convention Secretariat for comments to the GEF Secretariat. We expect to receive these comments within 15 working days. Therefore, we look forward to receiving the CEO's decision on or before 1 June 2001, but understand that the project will not be formally approved, even if the CEO has endorsed it, until the Council has reviewed it within the following 15-day period, namely by 22 June 2001.

Thank you and best regards.

**cc:** Robin Burgess, UNEP  
Ahmed Djoghlaif, UNEP  
Kristin Elliott, UNEP  
Madhav Gadgil, STAP  
Mark Griffith, UNEP  
Ramon de Mesa, GEFSEC  
Francine Stevens, World Bank  
Lars Videus, World Bank  
Hamdallah Zedan, CBD

## MEDIUM-SIZED PROJECT BRIEF

### 1. PROJECT SUMMARY

Project Identifiers															
<p><b>1. Project name:</b> Developing an integrated protected area system for the Cardamom Mountains</p>	<p><b>2. GEF Implementing Agency:</b> UNDP</p>														
<p><b>3. Country or countries in which the project is being implemented:</b> Cambodia</p>	<p><b>4. Country eligibility:</b> Ratified the CBD 1995</p>														
<p><b>5. GEF focal area(s):</b> Biodiversity</p>	<p><b>6. Operational program/short-term measure:</b> This project falls within the OP3 Forest Ecosystems and OP4 Mountain Ecosystems operational programs. (the latter refers specifically to montane regions of the Indochina peninsula)</p>														
<p><b>7. Project linkage to national priorities, action plans, and programs:</b> This project fulfils the three primary objectives of the Convention on Biological Diversity namely - conservation, sustainable use and the equitable distribution of the benefits of biodiversity. The project specifically addresses the following articles of the Convention on Biological Diversity:</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-left: 20px;">Article 7 a-d</td> <td>Identification and Monitoring</td> </tr> <tr> <td style="padding-left: 20px;">Article 8 b-f</td> <td>In-situ Conservation</td> </tr> <tr> <td style="padding-left: 20px;">Article 10 a-e</td> <td>Sustainable Use of Components of Biological Diversity</td> </tr> <tr> <td style="padding-left: 20px;">Article 11</td> <td>Incentive Measures</td> </tr> <tr> <td style="padding-left: 20px;">Article 12 a-c</td> <td>Research and Training</td> </tr> <tr> <td style="padding-left: 20px;">Article 13 a &amp; b</td> <td>Public Education and Awareness</td> </tr> <tr> <td style="padding-left: 20px;">Article 14 a-c</td> <td>Impact Assessment and Minimizing Adverse Impacts</td> </tr> </table> <p>The projects is linked and contributes to the following national priorities and programs:</p> <ul style="list-style-type: none"> <li>✓ National Environmental Action plan</li> <li>✓ Ministry of Environment Strategic Plan 1998 -2000</li> <li>✓ Development of National Biodiversity Action Plan;</li> <li>✓ Forest concession review;</li> <li>✓ Forest crime monitoring;</li> <li>✓ First Five Year Socio-economic Development Plan 1996-2000</li> <li>✓ Post-war recovery programmes;</li> <li>✓ World Bank Biodiversity and Protected Areas Management Project</li> <li>✓ Develop of National Species Action Plans (Elephant &amp; Tiger).</li> </ul> <p>The foremost priority for the Cambodian government is post-war reconciliation and economic recovery programs, as well as immediate humanitarian aid. It is the declared aim of this project to integrate biodiversity conservation with post-recovery and reconciliation programs under the umbrella of UNDP/CARERE (Cambodia Area Reconciliation and Rehabilitation), which is the principal agency operating post war recovery &amp; reconciliation programs in the Cardamom Mountains.</p>		Article 7 a-d	Identification and Monitoring	Article 8 b-f	In-situ Conservation	Article 10 a-e	Sustainable Use of Components of Biological Diversity	Article 11	Incentive Measures	Article 12 a-c	Research and Training	Article 13 a & b	Public Education and Awareness	Article 14 a-c	Impact Assessment and Minimizing Adverse Impacts
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<p><b>8. GEF national operational focal point and date of country endorsement:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="padding-left: 20px;">Submitted: 10.9.1999</td> <td style="padding-left: 200px;">Acknowledged: 10.9.1999</td> </tr> <tr> <td style="padding-left: 20px;">Endorsed: 21.9.1999</td> <td></td> </tr> </table>		Submitted: 10.9.1999	Acknowledged: 10.9.1999	Endorsed: 21.9.1999											
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<p><b>9. Project rationale and objectives:</b></p>															
	<p><b>Indicators:</b></p>														

<p>Covering an area of approximately one million hectares, the Cardamom Mountains of Southwest Cambodia support biodiversity of national, regional and international importance and form one of the largest and most intact wilderness remaining in Southeast Asia. The two wildlife sanctuaries are currently in the process of being nominated for inscription into the World Heritage Site List.. The wide variety of natural habitats support a number of endemics as well as significant populations of globally threatened plants and animals. Nevertheless, the species and habitats of the Cardamom Mts. are under rapidly increasing threat from a complex suite of human pressures.</p> <p><b>Goal:</b> Long-term conservation and sustainable management of the Cardamom Mountains ecosystems</p> <p><b>Purpose:</b> The develop an effective and integrated conservation management system for Phnom Aural and Phnom Samkos wildlife sanctuaries.</p>	<ul style="list-style-type: none"> <li>• Forest cover and structure are not degraded in project areas</li> <li>• Stable or growing faunal populations within the wildlife sanctuaries</li> <li>• Management decisions and actions taken by <i>PAMB</i></li> </ul>
<p><i>10. Project outcomes:</i></p> <p>Improved planning, management and regulatory frameworks for the Cardamom Mountains, including the Phnom Samkos and Phnom Aural Wildlife Sanctuaries</p> <p>Significant improvement in species and habitat protection in the Cardamom Mountains, including Phnom Samkos and Phnom Aural Wildlife Sanctuaries</p> <p>Use of natural resources by local communities in the Cardamom Mountains is more sustainable</p> <p>Improved livelihoods and welfare of local communities</p> <p>Sustainable financing in place for long term</p>	<p><i>Indicators:</i></p> <ul style="list-style-type: none"> <li>• Longterm management plans exist and are being applied.</li> <li>• Submission of proposal for revision of protected areas law to Council of Ministers</li> <li>• Wildlife sanctuary codes exist for both protected areas</li> <li>• Community conservation plans and codes of good practice developed</li> <li>• Status of habitats and species does not deteriorate</li> <li>• Reduction of threats</li> <li>• Status of habitats and species does not deteriorate</li> <li>• Number of sustainable use projects in place</li> <li>• Human population of wildlife sanctuaries</li> <li>• Reduction in malaria mortality</li> <li>• Standard of living among local communities</li> </ul>

management	<ul style="list-style-type: none"> <li>• Level of support in place</li> </ul>
<p>11. <i>Project activities to achieve outcomes (including cost US\$ or local currency of each activity):</i></p> <p>Create agreed operational plans for Aural and Samkos with supporting implementation structures at provincial, district and community levels and mechanisms to coordinate management with Central Cardamoms authorities <b>(GEF request): \$ 174,083 (Output 1)</b></p> <p>Enhance the legal and regulatory framework for protection, land use and land tenure and elevate the global status of the two sanctuaries and the Central Cardamoms <b>(GEF request): \$ 55,250 (Output 1)</b></p> <p>Develop and implement a conservation awareness programme at all levels <b>(GEF request): \$ 72,155 (Output 3)</b></p> <p>Increase capacity for management and protection <b>(GEF request): \$ 176,185 (Output 3)</b></p> <p>Improve infrastructure for management and protection <b>(GEF request): \$ 302,720 (Output 2)</b></p> <p>Improve law enforcement <b>(GEF request): \$ 99,250 (Output 2)</b></p> <p>Promote alternative and conservation compatible livelihoods and enterprises <b>(GEF request): \$ 69,500 (Output 4)</b></p> <p>Promote activities that improve the health, safety and security of local people <b>(GEF request): \$ 0 (Output 4)</b></p> <p>Develop sustainable finance mechanisms for protected areas management <b>(GEF request): \$ 49,000 (Output 5)</b></p>	<p><i>Inputs:</i></p> <ul style="list-style-type: none"> <li>• Technical assistance from local and international experts, the Government of Cambodia and international and national NGOs</li> <li>• Improvements and additions to basic infrastructure</li> <li>• Supply of equipment and consumables</li> </ul>
<p>12. <i>Estimated budget (US\$):</i></p> <p>GEF:</p>	<p>\$ 998,143</p>

Available Co-financing:	UNF:	\$ 2,140,000
	UNDP:	\$ 400,000
	FFI:	\$ 293,600
	CI:	\$ 500,380

Total : \$ 4,336,000

**Information on institution submitting project brief**

Information on project proposer: Fauna & Flora International (FFI)  
 FFI is collaborating with the Ministry of Environment, (Dept. B) for project implementation

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 Richard Paley, Cambodia Programme Coordinator

**Date of establishment, membership and leadership**

Founded 1903  
 UK Registered Charity No. 1011102  
 Company limited by guarantee, registered in England No. 2677068  
 40 staff, 4000 subscription members  
 Director: Mr. Mark Rose  
 Chairman: Mr. Lindsay Bury

**19. Mandate**

- FFI acts to conserve threatened species and ecosystems world-wide, choosing solutions that are sustainable, based on sound science and take account of human needs.
- FFI has been working in Indochina for 6 years and in Cambodia for 3. It has a regional office and staff in Hanoi and a representative office and coordinator in Phnom Penh
- FFI has carried out initial assessments and survey work in the Cardamom Mountains through its own fundraising
- FFI works closely with the Ministry of the Environment through capacity building, joint field work and project development

**Sources of revenue**

(1998 in pounds sterling, UK£)

Donations	1,036,801
	46.3%
Grants	1,043,335

Legacies	46.6%
	11,035
	0.5%
Subscriptions	
	72,736
	3.3%
Investment income	
	42,499
	1.9%
Charitable trading income	
	13,342
	0.6%
Publications, royalties & sponsorship	
	17,710
	0.8%
<b>Total</b>	<b>2,237,458</b>

**Recent activities/programs in particular those relevant to GEF**

FFI has been involved in GEF activities in the following projects:

- Vietnam – Implementation of GEF MSP (World Bank) Ecosystems Conservation of Cuc Phuong – Pu Luong Limestone Landscape, Northern Vietnam
- Indonesia – Implementation of GEF MSP (World Bank): Conservation of Elephant Landscapes in Aceh Province, Sumatra.
- Cebu, Philippines. Project preparation for GEF MSP (UNDP): Cebu endemic forest biodiversity restoration, conservation and sustainable development
- Indonesia - Subcontracts for biodiversity assessment projects in Kerinci Seblat NP, Sumatra.
- Jordan - GEF Dana Wildlands Biodiversity Project: Design and implementation of capacity building programme. Protected areas management advisors.
- Mauritius - Capacity building activities within the GEF biodiversity Restoration Project.
- Kazakhstan, Uzbekistan, Kyrgyzstan – Project preparation for GEF Central Asia Transboundary Biodiversity Conservation Programme.
- Kyrgyzstan - Preparation of the National Biodiversity Strategy and Action Plan.
- Armenia – Technical review of the National Biodiversity Strategy and Action Plan.
- China & Tibet - Development of suitable MSP projects with Chinese authorities.
- Nicaragua - Project implementation activities for GEF Atlantic Biological Corridor project.

14. *Information on proposed executing agency (if different from above):* see above

15. *Date of initial submission of project concept:* April 23<sup>rd</sup> 1999

**Information to be completed by Implementing Agency:**

16. *Project identification number:* CMB/99/A01

*Implementing Agency contact person:* Tim Boyle, Regional Co-ordinator, UNDP/GEF, One UN Plaza, DC1-2364, New York NY 10044. Tel: 212-906-6511; fax: 212-906-5825; email: tim.boyle@undp.org

18. *Project linkage to Implementing Agency program(s):*

UNDP and UN FAO in 1998 established a forest inventory process in Cambodia with the objectives of establishment of a forestry inventory service within the Department of Forestry and Wildlife (DFW) capable of setting up and updating a forestry inventory on a permanent basis and developing capacity of DFW to manage and control forest resources. The project made valuable contribution in developing forest resource assessment capability and improving forestry education. The findings and conclusions of the

technical studies highlighted the need for the RGC to take urgent measures to arrest the fast deteriorating forest resource degradation and deforestation.

As part of Cambodia's overall forest policy reform efforts, UNDP initiated a 12-month Forestry Policy and Programme Development project in late 1998. This focused technical assistance, built on the recommendations from prior preliminary forestry sector studies conducted jointly by UNDP, FAO and the World Bank. The objective of the follow-up assistance was to support the Royal Government to formulate a forestry programme to improve management of Cambodia's forestry resources. The main output, a draft National forestry Policy, aimed at establishing a sustainable balance between protected permanent forest estates and commercial production forest. The policy promoted greater participation of local communities in protection and management of production forests, primarily to improve rural economies. Finally, the draft policy included objectives and guidelines for concession management and institutional support regarding strengthening of forestry sector legislation and institutions.

### **UNDP Forestry Crime Monitoring and Reporting Project**

In 1999, in response to the alarming rate of illegal logging and wildlife trade in Cambodia's forests and protected areas, a forestry crime monitoring and reporting (FCMR) programme was established to monitor and track forest crimes from initial detection to final resolution. This three-year programme began in October 1999 and is ambitious and unique, both in terms of its project structure and the partnership of the many stakeholders involved. For the first time ever former criminal investigators with prior work experience in the forest sector have been recruited as Forest Law Enforcement Experts to lead the joint project activities and capacity-building efforts in an environmentally sustainable development project. The project is supported by the Governments of the United Kingdom and Australia through a UNDP Trust Fund. The programme is executed by the FAO, together with joint efforts of the Ministry of Agriculture, Forestry and Fisheries and the Ministry of Environment. In addition, the international NGO, Global Witness, serves as an independent monitor.<sup>1</sup>

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<sup>1</sup> UNDP Cambodia 2000 Annual Report

## 2. PROJECT DESCRIPTION

### 2.1 PROJECT RATIONALE AND OBJECTIVES

Covering an area of approximately one million hectares, the Cardamom Mountains of Southwest Cambodia support biodiversity of national, regional and international importance. Long protected by their remote location and security problems, the mountains have been remarkably little affected by human disturbances and form one of the largest and most intact wilderness remaining in Southeast Asia. Species confirmed to occur here include a number of endemics as well as significant populations of globally threatened plants and animals. Today, however, the species and habitats of the mountains are under rapidly growing threat from a complex suite of human pressures.

The Cardamom Mountains are cloaked in a wide variety of natural habitat types that reflect their highly variable topography, hydrology, geology, soils, and climate. These range from wetlands and lakes to pine forest and savannah, but the most extensive formation is primary tropical lowland evergreen forest. Although current species inventories are far from complete, field surveys in 1999 and 2000 documented 69 mammals, 213 birds, 65 reptiles, up to 40 amphibians, 362 snout moths and numerous other invertebrates, fish and plants. Reports on the 2000 surveys by Fauna & Flora International, the Department of Nature Conservation & Protection (Ministry of Environment) and the Department of Forestry & Wildlife (Ministry of Agriculture, Forestry and Fisheries) are attached.

A wide range of globally threatened species are present in exceptionally high densities here, for example the Indochinese tiger (*Panthera tigris corbetti*), Asian elephant (*Elephas maximus*), Asiatic wild dog (*Cuon alpinus*), Gaur (*Bos gaurus*), Southern serow (*Naemorhedus sumatraensis*), Pileated gibbon (*Hylobates pileatus*), Siamese crocodile (*Crocodylus siamensis*), Koh Chang frog (*Rana kohchangae*), elongated tortoise (*Indotestudo elongata*), Indochinese green magpie (*Cissa hypoleuca*), great hornbill (*Buceros bicornis*) and green peafowl (*Pavo muticus*).

Known endemics include at least 16 species and subspecies of birds, such as the chestnut-headed partridge (*Arborophila cambodiana*), the Cambodian laughing thrush (*Garrulax ferrarius*) and white-browed scimitar babbler (*Pomatorhinus schisticeps klossi*). There are at least two endemic reptiles - the Cardamom banded gecko (*Cyrtodactylus intermedius*) and the Cardamom wolf snake (*Lycodon cardamomensis*) - and recent surveys indicate that a number of additional reptiles, small mammals, amphibians, fish and invertebrates are also unique to these mountains. The indigenous flora is poorly known, but the available data suggest that the Cardamom Mountains could contain greater plant diversity and endemism than any other forest biome in Cambodia.

The FAO has rated the Cardamom Mountains as being one of the most important areas for biodiversity conservation in Asia, and the WWF biodiversity conservation priority setting workshop for the forests of the Lower Mekong region in March 2000 ranked them in the highest conservation priority category in Cambodia. In addition to their outstanding biological importance, the Cardamom Mountains are a critical watershed area, serving to regulate the water supply to the nation's most productive farmland around the Tonle Sap and lower Mekong as well as to essential coastal fisheries in the Gulf of Thailand.

Two protected areas were established at each end of the Cardamom Mountains Range by royal decree in 1993 to conserve representative biota: the Phnom Samkos Wildlife Sanctuary (3,338km<sup>2</sup>) and the Phnom Aural Wildlife Sanctuary (2,536km<sup>2</sup>). These encompass Cambodia's two highest mountains, Phnom Samkos (1,717m) and Phnom Aural (1,771m). Although part of the same mountain range, the areas display some significant differences in terms of their geology and in the communities of plants and animals that they support. For example, the endangered Thailand brow-antlered deer (*Cervus eldi*

*siamensis*) and the critically endangered Siamese crocodile are confirmed only from Phnom Aural WS and Phnom Samkos WS respectively. The Department of Nature Conservation & Protection (DNCP) is the sole body responsible for managing the sanctuaries.

Recognising the international importance of Phnom Aural WS and Phnom Samkos WS, the Cambodian Government's Council of Ministers has approved national tentative listing of both protected areas for World Heritage Site nomination. Neither is marked on the ground, however, or has a management plan. A total of 65 DNCP rangers were deployed in the sanctuaries for the first time in mid-2000.

The threats now facing both wildlife sanctuaries are severe. In the period of peace since 1998, thousands of returning refugees have flocked to the Cardamom Mountains, the majority of which are extremely poor and highly dependent on external aid and natural resources. By mid-2000, the human population was estimated to number more than 5,200 in Phnom Samkos WS and more than 15,000 in Phnom Aural WS. Additional land in both areas has already been illegally claimed in advance of expected future immigrants. Although there was some limited agricultural activity in lowland areas in the past, much of the farmland has been mined, forcing the settlers to encroach on virgin forest. This problem is compounded by the recent increase in road and bridge construction by logging companies and human development organisations, improving access to and within both sanctuaries.

In the absence of effective protection, illegal hunting of and trade in wildlife is on increase. The most sought after species are unfortunately the most vulnerable to extirpation, such as tiger (*Panthera tigris*), elephant (*Elephas maximus*), gaur (*Bos gaurus*) and aloe wood (*Aquilaria sp.*). Landmines, armaments and munitions are still widespread, posing a severe threat to humans and wildlife alike. Illegal logging is escalating, especially in Phnom Aural WS where at least 25 sawmills have been established. Law enforcement is virtually non-existent, and few people at commune, district and provincial levels are even aware that the land and all wildlife are protected.

The DNCP recognises the urgent need to manage and safeguard the wildlife and natural habitats of both protected areas effectively. This relatively young department (founded in 1993) has limited capacity in terms of trained staff and funding, however, and is handicapped by weak and unclear legislative and judicial systems.

The main goal of the project is to conserve the globally important wildlife populations and natural ecosystems of the Cardamom Mountains in a manner that is both sustainable in the long term and compatible with human needs.

GEF resources will be used in support of interventions in the two wildlife sanctuaries, where threats are most immediate, while the intervening area will be conserved using co-financing from a variety of sources, so as to maintain continuous forest cover linking the two protected areas. In working towards this goal, the project will focus on the following themes:

- Building the capacity of the DNCP to manage Phnom Samkos WS and Phnom Aural WS effectively, by providing appropriate technical training at national [Dept B] and park level, infrastructure and other essential support.
- Participatory creation of clearly defined and agreed operational plans for Phnom Samkos WS and Phnom Aural WS, with supporting implementation structures at commune, district and provincial levels.
- Identification of critical species and areas in need of priority conservation effort, and enhancement of the expertise and experience of Cambodian nationals in carrying out ecological surveys and monitoring programmes.

- Enhancement of the legal and regulatory framework for wildlife and habitat protection and land tenure within protected areas, with emphasis on more effective detection and punishment of crimes against wildlife and forest laws.
- Clarification of the roles, responsibilities and powers of rangers, and provision of essential training, equipment and infrastructure.
- Development and implementation of a conservation awareness and education programme to sensitise all levels of society of the need to conserve biodiversity and watersheds, of the national wildlife and forest laws, and of the existence and purpose of the Phnom Aural WS and Phnom Samkos WS.
- Enlisting the active support and participation of local communities and non-governmental organisations, including humanitarian aid organisations, from the earliest stages to ensure that human welfare and development needs in and around the protected areas are integrated with biodiversity conservation to mutual benefit.
- Development of an alternative livelihoods for local communities that contribute to poverty alleviation while directly benefit biodiversity conservation.
- Elevation of the global profile of the two sanctuaries by securing World Heritage Site status.
- Development of sustainable finance mechanisms to ensure the effective management of both sanctuaries in perpetuity.

The DNCP is the governmental body responsible for managing all of Cambodia's 23 protected areas, which cover more than 18% of the kingdom. Success in developing and implementing effective and sustainable conservation management strategies for Phnom Aural WS and Phnom Samkos WS under the current project will have spin-off benefits for other important protected areas in Cambodia.

## 2.2. CURRENT SITUATION

### 2.2.1 *Direct threats to biodiversity*

#### ***Widespread poverty, putting pressure on natural resources to satisfy basic needs***

The forests are a rich source of non-timber forest products (NTFPs), which are used locally for a variety of purposes such as food, medicines and construction materials. Plant collection is often accompanied by opportunistic fishing and hunting, and many of the collectors that were encountered in the mountains during the present survey had hunted a wide range of animals for personal consumption (food and/or medicine). The identified 'bushmeat' species were binturong, pileated gibbon, wild boar, oriental pied hornbill, giant hornbill, silver pheasant, jungle fowl, water monitor lizard, elephant, common muntjac, larger mouse-deer, jungle fowl, slow loris, hog badger rajah frog and various tortoises and turtles.

Villagers at lower elevations also periodically fish and hunt for food, especially wild boar, sambar and muntjac, which are usually shot or caught using selective or non-selective snares. Men are responsible for most, if not all, of these activities and share most of the food with their family and neighbours. The livelihood analysis conducted by Maxwell (2000) confirmed that local people are extremely poor and isolated, and often have little choice other than to use forest resources.

Owing to the relatively small numbers of people involved and the great abundance of wildlife, the current levels of bushmeat hunting appear to be sustainable. The main quarry species still appear to be abundant, even close to villages. The human population in the Cardamom Mountains is currently undergoing a rapid increase, however, due to the high birth rate (the national average growth rate is 2.7%, but local populations probably exceed this) and immigration. Unless sustainable alternatives are found, even bushmeat hunting could lead to the local extinction of certain species. More seriously, however, experienced bushmeat hunters may all too readily turn their skills to targeting certain species for profit, such as tigers and elephants. Associated with bushmeat hunting is the regular burning of dry deciduous

forest in Mount Samkos Wildlife Sanctuary to create fresh young grass growth for herbivores near roads and settlements. While this may, on balance, benefit local deer populations, burning is disastrous for certain other large mammals, the diversity of plants and smaller animals. Desai & Vuthy (1996) reported reduced biodiversity in parts of Northeast Cambodia that were similarly subjected to burning.

#### ***Depletion of endangered species through national and international trade***

Much of the hunting and collection that currently occurs in the Cardamom Mountains appears to be largely for personal consumption, but certain NTFPs and animals also play a part in domestic and international trade. Two plant-derived products are especially worth highlighting here.

One of the commercially valuable NTFPs is kresna wood or 'khlem' (probably *Aquilaria malaccensis* = *agallocha*) in evergreen forests. When damaged or infected with fungus (Rao and Dayal, 1992), this tree produces an aromatic resin commonly called aloe wood. People from as far away as Phnom Penh come to the Cardamom Mountains to collect this resin, which is sold to local 'middle-men'. A large market exists in Bangkok where traders said that much of their stock comes from Cambodia. Aloe wood is prized in many parts of the world for the production of perfume and incense, and for various schools of traditional medicine. The *Aquilaria* trees have declined significantly in numbers in recent years (Momborg & Weiler, 1999) and are currently listed on CITES Appendix II.

Collection of the woody liana known as 'yellow-wood' is also widespread. This is harvested in lowland evergreen forests and processed on an industrial scale, using sulphuric acid, to produce a treatment for malaria. Boonratana (1999) reported that the yellow powder is sold to Vietnamese traders for US\$50 per kg. This plant still appears to be common and widespread, even in secondary forest, but – like the aloe wood collectors – the harvesters of yellow wood are likely to hunt bushmeat while they are in the forest.

Although hunting of animals currently occurs at an exceptionally low level here in comparison with neighbouring provinces and countries, it is a growing problem. Hunters and traders from Pursat, Koh Kong, Battambang and even Thailand have started to enter the Cardamom Mountains to hunt and purchase endangered species. For example, wildlife traders from Thailand reportedly visit Koh Kong town almost monthly to buy wildlife products from the Eastern Cardamoms, while one trader visits the remote village of O'Som about 10 times per year.

Traders in Vietnam, Thailand and Laos admit to obtaining a large proportion of their stock from Cambodia (Groombridge & Luxmoore, 1991; Le Dien Duc & Broad, 1995; Martin & Phipps, 1996). The current extent to which such international trade specifically affects plant or animal populations in the Cardamom Mountains is unknown, but trade is likely to grow as access to this region improves.

Such commercial trade currently accounts for far fewer animals in the Cardamom region than domestic consumption, but unfortunately targets some of the country's most vulnerable species, such as tiger, elephant, bear, gaur and banteng. Many local people in the survey areas were well aware of the high commercial value of tigers. Tigers currently appear to occur at a near-natural density in the Cardamom Mountains, but are becoming much less commonly seen during the day, and could be extirpated altogether if hunting continues to increase. Enterprising hunters often kill tigers by baiting landmines with carrion, which unfortunately also attracts and kills non-target carnivores.

#### ***Habitat loss and fragmentation***

As shown in Table 1, habitat loss and fragmentation were identified as a threat to all the taxonomic groups studied during FFI's recent survey, and in fact have been the leading causes of all known extinctions worldwide (Smith, *et al.*, 1998). Although key habitats also include marshes, rivers and 'fernland' (upland moors with large tracts of fire-regulated ferns), we are especially concerned here with forest habitats, which constitute the majority of natural habitats in the Cardamom Mountains.

**Table 1**

<b>Main threats to plants and wildlife in the Cardamom Mountains</b>	<b>Plants</b>	<b>Large mammals</b>	<b>Small mammals</b>	<b>Bats</b>	<b>Birds</b>	<b>Reptiles</b>	<b>Amphibians</b>	<b>Fish</b>	<b>Insects</b>
<i>Habitat loss and fragmentation</i>	X	X	X	X	X	X	X	X	X
<i>Hunting/collecting for personal consumption</i>		X		X	X	X	X	X	
<i>Hunting/collecting for profit</i>	X	X			X	X		X	

Cambodia's forest cover has declined from about 70% in 1970 to around 30% of the total land area, and the Cardamom Mountains contain some of the last major tracts of intact forest left in the country. Trees were felled to finance both sides in the civil war and, while timber still represents one of the nation's most easily realized natural resources, recent levels of exploitation have clearly been unsustainable (Global Witness, 1999b). Prior to Prime Minister Hun Sen's crackdown on forestry in January 1999, the World Bank estimated that Cambodia's forests – including those in the Cardamom Mountains – would be commercially logged out by 2003 (*Bangkok Post*, 23 May, 1998).

With the advent of peace, the forests of the Cardamom Mountains have inevitably attracted the attentions of legal and illegal loggers alike. Although logging activity has clearly become much more tightly controlled by the Cambodian Government since January 1999, Global Witness (1999a) recently recorded illegal activities by 12 concessionaires, some of which hold land in the Central Cardamom Mountains. The army is also known to be directly involved in illegal logging (Global Witness, 2000). During the recent survey, the FFI team witnessed and a reported illegal logging in the logging concessions in T'Mar Bang District. As a result the respective company has been found guilty in a recent court case.

The mounting threats of illegal and legal logging are compounded by encroachment by returning refugees and other landless Cambodians in need of land and timber for homes and farms. Even in the Mount Samkos Wildlife Sanctuary, sizeable plots of forest are being cleared with axes, chainsaws and fire, and new wooden houses are being constructed. Roads through the sanctuary are lined with signs proclaiming land ownership. Opportunistic settlement was also very much in evidence in the Central Cardamoms. This is in direct contravention of Point 10 of Prime Minister Hun Sen's January 1999 17-Point Declaration: 'The clearing of natural forest or forest plantations for personal use is banned. All deeds and permits for land ownership of forest land are banned until the boundaries of forests are officially approved'.

The poverty among the returning refugees and newcomers to the Cardamom Mountains means that they are generally short of the agronomic techniques to enable them to grow subsistence food on permanent forestland plots. This will inevitably force them to keep pushing deeper into the forests as their erstwhile farm patches lose natural soil fertility.

Fragmentation of the forest of the Cardamom Mountains into 'islands' separated by agricultural land, logged areas and settlements would have devastating effect on biodiversity. The precise effect will vary from species to species – some can thrive in habitats modified by humans, while others are unable to tolerate even moderate disturbance – but there will inevitably be a net loss of species richness.

***Construction and upgrading of roads through the Cardamom Mountains exposes more areas and wildlife to exploitation before adequate safeguards have been put in place***

New roads are under construction, criss-crossing the mountain range and opening up the area for the first time. At the time of the survey, the GAT International Company was constructing a road through the

middle of the Central Cardamom range from Koh Kong to Pursat via T'Mar Bang. Subsequently construction of the road has been publicised and construction was stopped by the department of forestry. In addition, the company You Ry Sako was extending a road from its concession north of the Mount Samkos Wildlife Sanctuary to Koh Kong via O'Som. Both roads could be completed in 2001. Yet another major road is to be completed within 2 years, linking Koh Kong directly with Phnom Penh. (Currently, Koh Kong is only accessible from Phnom Penh by boat and by twice-weekly small plane flights). Global Witness (2000) also reported other significant logging roads under construction on both sides of the Thai border. There are unverified reports that You Ry Sako is building a road between Koh Kong and Pailin, parallel to the Thai border on behalf of the Cambodian Government in return for permission to fell trees up to 100 m on either side of the road. This road presumably traverses the Mount Samkos Wildlife Sanctuary. More recently 50km of road has been constructed for national security reasons in the part of Mount Samkos Wildlife Sanctuary adjoining the Thai Border (North of Thmar Da village).

Such developments will undoubtedly help illegal loggers and poachers to access more parts of the range rapidly and extract wood, trophies and other goods more easily. Worryingly, the roads are due for completion well before any safeguards, such as wardens and check-posts, have been established.

#### ***Landmines and other unexploded ordnance***

There are believed to be between 4 and 6 million landmines scattered across Cambodia, and some 300 people are killed or seriously injured every month. UNDP/ CARERE estimates that as much as 30% of Veal Veng District (which encompasses the western part of the Cardamom Mountains) is planted with landmines.

While this figure is almost certainly an overestimate, landmines and other unexploded ordnance unquestionably pose a serious threat to both humans and large animals in many parts of the mountain range. Ongoing efforts to demine land around roads and villages should of course be sustained, but there are worrying indications that the same landmines are then being deployed in the forest to hunt wildlife. The presence of landmines also exerts constraints on biodiversity conservation in this area (see below), by making large areas hazardous for rangers, biologists and other workers to travel in.

#### ***2.2.2 Constraints on biodiversity conservation***

##### ***Confusion over the roles and responsibilities of agencies involved in conservation, and lack of skilled and experienced staff and resources***

Although Cambodia has made substantial advances in establishing a legislative and administrative framework to protect wildlife in recent years, there still needs to be a clearer definition of the precise roles and responsibilities of the various staff and agencies (Ashwell, 1997). For example, the powers and responsibilities of district, provincial and national authorities often overlap, leading to confusion when attempting to enforce the law.

There is also the considerable problem that, through no fault of their own, some of the staff of these agencies are relatively inexperienced in biodiversity conservation and have only a limited understanding of ecology. Even basic conservation management resources, such as identification guides and vehicles, are in short supply. There needs to be a substantial investment of training and resources to enable staff charged with the responsibility of protecting Cambodia's wildlife to perform their jobs to the best of their abilities.

##### ***Lack of environmental awareness and respect for the law among local people***

Ashwell (1997) observed that there is a systemic problem of disregard for the law and regulations to protect wildlife and habitats in Cambodia. Enforcement of wildlife laws presents special difficulties in the

Cardamom Mountains, where peace was only recently secured. Many of the local people are still armed, and some of the civilian administrators were, until 1998, Khmer Rouge elite. It is inevitable that there will be some reluctance among law enforcers from outside this region to confront local offenders.

In virtually every case in which wildlife materials were observed being sold or transported in the Cardamom Mountains during the present survey, the hunters and dealers freely displayed the illegal materials and readily provided any details requested (e.g. Cutter, 2000). This shows a worrying lack of concern for 'official' scrutiny, which may be indicative of (a) inadequate law enforcement, but also (b) a lack of awareness of Cambodia's wildlife laws among local communities.

There were also many incidences observed of local people using highly destructive methods of hunting, which was indicative of ignorance of or disregard for the possible long-term impact on natural resources. For example, the use of landmines to hunt tigers also kills non-target large animals, while the common practice of fishing with explosives kills many undersized and inedible fish, as well as other non-target aquatic animals. In the survey by Weiler *et al.* (1999), 45% of hunters said they knew what wildlife conservation meant, and defined it mainly in terms of protecting wildlife as a future food source and 'allowing the next generation to know wildlife'.

Some of the agricultural activities also appeared to fly in the face of good conservation practice, with new settlers attempting to turn forestland of dubious fertility into permanent homesteads. Rural Cambodia is one of the poorest regions in the world, however, with over 70% of the population under the age of 21 and with very limited educational opportunities. In the Cardamom Mountains, schools and teachers are largely non-existent. Moreover, many people have spent the past few years as fighters or in refugee camps. Not everyone in the Cardamom Mountains can therefore be expected or assumed to understand even such basic ecological principles as sustainable management or soil exhaustion. The fact that many communities have been living on a day-to-day basis and have become unaccustomed to planning for the future, may also be a factor in this.

Nevertheless, there were encouraging signs that some local communities have retained a respect for wildlife and the natural environment, and express cultural taboos against hunting certain animals, pollution and overexploitation. In addition to ancient Khmer traditions, Theravada Buddhism also provides some religious guidance on protecting wildlife and the environment. This was reinstated as the national religion in the late 1980s, after the ban on religious activity in 1975, and is practised by approximately 95% of Cambodians.

The protected-area system of Cambodia was developed on the basis of relatively limited biological information. Cambodia's protected-area system was developed in 1993 using a landscape approach, chiefly on the basis of satellite maps and aerial photographs. The selection process was carefully planned and well judged according to the information at that time. Ashwell (1997) noted that, while the Royal Decree provided large areas for large mammals and associated wildlife, it 'did not address the conservation needs of those parts of the country which possess the greatest biological diversity and which also serve economically important ecosystem functions, such as watershed protection'. These include extensive areas of bio-diverse evergreen forests in Southwest Cambodia.

Fortunately, Article 3 of the decree states that 'this protected area system may be amended or extended in the future on the basis of scientific information relating to biological conservation and maintenance of the productivity of the Cambodian landscape'. In view of recent field surveys in Southwest Cambodia, including the work described in this report, it is perhaps time for some aspects of the protected area-system here to be revised to ensure that all critical species and habitats are adequately represented and protected.

***The two designated Cardamom protected areas – Mount Aural wildlife Sanctuary and Mount Samkos Wildlife Sanctuary – have little effective management***

Both protected areas were designated by the 1993 Royal Decree, and as such are under the administrative authority of the Ministry of Environment (Department of Nature Conservation and Protection, MoE/DNCP). Owing to the recent security problems in this area – as well as a severe shortage of funding and other resources in the MoE – however, neither sanctuary has yet become actively managed on the ground. However, just after the recent FFI field survey, MOE recruited 65 rangers for Aural and Samkos WS. Both sanctuaries lack a management plan. There are no wardens or other staff yet deployed in the field, and the sanctuary boundaries have not been surveyed or marked on the ground. No park infrastructure exists at all in either sanctuary.

***Few development assistance agencies are incorporating biodiversity conservation needs into their projects***

Cambodia has received well over US\$2 billion in international aid since 1993, and foreign aid is still the nation's primary source of income. Numerous international governmental and non-governmental organizations are on the ground, helping to rebuild the nation's economy and improve the health and living standards of Cambodian people. As in all post-conflict countries, however, biodiversity conservation is being pushed into the background in the rush to deal with pressing human needs (e.g. Appleton & Morris, 1997; Appleton, 1999).

Ashwell (1997) stated that effective biodiversity conservation and sustainable use of natural resources is possible only where basic social and economic development needs are addressed. Certainly, a number of the threats to biodiversity that were identified during this survey stem from the fact that poor rural communities have little choice other than to hunt for bushmeat and other natural resources to meet their basic needs.

Although nobody would disagree that Cambodian people need and deserve immediate assistance from the international community, there are, strong arguments for ensuring that social and economic development is integrated with the long-term conservation of wildlife, habitats and other natural resources from the earliest stages. In a review of post-conflict countries around the world, Appleton (1999) concluded that 'healthy, well managed ecosystems and natural processes have the potential to play a vital role in providing long-term solutions to humanitarian problems'. The future health and wealth of the Cambodian nation are ultimately dependent on preserving its natural resources.

The governments and other organizations that are providing financial and other assistance to Cambodia have a responsibility, therefore, to ensure that, for the sake of future generations, the nation's natural heritage is not squandered. Even seemingly non-contentious acts, such as provision of all-weather access and trade routes to remote communities, can unwittingly help encourage poachers, illegal loggers and settlers unless adequate safeguards are first put in place. For example, the survey team was informed of a proposed grant from the Australian Government to UNDP/CARERE to upgrade the road through the Mount Samkos Wildlife Sanctuary to the Thai border, to develop roads and permanent settlements with basic rural infrastructure at the very heart of the Mount Samkos Wildlife Sanctuary, as part of the post-war reconciliation process. As a result of the FFI Cardamom report, UNDP/UNF (PDFA) funded stakeholder consultations and participatory planning workshop, the CARERE program has employed an environmental impact advisor to build to consider biodiversity conservation in their develop plans. The Carere funding will not be used for a road construction into Samkos WS, but instead for road upgrades outside the reserve.

***Prevalence of malaria in certain parts of the Cardamom Mountains***

The common strain of cerebral malaria on the Thai-Cambodia border is notoriously virulent, potentially fatal and highly resistant to conventional treatments. This is caused by *Plasmodium falciparum* and is

transmitted by mosquitoes. Even though all of the members of the present survey used prophylactics in accordance with the best medical advice, many of them contracted this form of malaria. A less hazardous form, caused by *P. vivax*, is also common. Although the epidemiology of this disease in the Cardamom Mountains is not fully understood, it appears that Mount Samkos Wildlife Sanctuary is a particularly high risk area for malaria, a fact that must be borne in mind when planning further conservation activities here. This explains the allocation of funds for malaria prevention, health care and insurance for project employees.

## 2.3 EXPECTED PROJECT OUTCOMES, WITH UNDERLYING ASSUMPTIONS AND CONTEXT

### ***2.3.1 Improved planning, management and regulatory frameworks for Mount Samkos and Mount Aural Wildlife Sanctuaries***

Both wildlife sanctuaries were established on the basis of satellite maps and neither has any formal management plan or staffing. Stakeholder consultations have revealed widespread ignorance of the fact that there is a protected area and few of those who are aware know where the boundaries are. While the relative remoteness and inaccessibility of the areas have ensured that most of their biodiversity values have remained undiminished this situation cannot be assumed and already settlement, encroachment, hunting and logging are starting. Of those who are aware of the existence of the sanctuaries even fewer know where the boundaries are.

Each sanctuary falls within three provinces and each provincial government is responsible for management of their segment through local Environment Departments. While each province has set up a protected areas committee and from January 2000 have appointed ranger teams there is little or no coordination between provinces in management, planning or protection. Each sanctuary requires an agreed operational plan, developed through collaboration between Provinces, Districts, communities and other stakeholders.

On a wider scale Cambodia is currently updating its wildlife, forestry and land tenure laws as the current laws are outdated and in some respects ineffective. It will be of great assistance to this project if these laws are finalised and formally adopted at the earliest possible stage. In the meantime there is a need to improve coordination and planning for protected areas management and land use at the local scale and make best use of the existing laws.

### ***2.3.2 Significant improvement in species and habitat protection in Phnom Samkos and Phnom Aural Wildlife Sanctuaries***

In order to conserve the nationally and globally important biodiversity of these areas a number of emerging threats need to be addressed. While local subsistence hunting issues are addressed under outcomes \* and \*, hunting for the wildlife trade is increasing and it is important to address this not just through local enforcement, but also through tackling trading chains related to wildlife. Illegal logging is a particular problem in Phnom Aural WS; although local authorities claim some success in closing sawmills, further efforts are required. Continued encroachment, land claims and settlement development also represent considerable threats. Mobilising understanding of these areas and high level commitment to protecting and conserving them will be a significant challenge.

While local awareness and political will are important to resolving these issues, both sanctuaries still lack an equipped, trained and operational ranger force to carry out on-the-ground enforcement, awareness and community liaison work. Effective protection requires a visible and well-equipped presence.

### ***2.3.3 Use of natural resources by local communities in sanctuaries is more sustainable***

In Phnom Samkos WS the low numbers of people are not thought to be depleting local resources, but continuation of this situation cannot be assumed as more people are drawn to the area and as resource demand expands beyond local subsistence. In Phnom Aural WS resource exploitation is more widespread and commodity chains better established.

Long term conservation of both areas will require that local resource use is stabilised and made sustainable. While the GEF MSP can address this through supporting local incomes that directly benefit conservation (for example promoting local recruitment of rangers) wider sustainable use issues will require inputs from rural development specialists and close cooperation with development agencies already active in the project areas.

More fundamentally continued immigration to the project areas represents a serious threat and serious commitment will be required to curb further immigration and to encourage people seeking a better life not to move into Wildlife Sanctuaries.

### ***2.3.4 Improved livelihoods and welfare of local communities***

Economic, social and health conditions of people living in both sanctuaries are very poor. Almost all stakeholders have indicated that conservation success will be contingent on improved conditions for local people living in the area. In some places people are hunting purely for food; assistance with agriculture and animal husbandry is likely to have a positive impact in reducing hunting. In other areas old agricultural land is unusable because people do not have the tools to rehabilitate it or because it is mined. The result is forest encroachment for new land as well as hunting. Many local people have stated that access to rehabilitated agricultural land and associated extension advice will reduce encroachment and hunting. Chronic malaria problems not only cause direct human suffering, they also reduce the ability of both farmers to restore land and of rangers to patrol and enforce. The GEF MSP project will address these problems by community development interventions that provides local communities with improved alternative livelihoods. The project should also work with other relevant agencies to encourage improved and environmental sound local farming practice, to cellar mines from agricultural land and to reduce malaria.

The alternative livelihood component (co-financed by UNF) is based on an integrated conservation and development approach that clearly links community development interventions to conservation goals in the form of conservation stewardship agreements. FFI will facilitate a participatory process to establish village conservation stewardship agreements and village development plans. Village development grants can be given in the form of revolving funds for micro-credits to individual households or as grant for commonly agreed village development interventions (e.g. irrigation scheme, agroforestry plots).

### ***2.3.5 Sustainable financing in place for long term management***

The GEF investment will make a substantial difference, but sustainability is an important issue. Peace has helped the Cambodian economy greatly, but progress is slow and government investment in conservation, while increasing, is likely to remain inadequate for some time. Therefore the project needs

to work from the start to attract long term support to cover the recurrent management costs and secure the progress made through the GEF intervention.

## **2.4 ACTIVITIES AND FINANCIAL INPUTS NEEDED TO ENABLE CHANGES**

### ***2.4.1 Create agreed operational plans for Aural and Samkos with supporting implementation structures at provincial, district and commune level***

Initially in each sanctuary the project will facilitate detailed ecological, socio-economic and land-use surveys. A participatory process involving all stakeholders in land-use mapping and planning, boundary delineation, park zonation and the development of management plans for both sanctuaries will follow this. FFI will facilitate the development of an appropriate institutional framework at all level of governance to ensure a collaborative management system for the two wildlife sanctuaries. In this, the project will be greatly assisted by the activities of UNDP's Cambodia Area Rehabilitation and Regeneration programme (CARRERE). Under this programme, already active in and around the project site, the emphasis is placed on rural development with communities empowered to assume greater decision-making roles. Using social mobilisation as an instrument for organising communities into cohesive groups, the programme has steered the formation of elected Village Development Committees, Commune Development Committees and Provincial Rural Development Committees. With increased political support and budgetary commitment from the Government, this initiative is expected to be converted into a national programme for promoting local economic development through the strengthening of local governance structures and the promotion of participatory and decentralised planning and provision of public services and financing. As already demonstrated, the initiative has the potential to bring about social cohesion, behavioural change and organisation in the village and commune settings in regions where the social fabric and production organisation had been largely disrupted or even dismantled during the country's prolonged war. It will also serve to reintegrate former Khmer Rouge-held territories into the country. At the community level the project will facilitate the integration of community development plans in village conservation stewardship agreements.

### ***2.4.2 Enhance the legal and regulatory framework for protection, landuse and land tenure and elevate the global status of the two sanctuaries***

The project will facilitate the legal endorsement of land use and zoning plans by district and provincial government and assist established communities in land tenure and resource access rights. This set of activities will stop the current uncontrolled in-migration and land speculation. The establishment of exclusive use rights will also allow for sustainable management of non-timber forest products in utilisation zones and facilitate community co-operation in the designation of strictly protected core zones, and agreements on regulations and punishments for violation. The project will co-operate with national policy initiatives that aim to improve the framework on land tenure, protected area management, forest and wildlife protection. Environmental impact assessments will be conducted for road plans that would penetrate the two wildlife sanctuaries. FFI will also assist the Ministry of Environment in the World Heritage Site nomination process to secure a global status of protection.

### ***2.4.3 Develop and implement a conservation awareness program at all levels***

To develop and implement an awareness programme the project will disseminate information about the existence, value and purpose of the two wildlife sanctuaries to all stakeholders. Activities will include the development of a targeted media and public relations strategy including press releases and stories. The

project will commission press, radio and TV features. Biodiversity conservation and information about the two wildlife sanctuaries will be incorporated in local curricula. Based on FFI's extensive experience in community and school-based conservation awareness programs the project will train teachers, extension workers and monks in environmental education and conduct formal and in-formal environmental education programs for adults and children. The project will seek the co-operation of local NGO's (e.g. Mlup Baitong) with experience in conservation awareness programs for the implementation of awareness activities.

#### ***2.4.4 Increase capacity for management and protection***

The project will develop and update training programs and conduct training and capacity building at all levels in conservation and protected area management. Training programs will also be developed and implemented for rangers and field staff. The development of an improved incentive system will create improved motivation and job performance. At community level training will be provided for improved natural resource management and conservation. The project will facilitate management co-ordination and skill sharing with other protected areas through meetings and cross-visits. Training activities at national as well as reserve level will be co-ordinated with the national GEF/World Bank/MOE Biodiversity and Protected Area Management project.

#### ***2.4.5 Improve infrastructure for management and protection***

The project will develop a basic park infrastructure comprising ranger stations and sub-stations, set up a central project office and up-grade provincial DNCR offices to project offices and information centres. Field equipment will be provided for rangers, monitoring and surveying. Trails will be developed to allow patrolling and access for visitors. On the protected area peripheries, the project will undertake marking and explanation of boundaries in critical area of the reserves. This will include participatory demarcation and enforcement activities.

#### ***2.4.6 Improve law enforcement***

The project will conduct a series of workshops and meetings with police, military, judiciary and other enforcement agencies to raise the level of awareness and advocacy of environmental and species protection. Anti-poaching operations will also form an essential part of the training program for rangers and reserve management. The project will pursue a strategy to reduce hunting pressure through the facilitation of a weapon control strategy and voluntary gun amnesty. The project will develop an incentive and reward system for monitoring and detecting wildlife and forest crime and co-operate closely with governments forest crime monitoring units to crack down on illegal sawmills and poaching of endangered species. The project will lobby for adjacent logging concessions to adhere to regulations and enforce protection. At community level the village conservation agreements will include an element of community-based law enforcement and self-regulations.

#### ***2.4.7 Promote alternative and conservation compatible livelihoods and enterprises***

The project will facilitate a participatory process to develop community development interventions within the contractual framework of conservation stewardship agreements and village development plans. Village development grants can be given in the form of revolving funds for micro-credits to individual households or as grant for commonly agreed village development interventions (e.g. irrigation scheme, agroforestry plots, eco-tourism infrastructure, village co-operative, buffaloes & agricultural tools).

At the beginning of the first year village conservation and community development facilitators will be recruited and trained. The participatory planning process then starts with village PRAs, participatory land use mapping, and raising awareness for the importance of biodiversity conservation, followed by participatory delineation of park boundaries and management zones, that takes into account local resource rights. Community development planning take place as part of this process. Then a draft village conservation agreement (VCA) is formulated that includes a description of agreed wildlife sanctuary and management zone boundaries, rules and regulations, as well as a proposed community development plan. This draft VCA is then reviewed by the project and local government, suggestions are reviewed again at the village level and the final VCA is signed by community representatives, local government and the wildlife sanctuary authorities. The grant is then preferably disbursed in two instalments in the second and third project year to allow performance monitoring.

#### ***2.4.8 Promote activities that improve the health, safety and security of local people***

The project will facilitate increased malaria control through preventive measures (e.g. mosquito nets, increased awareness) and actively lobby for the de-mining of agricultural lands and disposal of mines and other unexploded ordnance.

#### ***2.4.9 Develop sustainable finance mechanisms for protected area management***

To develop a sustainable finance mechanism the project will utilize the additional donor co-financing that lasts beyond the three years project phase. Work will begin immediately on design of a trust fund mechanism, with a goal of establishing a fully capitalized trust fund for the Cardamom Mountains by year 5. The sustainable financing provided through the trust fund will be supplemented by other means, such as an entry fee system that supports park management.

### **3. SUSTAINABILITY ANALYSIS AND RISK ASSESSMENT**

#### **3.1 INSTITUTIONAL SUSTAINABILITY**

The project strongly emphasises the building of institutional capacities in the Department of Nature Conservation and Protection (DNCP) at the level of the wildlife sanctuary management units, as well as at provincial level and the national level [ie Dept B], to sustain project activities after the end of the GEF MSP project. Active stakeholder involvement, particularly local communities in reserve management planning and throughout all stages of project implementation will encourage local support for conservation in the future. For the conservation awareness component the project will co-operate with a local NGO that has expertise in conservation awareness programs (e.g. Mlup Baitong) and is willing to continue working in the project area beyond the end of the GEF project.

#### **3.2 FINANCIAL SUSTAINABILITY**

The government has just allocated an annual budget for the Ministry of Environment to cover basic salaries and allowances for 65 rangers. It is the clear aim of the project to develop a trust fund in cooperation with the United Nations Foundations at the end of this 3 years project phase to ensure long-term financial sustainability. Co-financing is also expected to last for at least 5 years.

In the long-term, income for the management of Mount Aural and Mount Samkos Wildlife Sanctuaries can be derived from the following sources:

- a) Proceeds from the lease of multiple use areas, including tourism concessions;
- b) Contributions from industries and facilities directly benefiting from the PA;
- c) Fines and fees, including protected area entry fees, collected from operation of the protected area;
- d) Contributions, donations, endowments and grants from any source;
- e) Any other revenues derived from operation of the protected area.

At community level, village development grants will be largely provided as a revolving loan fund as part of village conservation agreements. This fund will be managed locally by community-based organizations. The recurrent costs for maintaining Samkos and Aural Wildlife Sanctuary after the project are estimated to be 80,000 USD per year.

### **3.3 PROJECT RISKS**

Cambodia has only recently emerged from a protracted period of political turmoil and the Cardamoms were one of the last areas in the country where the security situation improved sufficiently to allow conservation activities to take place. Though a return to former levels of instability is unlikely, were it to happen, it is possible that the Cardamoms would rapidly become difficult and insecure to operate in for both national and foreign staff.

At present, the Cambodian government appears to have a clear understanding of the value of the biodiversity of the Cardamoms and a firm commitment to its conservation. However, this could be eroded in the face of development pressures, if tangible benefits do not accrue from the sustainable management of this biodiversity and external investment is not secured to ensure long term maintenance of infrastructure and management activities.

Stakeholder participation at all levels has been a cornerstone of the project implementation phase and is central to the implementation plan. This approach has so far been accepted and supported by all major stakeholders, this could however cease to be so in the case of some influential groups where management activities run counter to vested interests such as activities as illegal logging and wildlife trade. There is also a risk that the participation of large numbers of stakeholders could hinder consensus building, though as yet this has not been the case.

Many local people have stated that access to rehabilitated agricultural land through de-mining and anti-malarial initiatives as well as extension support for alternative livelihoods will reduce encroachment and hunting in the protected areas. There is a possibility however that improved security and welfare conditions it may attract more settlers to live inside or adjacent to the wildlife sanctuaries.

## **4. STAKEHOLDER INVOLVEMENT AND SOCIAL ASSESSMENT**

FFI's principal partner in developing this project proposal has been the Ministry of Environment (MoE). Nevertheless, many other stakeholders from varied disciplines have also been given the opportunity to share their knowledge and vision to create a strategic plan for Aural and Samkos Wildlife Sanctuaries, through workshops, meetings and bilateral discussions.

In September 2000 a series of meetings was held with provincial and district officials in four of the five provinces, which contain areas of Mt Aural and Mt Samkos wildlife sanctuaries (see report at Annex C). These included some district governors and deputy governors and participants from a variety of departments including those responsible for the environment, land use planning, agriculture, public works and mines and energy. In some instances representatives of the military and police also attended. The meetings were facilitated by a core team of people from The Protected Areas Office in the Ministry of Environment, the Wildlife Protection Office (WPO) in the Ministry of Agriculture Forestry and Fisheries (MAFF), FFI and Conservation International (CI). The three principal aims of the meetings were:

- to make formal contact with provincial committees and establish working relationships for project planning and implementation,
- to raise awareness at provincial level about the national and global importance of the Cardamoms,
- to gather initial information, impressions and ideas from provincial decision makers as the first stage of participatory project development.

At the conclusion of the meetings the provincial representatives were invited to follow up project planning workshops held in Phnom Penh in October. This follow up workshop was organised jointly by FFI and MoE. Participants included many of those involved in the provincial meetings, with the addition of officials from Battambang Province. It was also attended by representatives from central government, UNDP, UNESCO and other local and international conservation and development NGOs. A target group orientated project planning approach (ZOPP) was adopted for the workshop. This approach is designed to encourage maximum participation and resulted in all those present contributing to problem, objective and target analysis in relation to each of the wildlife sanctuaries (see Annex D). The outputs from the workshop were then used to develop the combined logical framework covering both Phnom Aural and Phnom Samkos wildlife sanctuaries, on which this proposal is based. The logical framework is given at Annex.

Continued stakeholder involvement is an integral part of the project proposal. Regular planning and management meetings will continue to be held involving stakeholders at provincial, district and wildlife sanctuary level. At provincial level committees already exist whose remit includes consultation and conflict resolution regarding issues pertaining to protected areas. Training in conservation and protected area management will support these initiatives. During the project implementation phase the scope of stakeholder participation will be further expanded to include a stronger input from the communities within or adjacent to the two wildlife sanctuaries. In addition community level training in conservation and sustainable use of natural resources will be supported.

Social assessment and land-use surveys conducted by FFI and MoE personnel have been an important element of the survey work carried out in preparation for this proposal and are fully incorporated in plans for project implementation. It is also proposed that community conservation plans and codes of good conduct will be developed through the medium of participatory workshops involving members of the community. It is hoped that these plans and codes will be formally endorsed and disseminated by the Village Development Councils (VDC).

Partnerships with other projects as well as competent NGOs with relevant geographic and sectoral experience are also actively being sought. To this end a close link with the UNDP CARERE project has been established, resulting in UNDP CARERE undertaking to conduct impact assessments on all their post conflict community reconstruction projects, to ensure they are compatible with conservation of biodiversity.

## **5. INCREMENTAL COST ASSESSMENT**

There is a baseline contribution by the Government of Cambodia to all outputs. It includes the government budget, which has just been made available for the management of Aural and Samkos wildlife sanctuaries, which comprises sanctuary staff wages, their uniforms and equipment, maintenance and running costs of the proposed ranger posts, a contribution to fuel for vehicles. Also included in the baseline cost assessment is a proportion of the wages paid to members of village development committees, district and provincial protected area committees, as well as the sub-committee on consultation and conflict resolution for National Parks and Wildlife Sanctuaries. These committees will play a very active part in the planning and management aspects of the project. However this baseline contribution is limited (USD 89,100). The current level of government funding is insufficient to develop an operational management system on the ground and cannot provide for the most basic reserve infrastructure such as ranger stations, means of transport, boundary demarcation and management plans etc. Cambodia is a country just emerging from civil war where only the increment can provide for the alternative of protecting the biodiversity resources in the Cardamom Mountains. Otherwise with mounting threats, currently still large and intact habitats will become degraded.

The Government of Cambodia has also contributed funds to the World Bank/MoE Biodiversity and Protected Area Management Project. A number of the outputs (accounted for with USD 200,000 across outputs) from that project will have direct relevance to the implementation of this GEF MSP in areas such as capacity building for department B (Nature Conservation and Protection), wildlife legislation, management plan development, staff training, protected area zonation and boundary demarcation and community development.

Incremental Cost Matrix

	Baseline	GEF Alternative	Increment
<b>Domestic Benefits</b>	<p>Open access to the Cardamom Mountains is endangering the forest's function as a critical watershed and its biodiversity resources.</p> <p>Local communities, refugees and internally displaced people currently living within the Cardamom Mountains are poor and have not yet established sustainable livelihoods since the end of the civil war.</p>	<p>Clearly defined, on the ground effectively managed wildlife sanctuaries with full stakeholder participation regulate access and protect the biointegrity of the two sanctuaries</p> <p>Social transformation of communities depending on forest resources through ecological and socio-economic information, and land tenure ensures community protection of remaining forest.</p> <p>Enhanced/alternative livelihood opportunities and improved community-based natural resource management systems reduce resource use pressures on Cardamom Mountains ecosystem.</p>	<p>Forest's function assured as critical watershed for domestic water consumption and irrigation for more than 100,000 people; forest biodiversity protected.</p> <p>Enhanced sources of income for households and for protection and conservation efforts.</p>
<b>Global Benefits</b>	<p>Limited capacity of the Ministry of Environment (Department B) as well as local stakeholders for protected area management leads to continuing forest degradation and loss of globally significant biodiversity</p> <p>The Ministry of Environment has limited funding to permit required biodiversity conservation and management</p>	<p>Capacity-building of the Ministry of Environment, protected area committees, and village development councils ensures collaborative management and sustainability of conservation and protection interventions to prevent habitat and biodiversity loss.</p> <p>Design and installation of financial sustainability mechanisms</p>	<p>Collaborative protection and conservation of the Cardamom Mountains ecosystem and biodiversity assures park integrity and establishes a strong "social buffer" around the protected area system.</p> <p>Sustained public and private sector co-financing for a sustainable biodiversity conservation and management</p>

			programme for the Cardamom Mountains protected area cluster.
Output 1: Improved planning, management and regulatory frameworks for the Cardamom Mountains	Management capacity in wildlife sanctuaries very weak, and no coordination with Central Cardamoms authorities 142,500	Improved management in wildlife sanctuaries and effective co-ordination mechanism established with Central Cardamom authorities 1,013,868	871,368 of which: GEF: 229,333 Co-finance: 642,035
Output 2: Significant improvement in species and habitat protection	Weak enforcement and ineffective habitat protection 74,650	Strengthened capacity for habitat conservation in wildlife sanctuaries and intervening forest area 1,692,906	1,618,256 of which: GEF: 401,970 Co-finance: 1,216,286
Output 3: Use of natural resources by local communities in sanctuaries is more sustainable	Destructive and non-sustainable practices widespread 40,650	Improved management and uses of natural resources that does not result in losses of biodiversity 479,103	438,453 of which: GEF: 248,340 Co-finance: 190,113
Output 4: Improved livelihoods and welfare of local communities	Welfare of local communities, including health care, very poor 10,650	Livelihoods of local communities more sustainable and health care improved 506,142	495,492 of which: GEF: 69,500 Co-finance: 425,992
Output 5: Sustainable financing in place for long term management	No long term sustainable financing 20,650	Sustainable financing mechanism established and operating 933,531	912,881 of which: GEF: 49,000 Co-finance: 863,881
Total	289,100	4,625,550	4,336,450 of which: GEF: 998,143 Co-finance: 3,338,307

## 6. BUDGET

Component	This Project	Funds Already Available	Project Total

	GEF	Chester Zoo	ACE	Keindanren	British Embassy	Singapore Zoo	Other donors	UNF	
Personnel (including travel):	543768	3000	8250	7025	11700	2000	188000	590230	1353973
Subcontracts:	32000	0	0	0	0		52000	120000	204000
Training/meetings/workshops/visits:	42650	4000	7500	4350	5300	1000	145000	172750	382550
Equipment:	314745	3000	5250	6280	7800	1000	555900	1105447	1999422
Project office costs:	50000	600	2250	645	200	500	132000	148800	334995
Miscellaneous:	14980	400	2250	0	0	500	36280	7100	61510
Project total :	998,143	11000	25500	18300	25000	3000	1109180	2144327	4336450

## 7. IMPLEMENTATION PLAN

At this stage detailed implementation plans have yet to be developed. As the timetable will shift due to how the project start relates to the rainy season pattern in Cambodia only a general outline of when the main project activities will be implemented is given in the table below.

Activities	Project-months														
	0	6	12	18	24	30	36	42	48	54	60	66	72	78	84
Completion of project activities															
<i>Project initiation</i>															
<b>Recruitment</b>															
<b>Equipment purchase</b>															
<i>Social assessment</i>															
<i>Biological survey</i>															
<i>Training and capacity building</i>															
<i>Infrastructure development</i>															
<i>Community land-use mapping/planning</i>															
<i>Participatory planning</i>															
<i>Development of management plans</i>															
<i>Development IDCP component</i>															
<i>Development of sustainable financing mechanism</i>															
<i>Financial mechanism operational</i>															
<i>Implementation of IDCP and mgt plans</i>															
<i>Tourism interpretation</i>															

## 8. PUBLIC INVOLVEMENT PLAN

Primary stakeholders are the local communities in 25 villages living in and around the park, who will be involved from the very beginning through initial PRA workshops, regular planning meetings and workshops at commune, district and provincial level, which involves all other stakeholders at the respective level of governance. Local communities will be involved in all essential decisions such as boundary delineation, reserve zonation, reserve management planning, and community development planning. Initial socio-economic and anthropological studies will be conducted to ensure that the project orientates its conservation interventions on local needs and cultural values. The project will work through the already established protected area committees for each reserve in each province, which includes all

relevant stakeholders. Local and international NGOs working in the project area will be invited to take part in the participatory planning process.

## **9. MONITORING AND EVALUATION PLAN**

FFI will be directly responsible to GEF for overall management of the project and overseeing both the financial and technical aspects of its implementation. FFI will ensure that transparent accounting and internal control systems are in place with regard to both governmental and NGO partners. These partner organisations will submit regular financial reports to FFI. Quarterly and annual performance reports will be compiled and disseminated on all aspects of the project detailing progress achieved over the reporting period and objectives for the forthcoming period. Project progress will also be measured externally by an independent mid-term evaluation team approximately halfway through the second year. Evaluation will be concluded by a further independent review in the last quarter of the final year.

Partner organizations, communities and other stakeholders will be actively involved in continuous monitoring and evaluation of the project. Training in participatory monitoring and evaluation will be conducted amongst partners and communities to enhance local participation in these processes. A detailed monitoring and evaluation plan will be produced as soon as GEF funding is obtained, together with a clearly defined process for consultative monitoring, based on the indicators in the log-frame.

## 10. PROJECT CHECKLIST

Project activity categories			
Biodiversity	Climate Change	International Waters	Ozone Depletion
Protected Area zoning/mgmt.: Yes	Efficient prods. & distrib.:	Water body:	Monitoring:
Buffer zone development: Yes	Efficient consumption:	Integrated land and water:	Country program:
Inventory/monitoring: Yes	Solar:	Contaminant:	ODS phaseout:
Eco-tourism: Yes	Biomass:	Other:	Production:
Agro-biodiversity: No	Wind:		Other:
Trust fund(s): No	Hydro:		
Benefit-sharing: Yes	Geothermal:		
Other:	Fuel cells:		
	Other:		
Technical categories			
Institution building:	Yes		
Investments:	Yes		
Policy advice:	Yes		
Targeted research:	Yes		
Technical/management advice:	Yes		
Technology transfer:	Yes		
Awareness/information/training:	Yes		
Other: Land Tenure	Yes		

## 11. REFERENCES

Daltry, J.C. & Momberg, F. (eds.), 2000. *Cardamom Mountains Biodiversity Survey 2000*. Fauna and Flora International, Cambridge, UK.

Maxwell, O. & Weiler, F.H., 2000. *A social assessment and Biological reconnaissance of Phnom Aural Wildlife Sanctuary*. Unpublished report, Fauna and Flora International, Hanoi.

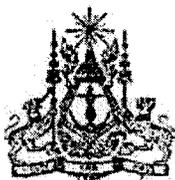
Long, B. & Paley, R. 2001. *Phnom Aural Wildlife Sanctuary; a reconnaissance report and risk assessment*. Fauna and Flora International, Phnom Penh

*Cambodia National Environmental Action Plan 1998-2002*. Ministry of Environment Publication

*Strategic Plan 1998-2000*. Ministry of Environment Publication

## **Annexes**

- A. PROJECT LOGFRAME
- B. DETAILED PROJECT BUDGET
- C. REPORT FROM STAKEHOLDER CONSULTATIONS WITH PROVINCIAL PROTECTED AREAS COMMITTEES: SEPTEMBER 2000
- D. TARGET GROUP ORIENTED PROJECT PLANNING APPROACH (ZOPP) OUTPUTS FROM FFI/MOE WORKSHOP: OCTOBER 2000
- E. REPORT ON CARDAMOM MOUNTAINS BIODIVERSITY SURVEY 2000
- F. REPORT ON AURAL RECONNAISSANCE SURVEY 2000



**KINGDOM OF CAMBODIA**  
NATION - RELIGION - KING

COUNCIL OF MINISTERS  
Ministry of Environment

Phnom Penh 20 9 1999

No : 456.....MoE

To: **Raphael Asengo**  
Executive Coordinator  
UNDP  
BPD/ SEED Global Environmental Facility (GEF)

Dear Raphael Asengo,

Subject: the GEF medium-sized project on "Development of a protected area system (Mt. Samkos and Mt. Aural Wildlife Sanctuary)"

The evergreen rainforest of the Cardamom Mountains are of global importance for biodiversity conservation. The Cardamom Mountains form Cambodia's most important watershed and still contain large viable populations of globally threatened species such as Tigers, Elephants, Banteng, Gaur, pileated Gibbon and possibly Javan Rhino and Khiting Vor.

The Ministry of Environment strongly supports the GEF medium-sized project proposal prepared by Fauna and Flora International in cooperation with the Ministry of Environment:  
"Integrating biodiversity conservation with post-war recovery in the Cardamom Mountains: Development of a protected area system (Mt. Samkos and Mt. Aural Wildlife Sanctuary).

The Ministry of Environment as national GEF focal point endorses the implementation of the project through UNDP, executed by Fauna and Flora International. The project will be conducted in cooperation with the Ministry of Environment

The Environment Ministry is committed to develop the protected areas of Mt. Samkos and Mt. Aural Wildlife Sanctuaries to contribute to the protection of the evergreen rianforests of the Cardamom Mountains.

Thank you very much for your consideration

Yours sincerely, 

Dr. Mok Mareth  
Minister of Environment