

# National Report



Review of Protected Areas  
and Development

## Cambodia

National Report on Protected Areas and Development

Lower Mekong River Region

Review of protected areas and development in the four countries  
of the Lower Mekong River Region

# Cambodia

National Report on Protected Areas and Development

Ministry of  
Economics and Finance

Ministry of  
Environment

Published by: ICEM, Indooroopilly, Queensland, Australia

The PAD Review publications have been made possible by funding from Danish International Development Assistance, Swiss Agency for Development Cooperation, Australian Agency for International Development, Asian Development Bank, Royal Netherlands Government and Mekong River Commission.

Copyright: © 2003 International Centre for Environmental Management

Citation: ICEM, 2003. *Cambodia National Report on Protected Areas and Development. Review of Protected Areas and Development in the Lower Mekong River Region*, Indooroopilly, Queensland, Australia. 148 pp.

ISBN: 0 975033 21 2

Design and layout: Patricia Halladay, Kimdo Design and Paul Insua-Cao  
Maps by Shaska Martin

Cover photo: Ream National Park by Stuart Chape  
Other photographs by Birdlife International in Indochina (pp. 94); Stuart Chape (pp. 22, 135 ); Ross Hughes (pp. 127); Paul Insua-Cao (pp. 95, 99); Shaska Martin (pp. 32-52, 77-82, 98, 102-109, 133) ; Iris Uyttersprot (pp. 120, 122); and WWF / Ben Hayes (pp. 13-19, 28, 53-73, 86, 89, 111-118, 124, 128, 132, 136, 140)

Printed by: Kimdo Design, Hanoi

Available from: ICEM  
70 Blackstone Street,  
Indooroopilly, 4068, Queensland,  
Australia  
Telephone: 61 7 38786191  
Fax: 61 7 38786391  
[www.icem.com.au](http://www.icem.com.au)  
[www.mekong-protected-areas.org](http://www.mekong-protected-areas.org)

The designation of geographical entities in this book, and the presentation of the material, do not imply the expression of any opinion on the part of ICEM or other participating organisations concerning the legal status of any country, territory, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Reproduction of this publication for educational or other non-commercial purposes is authorised without prior written permission from the copyright holder provided the source is fully acknowledged.

Reproduction of this publication for resale or other commercial purposes is prohibited without prior written permission of the copyright holder.

Review of protected areas and development in the four countries  
of the Lower Mekong River Region

# Cambodia

National Report on Protected Areas and Development



The PAD Partnership - 2003

## The PAD Partnership

### Principal government partners

#### *Royal Government of Cambodia*

Department of Nature Conservation and Protection, Ministry of Environment (lead agency)

Department of Forestry and Wildlife, Ministry of Agriculture, Forestry and Fisheries

Department of Fisheries, Ministry of Agriculture, Forestry and Fisheries

Cambodia National Mekong Committee

#### *Government of the Lao People's Democratic Republic*

Department of Forestry, Ministry of Agriculture and Forestry (lead agency)

Science, Technology and Environment Agency

National Economic Research Institute, State Planning Committee

Lao National Mekong Committee

#### *Royal Government of Thailand*

Department of National Park, Wildlife and Plant Conservation, Ministry of Natural Resources and Environment (lead agency)

Office of the National Economic and Social Development Board

Thai National Mekong Committee

#### *Government of the Socialist Republic of Vietnam*

Forest Protection Department, Ministry of Agriculture and Rural Development (lead agency)

Department for Science, Education and Environment, Ministry of Planning and Investment

National Environment Agency, Ministry of Science, Technology and the Environment

Department for Fishery Resources Management, Ministry of Fisheries

Vietnam National Mekong Committee

### Donors

Danish International Development Assistance (DANIDA)

Australian Agency for International Development (AusAID)

Swiss Agency for Development and Cooperation (SDC)

Asian Development Bank (ADB)

Royal Netherlands Government

### International technical support partners

International Centre for Environmental Management (ICEM) (lead partner)

IUCN - The World Conservation Union

United Nations Development Programme

Mekong River Commission

Worldwide Fund for Nature

Birdlife International

New South Wales National Parks and Wildlife Service

Tropical Forest Trust

## Contents

Foreword .....	8
Acknowledgements .....	10
Summary .....	12
Introduction .....	19
<b>PART 1: Biophysical and demographic features .....</b>	<b>22</b>
1. Biogeographic characteristics of Cambodia .....	22
Biogeographic profile .....	22
Bioregional planning, protected areas and priority setting .....	28
2. Demographic characteristics of Cambodia .....	32
Population profile .....	32
Socio-economic profile .....	32
Migration trends .....	35
Socio-economic trends and protected areas .....	36
<b>PART 2: Economic development, governance and protected areas .....</b>	<b>37</b>
3. Governance and institutional reform .....	37
Government Structure .....	37
Decentralisation .....	38
Other governance reform priorities .....	41
The role of protected areas in governance reform .....	43
4. The Cambodian economy .....	45
Cambodian economic performance .....	45
Economic outlook .....	46
5. Development planning and finance .....	48
Socio-economic planning .....	48
Government priority setting .....	49
National finance and budgetary system .....	51
Future directions .....	52
<b>PART 3: Protected areas and environmental management .....</b>	<b>53</b>
6. Protected area planning and management .....	53
Institutional arrangements .....	54
Staffing issues .....	57
Intersectoral cooperation and conflict resolution .....	58
Management planning .....	59
Zonation .....	62
Investment in protected areas .....	63
Protected areas legislation .....	65
Integrated planning and the cluster approach to protected areas .....	66
Future directions .....	67
7. Environmental management and protected areas .....	70
National environmental policy .....	70
The EIA framework .....	70
Future directions .....	73
<b>PART 4: Poverty alleviation and protected areas .....</b>	<b>75</b>
8. Poverty, migration and protected areas .....	75
The relationship between protected areas and poverty .....	75

	Key issues .....	80
	Achievements .....	81
	Challenges .....	82
	Future directions .....	82
	<b>PART 5: Sector Development and Protected Areas .....</b>	<b>86</b>
9.	Forestry and protected areas .....	86
	The relationship between the forestry sector and protected areas .....	86
	Forestry policy .....	87
	Protected areas covering forests .....	88
	Achievements .....	89
	Challenges .....	90
	Future directions .....	90
10.	Agriculture and protected areas .....	95
	The contribution of agriculture to development .....	95
	Relationship between agriculture and protected areas .....	95
	Agriculture policy .....	96
	Protected areas as an essential development strategy in the agriculture sector ..	97
	The urgent need for regimes of protection in the agriculture sector .....	98
	Achievements .....	99
	Challenges .....	100
	Future directions .....	100
11.	Fisheries and protected areas .....	103
	The contribution of fisheries to development .....	103
	Institutional arrangements .....	104
	Protected areas as an essential development strategy in the fisheries sector ..	104
	Fishing communities and protection zones .....	106
	Key issues .....	107
	Achievements .....	109
	Challenges .....	109
	Future directions .....	110
12.	Water resource management and protected areas .....	114
	Current relationship .....	114
	Institutional arrangements .....	115
	Key issues .....	115
	Achievements .....	117
	Challenges .....	117
	Future directions .....	118
13.	Energy development and protected areas .....	120
	Current relationship .....	120
	Achievements .....	121
	Challenges .....	121
	Future directions .....	123
14.	Tourism and protected areas .....	126
	Current relationship .....	126
	Key Issues .....	127
	Achievements .....	129
	Challenges .....	130
	Future directions .....	130

PART 6: Strategies for protected areas as engines for development .....	134
15. Priorities for action .....	134
1. National policy framework for protected areas .....	134
2. Protected area trust funds and financing .....	136
3. Pilot demonstration project in the south-west cluster of protected areas .....	138
4. Economic analysis of protected areas .....	139
5. Protected area training program .....	139
Conclusion .....	140
References .....	141
Acronyms .....	145
Annex 1. The budget process .....	146
Annex 2. Data derivation and sources .....	147

### List of maps

Map 1. Land use in Cambodia .....	23
Map 2. Cambodia's protected area system .....	24
Map 3. Wetlands in Cambodia .....	25
Map 4. Biodiversity management regions of Cambodia .....	26
Map 5. Ecoregions of Cambodia .....	27
Map 6. Village location and protected areas .....	33
Map 7. Population distribution and migration in Cambodia .....	34
Map 8. Protected areas with potential for transboundary cooperation in Cambodia .....	61
Map 9. Poverty and protected areas in Cambodia .....	76
Map 10. Wildlife trade in Cambodia .....	92

### List of boxes

Box 1. Cambodia's seven biodiversity management regions .....	29
Box 2. Reasons for identifying the three biodiversity regions for priority action .....	30
Box 3. The Social Economic Improvement Agency Program (SEILA) .....	39
Box 4. The IUCN system of protected areas categories .....	55
Box 5. Migration and resettlement to the south-west cluster of protected areas .....	78
Box 6. Kamchay Hydropower Project .....	122
Box 7. National and local nature based tourism strategies .....	131

### List of tables

Table 1. Comparison of socio-economic indicators between rural and urban populations ..	35
Table 2. Cambodia's multiple use areas .....	96
Table 3. Fish Sanctuaries established by DOF .....	105
Table 4. Protected areas which include or influence significant aquatic ecosystems .....	106

### List of figures

Figure 1. Economic zones of influence of a protected area cluster .....	20
---	----



## Foreword

The Review of Protected Areas and Development (PAD) represents a major watershed in our thinking about protected areas. We are in a transition. Protected areas have been viewed as places locked away and isolated from everything around them. Now, we are beginning to understand the complex and productive ways they are linked to the surrounding development landscape - and we are becoming more outward looking in our management of them. This shift in thinking and practice is essential for two reasons:

1. First, it is the only way in which all sectors will recognise the development benefits of protected areas and invest in them; and,
2. Second, it allows us to increase the benefits while better conserving the natural systems providing them.

This is not an easy transition. For much of the past ten years our national parks, wildlife sanctuaries and other protected areas have been under development pressures. It has been a continuing battle to control the harvesting for short-term gain of timber, wildlife and other protected area products. It has been a battle to prevent protected areas from being steadily eaten away by encroachment, construction and infrastructure projects.

These problems are not going to disappear over night. But we are at a turning point. In Cambodia, we are starting to have very positive experiences by bringing local communities into the management of protected areas. Collaborative approaches are challenging, but they have potential to bring improved fish yields, sustainable harvests of forest products, and additional income from nature-based tourism as well as significant improvements in biodiversity conservation in the areas concerned. We need to better understand these development dividends of conservation.

For example, our PAD Review field study found that Ream National Park constitutes an extremely important economic resource for local communities. Up to 84 percent of households depend on the Park's resources for their basic subsistence and income, to a net value of some US\$ 1.24 million a year or an average of US\$ 233 for every household living in and beside the National Park. Without access to the basic subsistence, income and employment that the Park provides, many of the 30,000 local people would find it difficult to survive, as they lack access to other sources of livelihood. The field studies also found that tourism in Bokor National Park forms an important component of the regional economy in Kampot Province, contributing an annual income of more than \$0.7 million for government agencies and private enterprises. These cases illustrate the significant contribution which protected areas make in helping implement the Government's poverty reduction policies. The critical issue is that these benefits can continue only if the natural systems and products within the national parks are conserved and used within their sustainable limits.

Protected areas managers need to begin talking the language of development, and marketing their products and services more effectively. Opening all the doors and windows of our conservation house, does not mean selling off all the furniture. The more that key sectors appreciate the development and economic returns they receive from protected areas, the more they are likely to lend budgetary support for their maintenance.

Already this is happening in Cambodia. Our fisheries and forestry agencies, for example, are promoting fish habitat sanctuaries, protected forests, gene pool conservation areas and other forms of protection as a key ingredient in their sector development plans. The same is true for tourism. And we are beginning to think through how similar approaches can be applied to energy development and agriculture.

One thing is clear – protection of our natural systems and resources is not receiving the investment required for the job. There is no question about our government’s commitment to protected areas – Cambodia has one of the largest systems in the world, now covering some 21 percent of the land area and expanding to cover 25 percent over the next five years. That is a remarkable achievement through a period of relative instability. But that commitment is not fully translated into budget share, which in 2001 was 0.18 percent of national expenditure. This will need to change if the growing contribution of protected areas to national and local development is to continue. The source of that additional investment will need to come from all protected area users.

This is why the PAD Review and partnership is so important. It provides strategic direction for bringing protected areas into the mainstream of economic development. The first national round table for the PAD Review was conducted in November 2001. Since then, the national PAD team and inter agency core group have been involved in a lengthy field study, in preparation of a national lessons paper and sectoral background papers, in a series of core group meetings and in two international meetings held in Phnom Penh. This national report itself has gone through several stages of drafting and comment and will be widely distributed throughout all levels of government. It represents the end of the first phase of a creative and valuable process. The next phase is the most important – for it involves the progressive implementation of the strategies set out in this report. It will require actions across government including the testing of new economic policies and instruments, reorientation of budgets and more comprehensive sector and regional planning.

Our government is committed to taking the PAD process forward. But we will need the support of our international partners – the PAD partnership should continue and expand. It has been a very productive relationship and we must not let its momentum and energy fade.

We would like to express special thanks to the three governments contributing to the success of the PAD Review – Australia, Denmark and Switzerland. Without their backing we would not be able to take this critical step forward in protected area development and conservation. UNDP and ADB have also been strong partners in the review process. Our thanks are extended to the MRC Secretariat for its support of the two regional workshops associated with the review. There is a growing need for regional collaboration in this field and it is very significant that MRC is taking a leading role in integrating the results of the PAD Review into the Basin Development Plan.

Our international technical partners are especially important to us and they are acknowledged earlier in this report along with the many government and non-government experts who have contributed so much in shaping this report. We will do our utmost to maintain the PAD partnership and, through it, realise the goals set out in this national report.



H.E. Dr. Mok Mareth  
Minister of Environment



H.E. Keat Chhon  
Minister of Economics and Finance

## Acknowledgements

More than 150 people contributed to the Cambodia PAD Review either through interviews, roundtable meetings, group discussions or written comments and materials. Most are government officers representing some 30 agencies at national and local levels. This was truly a cross-sectoral review initiated by government as is reflected in the Cambodia PAD Core Group membership which provided the overall technical guidance for the review, undertook the field studies and prepared the sector background papers. Other review contributors come from NGOs, international development organisations, and conservation projects. This report is rich with their ideas, views and experiences. Their involvement and commitment to conservation in Cambodia is deeply appreciated.

**PAD Review contributors:** Many of the PAD Review contributors are listed below.

Am Norin	Ian Campbell	Michael Hayes	Sbong Sarath
Amanda Bradley	In Sokhum	Nao Bonheur	Seng Chhaung
Anders Thuren	Ing Try	Nao Kunthea	Seng Kim Hout
Andrew Cock	Jean Claude	Nao Thuok	Seng Teak
Blair Exell	Levasseur	Neou Bonheur	Sin Meng Srun
Cao Soeun	Joanne Morrison	Net Neath	Sin Sophat,
Chan Somaly	Joe Gartner	Nhal Thoun	So Rothavy
Chan Sopheoun	Joe Walston	Nick Cox	Soeung Bun Thoeun
Chayya Hang	Jorge Malleux	Nicolaas Van Zalinge	Sok Vong
Chey Yuthearith	Joy Daniel	Nop Chanarith	Sorn Saravuth
Chhan Saphan	Kang Heang	Nouv Karon	Sou Savuth
Chhim Choun	Kay Pheng	Nuth Sakhan	Sovanna Gaunlett
Chhun Sareth.	Ken Serey Rotha	Ouk Siphon	Steven Navon-
Chin Samouth	Ken Sonn	Oung Sam Ath	Schonberger
Chris Price	Kim Sokha	Patrick Lyng	Tan Setha
Chup Kao	Kieu Muth	Paul Van Im	Theng Tara
Colin Poole	Kim Nong	Phearith Heng	Thoeuk Kroeun Vutha
Dale Withington	Kong Heang	Phin Phean	Tim Redford
David Ashwell	Kong Kim Sreng	Pich Dun	Tine Feldman
David Mead	Koy Sokha	Pich Serey Vath	Tin Ponlok
Dennis J. Cengel	Kuch Savat	Prach Sun	Touch Seang Tana
Doug Henderson	La Peng Ly	Pum Vicheth	Touch Sum
Edwin de Korte	Lars Lund	Puth Chentharith	Ty Sokhun
Eng Cheasan	Lay Khim	Richard Paley	Urooj Malik
Gorm Jeppesen	Mak Sithirith	Ruud Corsel	Van Roeun
Hang Chuon Naron	Mam Kosal	Sabu Bacha	Von Monin
Hans Guttman	Mann Kosima	Sam Chamroeun	Vong Sarun
Harald Kirsch	Marcus Hardtke	Sam Nuov	Y. Lavy
Has Vibol	Mark Sithirith	Sam Saman	Yem Sokhan
Hem Saroeun	Meas Sophal	San Vanty	Yin Samray
Heng Sorin	Men Phymean	Sarah Burgess	
Hour Lim Chhun	Meng An	Sareth Boramy	

**PAD Core Group:** The review owes most to the PAD Core Group, which met regularly throughout the process to guide all review activities and to shape this review report. Group members come from six ministries.

Chay Samith	Director, Department of Nature Conservation and Protection, Ministry of Environment
Hang Chuon Naron	Deputy Secretary General, Ministry of Economy and Finance
Heng Pearith	Environment Program, Cambodia National Mekong Committee
Khiev Muth	General Director, Ministry of Environment
Kim Sour	Project Monitoring and Evaluation Officer, Department of Fisheries, Ministry of Agriculture, Forestry and Fisheries
Kol Vathana	Deputy Director, Department of Nature Conservation and Protection, Ministry of Environment
Lic Vuthy	Deputy Director, Forestry and Wildlife Research Institute, Ministry of Agriculture, Forestry and Fisheries
Mak Soeun	Department of Agronomy and Land Improvement, Ministry of Agriculture, Forestry and Fisheries
Meng Monyrak	Vice Head, National Parks and Wildlife Sanctuary Office, Ministry of Environment
Ngoun Kong	Deputy Director, Department of Environment Impact Assessment, Ministry of Environment
Ngoun Narin	Industrial Safety and Environment, Ministry of Industry, Mines and Energy
Nong Keamony	Department of Water Resources Management and Conservation, Ministry of Water Resources and Meteorology
Ouk Siphon	Deputy General Director, Ministry of Tourism
Oum Pisey	National Coordinator, National Biodiversity Strategy and Action Plan Project
Pich Sam Ang	Assistant to Minister, Ministry of Rural Development
Ros Seilava	Financial Controller, Department of Budget and Financial Affairs, Ministry of Economy and Finance
Thach Sovanna	Vice Chief of Hydrology and Flood Control Office, Ministry of Water Resources and Meteorology

**The PAD Review team** is led by Jeremy Carew-Reid. The team's sub-group on economics comprises David James, Bruce Aylward and Lucy Emerton. PAD Review country coordinators are Mao Kosal (Cambodia), Nguyen Thi Yen (Vietnam), Piyathip Eawpanich (Thailand), and Latsamay Sylavong and Emily Hicks (Lao PDR). Country specialists are Kol Vathana and Charlie Firth (Cambodia); Chanthakoumane Savanh and Dick Watling (Lao PDR); Andrew Mittelman and John Parr (Thailand); and Tran Quoc Bao, Nguyen Huu Dzung, Ross Hughes and Craig Leisher (Vietnam). Other team members are Kishore Rao (protected areas); Graham Baines (agriculture and marine protected areas); Nicholas Conner (water resources); Rob McKinnon (community development); Gordon Claridge (wetlands and fisheries), Shaska Martin (information technology); Jason Morris (poverty alleviation); Scott Poynton, David Lamb, Don Gilmour and Andrew Ingles (forestry); Guy Marris and Alison Allcock (tourism); Paul Insua-Cao (communications) with Patricia Halladay and Margaret Chapman assisting with editing.

## Summary

Ninety percent of Cambodia's 12.8 million people live and derive income from the floodplain lowland in the centre and south which occupies less than 30 percent of the country. Most protected areas are relatively isolated and located in areas of low population density. The significant exceptions are the protected areas on the western border of the country in provinces with high populations densities largely due to recent immigration, and the protected areas within Siem Reap Province, including parts of the Tonle Sap Multiple Use Area.

Over one third of Cambodians live in poverty. The national protected area system coincides with regions of medium to high poverty and relatively low but rapidly growing populations. Increasingly, protected areas will come under pressure for the development benefits they can provide, especially to the poor. A system of rights of access and tenure linking existing communities with protected areas is beginning to evolve, as tenure and ownership arrangements over land and other resources throughout Cambodia are clarified. This definition of rights is a critical step in the effective conservation of protected areas.

The national protected area system covers over 21 percent of the country. It comprises 23 protected areas created through a Royal Decree in 1993 and managed by the Ministry of Environment (MOE), and a growing number of fish sanctuaries and protected forest areas set up through the Ministry of Agriculture, Forests and Fisheries (MAFF). The system also includes provincial protected areas set to increase significantly in number once the current legislative framework and guidelines for protected areas are clearly defined at national level. Cambodia has one of the highest percentages of national territory within protected areas in the world and has a goal of taking that area to 25 percent by the year 2005.

## Governance reform

The way a government is structured has important implications for protected areas. An overriding force in the current political landscape of Cambodia is a commitment to decentralisation and the transfer of political, fiscal and administrative powers to local authorities at commune level. Decentralisation will facilitate the active participation of local communities and officials in the planning, implementation and monitoring of development. Communities located near protected areas will benefit from new structures and processes that involve them in decisions concerning the management of protected areas. MOE plans to introduce a Law on Protected Areas Management that provides a much-needed management structure and system for protected areas and builds on and reinforces the government's decentralisation policies.

In the next five to ten years, the management of protected areas will be a measuring stick of the effectiveness of the governance reform. The objective of attaining sustainable socio-economic development and social justice through governance reform can be implemented by fully realising the role for protected areas in local political and economic systems. Protected areas and their surrounding regions lie at the centre of complex land use and land tenure issues, and they need to play a critical role in piloting and demonstrating the government's reform measures.

## Development planning

The process of defining economic policies, development plans and associated budgets is critically important for protected areas. Protected area managers must give greater attention to participating in those processes and seeking to influence the priorities set through them. They should explore the use of economic policies and instruments to influence development behaviour and achieve conservation objectives.

Also, they will need to begin shaping development plans and the allocation of budgets so that investment flows from key sectors to the protected areas and natural services and products they provide. A shift is needed from a defensive mode looking inward at the immediate challenges of protected area management, to looking beyond their boundaries and actively engaging in the planning and priority setting of development in surrounding landscapes. It is those policies and plans that will determine the wellbeing and continuing contribution of protected areas to national development.

### Protected area planning and management

An intimate working partnership between MOE and MAFF is essential for the welfare of the national protected areas system. Equally, it will become increasingly important for the ministries to build partnerships with other stakeholders because of the growing importance of the local level.

MOE and MAFF will both need to work through the implications of decentralisation for protected area management and determine the balance between the number of staff and budgets at the central offices in Phnom Penh and at provincial and protected area levels. All evidence indicates that both MOE and MAFF protected areas need more staff for improved management. The demands on staff are increasing. Protected areas managers are now expected to be community development and poverty alleviation officers, as well as conservation managers – yet they do not have the mandate, skills and capacity to fulfil this community development role. Also, the new responsibilities in conflict resolution and in working with key economic sectors goes well beyond the experience and training of many staff.

Many protected areas still face problems in reaching consensus on the physical demarcation of their boundaries. More extensive guidelines for zoning are required to develop zonation systems for each protected area based on its habitats, species and patterns of use by local people and specific rules and regulations that govern how different zones will be used. These rules are especially important for any subsistence harvests that might be allowed in some parts of protected areas. Determining the location of core zones should be a high priority.

### The cluster approach to protected areas

The cluster approach provides an opportunity to quickly establish a framework for management over a group of parks at the same time - including the land and resources linking them. It allows for integrated regional planning in which the management of linked protected areas becomes a tool in sustainable economic development of an entire landscape. The concept is immediately relevant for the effective management of Cambodia's protected areas in a situation of acute resource scarcity. Most importantly it would allow protected areas to be recognised and managed as productive units within the socio-economic landscape of which they are a part.

### Investment in protected areas

In 2001, MOE estimated that it received approximately 0.18 percent of the national government budget, almost a threefold increase over ten years. Also, a significant amount of financing for protected areas and biodiversity conservation has been provided in the past 10 years as grants from multi lateral and bilateral aid agencies and NGOs. Yet, MOE's budget barely covers staff salaries and basic administration.

Cambodia's expenditure for protected areas is very low when compared to other countries in the region. Given the commitment of more than 21 percent of the country to this form of land use and its basic contribution to development in many key sectors, investment priorities will need to be reviewed. Increasing protected area budgets will require increased allocation from central government, transfers from development sectors for services received and raising local revenues.

As development benefits, such as providing stable water flows to irrigation systems or hydropower facilities, are better understood, a proportion of the revenue from water and power charges will need to go automatically to safeguarding the service through effective management of the protected area. The government will need to provide the appropriate system of economic incentives and regulations to promote the "user pays" approach.

Longer-term and sustainable funding options will need to be considered. Perhaps the most promising option is a trust fund at the national level and trust funds for individual and clustered protected areas providing a stable financing mechanism that can be supplemented by contributions over time. The process of setting up an efficient and transparent system of trust funds to supplement government budgets while simultaneously involving stakeholders will require consistent effort and support over several years.

### Environmental impact assessment (EIA)

The EIA system is not functioning in an effective manner due to the limited capacity and resources available to the EIA Department, the weak working links across departments within the Ministry of Environment and with many of the sectoral agencies, and the low priority which the EIA process is given across all arms of government.

There are numerous cases where developments have been planned without due respect for the EIA process or MOE's role in environmental review. Many have had potential to affect protected areas or to benefit from their services and products. These development proposals have been initiated by government or the private sector and funded from foreign investments, grants or loans. Often several arms of government have facilitated the plans. EIA is an essential mechanism of government for safeguarding protected areas and identifying opportunities for developers to contribute to their maintenance. The government and the international community must invest in the EIA system so that the development benefits from protected areas continue to flow to the national economy.

### Poverty alleviation

Protected areas can play a central role in alleviating poverty, especially when strategies take advantage of the range of development services which a group of linked protected areas can offer. By ensuring every sector pays for the benefits they receive from protected area services and encouraging the poor to take advantage of market opportunities, they can reap the benefits of domestic and foreign interests. Revenue generation for the poor may come, for example, in the form of tourism, NTFP commercialisation and transfer payments from developers.

Strategies for community development and poverty reduction are needed for each cluster of protected areas with collaborative management a cross-cutting theme. Special attention should be given to providing necessary support to immigrants.

All government resettlement and demobilisation plans should receive comprehensive environmental assessment, especially when protected areas may be affected. Mitigation programs should be designed into every plan so that the use of natural resources is well managed and sustainable, and the natural values of protected areas are maintained.

Co-management has been gaining support as a mechanism for reducing poverty and for ensuring sustainable use of natural resources near protected areas. In May 2002, the Prime Minister issued a decision requiring MOE to designate 10 to 30 percent of every protected area as a buffer zone to be co-managed with local communities on a sustainable basis. Because financial and staff resources are limited, the process should be undertaken country wide in stages by ranking groups of protected areas in order of priority for this kind of action.

Moving forward with co-management arrangements requires new skills and capacities within the affected communities. This is especially related to the capacity of protected area managers to have the resources and skills to support communities with the technical advice and assessments they need to manage their shared resources effectively.

## Forestry

Deforestation is the most common threat to biodiversity in Cambodia and to economic productivity in many key development sectors, such as agriculture, fisheries, tourism, energy and health. The wellbeing of Cambodia's protected areas is therefore intimately linked with the management of its forest.

The four most important forest management issues effecting the potential of protected areas to fulfil their potential as a critical development strategy in the sector are:

1. The conservation of forests within existing protected areas;
2. The inclusion of other important and under-represented forest ecosystems within the national system of protected areas of various categories including protected forests;
3. The inclusion of protection zones within forest concessions as buffers to existing protected areas and covering sensitive environmental areas and regions of biodiversity wealth elsewhere in the concession; and,
4. The role of community forests in achieving sustainable forest use.

Protection zones along the border with existing protected areas are especially important. Allowing logging up to the border invites illegal activity, but even with the strictest control it has the potential to negatively impact on natural systems within the protected area. In 1999, the Prime Minister recommended that such buffers should extend for 2-3 km from a protected area border. That recommendation needs to be put into practice.

A top priority must be DFW and MOE collaboration in controlling illegal logging within the protected area system. A special MAFF/MOE forest protection force should operate in each protected area cluster.

## Agriculture

Agriculture has been compromised by unsustainable practices leading to falling production for unit effort. Formal protected areas and protection zones in agricultural areas provide many services and products essential to agricultural productivity. This implies:

- Adopting a landscape perspective as a basis for agricultural planning and management in which protected areas and regimes of biodiversity protection are directly linked to maintaining agricultural productivity;
- Focusing on understanding and working with native biodiversity (both wild species and those that constitute local agricultural biodiversity) and the ecological processes important for sustainable agricultural production; and
- Developing and adopting measures to encourage native biodiversity throughout the agricultural landscape, wherever possible linking this with more formal protected areas through protection corridors and zones.



The issuing of land concessions for industrial agriculture provides an opportunity for the user pays principle to be applied in financing protection. Each commercial operator in the agriculture sector should pay a fee for protection of critical ecosystem services and products.

## Fisheries

Cambodia is heavily dependent on its freshwater and marine fisheries to provide livelihoods and nutrition to its people. There has been a consistent decline in the catch per unit effort and in the value of catch. Also, there has been a reduction in the catch of some long-lived species, and a shift to those that are smaller and short-lived.

Protected areas of various kinds play an essential role as an insurance policy in the fisheries sector. As a rule, to safeguard against fishery collapse it is desirable to set aside permanent reserves covering 10-20 percent of the breeding, nursery and migratory areas

Cambodia needs to develop national capacities for managing fisheries resources via two closely related strategies:

1. The development and management of protected areas for natural living aquatic resource conservation and production; and
2. A framework of regulations and incentives for the management and exploitation of fisheries resources in a sustainable way.

Management plans for fish sanctuaries and protected areas benefiting the fisheries sector need to be prepared with local communities and other stakeholders and include arrangements for collaborative management, zoning and enforcement, prohibitions and allowed uses and a clear definition of roles. The plans should be short and may initially cover more than one protected area.

Each lot operator in the fisheries sector should pay a fee for protection of the stocks. The process of auctioning of fishing lots covering freshwater areas and licensing of fishing activities in marine environments provides an opportunity for the user pays principle to be applied in financing protection.

## Water resource management

Cambodia suffers severe and regular drought and throughout the year it is becoming increasingly difficult to access clean water. Cambodia's protected areas play a vital role in the management and conservation of water resources and are an important "quiet partner" in the development of the water sector. There are seven main hydrological functions of protected areas which are of growing development significance and which need to be the focus of well defined investment and management strategies:

1. Water storage and natural flood regulation;
2. Water supply (irrigation, drinking water supply and hydropower);
3. Instream and estuarine fishing;
4. Flushing of pollutants;
5. Transportation and navigation;
6. Recreational use of water, including tourism; and
7. Microclimate impacts on surroundings.

The kind of information that might influence sector investment towards protected areas is not available to planners. As a result there is no appreciation of the value of hydrological benefits to the economy. Consequently it is difficult to express the level of effort which should go into safeguarding those values in budgetary and staffing terms. The initial economic assessments undertaken through the PAD Review should

become a routine component of river basin or catchment management planning. Protected area values in safeguarding hydrophysical processes that lead to high quality and secure water supplies and water resource services need to enter into economic planning for regions and individual sectors. Special attention should be given to the obligations of concession holders in fisheries, forestry and agriculture, industrial facilities, energy facilities and irrigation and water supply systems.

### Energy development

Protected areas have the potential to provide significant energy services and products – but are also very sensitive to exploitation. In some protected areas or zones within them, the long term development benefits of biodiversity conservation are too valuable to allow energy uses. In other protected areas, careful use of energy benefits can be sustained.

Fuelwood harvesting and consumption is the most immediate threat to protected areas in this sector. Yet, the emergence of hydropower and oil and gas development could be more of a problem in the near to long term if this potential is not planned and managed according to adequate environmental assessment, monitoring and investment in mitigation and conservation.

The first hydropower scheme and second proposed project are both in national parks. Many other schemes have been proposed for location in or close to various protected areas. The full effects of the projects for other sectors, such as tourism, and for other development and conservation values of the host protected areas have not been adequately studied. Two priority strategies require:

1. An effective legal structure for EIA of energy development proposals within protected areas;
2. Initial biodiversity studies and environmental assessments prior to decisions on energy projects.

Also, each commercial operator in the energy sector should pay for protection of critical ecosystem services and products that they use. Equally important to the user pays concept is that part of the payment should go back to safeguarding the resource and natural systems concerned. Use must be linked to protection in the beneficiary's mind.

The decision requiring 10 to 30 percent of every protected area to be a co-managed buffer zone is an important innovation to open the way for the designation of community use areas where the harvesting of fuelwood can continue.

### Tourism

Nature-based tourism can be an effective means to establish a reliable revenue source for protected areas and the communities that surround them. Cambodia is in a unique position of having a large protected area system yet to be tapped for tourism. It can take a leading role within the region by setting in place the capacities and framework to develop tourism for a network of protected areas in a way that is sustainable and profitable for local communities and businesses.

A national plan for tourism and protected areas should identify priority clusters of protected areas with special promise for tourism and appropriate sites for demonstration projects. A high priority should be the south west cluster of national parks which already attracts tourists, has ready access and a diversity of protected area “products” which could be marketed as a package. Demonstration projects in promising locations are needed to guide action in other areas as additional resources become available.

Studies indicate that tourists, even “backpackers” travelling on limited budgets, are willing to pay significant tariffs for nature-based experiences if the funds go to conservation and community development in the areas visited. A review of current financing arrangements should recommend a framework of economic instruments to apply to tourism in the protected area system.

Strong community involvement is important for the long-term sustainability of nature-based tourism and community development. The establishment of cooperative management committees in these communities can provide a transparent and equitable system for managing tourism initiatives and distributing income emanating from tourism.

### Priorities for action

The PAD Review has shown that protected areas are vital development assets – they are centres of development services and products essential to Cambodia’s growing economy. Only by managing protected areas as productive parts of wider development landscapes, will resource users appreciate the benefits of conserving their natural qualities.

To succeed, protected area managers will need to understand and express those qualities in economic terms. Protected areas need to be promoted and marketed, because this is the only way they will ever be effectively integrated in Cambodia’s national accounts and socio-economic development plans.

While it is essential to increase demand for protected area products, managers need to ensure that the uses of them are sustainable and appropriate. In other words, the natural capital held in protected areas must not be degraded – it must be maintained and enhanced – because that will bring the greatest development returns over the long term.

This national report has examined protected areas from the perspective of local communities and development sectors. The relationships between protected areas and resource users have been assessed and management strategies defined which increase protected area development contributions while better conserving them. The many recommended strategies relating to each field of development can be distilled into five main priorities for action:

1. A national strategy and sector plans for protected areas;
2. Protected area trust funds and financing based on a user pays policy;
3. A pilot demonstration project for the south-west cluster of protected areas;
4. Economic analysis of protected areas;
5. A national protected area training program.

Protected areas need to be placed much higher on the government’s list of priorities and to receive higher levels of investment accordingly. One important way to increase that flow will be by adopting the user pays principle. Whether they are government sector users such as water supply or irrigation agencies, private sector developers associated with hydropower schemes or tourism enterprise, or even local communities - if they use protected area services or products, they should pay for the privilege. This is a central theme of the report.

The PAD Review provides strong arguments for protected area conservation to be considered a priority in local and sector planning and development. Sectors and local government need to appreciate the benefits they receive from protected areas and to invest in their maintenance. The future of protected area management in Cambodia is not in building strong armies to hold development forces at bay, but in having those forces invest in conservation because they see that it is in their best interests to do so and they recognise protected areas as a vital development strategy.

## Introduction

This report examines the contribution of protected areas in implementing Cambodia's national strategies for socio-economic development<sup>1</sup>, poverty reduction<sup>2</sup> and biodiversity conservation.<sup>3</sup> It was prepared by an inter-agency core group of government experts, convened by the Ministry of Environment (MOE) to look at the links between protected areas and development and bringing together economic and financial planners, natural resource developers and conservation managers from ten ministries.

The premise of their work is as follows: *protected areas need to be understood and managed as essential development assets in socio-economic plans of surrounding communes and provinces and at national level.*<sup>4</sup> The

development values of protected areas come from the services and products that ecosystems provide in their natural state. If those natural systems degrade from overuse or misuse, their value for development diminishes. It is therefore in the interests of all sectors and communities receiving development benefits from protected areas to contribute to their maintenance and enhancement.

That premise led the core group to carry out the Cambodia Review of Protected Areas and Development (PAD) with four objectives in mind:

1. To identify and express in economic terms the development values of protected areas;
2. To have the development benefits of protected areas better understood and reflected in sector policies, plans and budgets;
3. To increase the level of investment in conserving the development services and products provided by protected areas; and
4. To identify the key areas where institutional strengthening and capacity building are needed so that protected areas are planned and managed as essential components of local and national economies.

As the review progressed and the results of field studies and sector analyses came in, the core group defined the following policy framework to govern the approach taken throughout this national PAD report:

1. Protected areas provide products and services essential to the national and local economies.
2. These values need to be expressed in economic terms so they can be effectively integrated in the national accounts and socio-economic development plans.
3. The natural capital held in protected areas must be conserved, maintained and enhanced so that it brings the greatest development returns over the long term.

1 Royal Government of Cambodia, Second Five Year Socio-Economic Development Plan, 2001-2005 (SEDPII)

2 Royal Government of Cambodia, *Poverty Reduction Strategy Paper* [First Draft] (Draft PRSP), August 22, 2002

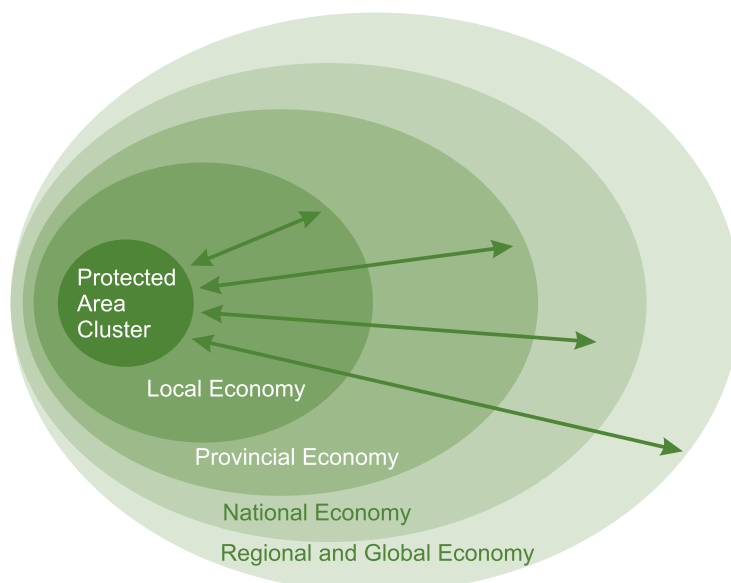
3 Royal Government of Cambodia, National Biodiversity Strategy and Action Plan, MOE, April 2002,

4 In this report, the term "protected areas" covers all areas set aside for conservation by MOE, MAFF, local government and other sectors. The goal is to have one national system of protected areas with a range of organisations contributing to their establishment and conservation. "Protected areas" are an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means (IUCN, 1994).

4. Protected areas need higher levels of investment, and users of protected area services and products must pay for their conservation (in other words, the user pays principle for protected area maintenance should apply to government sectors and commercial enterprises as the basis for maintaining and enhancing protected area benefits).
5. All sectors must embrace regimes of protection as an essential part of their own development strategies.
6. Sustainable use of protected areas must come with equity. Any increase in revenue going to manage and safeguard protected areas must also safeguard and enhance the wellbeing of local communities. They should benefit from the effort they put into conservation management. Enhanced systems of support, subsidies and compensation to local communities living around protected areas are needed.
7. There should be one national system of protected areas requiring a comprehensive national policy and legal framework that clearly defines responsibilities, categories and uses, and the linkages with development sectors.
8. Planning and management of protected areas should be undertaken on a landscape basis that recognises them as productive components in regional and local development strategies. In other words - protected areas and the adjoining forests, agriculture and aquatic systems need to be managed in terms of shared ecosystems across which there are varying intensities of protection and use. The objective of ecosystem management is to ensure that natural goods and services are available on a sustainable basis.

Every group or cluster of protected areas sharing an ecosystem (for example, the two wildlife reserves and one protected forest of the Cardamom Mountains or the four national parks associated with the Elephant Range) has productive linkages with the economy within that landscape. Each protected area within the cluster contributes to the surrounding local economy, to the provincial and national economies and, possibly, to the wider regional and global economy (Figure 1). In turn, to varying degrees the economies influence the condition of the protected areas. Those development relationships need to be carefully planned and managed if the benefits flowing from protected areas are to be maintained.

Figure 1: Economic zones of influence of a protected area cluster



In Cambodia, the links between protected areas and local communities are especially important and recent government decisions aim to put in place policies for managing those interactions productively. Increasingly the role of protected areas in development beyond local communities will need to be well defined and managed. For example, the PAD Review found critical links between protected areas and water supply for local districts and provinces; the energy sector and growth in the national economy; and fisheries and tourism for regional and global economies.

This national report of the Cambodia PAD Review (complemented by other reports in the PAD Review series) provides an initial analysis of the development relationships between the national protected area system and the economy and sets out strategies for each sector to optimise and maintain the benefits received.

# Part 1: Biophysical and Demographic Features

## 1. Biogeographic characteristics of Cambodia

### Biogeographic profile

Cambodia possesses many features of international conservation significance. It retains one of the highest proportions of land as natural habitat (forest and wetlands) in the world, and one of the least disturbed coastlines in continental Asia. Currently, over 45 habitat types have been characterised and mapped for the country.

Cambodia lies in the south western Indochina peninsula between Thailand to the west and Vietnam to the east, and shares a north eastern border with Laos. It has a total land area of 181,035 km<sup>2</sup>, and a coastline stretching along the Gulf of Thailand for 435 km supporting an exclusive economic zone (EEZ) of 500,000 km<sup>2</sup> with 64 islands and extensive mangroves and coral reefs. Dominating Cambodia's landscape are the centrally located Tonle Sap Lake and the Mekong River system, flowing north to south. Map 1 shows the main land uses in Cambodia.

Cambodia is divided into a number of regions by mountain ranges. The Central Plains occupy three quarters of the country, and include the alluvial plains and wetlands of the Mekong River and Tonle Sap Lake as well as plains in the northwest (near Battambang), northeast and in the east near Kompong Cham (Smith 2001). The plains are flat with an elevation of 5-10 metres. Key protected areas in this region include the Tonle Sap Multiple Use Management Area, Angkor Protected Landscape and the Kulen Promtep and Beng Per Wildlife Sanctuaries. Map 2 shows Cambodia's protected area system.

Cambodia's tropical climate includes an annual monsoon season from May to October when 80 percent of the annual rainfall occurs, turning the lowlands into an extensive floodplain. During the dry season, water drains from the Tonle Sap Lake (also known as the Great Lake) into the Tonle Sap River and eventually into the Mekong Delta. As the monsoon rains flood the lowlands and fill the Mekong River, the rise in river water level causes the Mekong to push water back up the Tonle Sap River into the Great Lake. During this season, the lake can increase between four to seven times its usual size. When the Mekong River levels recede, the lake begins to lose its water back into the Tonle Sap River. In this way, the Great Lake acts as an extensive natural flood retention basin. Map 3 shows Cambodia's vast wetlands including the extent of flooding during the monsoon season.

The plains are surrounded by the more densely forested and sparsely populated highland areas. To the southwest are the Cardamom and Elephant Mountains, a linked chain separating the coastal strip from the rest of the country. In the north the Dangrek Mountains form a steep escarpment along the border with Thailand and, with an average of 500 metres in height, announce the transition from the Tonle Sap Basin to the Thai Korat Plateau.

The ranges in the east that rise to form the Ratanakiri Plateau and Chhlong highlands are punctuated by hills that reach 700-800 metres in height. The north-eastern provinces of Ratanakiri and parts of Mondulakiri form a transition zone to the Annamite Ranges in Vietnam.

Map 1: Land use in Cambodia



Map 2: Cambodia's protected area system

Map 3: Wetlands in Cambodia

Map 4: Biodiversity management regions of Cambodia

Map 5: Ecoregions of Cambodia

Virachey National Park, which borders Laos and Vietnam in Ratanakiri Province, is the most remote protected area and boasts the highest elevations in this region and perhaps its greatest biodiversity. Lomphat and Phnom Prich Wildlife Sanctuaries are also located here.

The Cardamom Mountains, the country's largest and highest upland area, rise from the Gulf of Thailand through mangroves, lowland plains and on to its highest peak, Phnom Aural, which reaches 1,813 meters. This upland region passes through a second region of decreasing altitude until it merges with the central plains. The mountains are covered by the largest tract of virgin rainforest in mainland South East Asia and promise to be an important centre of the biodiversity conservation effort in Cambodia. Two wildlife reserves, Phnom Samkos and Phnom Aural, sit either side of a newly-created 402,000 hectare Protected Forest allowing for a collaborative conservation strategy covering the entire mountain region. Stretching over one million hectares, it is by far the largest uninterrupted region of protected areas in Cambodia and the largest protected region in mainland South East Asia. Few wildlife surveys have been conducted in the region, yet it's relatively minimal disturbance, remoteness and vast size mean that significant numbers of rare mammals are likely to remain, including tigers, pileated gibbons and Siamese crocodiles. MOE has responsibility for the two wildlife sanctuaries and the Ministry of Agriculture, Forests and Fisheries (MAFF) controls the linking protected forest. MOE and MAFF cooperation in creating a comprehensive management scheme will determine the sustainability of this key area.

To the south east of this region lie the Elephant Mountains, which constitute an extension of the Cardamoms. The Elephant Mountains reach elevations of between 500 and 1,000 metres and are bordered on the west by a narrow coastal plain facing the Gulf of Thailand and Sihanoukville Bay. Bokor and Kirirom National Parks dominate the landscape of this region.

Much of Cambodia's western coastline has been set aside as protected areas, comprising Botum Sakor and Ream National Parks, Peam Krasop Wildlife Sanctuary and Dong Peng Multiple Use Management Area. This region supports critically important forest resources.

### Bioregional planning, protected areas and priority setting

In situations of scarce resources and limited staff capacity, governments need to set priorities for action when managing their national protected area system. The biogeographical characteristics of a country provide a framework for determining the areas requiring the most urgent conservation attention.

As shown in Map 4 and Box 1, the National Biodiversity Prospectus divided Cambodia into seven relatively homogeneous and geographically distinct *biodiversity management regions* on the basis of the biological resources present, geology and soils, and their past and present use (Ashwell 1997). The definition of regions and groups of protected areas within each provides a management tool to focus resources. Criteria built on biological resources and their use also enables management responses linking protected areas to their surrounding development landscapes.

A recent survey by WWF has defined a more detailed set of ecoregions for the Lower Mekong based on biological characteristics as shown in Map 5 which locates Cambodia's protected areas in relation to forest type (Baltzer et al. 2001). In both cases, experts groups used the best information available to make practical judgements on boundaries.

### Box 1: Cambodia's seven biodiversity management regions

**1 South-western Coastal Ranges and Marine Waters:** Wet tropical forest including the Cardamom and Elephant Ranges, coastal formations and marine areas generally associated with sandstones. The area has low population densities and is dominated by natural and modified landscapes used for forestry, marine fisheries and the maintenance of biological diversity. Principal ethnic groups living in this area are the Khmer, Pear, Chong and Sóach.

**2 Northern Plains:** Lowland dry evergreen and associated deciduous forests on sandstones. The region has low population densities and natural and modified landscapes used for forestry, the maintenance of biological diversity, and limited agriculture. Ethnic groups living in this area include Khmer, Pear, Kouy and Stieng.

**3 North-eastern Forests:** Lowland deciduous forests and limited dry evergreen forest generally associated with sandstones and basalts respectively. The area has low population densities and is dominated by natural and modified landscapes used for forestry, the maintenance of biological diversity, and limited agriculture. Ethnic groups living in this area include the Tampoun, Brao, Rhade, Stieng and Khmer.

**4 Kompong Cham:** Remnant dry evergreen forests associated with basalts. High population densities and extensive agriculture, plantations and limited forestry. Principal ethnic groups living in this area are the Khmer and Cham.

**5 Mekong Delta Region:** Characterised by very high population density, these alluvial areas are heavily dominated by agriculture and semi-natural wetlands. Ethnic groups living in this area include Khmer, Cham and some Vietnamese.

**6 Tonle Sap Floodplain:** This extensive alluvial plain is characterised by unique flooded forest and swamp forests, much of which has been subject to degrading influences. Ethnic groups living in this area are Khmer, Cham and some Vietnamese.

**7 North-western region:** The Pailin area features lowland evergreen and deciduous forests associated with limestone outcrops. The people living this area are generally Khmer with small numbers of Burmese migrants working in the gem fields. Population densities are higher on the fertile lowland soils of the Battambang Plain, which is highly productive for agriculture.

*As identified in the National Biodiversity Prospectus (see Map 4).*

Recognition of bioregions is important for protected area management. It provides a framework for:

- identifying priority actions for the conservation and sustainable use of biological diversity;
- focusing attention of decision makers on key resource management problems; and,
- linking the conservation and sustainable use of natural resources to national policy frameworks through regional planning.

Once regions are defined, the next step is to assess their relative importance. This was an important stage carried out in 1997 as part of the national biodiversity planning process in Cambodia and should be subject to regular review as development conditions change and more information on biodiversity values is generated (Carew-Reid 2002). At that time three biodiversity regions were identified as of highest priority for conservation action;

1. The south-western coastal region;
2. The north-eastern forests; and
3. The central floodplain of Tonle Sap.

These regions were given priority for a combination of biodiversity, political, economic and logistical considerations (Box 2). The other three regions were given lower priority for conservation action due to a combination of lower biological significance, poorer security and weakly developed administrative frameworks.

### Box 2. Reasons for identifying the three biodiversity regions for priority action -

#### **Biodiversity conservation reasons:**

- The regions include areas of international conservation significance
- They are regions under greatest conservation threat

#### **Political and economic reasons:**

- They are relatively more secure
- They have been identified as priorities for economic development
- They have relatively stronger administrative capacities

#### **Logistical reasons:**

- They are associated with major transport corridors

In 2002, the biodiversity planning process reinforced the importance of the three high priority regions through the National Biodiversity Strategy and Action Plan. The NBSAP gave priority to the following actions:

#### *South-western coastal region*

- Integrated conservation and development of the protected areas of the Cardamom Mountains (Priority Action 1.1.7).
- Enhancing conservation and sustainable use of Kirirom, Ream and Bokor National Parks within their shared landscape and integration with local communities (Priority Action 1.1.11).

#### *North-eastern forest region*

- Integration of the management of protected areas in the north-eastern dry forest plain landscape conservation (Priority Action 1.1.9).
- Sustainable integration of the management of Virachey National Park with the surrounding landscape (Priority Action 1.1.10).

#### *Central floodplain of Tonle Sap*

- Integrated management and conservation of the Tonle Sap floodplain (Priority Action 3.3).

The Tonle Sap inundation zone and the north-western Mekong Delta wetlands, which rely on the health of the Tonle Sap Multiple Use Management Area are not well represented in the national protected area system.

#### *Northern plain region*

Based on more recent information and enhanced security, the NBSAP also gave priority to the Central Indochina Dry Forests of the northern plain region, which includes Preah Vihear Protected Landscape and the Kulen Promtep, Beng Per, Lomphat and Phnom Prich Wildlife Sanctuaries.

- Integration of the management of Kulen Prom Tep Wildlife Sanctuary into northern plain landscape conservation (Priority Action 1.1.8).

The importance of bioregional planning in setting priorities for protected area management and linking them in groups to surrounding development landscapes is an important theme of this report. It is reflected in many of the proposed strategies and is picked up in Chapter 6 with respect to protected area cluster planning.<sup>5</sup> Bioregional planning is not intended as an exact science, but more a management tool in decision making situations of limited information and uncertainty. The boundaries of regions need not be precise in ecological terms. They are best adjusted to be consistent with administrative and political boundaries when detailed management strategies are being defined.

---

<sup>5</sup> A "protected area cluster" is a group of protected areas which share an ecosystem supporting varying intensities of human use. Protected area cluster planning and management attempts to regulate human use of the shared ecosystem so that development benefits are maintained while preserving basic natural functions and areas of biodiversity wealth. Important within this process is the setting of explicit goals and practices, which should be regularly updated in the light of monitoring and research.



## 2. Demographic characteristics of Cambodia

### Population profile

In 2000, Cambodia's population was 12.8 million, reflecting a significant increase from the 11,561,000 population counted in 1998. Population growth is high for the region at 2.5-3.0 percent. The population is young due to the tragic loss of an estimated one to two million people during the Khmer Rouge regime, and the resulting baby boom that occurred after 1979. Sixty percent of the population is female.

Cambodia's capital city, Phnom Penh, supports roughly one million inhabitants, and the six central floodplain provinces surrounding it account for close to 60 percent of the national population. Other major population centres are the cities of Kampong Cham, Siem Reap, Battambang and Sihanoukville. Indeed, 90 percent of the population lives in rural areas with approximately 80-90 percent of the population residing and deriving income from 60,000 km<sup>2</sup> of floodplain lowland in the centre and south, a third of the total national area. Map 6 shows the distribution of villages in Cambodia and illustrates the concentration of the population in the floodplain. About 80 percent of the population reside in 20 percent of the country.

Contrasting the relatively high population density found in the central plains, Ratanakiri and Monduliri provinces to the north and north east together account for 13 percent of the land area, but support only one percent of the population. Not surprisingly, the population densities are much lower outside the central plains. The central plains region supports 235 persons per km<sup>2</sup>, the coastal region 49 persons per km<sup>2</sup>, and the plateau and mountain regions 17 persons per km<sup>2</sup>.

Map 7 shows that most protected areas are relatively isolated and located in areas of low population density. The significant exceptions are the protected areas on the western border of the country in Battambang and Pailin provinces, which have very high populations densities largely due to recent immigration. Also, in the midst of high populations are the protected areas within Siem Reap province, including parts of the Tonle Sap Multiple Use Area, Phnom Kulen National Park, Angkor and the western section of Beng Per Wildlife Sanctuary.

### Socio-economic profile

The number of economically active persons in Cambodia is just over 5 million of which 51.6 percent are females. Unemployment rates are higher in urban areas than rural regions: 6.7 percent of the males and 12.2 percent of the females in urban areas are without work, while the rural unemployment rates are 4.3 percent for males and 5.0 percent for females.

Over one third of Cambodians live in poverty. Significant rural-urban poverty discrepancies are apparent, as the rural poor account for over 90 percent of the national total. Table 1 illustrates the degree to which rural Cambodians are disadvantaged compared with their urban compatriots.

Map 6: Village location and protected areas

Map 7: Population distribution and migration in Cambodia

**Table 1. Comparison of socio-economic indicators between rural and urban populations**

Indicator	Rural	Urban
Average monthly income (riel)	314,247	1,139,553
Adult literacy (%)	64.9	79.1
Access to safe drinking water (%)	23.7	60.3
Access to electricity (%)	8.6	53.6
Access to toilet facilities (%)	8.6	49.0
Educational levels beyond primary school (%)	12.8	31.4

Source: Royal Government of Cambodia, *Second Five Year Socio-Economic Development Plan 2001-2005, National Economic Growth and Poverty Reduction Strategy [Draft] (Draft SEDP II), October 25, 2001, at 15-16 (statistics originally published in the Cambodia Socio-Economic Survey 1999, Ministry of Planning).*

While Cambodia appears to be finally emerging from decades of civil war and strife, the average annual per capita income remains low at US\$290. The 1998 General Population Census found that 76.5 percent of the population is employed in agriculture, forestry and fishing, while employment in services is 17.1 percent and industry is 6.4 percent.

Cambodia's national protected area system coincides with regions of medium to high poverty and relatively low but rapidly growing populations. Sensitive consideration of this situation is critical to effective protected area planning and management and the contribution of the system to national development, a theme discussed in detail in chapter 8 on poverty.

### Migration trends

The migrant population in Cambodia is high at 31.5 percent, which has important implications for protected areas. While there is growing migration from rural to urban areas, rural to rural migration remains the most common at around 70 percent of the total as illustrated in Map 7 and discussed in more detail in Chapter 8.

According to the 1998 Census, male migrants were slightly more likely to have moved to a rural area and female migrants to urban areas. Several reasons for migration are raised in the census including: family ties, the turbulent recent history of Cambodia, and natural resource insecurity. Migrants in rural areas were nearly three times as likely as those in urban areas to have moved for marriage, because of natural calamities and insecurity, or because of repatriation or return after displacement. As the flow of repatriation diminishes, the downward trend of migration from rural to rural areas may continue, although repatriation may be offset by the current waves of demobilisation of military personnel.

Generally, rural to rural migration occurs as a result of landlessness and desire of the poor for access to natural resources. As populations grow and available land and natural resources in the lowland agricultural areas become scarce, people have begun to relocate along the coastal regions and into Cambodia's highland areas, which contain relatively high natural resource wealth. Accordingly, regions surrounding protected areas have become target areas for migrants. Map 7 shows that over the past five years the migrant populations of the south western coastal region and western provinces have mounted to as much as 40 percent of the total in some areas.

The rural resettlement of populations rendered landless due to the civil war and ensuing instability, as well as the demobilisation of Cambodian soldiers, exacerbates the pressures on protected areas.

For example, one government resettlement scheme re-located demobilised members of the country's armed forces within a protected area in western Cambodia. In 1998, following the agreement on demobilising the Khmer Rouge and other militia, more than 1000 military families were resettled from Thailand directly into the Sam Laut Multiple Use Area. Extensive forest clearing and cultivation on the rich soils of the area has followed and the community has become relatively prosperous. This resettlement plan was implemented without prior assessment of the environmental affects on the protected area or surrounding landscape and without a protected area management plan in place.

### Socio-economic trends and protected areas

Cambodia's population is growing rapidly and large numbers are moving seasonally and permanently to areas of resource availability and employment. Increasingly, protected areas will come under pressure for the development benefits they can provide, especially to the poor. The trends show how important it is to undertake socio-economic and environmental assessments on regional scales (i.e. groups of protected areas) so that management strategies can ensure the greatest sustainable benefits to communities. Such assessments and the building of socio-economic profiles for regions would provide planners with:

- Early warning of migration and relocation flows to sensitive areas;
- A better understanding of longer term demographic characteristics of the region (and therefore the future demand on resources);
- The opportunity for anticipatory planning and management to reduce negative impacts and increase benefits; and
- The potential to prepare and implement poverty alleviation plans for regions which recognise and build on the contribution of protected areas and to which all sectors contribute.

A system of rights of access and tenure linking existing communities with protected areas is beginning to evolve, as tenure and ownership arrangements over land and other resources throughout Cambodia are clarified. This definition of rights is a critical step in the effective conservation of protected areas. Rapid changes in population can disrupt the process and make it more difficult. Socio-economic surveys and analyses undertaken on a systematic and regular basis is essential if the needs of dynamic local populations are to be accommodated and managed as an opportunity rather than a burden on local economies and ecosystems.

## Part 2: Economic Development, Governance and Protected Areas

### 3. Governance and institutional reform

The way a government is structured has important implications for protected area management, for example, by determining the relationship between ministries and between levels of government and their relative authority over natural and financial resources. Protected area managers need to be sensitive to the evolving centres of authority within government and target their communications strategies and submissions carefully to forge networks of allegiances with agencies and individuals of influence. Protected area

managers need to harness the force and momentum behind key areas of government institutional and policy reform to position the role of protected areas more centrally in government and the economy. To do that requires a high awareness and understanding within MOE and MAFF of the structure of government and the main fields and directions of government reform such as decentralisation. In this way ministries can reorient their own policies and approaches to promote protected areas as a critical engine for achieving the government's overall reform agenda, and consequently to justify a greater share of the government budget.

#### Government Structure

In 1993, following three years of occupation and government administration by the United Nations Transitional Authority (UNTAC), the Kingdom of Cambodia emerged from decades of civil war and conflict with the adoption of a Constitution.<sup>6</sup> The Constitution is the supreme law of the land, and establishes a foundation of liberal democracy and a multi-party system. According to the Constitution, Cambodian people are masters of their own country, possess all power of government and exercise these powers through the separate organs of government, namely the National Assembly, Senate, Royal Government and Judiciary.<sup>7</sup> The Constitution declares, moreover, that the King will reign but not govern, and will be a "symbol of unity and eternity of the nation."<sup>8</sup> The Royal Government is defined as the Council of Ministers, which is led by the Prime Minister.

The National Assembly holds the primary legislative power, including the authority to approve all laws, and in particular laws concerning the national budget, state planning, loans, financial contracts, tax and declarations of war. The National Assembly consists of at least 120 members and maintains a Permanent Standing Committee and nine standing commissions.<sup>9</sup>

<sup>6</sup> The Constitution of the Kingdom of Cambodia was subsequently amended in March 1999.

<sup>7</sup> According to Article 58, "[s]tate property notably comprises land, mineral resources, mountains, sea, underwater, continental shelf, coastline, airspace, islands, rivers, canals, streams, lakes, forests, natural resources..." While this makes clear that the state is the owner of all natural resources, Article 59 of the Constitution declares that the state also has the complementary duties to "protect the environment and balance of abundant natural resources and establish a precise plan of management" for these resources.

<sup>8</sup> Constitution, Art. 7-8.

<sup>9</sup> Asian Development Bank, 2000, at 15.

While the National Assembly retains the right to initiate legislation, most proposed legislation is initiated by line ministries, approved by the Council of Ministers and submitted to the National Assembly by the Prime Minister.<sup>10</sup>

The National Assembly's partner in the Parliament, the Senate, was created through an amendment to the Constitution in March 1999. The number of Senators cannot exceed half of the number in the National Assembly, and its main responsibilities are to review and provide recommendations on legislation and issues presented to it by the National Assembly. The Senate's power, however, is limited, as its recommendations concerning draft legislation can be ignored by a simple majority vote of the National Assembly.

The Royal Government of Cambodia (RGC), is the executive body charged with protecting the independence, sovereignty and territorial integrity of Cambodia and promoting national reconciliation and unity. The RGC consists of a prime minister, two deputy prime ministers, ministers and secretaries of state and encompasses both civil administration and the armed forces. There are 24 line ministries under the Council of Ministers, each led by at least one, and sometimes two, politically-appointed ministers, as well as supporting secretaries of state and under-secretaries of state.

The territory of Cambodia is divided into 20 provinces and four municipalities, with provinces divided into 183 districts (*srok*), and districts into 1,621 communes (*khum*). By sub-decree of the Council of Ministers, the Ministry of Interior administers provinces and municipalities, and provincial and municipal governors are appointed by the prime minister. On February 3, 2002, in a dramatic shift to decentralise government decision-making, Cambodia held commune council elections. In accordance with the Law on Administration of Communes, each commune council must represent the interests and the citizens of the commune.<sup>11</sup>

The Judiciary contains four distinct components: (1) the Constitutional Council; (2) the Supreme Council of Magistracy; (3) the courts; and (4) the prosecutors. The Constitutional Council exists to "safeguard respect for the Constitution, interpret the Constitution and laws adopted by the National Assembly and reviewed by the Senate."<sup>12</sup> The Supreme Council of Magistracy's role is to assist the King in guaranteeing the independence of the Judiciary. The court system is organised into provincial and municipal courts, a military court, an Appeals Court and a Supreme Court. As of 1999, 117 judges presided over the court system with 54 prosecutors employed to charge individuals with violations of criminal law (ADB 2000). It is significant that Cambodia has no environmental or natural resource lawyers.

## Decentralisation

An overriding force in the current political landscape in Cambodia is a commitment to "decentralisation and deconcentration". These policies promote participation of the people in the organisation and management of their livelihoods through the devolution of power to provincial and district governments and commune councils that are closest to the people and voters, thus allowing them to make decision on issues concerning their daily lives. The aim of the decentralisation and deconcentration process is to make local authorities more accountable and efficient in delivering public services and strengthening good governance.

In Cambodia "decentralisation" is the transfer of political, fiscal and administrative powers to local authorities at commune level. Decentralisation requires holding elections for community representatives to the local authorities, such as the commune councils. It also involves the transfer of budgetary resources and

<sup>10</sup> Constitution, Art. 91 and Rendall, 1999, at 141.

<sup>11</sup> Law on Administration of Communes Articles 9 and 42.

<sup>12</sup> Constitution Art. 136.

responsibilities for managing natural resources and land to local authorities. Decentralisation aims to increase the responsiveness of government to the development needs of local communities.

Irrespective of the electoral process and increasing community representation, the government is concerned with shifting authority from the centre. This can be achieved by increasing the autonomy of the provincial and district authorities and of local units of the central ministries. Deconcentration requires building staff capacity at local levels and a closer working relationship between the central and the provincial and district authorities.

The government sees management and financial devolution as strengthening grassroots democracy, and promoting political stability and security in the country. It is viewed as an essential process for improving living standards, for reducing poverty and for sustainable development) (ADB 2001b).

**The role of commune councils:** The Law on Administration of Communes reinforces the Social Economic Improvement Agency Program (SEILA) demonstration activities (Box 3) by giving direction to the creation of the commune councils. Each council consists of between 5 and 11 elected councillors and must hold public meetings at least once every month with most decisions made through a majority vote of the councillors.

### Box 3. The Social Economic Improvement Agency Program (SEILA)

Cambodia embarked on decentralisation well before the commune elections of 2002. In 1996 the government introduced the Social Economic Improvement Agency Program (SEILA) to test systems of devolved planning, financing, management and implementation of local development in five provinces: Siem Reap, Banteay Meanchey, Battambang, Pursat and Ratanakiri with a goal of reaching all provinces. The program is designed to contribute to poverty alleviation in rural areas through implementation of a decentralisation policy.

SEILA, in conjunction with the Cambodia Area Rehabilitation and Regeneration Project, has established village development committees, commune development committees and provincial rural development committees. Through the SEILA program resources were transferred to commune development committees which contracted private companies to build or repair local infrastructure such as roads, bridges, culverts, irrigation structures, schools, health centres and wells.

The SEILA program established the framework for long-term reforms. The SEILA systems and experience at commune level are being reviewed to prepare nation wide regulations for the Commune Councils. SEILA now acts as an aid coordination mechanism for mobilisation of resources to support the decentralisation reforms.

The commune councils' duties include providing public services, promoting economic and social development and upgrading citizens' living standards; and protecting and conserving cultural property, the environment and natural resources. Significantly, the commune councils do not have authority over forestry issues.

Policy and institutional reform is being supported by strategic public investments including village water supplies and rural roads for the restoration and maintenance of essential rural infrastructure and to generate rural employment. Setting local budgets needs to be based on a process of local development planning which identifies problems and sets priorities for action in an open and consultative manner.

Within one year of being elected, the councils must create a development plan that includes the councils' view of the current condition of their commune, what needs improvement and how this will be achieved.



The councils are responsible for approving the commune budget and setting the rates of local taxes and other service charges, including land, real estate and rental tax.<sup>13</sup> They must create a system for management, monitoring and control of their finances.<sup>14</sup>

Although the emergence of commune councils will decentralise official decision-making, the Ministry of Interior and the Ministry of Economy and Finance will retain significant authority to affect councils activities. For example, the Ministry of Interior appoints a commune clerk who will be intimately involved in the day-to-day operations of the councils. The ministry will also monitor, control and assist the commune, and can investigate and evaluate a commune's activities. Each commune's financial system and asset management will be subject to the control of the Ministry of Economy and Finance.<sup>15</sup>

The decentralisation shift may be gradual with central government maintaining its authority in major decisions at least in the medium term. The RGC will need to allocate a significant percentage of total domestic revenue to the decentralisation process for some time to come, thus ensuring at least some level of continuing centralised control.

***A shared commitment to devolution at central level:*** A National Committee to Support the Commune (NCSC) was established to implement the Law on Commune Administration and to formulate and implement decentralisation policies. NCSC is chaired by the Minister of Interior, assisted by the Minister of Economy and Finance and the Minister for the Council of Ministers as Deputy Chair, with the Minister of Rural Development, the Minister of Land Management, Urbanisation and Construction, the Ministry of Women's Affairs and Veterans as members. Other major ministries such as MAFF and MOE will need to bring to be committed to devolution if protected areas are to become an essential component of local development planning and implementation.

***Decentralised systems for receiving and managing funds:*** During the transition, while local capacities are being built to manage new systems of administration, innovative financing mechanisms are needed to link protected area management with local communities. Later, this report recommends the piloting of trust funds<sup>16</sup> for clusters of protected areas so that local revenue streams and other financing sources can go directly to meeting local conservation and management needs.

Already, the government has set up a Commune Fund, consisting of block grants from the government, tax and non-tax revenues to be assigned to the communes by the Parliament and international assistance. The Commune Fund will be used to finance:

- general administration of communal affairs;
- general development of the communal social and economic infrastructure; and
- delivery of local public services.

A Commune Fund Board was established involving representatives of the Ministry of Economy and Finance, the Ministry of Interior, the Ministry of Rural Development, the Ministry of Planning, the SEILA Secretariat and local communities. The establishment and the early stage of operation of the Commune

13 Law on Administration of Communes at Art. 74.

14 Law on Administration of Communes at Art. 82.

15 Law on Administration of Communes at Art. 83.

16 In this report the term "trust funds" for financing protected areas is used to cover endowment and sinking funds. Endowment funds invest their capital and use only income generated from those investments to finance activities. Sinking funds disburse their entire principal and investment income over a fixed period of time (usually 6-15 years). Sinking funds also invest their funds to generate revenue, but the earned income is programmed along with the original allocation for expenditure during the fixed time period. In this report, trust funds could also be called conservation or protected area funds. They can be established exclusively to finance activities in a particular protected area, to cover a region, or the entire national protected area system.

Fund should offer an opportunity to create incentives for the newly established commune councils and administrations to increase their capacity and adopt accountable, transparent, and effective local governance practices. This will require the provincial governments to strengthen their own capacity to support and oversee the communes. This capacity is crucial for the development of local institutions.

The Commune Fund remains a centralised authority, even though operating to promote local institutions. An essential component of local capacity building will be through the piloting of other forms of trust funds managed locally and applied on the basis of locally defined plans, including those for protected areas and surrounding communities.

### Other governance reform priorities

The RGC recognises the profound need for Cambodia to institute good governance as “an essential prerequisite to sustainable socio-economic development and social justice.”<sup>17</sup> Specifically, in its 2001 *Governance Action Plan* (GAP), the RGC identified two categories of governance reform to be implemented. The first category includes the following cross-cutting issues that lie at the core of the government’s ability to function:

1. Judicial and legal reform — To create a “credible, predictable and transparent legal framework and an independent and capable judiciary” as the foundation of the rule of law and facilitator of democracy, a market economy and social justice;
2. Public finance reform — To accelerate growth and reduce poverty caused by weak domestic revenues by improving governance in public finance, particularly customs, tax administration and budget management;
3. Public administration reform — To strengthen institutions and the legal framework for good governance and public service delivery, specifically addressing low salary levels, poor pay and employment controls and allocation of work in the civil service;
4. Anti-corruption reform — To promote sustainable development by enacting an anti-corruption law, establishing ethical standards for civil servants and strengthening enforcement and scrutiny of government actors; and
5. Gender equity reform — To maintain sustainable socio-economic development, social justice and alleviation of poverty by improving the RGC’s approach to women and children with regard to health, education, legal protection, socio-economic development, advocacy and capacity building.

The GAP identifies a second category of governance reform measures “to ensure sustainable national development and poverty reduction” which are:

1. Demobilisation of the armed forces; and
2. Natural resource management, including land, forestry and fisheries management.

Demobilisation of the armed forces is critical for public security through reintegration of soldiers into communities. Also the military is currently a major drain on public resources. In 1998, national defence accounted for roughly half of the government’s expenditures, or 2.9 percent of GDP, significantly higher than the combined budget for economic and social services.

RGC recognised natural resource management as one of the highest priorities in its governance reform program, and summarised its reasoning below:

“Fair resolution of [natural resource management] issues is essential to social peace and environmental sustainability, which are, in turn, fundamental to poverty alleviation and economic development. The

---

<sup>17</sup> Royal Government of Cambodia, *Governance Action Plan*, Council for Administrative Reform, April 2001, at 1.

resolution of land issues (e.g. classification, registration, tenure) is critical to basic rights and investments. In forestry, accelerating the elimination of corruption and mismanagement is required to ensure that the environment is protected and revenues associated with the sector are available to fuel economic growth. In fisheries, protecting the resource is essential to its long-term sustainability and to the well-being of the people. In all three areas, issues of accessibility by the poor are paramount to ensure sustainable livelihoods and alleviate poverty.”<sup>18</sup>

The government has categorised governance issues for natural resource management in terms of land, forestry and fisheries management. The health of protected areas will depend largely on the effectiveness of RGC’s reforms in these key categories.

### *Land management*

Land management governance issues include the need to enact necessary laws, regulations and implement guidelines to improve the capacity of implementing agencies and promote broad participation in land management development.<sup>19</sup>

In the GAP, the RGC proposes an array of actions it needs to take to enhance governance, including:

- Adoption of the Land Law and promulgating the corresponding implementing legislation;
- Initiation of the development of a land policy;
- Acceleration of land registration and strengthening land administration to enhance land tenure security;
- Initiation and eventual completion of pilot programs to address cadastral mapping and land registration.

### *Forestry management*

Through the GAP, the RGC aims to address forestry management issues by “bringing logging activities under control at a sustainable level,” introducing a comprehensive legal framework for forestry development, and enhancing human resource capacity and financial and materials means for forestry management.

The RGC strategies for addressing these issues include:

- publishing a report on forest crime monitoring on a quarterly basis;
- taking actions based on concession contract review, such as concession cancellation; and
- implementing sub-decrees on forestry concession management and community forestry.

### *Fisheries management*

The RGC hopes to address fisheries management by developing a comprehensive legal framework that ensures conservation and sustainable development, building the capacity and enhancing the efficiency of the Department of Fisheries, minimising “excessive exploitation of the resource and controlling technological abuses,” and reducing resource use conflicts.<sup>20</sup> The RGC’s strategies include:

- Establishing community fisheries development offices in the central department and related units at the provincial level;
- Providing 56 percent of fisheries lot areas to community fisheries;
- Implementing a fisheries management program that promotes the conservation and rebuilding of stocks and the sustainable development of the fisheries sector, including the establishment of an inland fisheries research institute; and
- Establishing community fisheries committees in all provinces, and especially in lot areas that have been released to communities.

<sup>18</sup> Royal Government of Cambodia, *Governance Action Plan*, Council for Administrative Reform, April 2001, at 2.

<sup>19</sup> Royal Government of Cambodia, *Governance Action Plan*, Council for Administrative Reform, April 2001, at 22.

<sup>20</sup> Royal Government of Cambodia, *Governance Action Plan*, Council for Administrative Reform, April 2001, at 24.

### The role of protected areas in governance reform

Protected areas can be a significant conduit through which the RGC achieves its stated natural resources management reform goals.

Decentralisation, both through SEILA and the creation of commune councils, will facilitate the active participation of local communities and officials in the planning, implementation and monitoring of development. Communities located near protected areas will benefit from new structures and processes that involve them in decisions concerning the management of protected areas. MOE plans to introduce a Law on Protected Areas Management that provides a much-needed management structure and system to protected areas, and will build on and reinforce the government's decentralisation policies.

Protected areas can be a focal point of governance reform for local communities that live near and rely on protected areas. It is here that the land, forestry and fisheries reform priorities identified by the RGC most clearly intersect with protected areas. In the next five to ten years, the management of protected areas will be a measuring stick of the effectiveness of the RGC's governance reform. The objective of attaining sustainable socio-economic development and social justice through governance reform can be implemented by fully realising the role for protected areas in local political and economic systems. Protected areas and their surrounding regions lie at the centre of complex land use and land tenure issues, and they need to play a critical role in piloting and demonstrating the RGC's reform measures.

Protected areas are expanding to cover more than one third of the nation's forest estate and must be seen as integral to forestry sector reforms. Similarly, existing protected areas that contribute to fisheries productivity and a growing network of fish sanctuaries will be a medium through which fisheries reform is implemented.

Community based government with authority over local resources would have a vested interest in seeing them managed for long term use. In Ream National Park, for example, local authorities launched community development programs including patrolling nearby fishing areas to prevent exploitation by outside intruders. Local fishing communities report increases in fish catch and are reinforcing the communal initiative. At the commune elections those leaders who had been actively involved in community development and natural resource protection schemes were re-elected. Giving such leaders greater political and financial powers brought a greater sense of local stewardship in the management of the protected area.

Both the MOE and MAFF are piloting decentralised community management structures associated with specific areas and natural resources and these initiatives need to be integrated with the government's overall decentralisation programs.

MOE has initiated collaborative management approaches in Ream, Kirirom and other protected areas.<sup>21</sup> The staffing levels and resources to adequately support and guide these initiatives are very limited which makes progress difficult. Communities can become intimidated when taking on difficult management tasks in the face of more influential forces and the level of support is minimal.

Broad issues to be addressed so that protected areas become a key force for reform in governance and natural resource management include:

- New capacities and skills in local communities and government;
- New methods for information gathering, analysis and sharing;
- A system of local development planning based on the concept of one plan for one area which all sectors respect;
- New and innovative structures for community involvement in natural resource management; and
- Innovative local funding structures which allow funds raised locally to be managed and used locally.

These issues are discussed further and strategies for them defined in later chapters.

---

<sup>21</sup> Collaborative management is a partnership in which government agencies, local communities and resource users, NGOs and other stakeholders agree on the responsibilities, authority, rights and duties they each have for the management of a specific area or set of resources. Other terms which have been used for the same process are co-, joint, participatory and multi-stakeholder management (Pirot et al. 2000).

## 4. The Cambodian economy

The PAD Review field study and a growing number of site-specific economic valuation studies in Cambodia are showing the very substantial contributions protected areas are making to socio-economic development throughout the country. Most often that contribution goes unrecognised in measure of economic performance at local and national levels. Protected area managers will need to begin using the language of development in promoting protected areas as vital productive units in the economy. To do that will require new forms of information gathering and analysis and a reorientation in the way protected areas are reflected in local and national socio-economic plans.

### Cambodian economic performance

Cambodia continues to develop its economy after decades of war and civil strife. Since the early 1990s, Cambodia has made positive strides in gaining membership to many international organisations, including the Association of South East Asian Nations (ASEAN) and the ASEAN Free Trade Agreement (AFTA). Cambodia aims to join the World Trade Organisation (WTO) by 2005 (CDRI 2001 p 5).

Cambodian economic growth reached 5 percent of GDP or higher for most of the 1990s. While Cambodia achieved economic growth of 7 to 8 percent from 1995-1996, the domestic political uncertainty and Asian financial crisis in 1997 plunged growth to below one percent. By 1999, however, the economy recovered to peak at between 5 and 6 percent growth in 1999 and 2000. This growth can be attributed to the rapid expansion of garment manufacturing, construction and tourism industries.

After experiencing three-digit inflation figures prior to 1993, Cambodia kept its inflation in check from 1994 to the present. The inflation rate has remained at just a few percent even in rural areas, which are more prone to rising prices. The widespread use of US dollars as currency helped combat inflation while Cambodia's use of bank financing to make up budget shortfalls remained limited, thereby sustaining the stability of the riel against the dollar. Moreover, unemployment remained at a manageable rate at just over 5 percent in 1998. Analysts warn, however, of possible widespread under-employment in future years as the labour force continues to expand above the rate of jobs created. The most significant effects of this under-employment are most likely to be seen in rural areas, promoting migration and increasing pressure on natural resources.

#### *Agriculture*

Agriculture and its related sub-sectors, livestock, fisheries and forestry, account for nearly half of Cambodia's GDP. In particular, crops account for 25 percent of GDP, livestock for 12 percent, fisheries for 4 percent, and forestry for 3 percent. In 1998, rice production alone accounted for 12.5 percent of GDP (MOC 2000).

According to MAFF and national account figures, since 1993, Cambodia's agricultural production has increased by 3 percent per year in real terms, paralleling total population growth. Since 1995, rice production has attained a level of food self-sufficiency on the national level. Productivity improvements has increased harvests even in 2000 (four million tons), when severe flooding occurred. Yet, compared to neighbouring countries, Cambodia's agricultural sector remains weak in part due to inefficient land management systems and poor rural roads (CDRI 2001 p7). Growing demand for water through irrigation networks, and the need to maintain watersheds and crop genetic resources will make the relationship between protected areas and the agriculture sector more important.

### *Industry*

From 1994 to 2000, Cambodia's industry grew rapidly at a rate of 8 percent, despite civil unrest and the 1997-98 Asian financial crisis. The notable sub-sectors that posted the highest growth were the garment, electricity and water industries. Other industries were generally flat. In particular, the garment industry continued to grow sharply in 2000, gaining 70 percent in real terms (CDRI 2001). Cambodia's garment exports accounted for 70 percent of the country's total exports of goods and services in 2000, up from nearly zero in 1994.

The industrial sector contributed 17 percent of GDP in 1998, with manufacturing accounting for roughly 6.9 percent, construction 7.6 percent and mining and quarrying 1.7 percent. Although updated figures are not yet available, the percent of GDP contributed by manufacturing and construction are likely to have risen since 1998 levels (MOC 2000).

The promulgation of the Law on Mineral Resources Management and Exploitation in 2001 foreshadows an increase in the number and scope of minerals exploitation operations in Cambodia in the near future. As Cambodia looks to expand its economy, this sector and oil exploitation will be relied upon to provide much-needed revenue. Anticipated growth in energy exploration, production and use has significant implications for the national protected area system – and increasing interaction with the energy sector will need to be carefully managed.

### *Tourism*

Along with garment manufacturing, tourism tops the list as one of Cambodia's best hopes for economic growth. The tourism sector posted impressive growth, and in 2000 contributed 8.7 percent of nominal GDP. From 1999 to 2000, the number of foreign tourists visiting Cambodia increased by 32 percent. The number of foreign tourists visiting Siem Reap-Angkor via direct flights tripled in 2000 relative to 1999 and the number of tourists travelling through Pochentong airport in Phnom Penh increased by 14 percent.

Since 2000, investment in the tourism sector has far outpaced the garment industry, but the net income and jobs created by the tourism industry were limited. Nonetheless, tourism is quickly becoming a critical part of Cambodia's economy, and the draw of its national system of protected areas will be very significant in building on current trends to ensure further development of this sector in years to come (MOC 2000).

### *Economic outlook*

The tourism and garment manufacturing sectors hold the most promise for meeting Cambodia's twin goals of expanding the economy and alleviating poverty. The success of Cambodia's plan to achieve and maintain an annual economic growth rate of 7 percent will depend on numerous factors, the most significant being the implementation of economic and governance reforms. Assuming the government can establish the rule of law and strong macro-economic stability, the introduction of a stock market may be feasible (CDRI 2001).

Significant revenue sources - other than tourism and garment manufacturing - are likely to emanate from the industry, energy and mineral development sectors, as Cambodia's path of reconstruction has yet to fully exploit its natural resources. Construction is expected to continue to be a major part of the industrial sector due to the rapid rehabilitation of physical infrastructure and private sector inputs.

The government's plans include the development of energy sources, including hydropower and fossil fuels, and the proven reserves of mineral deposits. Eleven sites on the Mekong River and its tributaries have been identified for further examination for exploitation of hydropower potential. An 11 megawatt hydropower project at Kirirom National Park has already commenced. The government is also considering a number of other projects, including the 100 MW Kamchay project in Bokor National Park and a 90 MW joint project with Thailand referred to as the Stung Mnam 2 project.

The RGC believes that vast untapped offshore oil and gas reserves exist in the exclusive economic zone of Cambodia. A Memorandum of Understanding was recently signed between Cambodia and Thailand regarding an area of contested jurisdiction called the Overlapping Claims Area. As a result of this Memorandum, Cambodia could soon see a surge in oil and gas exploration (Dirksen et al. 2002). Indeed, the government is negotiating oil and gas exploration rights to private interests through an open tender system. Surveys have also been commissioned to assess the availability of inland fossil-fuel deposits in the Mekong basin and Tonle Sap (MOC 2000).

In 2001, the Law on Mineral Resources Management and Exploitation came into force, and governs the management and exploitation of mineral resources, mines and all mining activities in Cambodia, except for the exploration and exploitation of petroleum and gas. The RGC has identified potential deposits of gold, gemstones (ruby, sapphire and zircon), phosphates (for fertiliser), limestone (for cement and building stone), bauxite, clay, sand/gravel and granite. Exploration for gold has been initiated by at least three companies with some mining activities affecting a core zone of the Tonle Sap Biosphere Reserve. The size and extent of the reserves for each of these minerals have not been thoroughly evaluated.

Cambodia's agriculture sector may also significantly contribute to economic growth. The government hopes to develop rubber production from approximately 61,000 to 330,000 hectares of cultivated area, and to diversify land cultivation - in addition to the 90 percent of land under rice cultivation - to include higher revenue crops such as groundnuts, cashew, vegetables, soybean, mung bean, cassava, sweet potato, tobacco, cotton, maize and coffee.

The RGC does not expect increased commercial production from fisheries due to resource limitations, but sees potential for expanding beef, pig and poultry production for export in future years (MOC 2000). After years of alarming deforestation through State-sanctioned and illegal timber logging, MAFF issued a prakas in December 2001 suspending all logging concession agreements from 1 January 2002.<sup>22</sup> It remains to be seen when and under what conditions the government will allow resumption of commercial logging in the near future.

---

<sup>22</sup> Prakas on Suspension of Forest Concession Logging Activities, Ministry of Agriculture, Forestry and Fisheries, 13 December 2001.



## 5. Development planning and finance

The process of defining economic policies, development plans and associated budgets is critically important for protected areas. Protected area managers will need to give much greater attention to participating in those processes and seeking to influence the priorities set through them. They will need to explore the uses of economic policies and instruments to influence development behaviour and achieve conservation objectives and have those policies adopted by government as a matter of priority. Also, they will need to begin shaping development plans and the allocation of budgets so that investment flows from the key sectors to protected areas and the natural services and products they provide. A shift is needed from a defensive mode looking inward at the immediate challenges of protected area manage-

ment, to looking beyond their boundaries and actively engaging in the planning and priority setting of development in surrounding landscapes. It is those policies and plans that will determine the wellbeing of protected areas and their continuing contribution to national development.

To succeed in meeting their protected area mandates, MOE, MAFF and their staff will need to:

- Influence and use economic policies and instruments to achieve their goals;
- Help shape sector development plans from the national to local and project levels;
- Seek to gain a greater share of the national budget based on evidence of the development benefits of protected areas; and
- Work with development sectors which benefit from and affect protected areas to channel investment for their budgets to protected areas.

MOE and MAFF will need to be pro-active in carrying out economic analyses and building working relations with other sectors and local government. As a first step, their staff will need to build understanding and links with the agencies setting economic policies and making the final decisions on national budget priorities.

### Socio-economic planning

Cambodia follows annual, three yearly and five yearly cycles in its socio-economic planning. Each sector and province must prepare annual plans and budgets based on their three and five year plans. In practice, annual plans change little over the five year planning period and tend to be wish lists with unreal budgetary expectations. Only a few provinces have had the capacity to prepare development plans. Progress in decentralisation will place greater emphasis on communal, district and provincial plans as the frameworks for setting priorities and for budget allocation at those levels, providing opportunities for a more intimate relationship between protected area and socio-economic planning on a local and regional basis.

All socio-economic plans seek to implement the national plan prepared every five years. Subsequent to the formation of a coalition government in 1993, Cambodia sought to move from its former centrally-planned economy to a democratic, market-oriented economy. Cambodia's initial needs were to establish financial stability, promote investment for rehabilitation and reconstruction and reform the central institutions of macro-economic management. Accordingly, in 1994 Cambodia launched a medium-term adjustment and reform program that sought to restore macro-economic stability and to strengthen institutional structure with the aid of the international community.

In 1996, Cambodia instituted its first Socio-Economic Development Plan (SEDP I), which set forth a framework for industrial policy-making from 1996 to 2000. SEDP I identified nine central areas for development: (Sok and Sarin 1998):

1. Promotion of export-oriented policies;
2. Promotion of labour intensive industries;
3. Promotion of natural resource-based industries (specifically including forestry, fisheries, agriculture, mineral deposits, non-metallic minerals, and oil and gas);
4. Encouragement of selective import substitution industries;
5. Promotion of micro and small scale industries;
6. Promotion of rural industry;
7. Promotion of informal sector employment in urban areas;
8. Promotion of tourism related industries; and
9. Promotion of downstream industries based on petroleum (offshore-based).

SEDP II (2001-2005), the successor to SEDP I, has as its primary focus poverty reduction through:

- The promotion of broad-based economic growth at a rate of 6 to 7 percent with equitable income distribution;
- Facilitation of social and cultural development; and
- Ensuring the sustainable management and use of natural resources and the environment. (ADB 2001d)

SEDP II sets forth the development objectives and strategies for the medium term and establishes allocation themes for the Cambodian economy. An inter-ministerial steering committee composed of high ranking officials from the Ministries of Economy and Finance, Planning, the Council for the Development of Cambodia and the National Bank of Cambodia, is responsible for setting the overall investment ceiling and sectoral allocation priorities in line with the SEDP II.

### Government priority setting

Cambodia spends what little domestic revenue it has on defence and security, public sector salaries and making contributions to foreign-financed investment counterpart funds. The RGC will reduce defence and security expenditures as it continues its demobilisation programs.

The 2001 budget indicated increased spending on social and rural development although Cambodia's expenditure on public investment, social development and environmental management still relies almost entirely on international assistance. For example, the RGC spends an estimated US\$5 per person per year for health care and education, where other less-developed countries in the region spend an average of US\$12 per person per year and Thailand spends US\$150. Donors and NGOs contribute to filling the gap, for example, financing 46 percent of Cambodia's education expenditures, but individual households have covered the vast majority of these costs (e.g. 82 percent of health and 27 percent of education expenditures) (CDRI 2001).

The RGC has made commitments to increase the budget for health to 2 percent of GDP, but this target has yet to be realised. Likewise, the RGC's administrative reform efforts aim to provide civil servants, including teachers, with living wages. To date, however, it cannot be said that RGC has made social development and natural resource management expenditures a priority.

### *The influence of official development assistance*

Cambodia's development planning is coordinated with donor organisations that provide the necessary funding for its implementation. The government meets annually with the donor community through a Consultative Group mechanism for a review of the previous year's performance and to discuss the main development priorities, progress and problems. Typically, the government presents its external funding requirements and the donors confirm their assistance portfolio (UN 2000). In the past five years forestry and other natural resource issues have been central to these discussions, even though receiving a small proportion of annual official development assistance (ODA).

Since 1995, ODA has averaged approximately US\$500 million, and represents roughly 17 percent of nominal GDP (almost twice Cambodia's domestic budget revenue). The amount pledged at the Consultative Group meeting between the RGC and donor organisations in June 2001, reached well over US\$600 million.

Since 1999, quarterly Consultative Group review meetings have been chaired by the Prime Minister and attended by the Cabinet and donor community representatives. In addition, in 1999 the RGC and donor community decided to establish a regular donor coordination mechanism. The donors meet in five working groups in advance of the quarterly review meetings to monitor the performance of the government implementation of its declared policies and programs of reform as well as to build consensus on key issues in each working group sector.<sup>23</sup> The five working groups are fiscal reform (led by the ADB), forestry (FAO), social sectors (UNICEF), public administration reform (UNDP) and demobilisation (World Bank).

In 1994, the Council for the Development of Cambodia was established to create and maintain an institutional framework to ensure that ODA and domestic resources were used efficiently and channelled to priority sectors. The Council for the Development of Cambodia is chaired by the Prime Minister and consists of two boards: the Cambodian Investment Board for private sector investments, and the Cambodian Rehabilitation and Development Board for mobilising ODA for public investment and technical assistance. Most of the external assistance to Cambodia is not subject to the budgetary process, and is directly implemented by donors and NGOs. Most line ministries also receive aid directly from donors.

Roughly 53 percent of ODA is spent on infrastructure development, such as road construction, power and water supply rehabilitation. ODA for social development accounted for 41 percent of funds spent, which is typically executed by NGOs. The remaining six percent of ODA is allocated for general administration, typically through foreign advisors appointed to different ministries or public institutions.

ODA to support the protected area system has been a small fraction of the total. From 1992 to 1998, the five largest recipient sectors of ODA were rural development (14 percent of total ODA), development administration (12 percent), transport/infrastructure (12 percent), economic management (11 percent) and humanitarian/relief aid (11 percent). During the same time period agriculture, forestry and fisheries received seven percent of total ODA (UN, 2000).

### *Foreign direct investment*

In 1996, Cambodia's foreign direct investment (FDI) nearly reached US\$300 million has declined thereafter, dropping to US\$110 million in 2000. The reasons for the decline include:

- Most foreign investors in Cambodia are from Asian countries that were severely affected by the 1997 Asian financial crisis;

<sup>23</sup> Major multilateral donors include the United Nations, European Union, World Bank, ADB and the IMF. The main bilateral donors, in order of amount of financial contributions in 1998-99, include Japan, France, the United States, Australia, Sweden, the Netherlands, Germany, Denmark, China, the United Kingdom and Canada.

- There are few incentives for investment, as the slow pace of anti-corruption reforms and lack of credit push investors elsewhere; and
- Investment opportunities abound in other countries in the region such as China and Vietnam.

China's recent membership in the WTO and Vietnam's likely successful bid to join the WTO in 2005 create further challenges to Cambodia in luring investors its way in the coming years.

### *External debt*

Between 1970 and 1975, Cambodia borrowed significant funds from the United States and, between 1980 and 1991 from the former Soviet Union and Russia that it does not now formally recognise and is negotiating a resolution of the dispute with the donor countries. The total un-recognised debt is approximately US\$1.7 billion. Cambodia recognises approximately US\$35 million in "old" debt that it incurred up to 1970. This sum provides important opportunities to explore debt for nature swaps as have occurred elsewhere in Asia with benefits directed at the protected area system.

Since 1993, Cambodia has borrowed funds from the World Bank and Asian Development Bank. In 2000, this "new" debt reached US\$400 million. Thus, the sum total of Cambodia's un-recognised and recognised debt exceeds US\$2 billion (UN 2000).

### *National finance and budgetary system*

The RGC operates its public finances through the Organic Budget Law, which the National Assembly adopted in 1993 in an attempt to bring skyrocketing inflation under control after the influx of international assistance during the UNTAC years (ADB 2000). Although the Organic Budget Law has been effective in maintaining fiscal discipline, the RGC has recognised the need to institute reforms in public finance. Accordingly, the Ministry of Economy and Finance has proposed a public finance reform program that addresses three areas:

1. Revenue-enhancing measures;
2. Measures to improve expenditure management; and
3. Establishment of accountability institutions and mechanisms to improve governance.

The 1993 Organic Budget Law consolidates the fiscal functions of both the central and provincial governments into a unified national budget and provides the central Treasury with authority over all revenue collected and expenditures. The Provincial Budget Management Law recognises provinces as having independent budgeting authority as well as limited revenue and expenditure powers.

For local level decisions, however, the 2001 Law on Administration of Communes provides that the Ministry of Interior and Ministry of Economy and Finance will be involved in the commune councils' affairs. Accordingly, the current economic planning and budgeting system remains a highly centralised affair. The decentralisation and devolution initiatives being implemented through SEILA and the commune councils will lead progressively to the practical transfer of this authority from the Ministry of Economy and Finance and the central government to the provinces and communes.

In general, the Ministry of Economy and Finance dominates the budget preparation process. For example, the Ministry of Economy and Finance sends deputised finance officials to the provinces to guide and assist various provincial departments in the preparation of their budgets. And while the Ministries of Defence and Interior have some influence over the budget, the Ministry of Planning and Cambodia Development Council still lack meaningful involvement apart from their participation on the inter-ministerial budget steering committee. The main steps in the budget process are set out in Annex 1.

### Revenue

Apart from the significant international financial assistance it receives, the RGC's revenue streams can be categorised into three areas: tax revenues; customs revenues; and non-tax revenues.

Despite the RGC's introduction of a value-added tax (VAT) in 1999 and implementation of measures to enforce tax collection to bolster its nearly non-existent direct tax revenue - such as payroll tax and taxes on unused land - Cambodia's tax structure remains weak. Taxes on imported goods, including VAT, customs and excise duties, continue to be the overwhelming source of tax revenue. The RGC intends broadening the VAT base, improving audits and reviewing incentives provided to companies with tax concessions in an attempt to increase revenue mobilisation (CDRI 2001).

Customs duties (foreign trade taxes) have played a significant role in Cambodia's public revenue, but in recent years their capture has been impeded largely due to a weak customs administration that fails to enforce anti-smuggling measures (ADB 2000).

In 1999, the government greatly bolstered its non-tax revenues when it instituted competitive bidding for garment export quotas. The RGC is taking measures to increase other non-tax revenue such as timber royalties, lease of enterprises and post and communications fees to improve poor management of state-owned assets and to strengthen the recovery of arrears for the lease of state-owned assets. The effects of these measures have yet to be realised, but should increase non-tax revenue in future years.

### Future directions

It may appear unusual to include detailed sections on budget and finance mechanisms and influences in a report on protected areas. Yet, the future success of protected area managers will depend on their ability to understand and harness these economic forces for more effective conservation. There are critical opportunities for increasing investment in the national protected area system by:

- 1 Actively participating in the main national forums for defining economic development and budget priorities;
- 2 Working with government sector agencies to build protected areas and protection into their annual budgets and programs;
- 3 Applying a range of economic instruments, such as taxes, fees and subsidies to shape behaviour of the existing and potential user groups of protected area services and products;
- 4 Justifying an increased share of the national budget based on the development contributions of protected areas;
- 5 Justifying an increased share of ODA investment based on local and international economic and conservation contributions of protected areas, and by taking a more assertive approach to gaining donor support;
- 6 Attracting foreign direct investment in developing protected area assets for sustainable use (i.e. actively market protected area services and products);
- 7 Managing new forms of funding through innovative funding structures that provide for consistent levels of protected area finance over the long term (a strategy emphasised in Chapter 3 on governance reform).

These strategies are discussed in greater detail in the chapters to follow.

## Part 3: Protected Areas and Environmental Management

### 6. Protected area planning and management

Cambodia was the first country in South-East Asia to establish protected areas. The forests surrounding the temples of Angkor were declared a national park in 1925. By 1969, six wildlife sanctuaries had been set aside covering 2.2 million hectares or 12 percent of the country for the protection of wildlife, in particular large mammals. The long period of civil war led to the effective collapse of the system in any practical sense but over the past decade efforts at biodiversity conservation through protected areas recommenced and intensified. The current national protected area system comprises:

- 23 protected areas covering 3.3 million hectares - more than 18 percent of the country - created through a Royal Decree in 1993 and managed by MOE; and
- a growing number of fish sanctuaries and protected forest areas set up through MAFF.

This brings the national protected area system to over 21 percent of the country (Map 2). The system also includes provincial protected areas, which are set to significantly increase in number once the current legislative framework and guidelines for protected areas are clearly defined at national level. Ratanakiri province has established thirteen provincial protected areas and five other provinces have expressed interest in following this lead.

Cambodia has one of the highest percentages of national territory within protected areas in the world and has a goal of taking that area to 25 percent by the year 2005.<sup>24</sup> It is an exceptional commitment to protected areas as a major component of Cambodia's national development strategy, and one gradually being recognised internationally.

The Angkor Protected Landscape adjoining the temple complex is listed under the World Heritage Convention and the Tonle Sap Multiple Use Area is identified as a Biosphere Reserve under UNESCO's Man and Biosphere Program. Cambodia also has three sites designated under the Ramsar International Wetlands Convention. Currently, MOE is seeking to have the Cardamom Mountains Protected Forest and the two adjoining wildlife sanctuaries recognised as a World Heritage Site.

Despite very limited management presence on the ground throughout most of the past decade, the 1993 Royal Decree and its definition of protected area boundaries on maps has constrained damaging uses of these important areas, which would otherwise have led to long term development and conservation losses. While illegal logging and encroachment continue, the condition of natural systems within most protected areas in Cambodia today is better than if they had been under other forms of tenure which allowed wholesale exploitation.

<sup>24</sup> Mok Mareth, Minister for Environment, 2002, Opening address to the Second Regional Workshop on protected areas and development, PAD Review, Phnom Penh, Cambodia, October 2002

### *Protected area categories:*

A protected area is “an area of land or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.” Some 120 countries at the Fourth World Congress on National Parks and Protected Areas, held in Caracas, Venezuela in 1992 agreed upon this definition.

Globally over 200 different designations are used to describe protected areas. The IUCN system classifies all protected areas into 6 categories based on their principal management objectives and varying intensities of use (Box 4). The IUCN guidelines on applying the categories emphasise that all categories are important and needed for conservation and sustainable development. They encourage countries to develop a system of protected areas covering a diverse range of categories that meet their own natural and cultural heritage conservation objectives. Each category is defined by the “principal” objective of its management, which means two-thirds or more of a particular protected area is managed for that primary purpose. The rest of the area can accommodate activities that are not inimical to that fundamental management objective.

This international classification system reduces confusion of terminology, demonstrates the range of purposes that protected areas serve, provides an agreed set of international management standards and facilitates international comparison and accounting (Phillips and Harrison 1997).

The Cambodian protected areas system includes 7 national parks (4 are coastal and marine protected areas), 10 wildlife sanctuaries, 3 protected landscapes, 3 multiple use areas (one of which is a coastal and marine area), 13 fish sanctuaries and 2 protected forests. The national parks, wildlife sanctuaries, fish sanctuaries and protected forests conform to categories II and IV of IUCN’s classification system, areas at least based on their stated objectives of management. The 3 protected landscapes conform to category V of the IUCN’s classification system and the 3 multiple use areas to category VI. The designations of Biosphere Reserve, World Heritage Site and Ramsar site are not discrete management categories but titles given to areas of global importance under international agreements. They are generally overlain on one or other of the IUCN management categories.

In practice, each protected area in Cambodia is subject to a range of uses and it has proved difficult to strictly adhere to the primary management objective in the absence of clear zoning and management resources.

### *Representativeness:*

The protected areas of Cambodia are fairly evenly distributed over the country and represent all major ecological regions, although the dry evergreen forest of the north-west regions, the peat swamp forest of the southern floodplains and marine ecosystems are poorly represented (Maps 1 and 5).

Taking advantage of the moratorium on logging while concession management planning continues, international NGOs are cooperating with MAFF to identify areas of critical conservation value within the forest estate and to have them designated as protected forest. One area – the Cardamom Mountains Protected Forest, has been formally established. Two other large areas are under consideration, one in Mondolkiri province to the east and the second in Preah Vihear province to the north, both important areas of Indochina dry forest and recognised as priorities under the National Biodiversity Strategy and Action Plan.

## **Institutional arrangements**

There are two key ministries with responsibilities for the establishment and management of protected areas - the Ministry of Environment (MOE) and the Ministry for Agriculture, Forests and Fisheries (MAFF). The provinces also have the authority to establish and manage protected areas.

#### Box 4: The IUCN system of protected areas categories (IUCN 1994)

**I Strict Nature Reserve/Wilderness Area.** Areas of land and/or sea possessing outstanding or representative ecosystems, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring; or large areas of unmodified or slightly modified land, and/or sea, retaining their natural character and influence, without permanent or significant habitation, which are protected and managed so as to preserve their natural condition.

**II National Park: Protected Areas Managed Mainly for Ecosystem Conservation and Recreation.** Natural areas of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for this and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area, and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible.

**III Natural Monument: Protected Areas Managed Mainly for Conservation of Specific Features.** Areas containing one or more specific natural or natural/cultural feature which is of outstanding or unique value because of its inherent rarity, representative or aesthetic qualities or cultural significance.

**IV Habitat/Species Management Area: Protected Areas Managed Mainly for Conservation Through Management Intervention.** Areas of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species.

**V Protected Landscape/Seascape: Protected Areas Managed Mainly for Landscape/Seascape Conservation and Recreation.** Areas of land, with coast and sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, cultural and/or ecological value, and often with high biological diversity. Safeguarding the integrity of this traditional interaction is vital to the protection, maintenance and evolution of such an area.

**VI Managed Resource Protected Area: Protected Areas Managed Mainly for the Sustainable Use of Natural Ecosystems.** Areas containing predominantly unmodified natural systems managed to ensure long-term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs.

The mandate of MOE is to supervise and manage the environment throughout Cambodia.<sup>25</sup> The planning and management of the protected area system, and supervision and coordination of conservation work country-wide falls under its Department of Nature Conservation and Protection (DNCP). Protected areas units are operating in each of the 23 protected areas managed by MOE. Subsequent laws have brought conservation functions to a range of sectoral agencies, particularly MAFF

When first established in 1993, DNCP had 35 staff. Currently, it has 97 staff working in the 5 main offices at the national level. 525 staff members are deployed in 59 protected areas units or one staff for more than 6,000 hectares. Vietnam has adopted a standard of one staff member for every 1000 hectares of protected

<sup>25</sup> Sub-Decree No. 57 on the Organisation and Functioning of the Ministry of Environment dated 25 September 1997



area, which would be a norm worth adopting in Cambodia. The number of staff assigned to each protected area ranges from 7 to 35 staff depending on the need and remoteness of the protected area. In addition, some protected areas such as Kirirom National Park, Bokor National Park, Ream National Park, Virachey National Park and Boeng Per Wildlife Sanctuary have sub-offices in strategic locations. Some protected area units have set up an efficient organisational structure, including sections for administration, patrolling and enforcement, environmental education and tourism.

The provincial and municipal departments of environment are under the direct control of MOE and are responsible for implementing environmental policy, preventing violations in protected areas and preparing proposals for the creation of new protected areas and extension of existing areas in cooperation with relevant departments.

MAFF has a mandate for planning and managing the agricultural, forestry and fisheries sectors.<sup>26</sup> In 1999, its staff totalled 10,995. There are two main departments having a very significant stake in the protected area system: the Department of Forestry and Wildlife and the Department of Fisheries. The responsibilities of the Department of Forestry and Wildlife (DFW) include:

- Preparing policies and regulations for the protection and management of forest resources, and wildlife conservation;
- Participating in setting up measures for environmental protection and developing plans for the management of forests, forest reserves for wildlife, protected areas and reforestation areas; and
- Supporting initiatives on protection and rehabilitation of forest resources and wildlife.

Duties of the Department of Fisheries include<sup>27</sup>:

- Preparing policies and regulations for the protection, improvement and management of fishery resources;
- Participating in setting up measures for environmental protection and developing plans for the management of fisheries and fishery reserves; and
- Supporting initiatives for protection and rehabilitation of fishery resources.

Provincial and municipal Departments of Agriculture, Forestry and Fisheries are required to protect natural resources such as forests, water and fisheries in cooperation with other relevant agencies.

An intimate working partnership between MOE and MAFF is essential for the welfare of the national protected areas system. For example, the Forest Crime Monitoring and Reporting Project brings MAFF and MOE together to work on an issue of great mutual concern, which is controlling illegal exploitation of forest and wildlife resources. It establishes links between the two agencies at both the central and local levels and thus, promotes co-operation and collaboration between two important natural resource management agencies in dealing with forest crime. It has also bridged the gap between the central and provincial/district levels. This positive contribution of the project needs to be built on in other aspects of planning and management of forests and protected areas.

A new Royal Decree seeks to clarify responsibilities concerning the Tonle Sap Biosphere Reserve - MOE is given the mandate for managing three core areas, while MAFF is responsible for managing the buffer zone in collaboration with other agencies. This collaborative framework has yet to work effectively in practice. For example, difficulties remain in sorting out management consistency and arrangements for the fish sanctuaries overlying parts of the multiple use area.

<sup>26</sup> Sub-Decree No. 17 on Management and Process of the Ministry of Agriculture, Forestry, and Fisheries, dated 7 April, 2000

<sup>27</sup> Circular No. 37 on the Role, Responsibilities, and Organization of the Department of Agriculture, dated 15 January, 1986

Equally, it will become increasingly important for MOE and DFW to build partnerships with other stakeholders because:

- **Central government does not have the resources to do it all:** MOE and DFW alone will not have the funds and staffing to maintain the growing national system of protected areas.
- **The growing importance of the local stakeholders:** Local people and local governments are becoming more important due to decentralisation and growing interest in and support for the rights of traditional communities. Local governments and communities are becoming actively involved in protected area and buffer zone<sup>28</sup> issues and are being given the authority to determine their use. The challenge will be to recognise the right to participate while reinforcing the obligations and accountability that comes with it.

The entire government public service system is undergoing difficult reforms and MOE and MAFF will both need to work through the implications of decentralisation for protected area management and determine the balance between the number of staff and budgets at the central offices in Phnom Penh and at provincial and protected area levels. All evidence indicates that both MOE and MAFF protected areas need more staff for improved management.

### Staffing issues

Overall staff expertise has increased. Some staff have received formal and informal training from several sources, particularly conservation NGOs working in Cambodia. Often government staff are formally seconded to NGOs and received on-the-job as well as other, more formal training opportunities. Some have participated in international conferences, where they exchange information with colleagues from other countries. The knowledge level, abilities and effectiveness of staff, particularly at central level, has increased significantly. Some staff also report improvements in the energy, motivation, teamwork, and overall professionalism in both MOE and MAFF.

Despite these improvements staff also mention the following concerns as disincentives to consistent performance:

1. *Inadequate training* - particularly in the field;
2. *Poor government salaries* - on average, US\$20 per month, reduces commitment. Field staff lack financial motivation and spend a good deal of time working for alternative sources of income;
3. *Brain drain* - Many staff are more interesting in working for NGOs or NGO-supported projects to increase income;
4. *Few operational resources* - The DNCP has limited funds constraining staff initiative, for example, for infrastructure rehabilitation and development, interpretation, patrolling and restoration;
5. *Too much to do and too few staff to do it.*

Another issue is the “two speed” staff structure. One group involved in foreign funded projects is well paid, motivated and works full time. The remaining government staff are poorly paid, have broad responsibilities and demands but need to find additional work to supplement their income. Placing so many staff as counterparts to NGOs has resulted in many advantages to individuals and the NGOs involved (and to the country as a whole in the long term), but there are managerial challenges and disadvantages that have to be faced, and these are likely to increase in the future.

<sup>28</sup> A buffer zone is a clearly demarcated area, with or without forest cover, lying outside the boundaries of a protected area that is managed to enhance the conservation value of the protected area, and of the buffer zone itself, while providing benefits for the people living around the area. This will be achieved through the adoption of special development activities that contribute to improving the socio-economic wellbeing of the buffer zone inhabitants (Gilmore and San, 1999; Sayer, 1991)

Prior to 1999, there were no protected area field staff in place other than those supported through international projects and these numbers were small and fluctuating. It is difficult for DNCP to add staff given the government's commitment to reducing the size of the public service. Transfers within government are possible, but more than 80 percent of new field staff are not in permanent government positions. Instead they have one year contracts of around 52,000 riel, i.e. US\$14 per month. This level of income is not sufficient to live on so all protected area field officers need additional income generating activities.

Even so the demands on staff are increasing. Protected areas managers are now expected to be community development and poverty alleviation officers, as well as conservation managers – yet they do not have the mandate, skills and capacity to fulfil this community development role. Also, new responsibilities in conflict resolution and working with key economic sectors go well beyond the experience and training of many staff.

### Intersectoral cooperation and conflict resolution

Many other sectors now have responsibilities relating to the use and conservation of protected areas. The government has introduced a range of institutional mechanisms to promote collaboration among sectors in meeting their mandates. This becomes critical at the local level when the conflicts between resource users and development options are most evident. Often, the activities of key sectors are not undertaken with a strategy for optimising and maintaining protected area benefits in the long term. Also, local people and powerful individuals misuse most protected areas. Even the few areas that are actively managed do not escape illegal exploitation. These kinds of conflicts can only be resolved through close and concerted intersectoral action.

With this need in mind, the National Committee on Discussion, Recommendation, and Conflict Resolution for Protected Area Management was established in 2000.<sup>29</sup> The Minister for Environment chairs the committee and leaders of the Ministry of Interior and MAFF are vice-chairmen. Committee members are leaders from relevant government line ministries.<sup>30</sup> The committee is mandated to:

- Participate in discussions and make recommendations relevant to protected area management, their conservation and development;
- Recommend preventative measures and immediately solve violations or anarchic activities occurring in protected area; and
- Participate in discussion and make recommendations and decisions on protected area boundary demarcation.

The committee is also assigned to create sub-committees in all provinces and municipalities in which protected areas are located. The deputy governor of the province or municipality chairs the sub-committee and the directors of the local Department of Environment and Department of Agriculture, Forestry and Fisheries are the co-vice-chairmen.<sup>31</sup>

<sup>29</sup> Resolution No. 49 on 24 July 2000

<sup>30</sup> Ministry of Rural Development, the Royal Government of Cambodia Armed Forces, the National Police, the National Military Police, the Council of Ministers, the Ministry of Tourism, the Ministry of Justice, the Ministry of Land Management, Urbanisation and Construction and provincial and municipal authorities.

<sup>31</sup> Directors of all relevant provincial or municipal line departments are members, including the commander of the Royal Government Armed Force, the commander of the National Police and the governor of the districts or heads of communes that are located within or adjacent to the protected areas. The head of the relevant protected area unit is nominated to act as secretary to the sub-committee.

### *Physical demarcation of protected area boundaries*

Eight protected areas, including Kirirom, Bokor and Ream National Parks, are officially partially demarcated on the ground following discussion and negotiation between members of conflict resolution sub-committees. The process of physical demarcation has involved strong facilitation and coordination among relevant government institutions and a reinforcing of their shared mandate to reduce the extensive conflicts affecting protected area conservation.

### *Suppression and prevention of violations*

The efforts of protected area field units, especially their patrolling sections and intervention from national level, have ensured that violations in protected areas have been significantly reduced over the past 2 to 3 years. Protected area rangers have documented some serious violations and initiated court actions. For example, land encroachment in Kirirom National Park is now under control and several of the more important cases are awaiting court decisions.

In case of conflicts in a protected area, the director of the protected area tries to solve the problem first. If unresolved, he then reports the matter to the sub-committee and the Director of DNCP requesting intervention. At national level, the committee has proved to be an important forum for raising critical issues negatively affecting the national protected area system. At local level the sub-committees have not been as successful. They tend not to be active in intervening in protected area problems because:

- Resources to complete the tasks are inadequate;
- Capacity and interest in protected area management among members of the sub-committees is limited;
- Understanding of the benefits of protected areas for development is lacking;
- Coordination among sub-committee members is difficult to achieve;
- All members have other responsibilities in their institutions;
- There are no incentives to fulfil sub-committee mandates; and
- Most violators are powerful people or armed.

## Management planning

### *Preparing management plans*

Only two protected areas - Ream and Bokor National Parks - have draft 5-year management plans. Broader, less detailed assessments of the management status and needs of several other protected areas have been completed recently, such as for Virachey National Park and the MOE protected areas in Monduliri province – Snoul, Phnom Prech and Phnom Nam Wildlife Sanctuaries. Although a field presence has been established in most protected areas, generally only the most basic management activities have been carried out. In 2001, only about 20 percent of the total area designated as protected was under some form of active management (ADB 2001c).

Creating useful and effective management planning frameworks for the remaining protected areas is a great challenge. Using one or more of the rapid management assessment and priority setting methodologies for protected area systems developed by the IUCN World Commission on Protected Areas, WWF, The Nature Conservancy Council and others would be useful. Some of these tools give an overall picture of the relative management effectiveness of an entire protected area system. Others provide a more in-depth, detailed regional or site-level evaluation.

All of these methods provide a participatory and objective framework that can be repeated at intervals for monitoring progress and achievements.

### *Making additions and adjustments to the protected area system*

The protected area system is mainly based on forest reserves developed in the 1950s, as well as limited information available in the early 1990s. This information was incomplete and uncertain. One challenge is to further review the system of protected areas for remaining gaps. Habitats that are considered to be missing or insufficiently covered by the current protected area system include lowland evergreen forests, riverine forests, limestone forests and marine areas. Determining how to add examples of these habitats to a protected area system, and which government agency at which level will manage them should be a collaborative process undertaken by MOE and MAFF together.

In addition, the boundaries of many protected areas were established with incomplete information about habitats, species, and traditional uses. Existing boundaries need to be reviewed to see if changes are needed to improve a protected area's coverage of a particular habitat, and/or to resolve land-use conflicts with local communities and government sectors that might erode or destroy local support. Adding new areas will be difficult, even if other parts of a protected area are released to communities. The final delineation and marking of park boundaries requires sustained commitment and funding.

Consensus still needs to be reached on physical demarcation of the boundaries of many protected areas due to a lack of coordination in forest land allocation between government line ministries, overlapping areas between protected area and forest concessions or land concessions, and conflicts in narrow institutional interests. Many of the sub-committees are not innovative or conscientious in addressing boundary issues.

### *Maintaining habitat corridors*

Another challenge will be to maintain habitat corridors between protected areas, particularly where they are not large enough to maintain important species in viable populations. This effort should include better integration of conservation policies and development frameworks into socio-economic development planning and implementation. The key is to ensure that the use of land with the corridors does not compromise the ability of fauna to move about the landscape.

There are ample opportunities to extend the protected areas system in this way because of the extensive remaining national forest estate which is largely divided into forest concessions and now undergoing a review.

### *Transboundary cooperation*

Cambodia also has protected areas along its international borders with Thailand, Lao PDR and Vietnam and there is potential to strengthen biodiversity conservation over the shared ecosystems with these countries through the coordinated management of transboundary protected areas. The Virachey National Park, which is contiguous with protected areas in Lao PDR and Vietnam, in particular would have great value as a collaboratively managed protected area complex (Map 8 shows the protected areas with potential for transboundary collaborative management).

Map 8: Protected areas with potential for transboundary cooperation in Cambodia

## Zonation

According to the MOE draft protected area legislation, each protected area will be developed into four zones as set out in Article 17:

1. **Core zone:** area(s) containing biodiversity, natural resources, ecosystems and genetic resources of high values for scientific research and for sustaining the environment.
2. **Conservation zone:** area(s) adjacent to the core zone where access by local communities and people living within and next to the PA to use resources is allowed in accordance with *Prakas* issued by the MoE.
3. **Buffer zone:** the zone may contain one or more areas as below:
  - a. conservation of national culture and heritage;
  - b. eco-tourism;
  - c. protection and rehabilitation of biodiversity;
  - d. establishment of PA community;
  - e. establishment of botanical garden; or
  - f. special protection and use: irrigation system, reservoir, hydro-station, electric network, public infrastructure and infrastructure for the management of the PA.
4. **Community zone:** area(s) for socio-economic development of the local communities and may contain residential land, rice field and field gardens (*Chamkar*). The establishment of community zones shall be defined by Sub-decree.

Zones need to be very clear in terms of their primary management objective and their distinguishing characteristics. If uncertainty remains then management is difficult. The distinction between the proposed conservation and buffer zones under the draft law is not clear and needs further consideration.

### *Zoning must be a collaborative process*

More extensive guidelines for zoning are required to develop zonation systems for each protected area based on its habitats, species and patterns of use by local people and specific rules and regulations that govern how different zones will be used. These rules are especially important for any subsistence harvests that might be allowed in some parts of protected areas. Community mapping, research on patterns of natural resource use and joint development of rules and regulations for harvesting natural resources will be needed.

### *Working with local communities in core zones*

Local communities often rely on NTFPs and animals from all parts of a protected area for subsistence and/or cash income. In these critical circumstances, development of alternative sources of food, other products and cash income should receive attention. In some protected areas it will be financially and politically difficult to immediately and fully enforce strict core zones in which all subsistence harvesting of non-endangered species is banned. A transition period may be necessary while alternative sources of revenue are developed. Yet, the lack or small size of core zones will also have potentially negative consequences on the long term contribution of protected areas to development. Determining the location of core zones should be a high priority. The identification in parallel of “softer” zones where some subsistence activities might continue is also important. MOE and MAFF must work in unison to manage this process with local communities, local governments and key sectoral agencies.

### Investment in protected areas

Government budget for protected areas has increased. In 2001, MOE estimated that it received approximately 0.18 percent of the national government budget, almost a threefold increase over ten years. Also, a significant amount of financing for protected areas and biodiversity conservation has been provided in the past 10 years as grants from multilateral and bilateral aid agencies and NGOs.

Angkor Wat has been able to develop high levels of additional revenue from entrance fees and other tourism-related revenue. It is close to becoming 100 percent self funded. The Ya Poey Community Forest Association also levies a small tax on community members and others who harvest NTFPs, as well as fines from people who break the harvesting rules. These funds help cover some management costs.

Yet, MOE's budget barely covers staff salaries and basic administration. Cambodia's expenditure for protected areas is very low when compared to other countries in the region. Given the commitment of more than 21 percent of the country to this form of land use and its basic contribution to development in many key sectors, investment priorities will need to be reviewed. Increasing protected area budgets will require increased allocation from central government, transfers from development sectors for services received, and the raising of local revenues. The government's commitment to protected areas "is not fully translated into budget share....This will need to change if the growing contribution of protected areas to national and local development is to continue. The source of that additional investment will need to come from all sectors and users." (Mok Mareth 2002). The government must provide the appropriate system of economic incentives and regulations to apply the "user pays" approach.

There is potential for business contributions to conservation programs. Cambodia is making the transition to a market economy. For the corporate sector to invest in conservation it has to be assured of profits and believe that the contribution will increase market share through consumer recognition of good environmental performance. Given the present low level of environment awareness and the limited purchasing power of most of the population, the potential for private enterprise investment will come gradually on a case by case basis through sectors which are currently receiving significant protected area benefits such as tourism, energy and water supply. Once again government will need to provide the appropriate economic incentives and regulatory environment to promote private sector involvement.

### *Sustaining conservation funding*

Donors often favour short-term projects that can be self-sustaining after one or two grants. Yet, given the challenges the government is facing in increasing national revenue from local sources and the time it will take to effectively integrate the national protected area system into the government's development programs, long term external funding will be needed to maintain protected areas. Longer-term and sustainable funding options will need to be considered very carefully. Perhaps the most promising is a trust fund at the national level, and trust funds for individual and groups protected areas providing a stable financing mechanism that can be supplemented by contributions over time. The process of setting up an efficient and transparent system of trust funds to supplement government budgets and at the same time to involve stakeholders will require consistent effort and support over several years.

### *International support must facilitate working relationships between protected areas and development sectors.*

ODA support through the MOE has focussed on building the environmental management and protected area system. Five or six international support projects implemented through MOE and MAFF have targeted specific protected areas. All emphasised protected area management concerns, some with local community support components. None have had the resources to link the protected areas with key economic sectors in a systematic and productive way although the current portfolio of projects do take a landscape approach seeking to integrate protected area management with local communities on an ecosystem basis.



Basic protected areas management functions are an essential and critical first step, but now MOE/MAFF and their partners also need to reach out and build working relations with development sectors. Given Cambodia's special commitment to protected areas as reflected in the exceptional size of the national system, donors and conservation organisations need to ensure that support to all sectors recognises and nurtures the protected area development contribution in a way which sustains and enhances their services and products. Also, bilateral donors seeking to promote their own private sector in Cambodia should explore parallel aid programs when commercial interests and protected areas intersect. For example, private developments in energy, forestry, tourism or water supply, which benefit from or effect protected area values may provide an opportunity for targeted capacity building assistance.

### Protected areas legislation

Since the Royal Decree of 1 November 1993 establishing 23 protected areas no comprehensive law has been introduced to implement management and enforcement within protected areas. MOE rangers do not have powers to intervene or apprehend offenders outside the boundaries of protected areas and the ambiguous status of many boundaries makes law enforcement difficult. After many years of dependency on MAFF powers to prosecute, in 2001, MOE staff were given judicial authority within protected areas, although prosecution is still carried out under the forest law. Several cases of land speculation inside protected areas have been successfully dealt with through the courts.

Since 1998, MOE has had several attempts at drafting an umbrella protected areas law. But the evolving legislative scene in other sectors, especially forestry, left the ministry uncertain where in the hierarchy of law to place a comprehensive legal instrument for protected areas. From the late 1990's, various government sectors introduced laws, decrees and sub-decrees with direct or indirect links to protected areas, such as forestry, community forestry, wildlife, water resources, fisheries and land tenure. These initiatives will be reviewed in the various sector chapters of this report. Now that the approach to protected areas in the new forestry laws has become clearer, the MOE is giving priority to drafting a fresh statute on protected area management and a task force has been established for this purpose.

The MOE needs to work closely with MAFF so that the protected areas law is aligned to and complements the Forestry Law. The conditions are currently favourable for such cooperation as many of the earlier uncertainties between MOE and MAFF over enforcement and jurisdiction have been settled during negotiations on the Forestry Law. Moreover, the process of drafting, passage and implementation of protected area legislation can benefit from the lessons of consultations on the Decree on Community Forestry.

This wave of recent policy and legal reform in the land, forest, fishery and local governance sectors provides an opportunity for consistency between the protected area legislation and other legal frameworks (especially the Immovable Properties Law, Forestry Law, Commune Administration Law, Decrees on Community Forestry and Fisheries).

By early 2003, MOE had completed a first draft of the protected area law. The draft is undergoing review within DNCP and in its current form its coverage includes:

- The roles and responsibilities of various government bodies in the management of protected areas and their surrounding environs;
- The establishment of national and local protected area management boards;
- Protected area categories, objectives and establishment criteria based upon IUCN standards;
- Procedures to establish, modify and terminate protected areas;
- Requirements to prepare a national strategy plan and site-specific management plans;
- A structure for zoning activities within protected areas;
- Prohibited acts and a system for permits and licenses;

- Enforcement of criminal and administrative violations;
- Applicability of environmental and social impact assessments;
- Sustainable funding; and
- Public participation and dispute resolution.

Translating the new legislation into specific and detailed field level regulations and guidelines for protected area managers will be an important task. For example, regulations are needed concerning zoning, changing boundaries of protected areas, rights and responsibilities of local people to use protected areas for NTFPs, development of tourism, enforcement, and involving local people and governments in making management decisions, and for the establishment of protected areas by provinces.

The authority of the draft law relative to other legislation will be an important issue to resolve at the most senior level. Cambodia has no legislation for determining the relative priority of different legal instruments or standards for consultation between agencies with common interests (World Bank 2000). Natural resource laws have sometimes created institutional tension and uncertainty concerning functions and authority.

### Integrated planning and the cluster approach to protected areas

During 1996-7, while preparing the National Biodiversity Prospectus, MOE explored the adoption of a cluster approach to planning and managing protected areas (Ashwell 1997). The cluster approach provides an opportunity to quickly establish a framework for management over a group of parks at the same time - including the land and resources linking them. It allows for integrated regional planning in which the management of linked protected areas becomes a tool in sustainable economic development of an entire landscape. It also provides for:

- Focusing resources on the highest priority problems within the cluster;
- Sharing experience and lessons between parks within the cluster;
- Developing common management approaches;
- Sharing limited resources and skills;
- Integrated resource development approaches within and outside the parks; and,
- Intersectoral and coordinated delivery of government and community services (Carew-Reid 2002).

Several protected area clusters were identified as requiring priority action. For example, in the south-west region, there are nine protected areas and the staff and financial resources to address each park's management needs individually are not available. They can be grouped into three "clusters" each according to shared biodiversity characteristics and to the feasibility of collective management approaches, for example, where existing administrative divisions are shared. These clusters in the south-west region were given priority because:

- The region has high biodiversity values including a substantial number of internationally threatened animal species.
- The area includes sites of potential international importance for biodiversity conservation.
- It provides the opportunity for demonstrating sustainable use of biodiversity resources.
- The region offers immediate potential as a national resource for conservation tourism.
- The area is relatively secure.
- It forms part of a major development corridor between Phnom Penh and the country's largest port at Sihanoukville and the protected areas provide essential natural services and products for continued development of the region.
- Much of the area is well serviced, having easy access by road, air and sea.
- The potential for integrating conservation and development is high with consequent benefits flowing to local communities.

At the time, political instability and withdrawal of donor support prevented MOE from taking the cluster approach further, but the concept remains of immediate relevance to the effective management of Cambodia's protected areas in a situation of acute resource scarcity. Most importantly it would allow protected areas to be recognised and managed as productive units within the socio-economic landscape of which they are a part.

### Future directions

Underlying all other challenges facing Cambodia in effectively managing its large and growing protected area system is the problem of capacity and resources. These are the first and most serious concerns that the government needs to address as an issue of importance for the national economy. An estate that will cover one quarter of the country and the most important natural terrestrial and aquatic systems provides the foundation for long term socio-economic development. Effective management and protection of this natural estate is essential to maintaining its increasing contribution to national development.

#### *Implement a three year in-country training program*

To address the critical capacity issue the following initial steps need to be taken:

1. MOE should seek international support in undertaking a comprehensive protected area staff capacity and training needs assessment leading to the definition of a program for training and capacity building.
2. MOE should seek a special central budgetary allocation for implementation of the program on the condition that a range of international organisations and bilateral agencies will collaborate in supporting the program. In particular MOE should be assisted in approaching sister protected area agencies in developing countries to provide staff input to course implementation.
3. The program should identify short term in-country training activities over a 3 year period as the highest priority need and ensure that all MOE central, local and field staff as well as selected MAFF staff are targeted.

The international community will need to show real and determined commitment to supporting MOE at all stages from design to financing and implementation of the training program.

#### *Seek an increase in government budget contributions:*

Regarding the resource gap for protected area management, MOE needs to be supported in preparing a comprehensive submission to government for a major increase in staff and budget share. The additional public investment should be justified in part by the existing and potential economic values of protected areas and their overall contribution to socio-economic development if appropriately managed.

The government will need to show commitment through a significant budget increase. Also, for some time to come the international community will need to show a much greater level of long term commitment than in the past to supporting protected area planning and management.

#### *High priority protected area planning and management actions*

Staff capacity and increased protected area finances are needed to undertake the following priority planning and management activities, which aim to better integrate protected areas within the surrounding development landscapes and better safeguard the natural services and products they provide:

1. Introducing the framework protected area legislation and associated regulations;
2. Introducing a system of management guidelines and procedures for high priority clusters of protected areas using rapid appraisal and planning methods;
3. Piloting a cluster wide protected area fund and planning approach in the south-west group of national parks (in collaboration with the current Cardamom Mountains fund initiative);

4. Establishing a sector advisory committee for each high priority protected area cluster (building on and learning from the conflict resolution committees);
5. For each protected area, working with the sector and community committees to define management zones beginning with the core zones;
6. For each protected area, establishing a community management committee and defining rights, responsibilities and management arrangements for protected area zones;
7. Developing a plan for regional cooperation with Lao PDR, Vietnam and Thailand, for the collaborative management and conservation of PAs close to or on international borders linking one or more of these countries;
8. Implementing provisions of international conservation conventions, for example, on biodiversity, wetlands and climate change, which relate to environment assessment, regional planning and to managing the relationship between protected areas and development through sustainable use and sharing of benefits;
9. Clearly defining boundaries for all PAs and ensuring their effective demarcation on the ground as a basis for management of use and access.

#### *Promoting protected areas through decentralisation*

The government's goal of decentralisation provides important opportunities to bring greater human and financial resources to protected area management. MOE and MAFF need to harness the commitment to and power of decentralisation to promote their shared protected areas goals. The ministries must clearly chart their course as to how best use decentralisation as a positive force in realising their respective protected area mandates.

#### *MOE and MAFF should prepare strategies for decentralisation*

All ministries need to prepare strategies for implementing the government's directive on decentralisation. MOE has a special need to do so given its responsibility for more than 18 percent of the country conserved through the 1993 Royal Decree on protected areas. Similarly, MAFF needs to give high priority to defining its decentralisation strategy, given its management responsibilities over fisheries, forests and agricultural resources and lands, and an increasing number of protected forest and fish sanctuaries. Already, both ministries are testing various forms of community management on a small scale. An important impetus for transferring certain central authorities and functions to local levels is that central ministries do not have the capacity to carry out their mandate alone. They need the users of resources and those communities living closest to them to share in the responsibility for managing them. The MOE and MAFF decentralisation strategies should define:

- Strategies to facilitate and promote decentralisation to better fulfil their mandates;
- Staff skills required for decentralised management and strategies to acquire those skills;
- Targets and timing for decentralisation of centralised functions;
- A description of programs to support and pilot specific decentralisation structures and mechanisms;
- The costs involved in decentralisation.

To properly manage decentralisation requires strong central capacities and resources. This is a quandary facing MOE. The process needs consistent guidance, technical support and a flow of resources to the local level. In fact, decentralisation can be more costly in terms of time and resources in the early stages than maintaining central controls and approaches. If devolution of authority proceeds without increased central input, new responsibilities can enter a capacity vacuum at local level in which anarchy and misuse of natural resources increase.

### *Build MOE staff capacity to effectively guide and manage decentralisation*

A first stage in effective decentralisation includes building a strong central capacity in the main natural resource ministries so that they can shepherd and nurture local government and communities along the road to greater self reliance and control. This will require a greater investment by government in MOE over the initial phase of decentralisation in recognition of the critical role it can play in implementing the policy. The effective management of the country's most important natural systems is at stake. This MOE capacity building effort will need to focus on the protected area management units in addition to central departmental staff.

### *Pilot local trust funds covering individual or clusters of protected areas*

An important way to build decentralised capacity for managing specific areas or natural resources and to establish a sense of responsibility over them is to give direct control over the funds for doing so. MOE should pilot trust funds for selected protected area clusters as a way of enhancing decentralised staff authority and priority setting capacities and as a framework for involving various stakeholders in protected area and buffer zone management.

### *Build capacity in local government for collaborative management*

MOE and MAFF should seek to reinforce the role of the commune councils in various aspects of protected area management. It is important that community management structures do not undermine the authority and role of the councils, but instead reinforce and supplement them. The approach to be taken may vary according to each situation.

Councils and their administrations should engage in and promote collaborative management regimes associated with protected areas and surrounding landscapes. They will need a range of technical, administrative and management skills to do so. MOE and MAFF should seek to involve international and local NGOs in this process and be active in arguing for greater central government funding for the purpose. For example, there is a strong case for channelling a proportion of the resources managed through the Commune Fund to contribute to these capacity building programs.

Collaborative management structures should be established for:

- Each protected area multiple use zone (defined by the government as 10-30 percent of each protected area);
- Protected area buffer zones in whole or in part;
- Special protection zones in forest, fisheries and agricultural concession areas.

Management structures promoting the role of communities in managing natural resources in their surrounding environment are facilitating the government's decentralisation goals. They are of special importance for protected areas, whether managed by MOE or established through MAFF.

### *Establish consultation structures for clusters of protected areas*

The commune and district level of government is more concerned with resource management associated with individual protected areas. But in situations of scarce resources, MOE and MAFF will need to share technical and financial capacity across several protected areas. There is an important regional level of planning and decision making. Plans and consultative structures are needed covering each cluster of protected areas and

their linking landscape. The ministries should test approaches for involving key resources users and other stakeholders living within the cluster landscape.

Over the remainder of the five year development period to 2005, MOE should seek to establish effective planning and consultation structures associated with at least three clusters of protected areas.

*MOE and MAFF should have membership on the National Committee to Support the Commune and the Commune Fund Board*

Together MOE and MAFF are responsible for more the 21 percent of the country falling within protected areas. The PAD Review found that local communities and major government sectors are becoming increasingly dependant on the natural services and products provided by the extensive protected area estate. Decentralisation will place greater emphasis on local government and communities managing that estate for protection and sustainable use. MOE and MAFF have a key role in guiding the Committee and Board in determining priorities for action in this field.

## 7. Environmental management and protected areas

### National environmental policy

The 1996 Law on Environmental Protection and Natural Resources Management provides the basic legal framework for the operation of MOE. The objectives of the law are to protect, manage and enhance the environment and promote socio-economic development in a sustainable way. MOE is given responsibility for environmental action planning, protected area management, environmental impact assessment, environmental monitoring, pollution control and inspection and public participation. The law provides the umbrella for follow up sectoral laws, sub-decrees and regulations for environmental protection and natural resource management. The first such law was the 1997 Sub-Decree on the creation and the procedures of the MOE, which details the mandate of MOE and its structure. It defines the activities and functions that could be assigned to the Provincial Offices of Environment. In 2001, the Royal Decree on the Creation and Management of Tonle Sap Biosphere Reserve was introduced.

National policy documents such as the National Environmental Action Plan for 1998-2002 and the National Biodiversity Strategy and Action Plan (NBSAP) of 2002 emphasise the need to prepare and implement management plans for protected areas and to integrate them into the government's broader policy framework for environmental management. The two main mechanisms for achieving that integration are regional planning and environmental impact assessment (EIA) in which sectors work together to plan for optimum use of areas and resources and minimise negative environmental consequences. Cambodia has not progressed far in regional planning although the protected area cluster concept and discussion on watershed and coastal management have moved in that direction. At this stage, EIA is the main process for linking protected areas to surrounding development in a way that safeguards natural systems and the services and products they provide.

### The EIA framework

Chapter 3 of the Environment Law established an EIA system. The EIA provisions are far-reaching, requiring that EIA "shall be done on every project and activity, private or public, and shall be reviewed and evaluated by the Ministry of Environment before being submitted to the Royal Government for decision." The law qualifies this provision by directing that the "nature and size of the proposed projects and activities" subject to the EIA process will be determined by sub-decree.<sup>32</sup> The law specifically charges MOE with the task of reviewing and providing recommendations on either initial or full EIAs.<sup>33</sup>

Further details of the EIA system are set out in the 11 August 1999 Sub-Decree on the Environmental Impact Assessment Process. This sub-decree makes it clear that MOE is responsible for examining and evaluating EIA reports as well as "monitoring, observing and taking action to ensure that the project owner follows the environmental management plan during the construction, operation and termination" of the

<sup>32</sup> Law on Environmental Protection and Natural Resource Management dated December 24, 1996 at Article 6.

<sup>33</sup> Law on Environmental Protection and Natural Resource Management dated December 24, 1996 at Article 7.

project.<sup>34</sup> While MOE is the primary government authority charged with review and evaluation of the EIA reports submitted by project owners, other government institutions, ministries and local agencies with the authority to approve projects have a duty to examine and make decisions on projects MOE has examined and evaluated.<sup>35</sup>

The EIA Sub-Decree requires project owners to submit an initial EIA and feasibility study for all proposed and ongoing projects that are listed in the annex to the sub-decree and to request MOE to review them.<sup>36</sup> A full EIA and feasibility report are required for projects with potential to have a “heavy environmental impact on natural resources, the ecosystem, health and public welfare.”<sup>37</sup>

MOE must review the feasibility study and initial or full EIA report and send recommendations to the project owners and institutions approving the project within 30 days of receiving the documents.<sup>38</sup> In a provision which seriously weakens the EIA system, institutions deciding on a project may declare that it meets the requirements of the EIA Sub-Decree if the MOE fails to perform the review duties within the mandated time-frame.<sup>39</sup> Project owners must receive approval of their initial or full EIA from MOE prior to commencing a project or pursuing ongoing activities.<sup>40</sup> The EIA Sub-Decree does not contain standards to guide MOE in reviewing feasibility studies and EIAs for decision. MOE does not have the authority to reject project proposals, and is limited to providing recommendations to project owners and monitoring the implementation of such recommendations.

Project owners are subject to penalties for non-compliance with the EIA provisions of the Law on Environmental Protection and Natural Resource Management and the EIA Sub-Decree. In addition, “environmental officers” who negligently, carelessly or actively conspire with violators of the legislation are subject to administrative penalties and even court action.<sup>41</sup>

The EIA Sub-Decree authorises MOE to issue guidelines concerning the EIA process.<sup>42</sup> The MOE Declaration on the Guidelines for Conducting Environmental Impact Assessment Reports, issued on 9 March 2000, delegates responsibility for EIA related activities to the Department of EIA Review and Monitoring and empowers the department to create guidelines for complying with EIA laws.<sup>43</sup>

In addition to the guidelines, the EIA Department has prepared flow charts that describe the EIA process under varying circumstances where approval for proposed and existing projects is provided by different government institutions. While the EIA Sub-Decree declares that one of its purposes is “[t]o encourage public participation in the Environmental Impact Assessment as well as to consider suggestions when approving the project,”<sup>44</sup> public participation is absent from the EIA review process.

---

34 EIA Sub-Decree at Article 3.

35 EIA Sub-Decree at Articles 4 and 5.

36 This annex provides a chart listing industries and categories of projects and the corresponding size of the project that triggers the project owners’ duty to submit an initial or full EIA. For example, while all sizes of garment factories fall under the EIA process, only golf courses with 18 or more holes are subject to the EIA procedures.

37 EIA Sub-Decree at Articles 6-8.

38 Specialized timing requirements apply to ongoing projects, but the essential reporting procedures remain the same for proposed and ongoing projects. EIA Sub-Decree at Chapter 5.

39 EIA Sub-Decree at Article 18.

40 EIA Sub-Decree at Articles 20 and 26.

41 EIA Sub-Decree at Chapter 7.

42 EIA Sub-Decree at Article 10.

43 The EIA Department’s Guidelines provide the format to be used by project owners in preparing their EIA reports. Each EIA report thus must include the following components: (1) project summary; (2) introduction; (3) purpose of the project; (4) project description; (5) description of environmental resources (including physical, ecological and socio-economic resources); (6) public participation; (7) environmental impact analysis; (8) environmental impact mitigation measures; (9) cost/benefit analysis; (10) environmental management plan; (11) institutional capacity; (12) conclusion and suggestions; and (13) references.

44 EIA Sub-Decree at Article 1.



### *Challenges presented by the EIA system*

Despite the relatively clear description of the EIA process in the legislation, in practice the EIA system fails to function in an effective manner. There are three main reasons for this failure: the limited capacity and resources available to the EIA Department; the weak working links across departments within the ministry and with many of the sectoral agencies; and the low priority that the EIA process is given across all arms of government.

Within MOE, an ongoing dialogue is needed between the EIA Department and the Department of Nature Conservation and Protection. Without it protected area values are not consistently incorporated into the EIA Department's review of EIA documents and recommendations.

### *Strengthening of capacity in the Department of EIA Review*

The EIA Department's 20 staff members require substantial support in building the required knowledge, skill and experience to adequately examine and review feasibility studies and initial and full EIAs or to monitor the implementation of environmental management plans. Despite the inputs of the ADB's project in 1999 on "Institutional Strengthening and Expanding EIA Capacity in Cambodia", the EIA Department is regarded by sector agencies as a "rubber stamp" approval office. Other than the ADB capacity-building project, the EIA Department has received no significant and consistent long term donor support of the kind which is needed to make the EIA system work effectively.

MOE's ability to monitor project owners' implementation of EIA recommendations is limited. For example, the Kamchay hydropower project owner made numerous pledges in its pre-feasibility study to safeguard Bokor National Park in all its activities. Furthermore, MOE approved exploratory activities on the condition that the park was not negatively affected. Yet, significant degradation of the exploration area within the park has occurred. MOE did not have the resources to monitor the situation and the company did not make park staff aware that exploration had begun. Most seriously, the entire project appears likely to proceed without adequate consideration of its affects on the park. This case is discussed in more detail in Chapter 13 on energy development. The situation is typical for all major development projects including those with potential to affect protected areas negatively.

In reality, MOE's EIA mandate is not respected. Project owners have used threats of violence, including a show of arms, when visited on-site by MOE officials, justifying certain development activities on higher level authorisation. Moreover, resource limitations mean that the EIA Department currently monitors its EIA recommendations on only one project. MOE can not adequately satisfy its EIA mandate and this puts the national protected area system at serious risk of unwise and exploitative development.

### *Transparency and accountability in the EIA process*

Project owners and MOE do not systematically release important EIA documents for public review including the EIA Departments recommendations. Generally, input by the public throughout the process is not sought or received by the project owners, approving government institutions or MOE. The benefits of public scrutiny and support to the EIA Department are lost. Broad involvement is costly, requires special skills and is time consuming. For all those reasons, the project owner and associated financing agencies need to incorporate those expenses in the overall cost of the projects.

### *The role of sectoral agencies in EIA review*

Over time it is desirable for each sector agency to build the capacity to shoulder the responsibility for EIA review and monitoring relating to development within its own portfolio.<sup>45</sup> But, delegation of that responsibility should only occur on the basis of proven capacity and comprehensive agreement with MOE on the nature of projects and procedures which need to apply. Besides, MOE should retain the authority to review all cases where significant environmental effects may be involved.

This is not the case with respect to the environmental management of MAFF's new forestry concession planning system. In creating its own EIA office and taking the lead in environmental review of forestry concessionaire plans, MAFF has effectively wrested this function away from MOE. It is to Cambodia's overall advantage to have a strong EIA office within MAFF (and all other ministries), but its responsibilities need to evolve under the overall framework for EIA that has MOE as the ultimate authority. Otherwise the system will fail to grow in credibility and effectiveness.

### *Donor commitment to reinforce the EIA system*

The donor community has consistently failed to rigorously uphold international EIA standards in providing support for major projects, or to comply with the EIA legislation. For example, the ADB is providing funding for rehabilitation of National Road No. 1 from Neak Leung to the Cambodian-Vietnamese border at a cost of approximately US\$60 million. Already, project implementation is well advanced. Yet, the EIA Department has never received, let alone reviewed, the associated EIA documents. This project is more the rule than the exception. The MOE EIA Department is not taken seriously in its review functions, and bilateral and multilateral donors do not assist it in taking an assertive role.

Often the EIA Department has not acted to demand the submission of EIAs for major projects because powerful ministries or central government have already approved the developments with support from members of the international donor community.

All these difficulties with the national EIA system put protected areas at risk. As Cambodia's economy grows the flow of development proposals that benefit from or may negatively affect protected area services and products will grow. EIA provides an essential mechanism of last resort in safeguarding and ensuring the most appropriate uses of the national protected area estate.

### *Future directions*

In the medium term, a system of regional planning is required which covers entire landscapes and encourages an ecosystem management approach to development (Pirrot et al. 2000). Regional planning which includes groups of protected areas would better integrate them within overall socio-economic development planning at central and local levels. Also, it enables a range of development options to be explored so that optimal strategies for resource use and conservation are defined on a regional scale.

Even with an effective regional planning system, EIA is an essential screening mechanism for safeguarding the national protected area estate from unwise use and degradation.

Strategies for reinforcing the EIA system include:

- 1. *Strengthening the EIA legislative framework*** to clarify EIA procedures and penalties for non-compliance.
- 2. *Setting minimum standards for public participation*** in the EIA process and building them into the legislation. This would help the EIA Department build the credibility and authority to genuinely influence the shape of development.

---

45 Under Articles 4 and 5 of the EIA Sub-Decree, relevant line ministries and provincial authorities have authority to comment on EIA documents, but the MOE is granted overall lead status.

3. **Reinforcing the role of MOE.** A government decree is needed that definitively determines the role of MOE in the EIA review and monitoring process vis-a-vis all other concerned ministries.
4. **Establishing an inter-ministerial EIA committee** or task force through the decree to address EIA issues as they arise.
5. **Negotiating memoranda of understanding between every sector and MOE** on detailed EIA arrangements, procedures and respective responsibilities. EIA review functions can be progressively transferred to sector agencies as the system and commitment to it matures.
6. **Demanding EIA documents from project owners.** The EIA Department needs to be pro-active in enforcing EIA procedures when developments are planned until, as a matter of course, sectoral agencies keep it informed of the flow of development proposals they have under consideration.
7. **International donors and organisations must ensure that they firmly support the EIA Department** when they fund or implement projects that trigger the EIA process. It is not enough for a donor to sponsor EIAs and perform internal EIA review. Donors must be instrumental in ensuring that implementing entities comply with the EIA legislation. In most cases that will mean providing the necessary support to the EIA Department to fulfil its functions. Every EIA should be regarded as an opportunity to build capacity within the department and add credibility to the system.

There are numerous cases where developments have been planned without due respect for the EIA process or MOE's role in environmental review. Many have had potential to affect protected areas or to benefit from their services and products. These development proposals have been initiated by government or the private sector and funded from foreign investments, grants or loans. Often several arms of government have facilitated the plans. In 1997, for example, the government approved an investment plan to develop a casino on the Bokor National Park plateau without an EIA. Even the park director was not aware of the proposal. In this case, the developer did not proceed with the project, but in other situations developments have gone forward.

The key message of this chapter is that EIA is an essential mechanism of government for safeguarding protected areas and identifying opportunities for developers to contribute to their maintenance. Government and the international community must invest in the EIA system so that the development benefits of protected areas continue to flow to the national economy.

## Part 4: Poverty alleviation and protected areas

### 8. Poverty, migration and protected areas

#### The relationship between protected areas and poverty

##### *The extent and distribution of poverty in Cambodia*

Poverty reflects a lack of income or consumption and lack of opportunities. Common characteristics of poverty in Cambodia include: poor education and health outcomes (low capabilities); vulnerability (livelihood insecurity); powerlessness; and social exclusion (e.g. illiteracy, discrimination based upon sex and ethnicity and corruption) (ADB 2001c). During interviews conducted as part of a Participatory Poverty Assessment, poor Cambodians described poverty as: “the inability to be certain that one can use as much of local natural resources as necessary for household purposes or to be able to sell to purchase basic necessities. It is also the inability to be certain that the land one occupies truly belongs to your family and that no one can take it away from you. If you can’t be certain about these two things then you cannot be certain that you will have enough food to feed the family.” (ADB 2001c)

In 1999, approximately 36 percent of Cambodian’s lived in poverty. While this reflected a slight decline in the 1994 poverty rate of 39 percent, the actual number of poor rose from 3.8 million to 4.3 million during that period due to the rapid increase in the total population (CDRI 2001). Poverty is four times as common in rural areas as it is in Phnom Penh and key urban centres (40 percent and 10 percent poverty rates, respectively). Rural households, especially those for whom agriculture is the primary source of income, account for almost 90 percent of the poor.<sup>46</sup>

Protected areas in Cambodia are found in regions of serious poverty (Map 9). These are regions where communities are most dependent on common forest and aquatic resources. Over 87 percent of the communities living in and around protected areas have a “medium” or “high” poverty rating (ICEM 2003a). The Tonle Sap Multiple Use Management Area, the South West cluster of four national parks and the protected areas located across northern and eastern Cambodia are all in areas of high poverty where people lack fundamental amenities of clean water, food and adequate housing (ICEM 2003b). Many protected areas in Cambodia are relatively remote from infrastructure and distant from urban and trade centres. Commercial enterprise in these regions has often lacked consistent investment over the long term to succeed.

##### *Migration and protected areas*

In Cambodia, major changes in habitat in and around protected areas result from human settlement, migration and population growth. Human populations are dynamic - the numbers and distribution of inhabitants in the vicinity of protected areas are constantly shifting due to natural population dynamics, migration and resettlement. Changes in the size of a community and in its characteristics, such as age and gender balance and occupations, can be of great significance to the way it uses and affects protected areas.

<sup>46</sup> Royal Government of Cambodia, *Interim Poverty Reduction Strategy Plan (IPRSP)*, October 2000, at 7. Royal Government of Cambodia, *Second Five Year Socio-Economic Development Plan 2001-2005, National Economic Growth and Poverty Reduction Strategy [Draft]* (Draft SEDPII), October 25, 2001, at 18.

Map 9: Poverty and protected areas in Cambodia

There are two types of settlement patterns within and around protected areas in Cambodia - sedentary (for example, in the south-west cluster of national parks) and nomadic (usually found in the protected areas at high elevations). Migration can be a significant component of demographic change in small communities such as those influencing isolated protected areas. Although, immigration and emigration are not usually documented at the local level, three main migration patterns are observed in regions associated with Cambodia's protected areas:

- Permanent migration (for example, those who moved in right after the civil war, during the national reconciliation process, and after the end of the Khmer Rouge in 1993 and again in 1998);
- Temporary migration (landless migrants who seek work in fishing or in illegal activities in the parks from nearby locations and from other provinces where they suffer from shortages of land and natural resources, and natural calamities such as drought);
- Seasonal migration (especially during the dry season when, for example, they can work in small-scale mining operations).

Those living in poverty are often drawn to protected areas where some of the last remaining "free" natural resources can be accessed. Many areas receiving high immigration coincide with regions in or near protected areas (Map 7). For example, over the past ten years there has been high migration to the south-west cluster of protected areas (Box 5), Samlout Multiple Use Management Area and Kulen-Promtep and Phnom Prich Wildlife Sanctuaries. Government resettlement schemes have also directed poor families to protected areas. In 1998, more than 1000 demobilised military families were re-located inside Samlout Multiple Use Management Area near Cambodia's western border with Thailand. The ensuing clearance of forest and agricultural development have brought increased income to the resettled families but fundamentally changed the nature of the area.

All protected areas and their surrounding regions are experiencing rapidly growing populations through immigration, resettlements and natural growth. Such population growth along with greater access through expansion of the rural road network is leading to the mounting use and importance of protected area services and products for the poor.

For example, each year Ream National Park yields US\$1.24 million in economic benefits – from fishing, harvesting forest products and farming – to the 5,000 households near the park that use it. This amounts to US\$233 annually from Ream for each household, contributing more than two thirds of the average family income of about US\$316 (ICEM 2003c).

### Box 5. Migration and resettlement to the south-west cluster of protected areas

The PAD Review conducted a field study on the economic benefits derived from the south-west cluster of national parks (ICEM 2003c). Almost 25,000 households or 125,000 people live in or directly adjacent to the parks in 23 communes in Sihanoukville, Kampot and Kampong Speu provinces. Overall, the population growth rate is estimated at just under 3 per cent, and there is a very high level of immigration to the region (IUCN 1997).

The pressure on the south-west cluster caused by immigration is acute and can be explained by the findings of the national census conducted in 1998. Sihanoukville and Koh Kong, where the parks are located, were among the provinces particularly attractive to migrants for their economic potential, rich natural resources and, particularly, forest. Roughly 50 percent of the population of these provinces are migrants, and over half have arrived during the previous five years. In contrast, Takeo and Svay Rieng which are relatively poor in terms of economic potential and natural resources have experienced little immigration and high population movements out to other provinces - in particular, to the coastal areas of Sihanoukville and Koh Kong.

Eleven communes surround Bokor National Park, containing some 9,650 households, i.e. 50,200 people. The recent history of this park illustrates well the pressures on many protected areas in Cambodia. During 1992-93 large groups of migrants moved down from the refugee camps in Thailand in the north west down to Bokor. Some 250 families settled inside the park in the south-east corner with semi official approval from the provincial authorities. They cleared forest and established agricultural crops and benefited from water and NTFPs from the park. Later, the area was claimed by private developers for commercial agriculture and it is identified as an agricultural concession on the provincial cadastral map. The complex situation of the land falling within the park, being settled and also identified as agricultural concession for commercial development remains to be resolved.

Another migrant group from the Thai refugee camps settled outside the park on the eastern boundary, and similarly cleared forest within a forest concession area abutting the park and established crops. They too use the park for various products and services as a significant supplement to their livelihoods. In 1993, more than 100 former Khmer Rouge military families were given permission to settle just outside the north east boundary of the park. They proceeded to encroach on the park and clear forest within and outside its boundary. Since then many have sold their land to more wealthy property developers and moved on.

Bokor's neighbouring parks - Kirirom, Ream and Kep - have a similar history. Two communes, Treng Troyeung and Chambak, border Kirirom National Park and contain just under 14,500 people. Except for about 800 soldiers, security police and their families, there is no official settlement inside the boundary of Kirirom National Park (Kim & Taylor-Hunt 1995). Almost 30,000 people or 5,300 households live in the five communes that lie inside and abutting Ream National Park, including the Ream Naval Base. Kep Town and beach resort lie inside the park boundaries and contain approximately 30,000 people, living in five communes.

The communities who live in the villages located inside or directly adjacent to the south-west cluster of national parks come mainly from Khmer, Cham, Pear, Chong and Sóach ethnic groups. The majority are Khmers, although there is a significant minority of Cham living in and around Ream and Bokor National Parks who are engaged in fisheries-related activities. The park populations include a mix of more recent immigrants (most who came to the area during and after the Khmer Rouge era), and longer-term settlers.

The main forms of livelihood for these communities are agriculture, fishing, small trade, contract labouring on large-scale plantations and the collection of forest products. Most irrigated agriculture is rain fed, and there are a few irrigation schemes with storage facilities for householders in the parks adjacent areas. There are few income or employment opportunities, little infrastructure and few services, especially, in the villages lying further away from the main roads, and near to the protected areas. The incidence of rural poverty is extremely high around the south-west cluster. Many households have few alternatives but to depend on forest resources for household income and subsistence. The park forest resources provide an important source of income and employment for many community members, as well as domestic energy, wild foods, construction materials and materials for handicrafts. Sales of fish, trade in wild animals, firewood sales, charcoals production, and timber extraction (either for sale or as hired labour) are all used to generate cash income.

### *The government response to poverty*

The Royal Government of Cambodia has repeatedly affirmed its commitment to alleviating poverty and has recognised the profound link between poverty and sustainable natural resource management. The following list summarises the RGC's evolving policies in this regard:

1. *First Five Year Socio-Economic Development Plan, 1996-2000 (SEDPI)* emphasises rural development in describing a framework for industrial policy-making from 1996 to 2000.
2. October 1999 - The *Policy Framework Paper* states its economic objectives are focused on poverty alleviation and economic growth.
3. October 2000 - The *Interim Poverty Reduction Strategy Plan (IPRSP)*, which "highlighted the government's policy framework, comprehensive strategies and commitment to pull Cambodia and Cambodians out of the shackles of poverty."
4. April 2001 - The *Governance Action Plan* recognises the link between poverty and protected areas: "Fair resolution of [natural resource management] issues are essential to social peace and environmental sustainability, which are, in turn, fundamental to poverty alleviation and economic development."
5. The *National Biodiversity Strategy and Action Plan (2002)* is intended to be "a framework for action at all levels that will enhance our ability to ensure the productivity, diversity and integrity of our natural systems and, as a result, our ability as a nation to reduce poverty..."
6. *SEDP II (2001-2005,)* emphasises poverty reduction through: (1) the promotion of broad-based sustainable economic growth at a rate of 6 to 7 percent with equitable income distribution; (2) facilitation of social and cultural development; and (3) ensuring the sustainable management and use of natural resources and the environment.
7. August 2002 - The *Draft Poverty Reduction Strategy Plan (PRSP)* builds on the earlier policies, particularly the IPRSP, in "spelling out a pro-poor policy framework, a set of comprehensive strategies and action plans" to alleviate poverty.
8. The 2002 Law on Commune Administration was a critical step forward in giving a legal foundation to these broad policies on poverty reduction. The Law facilitates decentralisation of powers to the commune level and greater control over development planning and budgets with involvement of local communities.

Despite government efforts to reduce poverty with assistance from the donor community, it continues to be a central issue of concern to the sustainable use and conservation of protected areas.



## Key issues

***Sustaining local livelihoods and conservation through protected areas:*** The relationship between poverty and protected areas is complex – local communities are constrained by protected areas, but they also benefit from them. The management of natural resources in protected areas can present both potential problems and solutions to the immediate and long-term living conditions of local communities. Poverty reduction strategies to address the needs of these communities must support the stabilising aspects of protected areas while promoting possibilities for economic advancement.

Protected areas act as essential “natural safety nets” for the poor by providing a wide range of goods and services. Yet, empowering the poor as stewards of resources in and near protected areas will not alleviate their poverty, as the income generated by collection of NTFPs and aquatic resources alone is unlikely to lift communities above the poverty line. In conjunction with co-management, the rural poor must be provided with opportunities to gain alternative livelihoods.

Protected areas can play a central role in alleviating poverty in the regions in which they are located; especially when strategies take advantage of the range of services which a group of linked protected areas can offer. Payments for protected area services coming from domestic and foreign interests can benefit the poor through, for example, tourism, NTFP commercialisation and transfer payments from developers.<sup>47</sup>

The most fundamental concern is how poverty in the vicinity of protected areas can be reduced while maintaining the natural systems and the goods and services they protect. Issues related to this overriding question include:

1. How can protected areas be managed to act as socio-economic safety nets for the poor – and eventually provide the basis for improved livelihoods - while ensuring sustainability?
2. How can the presence of major private and government resource developers, such as forestry and agriculture concessionaires and energy projects, benefit protected areas and local communities?
3. How can the needs of landless populations living near protected areas be addressed?<sup>48</sup>

***Migration and resettlement - a threat to protected areas:*** Migration, which occurs with and without government incentives, has two impacts. First, it is a direct threat to protected areas by increasing surrounding population growth and settlement, a search for economic prosperity and the overuse of protected area resources. Second, it stretches to the limit already strained protected area management and staffing capacities. Resettlements and demobilisation, promoted by government, have similar potential impacts.

***The exclusion model of protected areas is not working:*** The model of protected area as areas set aside exclusively for wildlife and wilderness protection and where people can visit under strictly controlled conditions, does not appear to be working. The national system of protected areas is fairly extensively settled and the agricultural frontier is moving in on all sides. Communities are impacting on protected areas in a number of ways:

- Agriculture - incursion by farmers and landless migrants;
- Fishing - illegal & large-scale with destructive equipment;
- Hunting;
- Forest degradation - fuelwood, charcoal, NTFPs, fire and logging for local use.

<sup>47</sup> “Transfer payments” are designed to ensure that the beneficiaries of protected area goods and services pay for their use; and then that these payments, or a proportion of them, go to support effective conservation of the benefits and to local communities who provide or bear the costs of ensuring that these goods and services are conserved. Transfer payments can be a key mechanism for financially recognising the contributions of local communities in protected area conservation and developing a more equitable distribution of its costs and benefits.

<sup>48</sup> For example, the *Draft SEDPII* reports that over 17 percent of rural households in the Tonle Sap region were landless in 1997.

***A lack of community development initiatives around protected areas*** leads local people to participate in the destruction of natural resources, further reducing productivity of land and aquatic systems. For example, the rapid reduction of forest resources in Ream National Park has increased local pressure on marine fisheries with up to 50 percent of farmers now participating in fishing. This trend is exacerbated by an influx of landless migrants and refugees from other more populated provinces, particularly from the Mekong River delta region, and the use of unsustainable techniques by fishermen. Sustainable use of the park's resources might increase the value of biodiversity for all concerned and could well serve to minimise the current long-term risks that people pose to the parks.

### Achievements

Broad strides have been made that address the problems associated with the direct and indirect use of protected areas by poor communities.

***A decline in poverty:*** The overall poverty rate declined from 1994 to 1999 by 3 percent, and appears to have been dropping steadily since 1999. Although modest, these figures demonstrate a positive trend.

***Government policies on poverty and governance include conservation and sustainable use:*** The government's Social Economic Development Plan and the Poverty Reduction Strategy Plan show strong commitments to the conservation of natural resources. A number of achievements can be highlighted which contribute to reducing the population pressure on protected areas and promoting the sustainable use of related natural resources:

- Economic and social policies aimed at poverty reduction;
- Government attempts to link pro-poor economic policy to the sustainable use of natural resources;
- Government actions on decentralisation and rural development;
- NGOs support to education, protection and other community development initiatives in the landscapes where protected areas are located.

While implementation is slow, these policies provide a foundation on which to build strategies for tackling poverty in protected area regions.

***Creation of collaborative managed zones within protected areas:*** The government illustrated its commitment to reducing poverty near protected areas when Prime Minister Hun Sen announced a decision in May 2002 to designate 10 to 30 percent of all protected areas as zones for co-management with local communities. This decision will require significant resources and long-term commitment for its successful implementation. MOE has made a start in Kirirom, Ream and Virichay National Parks and in several other protected areas.

***Conservation and community development projects:*** Efforts have been made by government with support from the NGO and donor communities to reduce poverty around protected areas through community forestry and fisheries projects. These projects will be complemented and strengthened by MAFF's promulgation and implementation of sub-decrees in these sectors.

## Challenges

**Getting the private sector to contribute to poverty reduction:** At the most fundamental level, the implementation of the government's commitment to reduce poverty poses the greatest hurdle. The RGC concedes that it has limited resources and weak capacity, and has therefore called for an expansion of the private sector's role in this effort.<sup>49</sup>

**Getting government resource development sectors to contribute to poverty reduction:** Similarly, those sectors which are attracted to protected area regions for the natural resources and services they provide need to give priority to supporting local communities and sustainable use initiatives. Government sponsored and promoted development projects in those regions should not leave protected areas and associated communities poorer with the benefits going elsewhere.

**Defining rights of tenure, access and use:** Uncertainty over resource-use rights and land tenure within and around protected areas mean that local communities have little incentive to harvest on a sustainable basis or to actively manage the resource base. Uncertainty creates a perverse incentive to harvest as much as possible before others do. Also, extraction methods become more careless and destructive because harvesters work as quickly as possible to escape rangers and forest guards.

**All protected areas in the national system are under economic pressure:** With little budget available for their running and upkeep, protected areas continue to suffer from unsustainable levels of resources exploitation, conversion to agriculture and modification from infrastructure developments. Government and the private sector often view protected areas as economically unproductive and therefore an impediment to poverty alleviation and development in near-by areas. Government resettlement and demobilisation schemes are not assessed for their environmental effects particularly their potential impacts on protected areas.

## Future directions

Poverty reduction is a cross-cutting concern for all arms of government. Each of the sector chapters in this report end with strategies to enhance and maintain the benefits received from protected areas. Many of those strategies are intended to generate additional streams of finance to local areas on a user pays basis, the goal being to ensure conservation of resources while improving the wellbeing of local communities. This section summarises some of those approaches to poverty reduction and focuses on the most important - the key to success will be in defining cross sectoral strategies which apply specifically to communities within and around protected areas and are implemented through cooperation.

### *Strategic approaches to poverty reduction*

**Strategies for community development and poverty reduction are needed for each cluster of protected areas** with collaborative management a cross-cutting theme. Special attention should be given to providing necessary support to immigrants. SEILA and associated initiatives for community development provide useful models that empower people to use natural resources rationally.

<sup>49</sup> Draft SEDPII at 31.

The following considerations are important for defining strategic solutions for poverty alleviation near protected areas:

- Recognising the economic benefits generated from protected areas and the economic cost of their degradation to communities, local and national economies;
- Integrating those benefits into economic and social planning with great care paid to the above-mentioned impacts;
- Establishing land tenure around protected areas and rights of use and access to well defined zones within them; and
- Promoting the government's decentralisation process in regions with protected areas introducing a clear concept of ownership and participatory approach to protected area management.

***The government needs to prepare a national strategy for resettlement, demobilisation and migration*** which directly considers its impacts on natural resources and protected areas, and seeks to minimise those impacts. The needs of seasonal and temporary migrants should be considered and guidance provided on their management. It is clear that migration from relatively poor rural areas to areas relatively rich in natural resources is economically motivated. A comprehensive approach to the problems of migration, settlement and population is needed to minimise the negative impacts on natural resources, which further undermine the long term livelihoods of affected communities and the condition of protected areas.

***All government resettlement and demobilisation plans should receive comprehensive environmental assessment***, especially when protected areas may be affected. Mitigation programs should be designed into every plan so that the use of natural resources is well managed and sustainable and the natural values of protected areas are maintained.

#### *Co-management*

***Co-management arrangements should be established for each protected area and buffer zone:*** The collaborative management of protected areas and abutting regions by government managers and local communities was proposed in the IPRSP.<sup>50</sup> Co-management has been gaining support as a mechanism for reducing poverty and ensuring sustainable use of natural resources near protected areas.

***Establish co-management arrangements within all protected areas:*** The Prime Minister has already laid the ground for collaborative management in specified zones of each protected area by designating 10 to 30 percent of all protected areas as co-managed buffer zones. That directive applies to protected areas management by MOE, MAFF or any other arm of government. The initial step will be to define what part of existing protected areas can be managed in this way. It will vary from one area to another depending on the sensitivity and significance of the conservation assets under protection and will require greater resources than those currently available to MOE. The process needs to be based on an adequate survey of biodiversity and of community uses and priorities. It is important to begin involving communities at this initial survey phase of co-management. Because financial and staff resources are limited, the process should be undertaken country wide in stages by ranking groups of protected areas in order of priority for this kind of action.

***Ensure the new protected areas legislation provides for collaborative management:*** The Ministry of Environment needs to give formal recognition to co-management and the situations in which it applies in the draft Protected Areas Management Law currently under preparation. Initial drafts of this legislation do address the issue.

***Establish co-management regimes in buffer zones:*** Collaborative management within parts of protected areas will have little chance of success if major development takes place up to the boundary without

<sup>50</sup> IPRSP at 37.

similar consultative arrangements in place. The new community forestry and fisheries policies of RGC embrace this concept and need to be further developed and fully implemented through practical regulations and demonstrations, giving priority to those regions abutting protected areas.<sup>51</sup> Many forestry concessions are located near or adjacent to Cambodia's protected areas and MAFF will need to consider co-management options in these situations when reviewing the forest concession management plans submitted by concessionaires. MAFF has an opportunity to greatly reduce the need for poor communities to encroach on protected areas by involving them in the management and use of forests in the surrounding regions. It would also minimise their conflicts with powerful concessionaires.

**Explore community and non-government management of former concession areas:** In cases where concessions are cancelled, or if no concession agreements are renewed, the MAFF should consider using the former forestry concession land for the establishment of protected areas that are under collaborative management and for redistribution to the poor.<sup>52</sup> The large Cardamom Mountains concession has been redesignated as a protected forest to be managed with support from Conservation International. There are opportunities here to pilot collaborative management approaches involving local communities and non-governmental organisations.

**Build capacity in local communities to take on co-management responsibilities:** Moving forward with co-management arrangements requires new skills and capacities within the affected communities. The initial efforts to establish a community committee to manage the multiple use zone of Kirirom National Park has been hampered by community reluctance to take on the responsibility of determining sustainable levels of use. This is as much related to the capacity of protected area managers to support communities with the necessary technical advice and assessments they need to manage their shared resources effectively.

#### *Generating revenues for poor communities*

**Pilot nature based and pro poor tourism developments in priority protected area clusters:** As described in chapter 14 on tourism, the revenue created through tourism from Cambodia's protected areas and their surrounding regions holds the promise to provide direct income for local communities. Local people can earn wages from formal employment, sell goods and services or perform casual labour in the tourism sector. More importantly, they can become involved in co-managing tourism developments.

Already, the Angkor Protected Landscape has achieved the status of a major international tourist draw. A number of other protected areas hold the potential for development as tourist destinations, such as the Tonle Sap Multiple Use Management Area, Phnom Kulen National Park near Siem Reap, Aural and Phnom Samkos Wildlife Sanctuaries in the Cardamom Mountains and protected areas in Ratanakiri and Mondulakiri such as Virachey National Park and Lomphat Wildlife Sanctuary (CDRI 2001). The government, through MOE and the Ministry of Tourism, should sponsor a number of demonstration co-management nature based tourism projects associated with groups of protected areas, which have the greatest immediate potential and access.

However, the risks associated with tourism development in these areas include physical degradation of natural resources, altering indigenous culture and tourist revenues not reaching those who need it most. For tourism to effectively function as a poverty-reduction tool in and around appropriately targeted protected areas, a coordinated inter-ministerial planning process must seek input from affected stakeholders and ensure the sustainable management of the areas.<sup>53</sup>

51 The *Draft PRSP* confirms the RGC's commitment to community forestry and fisheries policies at 51-53.

52 To address the critical issue of landless populations, the RGC has stated that a sub-decree on land concessions will be completed in 2003. *Draft PRSP* at 77.

53 The *Draft PRSP*, at 90-92, describes a policy of "pro-poor tourism development," and specifically calls for the establishment of an inter-ministerial poverty reduction tourism working group and pro poverty development zones, among other initiatives.

### *Promote NTFP commercialisation*

**Allow managed harvesting of NTFPs in protected areas and adjoining forests:** The poor can benefit from low-impact sustainable harvesting and commercialization of NTFPs. The draft protected areas legislation should allow for NTFP collection under specified conditions and zones. Already the new forestry law allows for community harvesting. This practice will be a critical part of the collaborative management arrangements proposed earlier within and next to protected areas. But it should also be piloted elsewhere within protected areas and adjacent forest concessions. Blanket bans on harvesting are not the solution to conservation or poverty reduction.

**Provide economic incentives and market opportunities for NTFP enterprises of the poor:** The government will need to test subsidies and other economic instruments which “kick start” and nurture NTFP enterprises including providing assistance for transport and marketing. This revenue source has the advantage of providing new income streams to the poor without requiring a high level of skill. NTFP commercialisation also allows for product diversification, relatively low labour inputs and high participation by women, as it is traditionally conducted in or near the home.

### *Introduce the user pays principle and mechanisms for transfer payments*

**Recognise the role of transfer payments in the draft protected area legislation:** Transfer payments involve sharing payments made by developers for either protected area goods or services, or as compensation for the loss of access to natural resources.<sup>54</sup> It is potentially the most important option for some areas in the medium term.

**Pilot the use of transfer payments and poverty reduction in one protected area cluster with major planned developments:** The regions linking protected areas can attract numerous forms of investment, from tourism to energy generation to commercial agriculture and industrial schemes. Transfer payments can provide a source of sustainable income to the poor in conjunction with such investments. Sensible development projects, which depend on protected area services, can benefit the poor while providing for increased biodiversity conservation. The system for payments and their management need to be planned along with the project in full consultation with local communities and protected area managers.

### *Inter-governmental coordination*

**Establish collaborative intersectoral forums covering clusters of protected areas:** Efforts to implement co-management and alternative livelihood objectives will require increased cooperation between the relevant ministries and local government entities. Already each protected area has an associated intersectoral conflict resolution committee mainly concerned with solving problems over access and resource use. A poverty alleviation strategy will need to be prepared for each linked group of protected areas, and a forum established to ensure that each arm of government plays its defined part in implementation.

MOE, MAFF and the Ministries of Water Resources, Rural Development, Health and Education, Youth and Sports will need to be involved.<sup>55</sup> At national level, MOE should work through the Council for Social Development, which “is responsible for promoting, coordinating and monitoring development policies and programs in relation to poverty reduction goals of the RGC.”<sup>56</sup> The role of local entities such as village and commune development committees, commune councils and provincial rural development committees should be promoted.

<sup>54</sup> A discussion on the use of transfer payments as tools for poverty alleviation is provided in more detail in ICEM, 2003a.

<sup>55</sup> The *Draft PRSP*, at page 120, indicates that these latter three ministries, along with MAFF, play key roles in poverty reduction.

<sup>56</sup> The Council for Social Development is chaired by the Minister of Planning and consists of members who are Secretaries of State from 14 ministries. Nine more members from other relevant ministries are slated to be added. *Draft PRSP* at 119.

## Part 5: Sector Development and Protected Areas

### 9. Forestry and protected areas

#### The relationship between the forestry sector and protected areas

Despite heavy losses in recent times, Cambodia maintains a wealth of forest resources<sup>57</sup>. In the mid 1970's Cambodia's forest cover stood at 73 percent, dropped to approximately 58 percent in 1999 and has undoubtedly declined significantly since then (World Bank 1998). While the MOE is responsible for protected areas, the Department of Forestry and Wildlife (DFW) within MAFF retains jurisdiction over Cambodia's forests, thus creating overlapping jurisdiction in forests existing within protected areas. It is generally understood that MOE is exclusively responsible for protected areas established through the 1993 Royal Decree. Yet, limited institutional capacity and funding means that it largely relies on the goodwill of DFW staff in enforcing forest crimes within protected areas (ADB 2001a).

While Cambodia's forest cover exceeds that of many other countries in the region, the remaining forests are coming under more intense use as their size diminishes and the human demands for their resources remains constant or, in most cases, increases.

Deforestation is the most common threat to biodiversity in Cambodia and to economic productivity in many key development sectors, such as agriculture, fisheries, tourism, energy and health. The wellbeing of Cambodia's protected areas is therefore intimately linked with the management of its forest. The causes of deforestation include systematic and indiscriminate logging by industrial and small-scale operators, clearing of forest for agriculture, fuelwood harvesting and shifting cultivation by upland populations. Logging is illegal within protected areas, although all have been seriously affected by commercial operations.

In 2001, the rate of extraction of timber, firewood and charcoal was approximately seven times the sustainable level and was expected to decimate the remaining commercial stands within 10 years (RGC 2002). Although logging and harvesting of forest products within protected areas is prohibited by law, such activities continue to occur due to lack of law enforcement, weak protected area management and the influence of the military in facilitating industrial extraction activities. The unsustainable use of forest products limits the ability of protected areas to emerge as one of the pillars of national development.

From 1995 to 1998, much of the land surrounding protected areas was allocated to logging concessions or was being considered for such use. The lack of clear boundary demarcations made it relatively easy for concessionaires to log inside protected areas. Harvested logs could be merged with those in the adjacent concessions. In 1997, for example, an estimated 20 percent of forests within protected areas were affected by high-impact illegal logging (Henderson 1999). Up to mid 2002, extensive illegal logging and encroachment within protected areas continued to be documented (Global Witness 2002).

<sup>57</sup> This report draws upon and should be read in conjunction with the PAD Review analysis of lessons from Cambodia's experience with protected areas (ICEM 2003b).

Fuelwood harvesting is another significant cause of forest degradation in all protected areas including the flooded forests of the Tonle Sap Multiple Use Management Area and the mangrove forests located within protected areas on Cambodia's Gulf of Thailand coast.

In 1998, it was estimated that Cambodia's commercial timber resources would be seriously depleted within five years at the then timber harvesting rates (ARD 1998). Following the general failure by timber concessionaires to redevelop their forest management plans and renegotiate their agreements with MAFF – using the Model Agreement for Forest Timber Concession Management as a foundation – the Ministry issued a regulation in December 2001 suspending all logging concession agreements as of 1 January 2002.<sup>58</sup> In November 2002, under pressure from stakeholders and following an agreement with the World Bank, MAFF released these management plans to the public. This public release was met with widespread criticism by affected communities, NGOs and some sectors of the donor community due to the quality of the management plans as well as the limited time allowed for stakeholders to give their comments.

Most timber concessionaires have submitted management plans, but challenges remain in the capacity of MAFF to assess those plans for their environmental implications and for the companies to meet more stringent conditions. Also, some companies were continuing to violate the logging moratorium.<sup>59</sup> Even so, MAFF's logging suspension and new concession procedures mark a major shift in its approach to the use and management of Cambodia's forest resources.

### Forestry policy

The government has yet to articulate a comprehensive official forestry policy. However, in March 2002, the DFW issued a draft "Statement of the Royal Government on Forest Policy" and solicited comments from stakeholders. This statement sets out the fundamental principles under which forestry policy will be developed within the broad objectives of environmental protection, biodiversity conservation, poverty reduction, economic development and good governance. DFW's draft Forest Policy Statement commits the government "to the conservation and management of the country's unique forest resources in a sustainable way now and for future generations." The Statement seeks to accomplish:

- **Forest resource conservation** – To dedicate the majority of the remaining natural forest stands to biodiversity conservation and to promote conservation and protection strategies with maximum participation of local populations.
- **Poverty reduction** – To legally recognise and protect traditional rights of local populations to use forest resources and to optimise the benefits emanating from them through participation of the local populations.
- **Economic development** – To promote timber plantations as a substitute for timber supply from natural forest stands by encouraging private investment and public participation and optimising the use, processing and marketing system for forest products to sufficiently support domestic demand and export.
- **Good governance** – To implement multi-stakeholder processes, transparency of information flow within the forest sector, capacity building, institutional strengthening and research programs as well as to conduct education, training and public awareness campaigns to promote public participation.

---

<sup>58</sup> MAFF, *Prakas on Suspension of Forest Concession Logging Activities*, December 13, 2001.

<sup>59</sup> Global Witness, 2002. Also, the 30 April, 2 May and 19 June 2002 editions of the *Cambodia Daily* featured articles describing illegal logging, including within Bokor National Park.



The revolution occurring in forestry policy is also emphasised in recent legislation promoted by MAFF. The cornerstone of these legislative initiatives is the Forestry Law, which was six years in preparation and entered into force in late 2002. This law secures user rights for forest products for local indigenous communities eligible to register with the State pursuant to the recently enacted Immoveable Properties Law (the Land Law). Under the Forestry Law, these local communities must sign a “Community Forest Agreement” with MAFF to avail themselves of the user rights. In such an agreement, the local communities undertake to manage the community forest in an economic and sustainable manner and to respect the natural balance of forest resources.

The Forestry Law also provides a coherent framework for concession management. Concessionaires will be required to respect local communities’ user rights, with the ultimate goal being the maintenance of an open dialogue concerning the sustainable management of forest resources between concessionaires and local communities, with the assistance and monitoring by the applicable authorities. User rights include subsistence, non-commercial use and selling/bartering of NTFPs, including common wildlife species. Concessionaires will be required to prepare concession management plans in compliance with the Forest Concession Management Planning Manual, Cambodian Code of Practice for Forest Harvesting and the terms of their particular concession agreement.

In anticipation of the Forestry Law, MAFF prepared a draft Community Forestry Sub-Decree. This draft sub-decree implements the Forestry Law and establishes the structure by which local communities can manage, use and benefit from forest resources. It also defines the rights, roles and responsibilities of responsible government authorities, communities and stakeholders. The donor community has funded numerous community forestry projects in recent years, providing a basis of experience and capacity on which successful implementation of the legislation may proceed.

The draft sub-decree empowers local communities, through a duly elected management committee, to enter into agreements with responsible government authorities to manage and use forest resources and requires them to prepare management plans. While a community cannot use the community forest as a concession or transfer or sell rights granted in a community forestry agreement to a third-party, they are granted numerous rights, including the right to process and sell NTFPs, practice limited swidden agriculture, and harvest and sell timber products under certain circumstances.

Importantly, the draft sub-decree also condones these community forestry activities within protected areas, subject to the approval of MOE.

### Protected areas covering forests

The four most important forest management issues effecting the potential of protected areas to fulfil their potential as a critical development strategy in the sector are:

1. The conservation of forests within existing protected areas;
2. The inclusion of other important and under-represented forest ecosystems within the national system of protected areas, including protected forests;
3. The inclusion of protection zones within forest concessions as buffers to existing protected areas and covering sensitive environmental areas and regions of biodiversity wealth elsewhere in the concession;
4. The role of community forests in achieving sustainable forest use.

All but a small fraction of Cambodia’s protected areas cover forest ecosystems. The original 23 forested areas set aside under the 1993 Royal Decree are managed by MOE. In the past two years MAFF has begun to extend its mandate to establish and manage various forms of additional protected areas. The Forestry Law confirms MOE as the agency having overall responsibility for “protected areas”. In practice,

other terms have been used such as “protected forest” for new and proposed MAFF protected areas which suggest that DFW will continue to be a significant player in managing important parts of the national protected area system. This will be especially relevant as effective regimes of protection are imposed on buffer zones surrounding existing protected areas and within forestry concessions.

In the past two years the following protected area initiatives involving MAFF and MOE have been taken:

- MAFF established the Sarus Crane reserve at Ang Tra Peang Thmor in the north-west of the country.
- An important innovation in protected area concepts took place with the proposal by MAFF of two “gene pool conservation areas” in the north and north-east of the country.
- The declaration in July 2002 of the central Cardamom Mountains “Protected Forest” linking Phnom Samkos and Phnom Aural Wildlife Reserves. A MAFF sub-decree designates the areas as protected forest under the new Forestry Law. The area is also being promoted for World Heritage nomination through MOE (the focal point agency for the World Heritage Convention); a move that was initially opposed by MAFF.
- Prey Long lowland dry evergreen forest, north-west of the Mekong River is under consideration as a World Heritage Site by MOE, but is entirely allocated to concessions managed by MAFF and under intensive logging pressure.
- Proposed extension of Virachey National Park to include significant areas currently under MAFF concessions.
- Mondulkiri dry deciduous forest and grasslands is being considered by MAFF/ DFW for designation as a protected forest but is currently under pressure from conversion of the forest to agricultural land.
- The establishment by MAFF of various “community forests” within concessions in a number of provinces.

Part of the difficulty in taking many of these important initiatives through to formal endorsement by government is the sensitive issue of whether they would entail the handing over territory from MAFF to MOE for management because of their new protected status. It is imperative that these institutional concerns do not impede the development of regimes of protection over critical forest areas. Every sector has a role to play in supporting protected areas, and that role now needs to be clearly defined.

One thing is clear from the ongoing documentation by the government’s former independent forest monitor, Global Witness - while progress has been made, forest clearing followed by agricultural encroachment by commercial enterprises is continuing to significantly reduce the development and conservation values of existing and potential protected areas.<sup>60</sup>

## Achievements

***Regimes of protection introduced as a development strategy in the forestry sector.*** Current reforms to forest policy and law introduce the potential for concession management plans to become vehicles for biodiversity conservation and the establishment of special protection zones. The rapid depletion of forest resources required MAFF to urgently embrace protection as an essential pillar in its sector strategy. The values of forests for development, such as water regulation and quality, soil erosion control and NTFPs, in addition to their timber are to be given greater emphasis in forest management strategies.

<sup>60</sup> In January 2003, the Government sacked Global Witness as the independent forest monitor following the group’s press coverage of an incident outside DFW offices involving community representatives and police.

**Forestry legislation and policy reform:** The Forestry Law, draft Community Forestry Sub-Decree, and draft “Statement of the Royal Government on Forestry Policy” are part of a comprehensive reform package. The forestry policy is currently being developed by MAFF in consultation with related sectors including MOE.

**Moratorium on logging and cancellation of concessions:** MAFF’s declaration in December 2001 to suspend logging and the subsequent cancellation of several concessions for illegal and unsustainable practices holds the promise of a new era in Cambodia’s approach to the forestry sector.<sup>61</sup>

**Establishment of additional protected areas:** The MAFF initiatives to establish new protected areas, for example, the Sarus Crane Reserve and Cardamom Mountains Protected Forest, are a significant contribution to conservation of internationally important biodiversity and the maintenance of development values other than timber.

## Challenges

**All protected areas have been subject to varying intensities of logging:** Bringing destructive and unsustainable logging activities under control and making the concession system work for protection continues to be MAFF’s most pressing challenge. The concessions bordering protected areas are masking harvesting, transport, trading and processing of wood from protected areas. There are still many small scale logging activities associated with armed groups in protected areas. This is a special problem for protected areas near international borders, where small scale illegal logging and transportation of timber and wildlife continues. Map 10 shows key routes where wildlife and timber leave the country illegally. Unclear physical boundaries between protected areas and forest concessions or other forests also lead to violations in the protected areas.

**Most protected areas are a source of firewood and/or charcoal for local communities:** Wood is the cooking fuel for 95 percent of households in rural areas, and for 92 percent of households throughout Cambodia. Although gathering firewood in protected areas is illegal it continues with or without informal consent from protected area authorities. Introducing community managed systems of protection and extraction may best ensure the sustainable use of this renewable protected area product.

## Future directions

### *Distinguish between the roles of MOE, MAFF and other sectors in protection area management*

**Review and revise the national classification and categories of protected area:** Using the term “protected areas” in its generic sense to cover all categories, a clearer definition of protected area categories and their primary functions including those established by MAFF would go some way in helping define roles and responsibilities between different ministries such as MOE, MAFF and the Ministry of Land Management, concerning the conservation of forests in Cambodia. MOE and MAFF should undertake the review as a joint exercise in support of MOE’s drafting of its national protected areas legislation.

**Resolve institutional uncertainties between MAFF and MOE concerning protected areas:** The Forestry Law goes some way to defining the respective roles for MAFF and MOE in protected areas. It states that MOE is the ministry responsible for “protected areas” but the categories of protection which fall within this umbrella are not defined. A practical and more precise definition of responsibilities is needed as the national protected area system is extended and adjusted, and as MAFF promotes protection within production forests. This clarity of institutional roles is essential if a mutually supportive relationship between the two ministries is to evolve for protected areas, forestry and environmental management.

<sup>61</sup> In June 2002, the Prime Minister signed a sub-decree cancelling the contract of Malaysian Grand Atlantic Timber International for illegal and unsustainable practices.

### *Expand and adjust the national protected area system*

The most appropriate primary use of an area can change when more information becomes available. This is the situation with a number of areas within regions set aside for forestry concessions that have been found to have biodiversity of international significance. The primary objective of those areas, for example, might become conservation and community use. A situation may also occur where an area within an existing protected area does not have sufficient biodiversity value to warrant its inclusion within a core zone. Those areas may be better zoned for other uses such as community forestry, agro-forestry or water catchment.

***Include areas of significant biodiversity values within the national protected areas system:*** Recent surveys have identified a number of areas of international biodiversity importance which need to be more carefully defined and included either within the national system of protected areas managed by MOE or as protected forest managed by MAFF. A number of significant marine and wetland areas also need to be formally designated for protection management.

***Review existing protected areas to adjust and mark boundaries:*** It is now time to survey each protected area (including the new protected forests established by MAFF) within the national system and precisely mark their boundaries. Although MOE has now defined boundaries in eight protected areas using GIS in consultation with other sectors, the lack of clear boundary demarcation on the ground is given by MOE and DFW staff as an important reason why illegal activities continue within these areas and are so difficult to control. Therefore, there is a fundamental management reason why boundary definition is essential. There is also the practical reason that the original boundaries were approximately drawn largely through a desktop exercise and that some are likely to include areas which should go to other primary uses.

### *The identification of protection zones within forestry concessions*

***Use concession management plans to define protection zones and practices:*** Already MAFF is committed to the inclusion of comprehensive environmental protection provisions within concession management plans. This proposed strategy reinforces that commitment by introducing protection zones in every concession. Protection zones could include:

- Religious or “spirit” forests;
- Environmentally sensitive areas (e.g. liable to erosion, steep slopes);
- Areas bordering rivers, lakes, lagoons and other water bodies;
- Areas of importance for tourism;
- Areas of importance for research, education and recreation;
- Areas of importance for other sectors such as irrigation, fisheries and energy;
- Ecological corridors linking protected areas;
- Buffers on the border of existing protected areas;
- Community forests and areas of critical importance to the maintenance of NTFPs.

In principle, logging operations should not occur in protection zones within concessions. They would be identified through comprehensive field surveys by MAFF and MOE, and written into concession descriptions. The approved concession “owner” would be obligated to invest in and manage the protection zones as an important element of sustainable forest use and of maintaining the productive potential of the natural system within the overall concession.

Map 10: Wildlife trade in Cambodia

**Identify protection zones within concessions to act as buffers when concessions border on protected areas:** Protection zones along the border with existing protected areas are especially important. Allowing logging up to the border invites illegal activity, but even with the strictest control it has the potential to negatively impact on natural systems within the protected area. In 1999, the Prime Minister recommended that such buffers should extend for 2-3 km from a protected area border. That recommendation needs to be put into practice.

*Applying the user pays principle to finance protection within forestry concessions and protected areas*

**Review the existing system of concession payments to make forest conservation central to concession management:** Private enterprises benefiting from timber within concessions should contribute financially to the maintenance and enhancement of that resource. Currently, the concession holder pays a registration fee of \$2 for every cubic metre of timber within the concession, but it is unclear how much of those funds go to forest rehabilitation and conservation activities in the area.

Each company should undertake essential protection functions specified in the concession management plans by involving company staff and equipment in effectively managing concession protection zones. Each company should also pay directly for the management of concession protection zones in three ways:

1. A concession forest conservation performance bond, which would be refunded on satisfactory performance of conservation requirements when the concession period is completed;
2. A percentage (e.g. five percent) of the original auctioned price received for the concession;
3. A percentage (e.g. two percent) of the market sale price per cubic metre of timber extracted from the concession.

MAFF already has a system of concessionaire payments that should be reviewed to reorient it more precisely to meet forest conservation objectives within each concession.

**Establish concession forest conservation trust funds:** The above-mentioned review should explore the establishment of concession forest conservation trust funds exclusively to support the effective management of protection zones within each concession, for environmental research and monitoring, and for capacity building programs for MAFF and MOE staff involved in protection and environmental work within the concession.

*Capacity building within MAFF*

**Enhance capacity for environmental assessment, survey and conservation management within MAFF:** Responsibility for the national environmental impact assessment process rests with MOE. But the objective of any national EIA process is to have each government sector take responsibility for the environmental effects of their own activities. In the case of MAFF's role in forestry, this includes having the capacity for:

- Biodiversity and environmental surveying and monitoring of concession areas;
- Definition of protection management guidelines;
- The environmental review of concession management plans, particularly with respect to managing protection zones;
- Active participation in protection zone management.

Staff capacity needs to be built up within MAFF, through an active collaborative training program with MOE.

### *Effective control of illegal logging within protected areas*

Establish a special joint MAFF/MOE forest protection force in each protected area cluster to control illegal logging in protected areas: A top priority for DFW and MOE is to collaborate on the control illegal logging within the protected area system. If logging cannot be controlled there, where the exploitation of timber has always been illegal, then efforts at control within concessions will have little credibility.

Already MAFF and MOE collaborate in monitoring and reporting logging infringements within protected areas, but control and follow up by qualified and equipped field staff has not been consistent. Given the current limited number and capacity of MOE protected area staff, a collaborative approach with MAFF is needed. The approach would involve seconding MAFF and MOE staff to a special forest protection force for each cluster of protected areas. The task forces would operate for a set period and with specific authority working to the directors of each protected area in the cluster.

### ***Promote community involvement in protected area and forest management:***

Community forestry has an important role to play in ensuring sustainable forest management in protected areas and areas not suited for commercial exploitation and that are beyond the capacity of governmental entities to manage (World Bank 1999). This might include designated protection zones within forest concessions and special community management zones within existing protected areas co-managed with local communities.

## 10. Agriculture and protected areas

### The contribution of agriculture to development

Cambodia's economy is overwhelmingly agrarian with 85 percent of its population living in rural areas (Table 1 p.35). Agriculture's contribution to Cambodia's Gross Domestic Product (GDP) dropped from 40.9 percent in 1993 to 37.6 percent in 2001, while still employing more than 70 percent of the labour force. Growth of agricultural output has lagged behind population growth and experienced large year-to-year fluctuations, reflecting over-exploitation of natural resources, insufficient investment in the sector and periodic drought. From 1993 to 1996 the sector's average annual rate of growth was 5.3 percent, partly due to exceptional growth in 1995 of 10.5 percent.<sup>62</sup> The rate of growth slipped to 1.4 percent in 1997 and then further to -0.8 percent in 1998. In 2000, the sector decreased by -7.3 percent due to the extensive flood damage to rice crops (MAFF 2000).

In 2001 the agricultural sector recovered from the adverse effects of the flooding with a forecast growth of 6 percent at constant prices, albeit from a low base. This growth is expected to stabilise to around 2-3 percent in 2002 (ICEM 2001).

Rice production remains a determining factor in the growth of the agricultural sector, accounting for nearly one third of the total agricultural value added. But the average yield remains well below those reached by neighbouring countries and is often effected by flooding and drought. In 2000, rice production was hit hard by a series of floods and, as a result, declined by almost 4 percent. There is significant scope for growth in rice production, given the current low yields and potential increases in area under cultivation from further land mine clearance.

In 2000, cultivated areas for other agricultural crops stagnated, leading to a slowdown in the growth of production to 3.3 percent. The following year growth in the production of other crops recovered reaching 11.6 percent. Rubber has been one of Cambodia's main cash crops. Rubber production has stagnated in recent years following the drop in rubber prices on international markets, and with yields well below their pre-1970 levels, largely reflecting the ageing of rubber trees. The government privatised all seven state-owned plantations in 1999.

### Relationship between agriculture and protected areas

Most protected areas in Cambodia cover forest ecosystems. Even the Tonle Sap Multiple Use Area was established primarily to cover the flooded forest areas around the Great Lake.<sup>63</sup> The protected areas are forested islands within a sea of agriculture and production forest. No protected areas have been established within the agricultural landscape and, until recently, protection has not been seen as an essential development strategy of the sector.

<sup>62</sup> At constant prices

<sup>63</sup> Although Prek Toi, one of the three Tonle Sap Biosphere Reserve core zones, is effectively a multiple use area including fishing, agriculture and collection of NTFPs.



The three multiple use areas (Table 2) come closest to qualifying as protected areas which formally embrace agriculture and protection as one productive system. Officially, multiple use areas are IUCN protected area category VIII – that provide for the sustainable use of water resources, timber, wildlife, fish, pasture and recreation with the conservation of nature primarily oriented to support these economic activities (IUCN 1994). In practice, agriculture is an increasing part of these areas and, as in all protected areas throughout the country, agricultural encroachment is degrading the development services and products which protection provides to the sector.

**Table 2. Cambodia's multiple use areas**

Multiple use area	Size (ha)	Location
Dong Peng	27,700	Koh Kong
Samlaut	60,000	Battambang
Tonle Sap	316,250	Kompong Chang, Kompong Thom, Siem Reap, Battambang and Pursat

An appreciation of the relationship between agriculture and protected areas requires an understanding of the geography of Cambodia. Apart from those of Tonle Sap, and the Stung Treng Ramsar Site, all protected areas fall outside the great central plain of the country where most agriculture takes place. The plains result from long-term deposition originating from the mountains in Cambodia and from sediments carried into the plain by the Mekong River. Heavy silt loads in the Mekong River assure fresh annual deposits of fertile soil over the deepwater and recession rice areas.

The Mekong River rises and falls approximately 9m each year, the water level influenced by melting snow in the Himalayas and rainfall in China, Myanmar, Vietnam, Lao PDR and Thailand. In Cambodia, the river passes through the provinces of Stung Treng, Kratie and Kampong Cham until it converges with the Tonle Sap River at Phnom Penh. When it reaches Phnom Penh, the water divides into the Mekong and Bassac Rivers and flows to Vietnam. As the river level rises in the wet season, some water also flows back into the Tonle Sap Lake. The lake expands during the flooding reaching 25,000km<sup>2</sup> in area between May and November (Map 3). Receding water from the large reservoir flows primarily down the Bassac and Mekong Rivers and feeds many irrigation areas in Kandal, Prey Veng and Takeo provinces.

During the wet season, flooding rivers also flow up hundreds of small tributaries and channels that are connected to lakes and small ponds. The lakes are allowed to flood and, as the main river begins to recede, the access ways are blocked off with barriers erected by farmers to retain the water for dry season crop production. Crops are planted along the edges of the flooded areas and, as the water recedes during the dry season, water is pumped back onto the crops where possible.

The central plain includes many critical natural features requiring protection for the continued productivity of the agricultural sector. As in other sectors, this can be achieved through two main strategies – one is through the imposition of activity specific controls to encourage sustainable practices, and the other is by the establishment and effective management of linked networks of protection zones.

### Agriculture policy

MAFF retains jurisdiction over Cambodia's agricultural policy and development, and has announced a strategy that includes the promotion of diversified farming methods, agro-forestry and protection and management of key watersheds.

The 2001 land law clarifies rights relating to land, including ownership and concessions of state private land, and the process by which land is transferred by sale or succession. The law only applies to “land concessions” for industrial crops, and not to other arrangements such as fisheries concessions. It allows the state to grant a non-transferable land concession by contract to a private person for up to 10,000 hectares of “private” state land. The maximum duration of a land concession is limited to 99 years. The law declares that all property identified in Article 58 of the Constitution is “public state land” and cannot be sold or leased.

The government has set a clear objective for the development of agriculture “to ensure food security and natural resources conservation”.

The agricultural development strategy rests on two pillars – the first embraces rapid, sustained and equitable agricultural growth as well as empowerment of the poor (MAFF 2000). The aim is to invigorate and modernise the agricultural sector, generate employment, enhance household incomes and improve access to food for the less privileged. The strategy seeks to promote productivity through the adoption of appropriate technologies such as small-scale, farmer-controlled, private irrigation facilities and crop diversification.

The second pillar empowers farmers, rural poor and other vulnerable groups to participate in the growth process. It focuses on improving access to land, water and other production inputs for sustainable livelihood, food security and overall socio-economic development.

The strategic framework for agricultural development includes:

- Accelerated and sustainable irrigation development including a greater degree of water control (and drainage) by farmers;
- Development of highly productive and diversified farming systems;
- Accelerated program for titling and distribution of agricultural lands;
- Improved management and introduction of appropriate technologies for rice, fish farming and aquaculture;
- Promotion of community-based forestry, agro-forestry-livestock farming systems and protection and management of critical watersheds.

Protected areas and zones within agricultural landscapes have a key role to play in each of those strategies.

### Protected areas as an essential development strategy in the agriculture sector

Formal protected areas and protection zones within agricultural landscapes provide many services and products which are essential to agricultural productivity and which need to be managed and conserved.

**Water supply and regulation:** Most of the Cambodia’s agriculture is watered directly from natural sources and, for this to be sustained, it is necessary to protect these sources. The current system of protected areas covers many of the most important watersheds and plays a dominant role in storing water and regulating the agricultural water regime. For example, the south-west slopes of the Cardamom and Elephant Mountains receive annual mean rainfall of 3600 mm and up to 4,000 mm. Rainfall drops to 1,750 mm to 2,500 mm in the agricultural land surrounding the protected areas so these are essential catchments for local water supplies and irrigation.

**Pollination and pest control:** Wild animals and insects are the principal pollinators of fruit trees and major staple crops in Cambodia including cassava, yam, sweet potato, taro, beans, coffee and coconut. Pollination is an essential ecosystem service provided by protected areas and relict areas of natural vegetation. Protected areas also provide pest control services by maintaining the habitat of insects and animals that prey on agricultural pests.

**Maintenance of soil quality and abundance:** Protected areas, both formal and informal, protect cultivated land from excess runoff and erosion, and maintain and enrich the nutrient cycle. The colluvial-alluvial plains result from natural erosion of surrounding hills and mountains in and around protected areas. These soil are nutrient rich and deposit in agricultural regions that surround the protected areas.

**Maintenance of local precipitation regimes:** The relationship between natural forests and rainfall in adjoining agricultural areas is not fully understood. But, in

Cambodia, there is much anecdotal evidence from observations of local farmers that forest loss within protected areas and concessions has changed local rainfall patterns and affected agricultural productivity.

**Protection from wind and storms:** Farmers around Bokor and Virachey National Parks give storm and wind protection as among the most important services which those forested areas provide. The use of smaller scale protection zones within agricultural landscapes has been used throughout the world as a strategy for reducing storm damage.

**Maintenance of genetic resources and biodiversity in farming systems:** Cambodia's protected areas are the repository of genetic resources of untapped agricultural potential. Also, the countries agricultural systems are unusually diverse and networks of protected areas are needed to maintain this rich store of material *in situ* – gene banks and botanical gardens are not adequate strategies. Crop cultivation in Cambodia is largely dependent on traditional cultivars, old varieties and native land races evolved over thousands of years within the country. Almost 80 percent of cultivated area is used for local unimproved crop varieties. This traditional agriculture relies on a diversity of rice strains and a diversity of associated rice ecosystem species to provide food security and stable production. Over 2000 different strains of rice are used in Cambodia (Smith 2001). Agro-biodiversity is essential to maintaining stability in agricultural systems and to food security, especially in poor communities more vulnerable to seasonal fluctuations in productivity.

### The urgent need for regimes of protection in the agriculture sector

**Loss of genetic diversity and agricultural potential:** Strategies for increased crop and livestock yields focus on improved forms and, by default, traditional ones are lost. Small farmers who maintain crop genetic diversity in the form of local cultivars are inclined to change to improved hybrids to increase production. The erosion of genetic resources is also resulting from encroachment, overuse and degradation in protected areas and remaining natural ecosystems.

**Loss of stability in agricultural systems and reduced food security:** The traditional agricultural systems are diverse in structure and species composition giving them greater ecological stability – and stability through diversity means food security. Should some crops fail, others will produce. Modern agriculture has produced economic gains, but it has sacrificed stability. Ecosystem stability and food security are also directly related to the maintenance of the remaining natural areas within agricultural landscapes. Yet, modern agriculture has become a major factor in the destruction of natural ecosystems and the elimination of species. Agricultural efficiency is equated to simplification. To be a 'good' farmer has meant to clear land and eliminate wild species and habitats.

**Agricultural encroachment:** The development services provided by protected areas are being reduced by steady encroachment from subsistence and commercial agriculture. Agribusiness and agro-industry in and around Ream, Bokor and Kep National Parks, for example, combined with lack of regulation and land use zoning control, are having serious long term impacts on those protected areas.

Shifting cultivation is also commonly used for clearing forests in protected areas for agricultural land leading to loss of biodiversity, soil erosion and habitat destruction. After the crops are rotated off the area, forest regrowth is often retarded, especially as traditional cycles of cultivation and fallow are being shortened. Encroachment is causing sedimentation of water reservoirs used for irrigation and drinking water. It has the potential to reduce the lifespan of hydropower and irrigation schemes associated with protected areas. Expansion of cultivation areas for crops, such as dry season rice and dry season crops (e.g. corn, beans, sesame and tobacco) has reduced valuable flooded forest areas around Tonle Sap and the contribution these wetlands make to productivity in the fisheries sector.

Fires escaping from stubble burns that erode protected area margins, and invasive alien species of plants and birds that aggressively compete with native species, are bringing about rapid changes in the composition and structure of affected areas damaging their capacity to sustain the environmental services needed by local agriculture.

**Decline in pollinators:** Agricultural production is threatened by declining populations of pollinators worldwide. Major contributors to this decline in pollinator populations are habitat fragmentation, agricultural and industrial chemicals, parasites and diseases, and the introduction of invasive alien species. It is necessary to identify adaptive management practices that minimise negative impacts by humans on pollinators, promote the conservation and diversity of native pollinators, and conserve and restore natural areas necessary to optimise pollinator services in agricultural ecosystems.

**Increasing use of chemicals:** Not only has local biodiversity, much of which is fundamental to local lifestyles and livelihoods, been degraded but the chemicals used to attack unwanted biodiversity (pests, diseases and weeds) have accumulated and been transferred to ecosystems and species removed from the crops and soils to which these chemicals were applied. Chemical use is still relatively low in Cambodia, but there is pressure on farmers to increase production through their application and existing use is causing localised problems. Improper use has led to cases of eutrophication, poisoning, loss in soil productivity and degradation of wetland habitats. Agro-chemical and bacterial contamination from livestock and people is particularly serious during the dry season.

## Achievements

**MAFF has proposed the establishment of two “gene pool conservation areas”.** All protected areas act as gene banks. Yet, the proposed designation of two gene pool conservation areas covering forest systems is an important step by MAFF in acknowledging the importance of maintaining endemic plant and animal stocks *in situ* as a sound investment. Yet, as most protected areas in Cambodia serve as gene pool conservation areas for forest systems, the establishment of protected areas to conserve agricultural genetic resources would be more significant.

The government's agricultural strategy promotes diversified farming systems, agro-forestry and protection and management of critical watersheds. Those strategies, and their direct link to the maintenance of protected areas and biodiversity are key to maintaining stability in agricultural systems and therefore to food security.

***The significant protected area contribution to the supply and regulation of water for agriculture is recognised.*** Populations are expanding and bringing agricultural activities to the edge of protected areas, including subsistence plots, market gardens and commercial operations. Every protected area in the country is contributing as a source of water to expanding agriculture either directly, through streams and rivers and through irrigation systems, or indirectly through their influence on local climate. Farmers and commercial operators acknowledge this contribution, although it is treated as a free service. The government has a program to expand irrigation facilities, which will increase the importance of protected areas to agriculture as a repository and regulator of water.

### Challenges

***Establishing regimes of protection as a development strategy in the agriculture sector.*** As modern agriculture methods and hybrids are introduced, government will need to establish protected areas to safeguard the areas of origin and representative samples of local agriculture genetic resources and ecosystems.

***Uncertain tenure and resource use rights,*** particularly in the regions surrounding protected areas leads to irresponsible development that degrades watersheds and their potential to support agriculture.

***Encroachment is degrading natural systems.*** 5 to 10 percent of all protected areas are affected by agricultural encroachment especially in the most densely populated southern and western regions of the country. In many cases powerful people and military take the land.

### Future directions

Agriculture has been compromised by unsustainable practices in which its critical natural elements have been squandered leading to falling production for unit effort. Conventional approaches to protected areas as islands in agricultural landscapes are no longer meeting the need; economic productivity and the biodiversity conservation that underpins it can be achieved only by extending protected area concepts throughout the whole agricultural landscape. This implies:

- Adopting a landscape perspective as a basis for agricultural planning and management in which protected areas and regimes of biodiversity protection are directly linked to maintaining agricultural productivity;
- Focusing on understanding and working with native biodiversity (both wild species and those that constitute local agricultural biodiversity) and the ecological processes important for sustainable agricultural production; and
- Developing and adopting measures to encourage native biodiversity throughout the agricultural landscape, wherever possible linking this with more formal protected areas through protection corridors and zones.

#### *Prepare a national plan for protected areas in the agriculture sector.*

MAFF and MOE should collaborate to prepare a national plan for the establishment and management of a comprehensive system of protected areas and zones in agricultural landscapes.

*Establish protected areas to conserve critical agricultural landscapes.*

Centres of origin of plant and animal varieties needed to be identified and protected as the richest source of genetic material. Increasingly, secondary areas of adaptation also need protection as places where local evolution of species has led to new cultivars adapted to local conditions. The maintenance of populations of local crop cultivars in the natural habitats where they occur is important to the long-term development and economic competitive advantage of agriculture in Cambodia.

The national system of protected areas should be expanded to include those natural areas and landscapes that are hotspots for crop species diversity. Such areas are inextricably linked to the maintenance of cultural and social diversity.

*Establish agricultural protection zones and corridors to preserve native biodiversity.*

In most agricultural landscapes, even those with intensive farming systems, a considerable area is not farmed. There are many unused or lightly manipulated areas that harbour native biodiversity at a local scale and help to sustain agricultural productivity. These important areas include:

- Streamside vegetation, natural waterways, irrigation canals, untilled and ungrassed water catchment areas and farm drainage ways;
- Community forests, vegetation filter strips which trap sediment and facilitate breakdown of agrochemical residues and uncultivated strips between crop fields;
- Windbreaks, border plantings and “living fences”<sup>64</sup> along field boundaries;
- Irrigation bunds, vegetation barriers planted to reduce surface soil erosion and promote water infiltration, and areas taken out of production to control salinity, or abandoned as a result of salinisation;
- Areas along roadsides and railways, “sacred groves”, temple grounds, burial grounds and recreational areas; and
- Areas of cultural or historical significance.

Vegetation along rivers and around ponds, lakes and lagoons has particular value for the conservation of natural services to agriculture. It serves as protection against storms, bank erosion, as a filter of sediment washed from the land and as a source of organic matter and nutrients for aquatic life. Also, through shading, it helps maintain conditions favourable to native aquatic life. Investment in the enhancement or rehabilitation of degraded watercourses and their fringes can greatly boost the biodiversity values of agricultural landscapes.

*Work through Farmer Water User Groups/Communities and Village Development Committees to manage agricultural protection corridors and zones.*

Farmers hold the key to effective management of the networks of agricultural protection zones. But they must be convinced of the direct development benefits that they receive.

*Pilot water catchment committees*

Cambodia should explore the usefulness of water catchment committees as one way of extending farmer and stakeholder participation in protection management on an agricultural landscape basis. Each committee would adopt a regime of protection and varying intensities of use, for example:

- 10 percent of a catchment could be managed as formal protected area for ecosystem services;
- 20 percent as agricultural protection zones and corridors;
- 30 percent managed for intensive use; and
- 40 percent managed through production systems designed to deliver balanced economic and conservation outcomes.

---

<sup>64</sup> “Living fences” are fence posts that grow – from freshly cut thick stems of tree species that, when fixed vertically in the ground, regenerate as cuttings.

The actual proportions in each catchment would be defined on the basis of existing land uses and ecosystem assessments. The overall aim would be enhancing productivity, reducing land degradation, conserving native biodiversity, enhancing water quality and supply, sustainable agricultural management practices and maintaining community values and ties to native ecosystems.

*Promote agro-forestry in protected area buffer zones*

Intensive industrial and commercial agriculture should be discouraged in regions adjacent to formal protected areas. Increasing attention needs to be paid in these areas to agriculture which embraces mixes of annual and perennial crops and which reflects the structure and species composition of traditional agricultural systems and the adjoining natural ecosystems. The development and promotion of sustainable agro-forestry is important for protected area buffer zone management.

*Expand the national system of protected areas in the floodplain and covering important wetlands*

Modern irrigation depletes wetlands from which water is extracted. Traditional water resource management for agriculture has sustained wetlands even while making water available for crops. Much greater attention is needed to protect the traditional productive wetland-agriculture associations which are found in Cambodia (this theme is discussed further in Chapter 12 on water resource management).

*Introduce a system of financing protection based on the user pays principle*

Each commercial operator in the agriculture sector should pay a fee for the protection of critical ecosystem services and products. Issuing land concessions for industrial agriculture provides an opportunity for the user pays principle to be applied in financing protection. Industrial and commercial enterprises should be required to invest in protecting ecosystem services and products within the catchment. The fee could be 10 percent of the existing concession charges and a percentage of profits from the enterprise (e.g. two percent). These resources should be channelled to protection trust funds managed on a protected area cluster wide or water catchment basis.

## 11. Fisheries and protected areas

### The contribution of fisheries to development

Cambodia is heavily dependent on its freshwater and marine fisheries to provide livelihoods and nutrition to its people. The Tonle Sap system alone places Cambodia as one of the top freshwater fish producers in the world. Freshwater fish capture tonnage has been increasing while the catch per unit and value of the catch has been decreasing.

In 1999, the commercial fish production was 284,100 tonnes, which included marine and inland industrial and small scale fisheries and aquaculture production (MAFF 2000b). Freshwater fisheries was the dominant category, with 81.3 percent of total production, with marine fisheries at 13.4 percent and aquaculture around five percent of the total. Estimates of commercial and subsistence inland fisheries are 300,000 to 400,000 tonnes each year, placing Cambodia fourth among the world's top freshwater fish producers (Nao and van Zalinge 2000).

Freshwater capture fishing occurs on three levels - industrial, artisanal and family or subsistence. From 1994 to 1997, family fisheries were the most important producers followed by artisanal and industrial fisheries. Tonle Sap maintains a central role in Cambodia's freshwater fish capture. It accounts for 60 percent of the nation's production in this sector and more than one million people depend on it for their livelihoods. The lake also maintains remarkable biodiversity as a breeding and feeding habitat for fish and other aquatic animals and as a habitat for migratory birds and other species that move back and forth within the Mekong-Tonle Sap floodplain.

Total production of aquaculture has increased from 1,600 tons/year in 1984 to 15,000 tons/year in 2000. Aquaculture is becoming increasingly important in the Tonle Sap-Mekong system as the usage of fish cages increases (ADB 2001a).

#### *The fisheries sector is under stress*

Concerns that fisheries resources have been over exploited are widespread. The overall tonnage of fish caught in the Mekong system has increased reflecting the increasing fishing effort, rapid improvements in fishing equipment technology, position fixing and catch preserving techniques. But there has been a consistent decline in the catch per unit effort and in the value of catch. Also, there has been a reduction in the catch of some long-lived species, and a shift to those that are smaller and short-lived (Sverdrup-Jensen 2002).

Small scale fishers are also suffering from the destruction of their set fishing gear by motorised boats (Tep et al 2000). Communities complain that they are unable to monitor and control illegal activities in their locality. Even when illegalities are reported offenders are not necessarily apprehended. The development of new fisheries has occurred with little consideration of stocks or the consequences of harvesting methods.

Yet, changes to land use in the floodplain are the main impact on freshwater aquatic systems. A major threat to sustaining capture fisheries in the Mekong system is environmental degradation arising from the activities of other sectors (Sverdrup-Jensen 2002), including:

- Destruction of spawning grounds or dry season refuges by habitat alterations;
- Local changes in the quality and quantity of water;
- Construction of dams, weirs or diversions which act as physical barriers to fish migration;
- Increased sediment load due to deforestation.



The expansion of agriculture, forest loss and urbanisation, particularly in the coastal zone, and increasing population has all added to the pressures on aquatic environments.

Most of the overall productivity of the freshwater fisheries sector comes from the seasonal inundation of the floodplain. During the dry season natural spatial refuges and nursery areas have a critical role in the protection and supply of fish stocks. If those areas are lost, fisheries collapse. Similarly, for marine fisheries, natural spatial refuges such as inlets, lagoons and mangrove systems are essential to stock maintenance. Those critical natural areas need to be protected.

Although less studied than freshwater fisheries, the marine fisheries appear to be declining especially in inshore areas, which have been the primary location for Cambodia's marine fishing effort. This is due to a combination of factors - including illegal industrial fishing by foreign operators, illegal fishing practices such as the use of dynamite, the destruction of coastal mangrove forests and river and coastal sedimentation.

Overexploitation, combined with water pollution, introduction of exotic species and degradation of fish breeding areas and habitat threaten to undermine the critical role fisheries play in the everyday life of most Cambodians.

### Institutional arrangements

The Department of Fisheries (DOF) within MAFF is responsible for the management of Cambodia's fisheries, and regulates industrial and medium scale (artisanal) fishing operators through a licensing system. DOF initiated fisheries reform measures in 2001 when it opened up over 50 percent of the fishing lots for use as communal fishing grounds. Further evidence of a decentralisation of control over fisheries is evident in Stung Treng province, where a Fisheries Community Commission has been established to manage local fisheries and create protective regulations.

DOF has designated a number of aquatic regions as fish sanctuaries where fishing is prohibited. DOF has also prepared a draft Fisheries Law and draft Sub-Decree on Community Fisheries, which are both currently undergoing government review.

### Protected areas as an essential development strategy in the fisheries sector

Protected areas of various kinds play an essential role as an insurance policy in the fisheries sector. Protection of key habitats in the life cycle of important stocks reduces fish mortality, increases fish density and individual size, maintains total fish biomass compared with exploited areas, increases reproductive output per unit area, and sustain fisheries outside the protected zones due to movement of adult fish, eggs and larvae.

Protected areas can protect representative ranges of species and habitats in situations where single-specie approaches to conservation are unlikely to succeed. They promote biodiversity and stability by protecting species and unique habitats. Protected areas also safeguard key habitat areas in the face of widespread habitat degradation, and contribute to the recovery of damaged areas. Protected areas are a mechanism for sustainable exploitation of fishery resources.

As a rule, to safeguard against fishery collapse it is desirable to set aside permanent reserves covering 10 to 20 percent of the breeding, nursery and migratory areas (Russ 1996). The DOF has received funding through the World Bank to carry out consultations with stakeholders and fishing communities on the idea

of establishing sanctuaries within or surrounding their fishing areas. Following consultations involving government officials, local communities, fishers, and fish farmers in Battambang, Siem Reap and Pursat Provinces, the establishment of fish sanctuaries was supported, with a strong recommendation that they be fully protected from illegal fishers.

### *Fish sanctuaries*

Protected areas established by DOF are called “fish sanctuaries”. Since the end of the civil war in 1979, 13 fish sanctuaries have been established in the Tonle Sap-Mekong system including the deep hole reserves on the mainstream between Kratie and Khone Falls to preserve inland fish brood stock for spawning and nursing from one flooding season to the next (Table 3 and Map 2). These sanctuaries are protected under the KRET-CHHBAB/33 Kra. Char/9 March 1987 on Fishery Management in Cambodia which states that “[a]ll kinds of fishing activities in fish sanctuaries are absolutely forbidden, except scientific fishery research conducted by the Department of Fisheries with special permission”. There have been difficulties in enforcing protection in these sanctuaries, which has led to a shift to community established protection areas.

**Table 3: Fish Sanctuaries established by DOF**

<b>Fish Sanctuary</b>	<b>Area (ha)</b>	<b>Location</b>
Kampong Pluk	6,377	Tonle Sap Lake (Siem Reap)
Piek Kantel	1,230	Tonle Sap Lake (Battambang)
Dey Roniet	5,826	Tonle Sap Lake (Pursat)
Riangtil	1,859	Tonle Sap Lake (Pursat)
Kampong Prak	3,954	Tonle Sap Lake (Pursat)
Chroy Sdey	1,490	Tonle Sap Lake (Pursat)
Pi Stuon	1,031	Tonle Sap Lake (Kampong Chhnange)
Bar Lord	1,777	Tonle Sap Lake (Kampong Thom)
Lot No. 14	691	Takeo
Lot No. 10	30	Kampong Cham
Lot No. 10	115	Kampong Cham
Lot No. 3	9	Banteay Meanchey
Lot No. 4	3	Banteay Meanchey
<b>Total</b>	<b>24,392</b>	

Sites supplied with fish from protected areas will be more resilient to overfishing. For example, many species of freshwater fish such as *Pangasius* migrate upstream in Stung Treng and Kratie Provinces, spawn and hatch, then the larvae drift down the Mekong River to the Tonle Sap Great Lake and the Bassac Marshes and other delta areas downstream from Phnom Penh. For this reason, the government set up fish sanctuaries in many pools of Stung Treng and Kratie to protect spawning stock of migratory species. Aquatic protected areas established by the DOF in Stung Treng and Kratie have provided a basis

for protection of some endangered species such as giant catfish and the freshwater irrawady dolphin. Little is known about the migratory behaviour or breeding habitat requirements of most species, though it is clear that the floodplain is a crucial part of the habitat and is responsible for the productivity of the system.

In addition to protection through designated fish sanctuaries in open water environments of Tonle Sap and the Mekong system, the DOF and units within MAFF have protected inundated forests within the Tonle Sap Multiple Use Area and mangrove forest along the coast for their fish spawning and aquatic species nursery functions. Clearing or cutting of these forests is prohibited.

#### *MOE protected areas as fish sanctuaries*

While not designated as fish sanctuaries, most MOE protected areas contribute to localised fisheries productivity by maintaining river, lake and coastal habitats. At least seven of the MOE protected areas are associated with major natural water systems, four marine and three freshwater. Also, MAFF has recently established the Sarus Crane Reserve at Ang Tra Peang Thmor which is a significant wetland and fisheries centre. Other wetland sites have been identified for protection including a proposed marine protected area around the three islands off Kiri Sakor District in Koh Kong province (Table 4).

**Table 4. Protected areas which include or influence significant aquatic ecosystems**

Protected area	Area (ha)	Location	Type of aquatic areas influenced
Kep National Park	5,000	Kampot	Marine
Ream National Park	21,000	Sihanoukville	Marine
Botum Sakor National Park	171,250	Kampot and Sihanoukville	Marine
Peam Krasop Wildlife Sanctuary	23,750	Koh Kong (Koh Kapik wetland and associated islets)	Marine
Beng Per Wildlife Sanctuary	242,500	Kampong Thom	Inland wetland
Tonle Sap Multiple Use Area	316,250	K. Chhnang, K. Thom, S. Reap, B. Bang, Pursat	Inland wetland
Stung Treng Ramsar Site	14,600	On the Mekong River between Stung Treng and the border with Lao PDR	Inland wetland
Sarus Crane Reserve		Ang Tra Peang Thmor	Inland wetland
Proposed marine protected area		Koh Kong province, Kiri Sakor District	Marine

\* *Tonle Sap multiple use area includes a number of fish sanctuaries and other protection zones.*

#### **Fishing communities and protection zones**

In 2001, the government embarked on a significant reform of the fisheries sector by improving community access to commercial fishing lots covering most of the traditional fishing areas. 56 percent (495,000 ha) of officially auctioned fishing lots in 12 provinces were repealed for use by the poor as communal fishing grounds.

In Stung Treng Province, local communities have set up a Fisheries Community Commission as well as Fisheries Community Regulations to help manage these common fisheries areas (Chea and Sean 2001). Some pools are given the status of "protected zones" by these regulations. All regulations prohibit catching fish by using dynamite, electro fishing and specify permitted sizes of gillnets in the pools. The creation of Village Fisheries Communities and local protected areas of various kinds is an important pilot in sustainable fisheries through local management. Country wide 217 fishery communities have been established and fishermen pledged to work as watchdogs, reporting illegal fishing to police.

The approach is also being taken with communities living near or within the boundaries of fish sanctuaries or protected areas with aquatic environments. For example, people living within Ream National Park make their living from fishing within and around the park with restricted gear. Community involvement in the protection and management of the park is vital for the continued productivity of the fisheries. Park staff are working with villagers to introduce community-based natural resource management as the foundation for local development.

While the protected area system has been progressively expanded by national government, it is now being augmented by an increasing number of areas established by local communities. Each of these protected area categories has an important role to play in maintaining and enhancing fisheries productivity.

### Key issues

A number of important factors are making it especially urgent to establish a comprehensive system of protected areas to maintain fisheries productivity.

#### *Sedimentation*

Extensive land degradation and associated erosion has increased. Although no scientific data exist, there are anecdotal reports that deforestation in the upper catchments and inundated forests have caused increased turbidity, sediment deposition and reduced fisheries productivity (MOWRAM 2001; ADB 2001a).

Sedimentation in Tonle Sap Lake has become a problem. Some fish sanctuaries in the lake, which once had deep water all year round, are now becoming shallow or drying up during the dry season. So fish are forced out of sanctuaries into areas where fishing is allowed.

In addition, some deep pools downstream of dams and essential for fish breeding and as nurseries have been lost as a consequence of changes in flow regimes and sedimentation (Poulsen and Valbo-Jorgensen 2001).

#### *Pollution degrading water quality*

In coastal areas, soil erosion and sedimentation come from inshore development and deforestation. Sediments and turbidity reduce light penetration and the addition of nutrients from raw sewerage favours algal growth, reduces coral recruitment and smothers benthic communities – all with negative implications for the health of fish populations. In a monsoonal system the inshore marine environment is adapted to seasonal surges in sediment and turbidity so more research is needed to assess the impacts on Cambodia's marine fisheries.

On the land surrounding Tonle Sap Lake and along the coastline, farmers use insecticides and fertilisers for their plants and rice. Rain causes infiltration of these poisons into the lake and seawater in fish nurseries and breeding areas. In 2000, around 1.3 million litres of pesticides were used in the lake's catchment area, including many highly hazardous chemicals illegally imported from neighbouring countries. It was recently reported that 10 tonnes of DDT and Folidol (methyl parathion) had run-off 2000 hectares of mung bean crops into the Tonle Sap (Tep et al. 2000). There have been no studies in Cambodia on the level of dangerous chemicals in fish – and thus there is no research on the potential impact of poisoned fish to humans.

Eutrophication is a growing threat to aquatic biodiversity in Cambodia. Its immediate effect is at the bottom of the food chain, rather than at the top. It is a biological process initiated by excessive nutrients caused by agriculture runoff, sewage, aquaculture and sediments. Eutrophication is initially associated with an increase in primary production. If slight, this might not be a problem, but if the increase continues

toxic blooms of planktonic organisms and low oxygen conditions can result in a total change in the structure of benthic communities and cause extensive fish kills.

### *Illegal fishing*

Establishing areas or zones to protect the fisheries sector is not effective unless those areas are effectively managed. Illegal fishing activities is one of the greatest threats to both marine and inland fish stocks and habitat in Cambodia. Illegal fishing in fish sanctuaries supported by influential people is common. The military and police are frequently implicated in illegal fishing and are thought to be the most serious offenders. In 2000, for example, just two days after fisheries officers were withdrawn from Kampong Thom by government order, military police were alleged to have allowed fishing boats with 1000 metres long seine nets to illegally operate within Lot No. 2 of Tonle Sap.

Deep pools along the Mekong River in Sambor district, Stung Treng Province, have been declared as protected areas, yet the use of large mesh size gillnets (20-35 cm) has increased, resulting in a decline in the abundance of large species. During the dry seasons of 1993 to 1997, approximately 8,000 explosive devices per year were used to catch fish in those deep pools (Chea and Sean 2001).

Fishermen have been using illegal gear such as push nets and trawl nets to fish along the coast in water shallower than 20 metres. There are anecdotal reports that some illegal fishers use cyanide to catch reef fish and possibly within protected areas.

In recent years illegal freshwater fishing using electrical charges has increased. About 90 percent of the fishers in Dom La Au (Kampong Thom) use illegal methods, and electrocution is the preferred option as it is a relatively cheap. There are no baseline scientific data in and around the parks as a basis for monitoring trends in fish stocks.

### *Habitat destruction*

The most critical long term impact on fisheries is habitat destruction - primarily inundated forests, seagrass, mangroves and coral reefs. The integrity of Ream National Park is threatened by various illegal activities, including charcoal production, logging, and use of illegal fishing equipment (MOE). Inundated forest in Tonle Sap Lake has been cleared or cut for firewood, charcoal, agriculture, farming and inshore development. Inundated forests on the shores of Tonle Sap have a very important role in fish spawning, nursing, and feeding.

Local communities have cleared mangrove forests along the coast near the Thai border, encouraged by Thai businessmen to grow tiger shrimp. However, many farmers have given up due to shrimp diseases and problems of acid sulphate in soil. Shrimp production declined noticeably from 731 tonnes in 1995 to 266 tonnes in 1997. Mangrove forests in Cambodia have also been cut for fuelwood and charcoal. Many local people have been involved in this business for local use and for export. Some mangrove forest, such as near Kampot, has been cleared for construction of salt fields. In coastal towns such as Kep Town and Sihanoukville damage is being done to coral reefs by harvesting coral for sale as tourist souvenirs.

### *Exotic species*

Exotic species have been introduced intentionally or accidentally, including species of cultured fish such as Tilapia, African walking catfish, and Chinese carp. These species, particular Tilapia, are believed to out-compete indigenous species. Species of aquatic weed such as water hyacinth (*Eichhornia crassipes*), have been invading the inland aquatic system including ponds, rivers, streams, and lakes. They reduce the penetration of sunlight into the water, which limits the growth of other aquatic flora and fauna, and upon decaying cause localised eutrophication. Another plant, *Mimosa pigra* is also invading freshwater environments along the edges of rivers and lakes. This plant grows rapidly and overwhelms other vegetation. In 1994, a number of the Tonle Sap fish sanctuaries were effected by aquatic weeds, which have now taken over the water's edge to the exclusion of native plants.

The invasion of exotic species can be extremely damaging to the aquatic ecosystems and no scientific studies on their impacts in Cambodia have been carried out yet.

*In conclusion*, each of these trends constrain development in the fisheries sector – i.e., increasing sedimentation and reducing water quality, habitat destruction and exotic species and illegal and damaging fishing practices – need to be managed through a regime of protection which includes networks of specific purpose protection zones.

## Achievements

**Regimes of protection have been introduced as a development strategy in the fisheries sector.** The new Fisheries Policy and Fisheries Law reinforce the importance of fish habitat sanctuaries and seasonal fishing controls in maintaining fish stocks and their diversity. Of special importance, DOF is concerned with:

- Enhancing the protection and sustainable use of natural fisheries resources;
- Extending fisheries management responsibilities to fishing communities; and
- Encouraging integration of fisheries management with overall local development in fishing communities.

**An initial system of fish sanctuaries and aquatic protected areas have been established at nation and local levels.** After the establishment and management of protected areas the population of some species of aquatic fauna and flora have begun to recover. For example, following the establishment of Peam Krasop Wildlife Sanctuary in Koh Kong province the catch of mud crab in surrounding areas increased, improving local livelihoods. The Village Fisheries Communities living in Ream National Parks have reported similar improvements in degraded fish populations since introducing managed controls over fishing activities.

**Village Fisheries Communities have been established to facilitate management and use of common fisheries resources.** National policies recognise the rights of fisheries communities to manage local fisheries and the importance of their involvement in protection of the resource. Furthermore, they emphasise the importance of increasing habitat protection to ensure the sustainable use of the resource. The Draft Fisheries Law includes provision for community co-management and fish sanctuaries.

## Challenges

### *The development and implementation of new policies and laws for protecting fishery resources*

**The draft fisheries law, decrees and sub-decrees have not yet entered into force.** The process for reviewing the fisheries law and associated decrees has been slow. The draft sub decree on community fisheries is to be reviewed by an inter-ministerial committee.

While this cross sectoral consultation is essential, it is difficult to implement the new system effectively and to focus limited resources until the legal framework is in place.

**Budgets and staff will need to be applied to implement the new system:** The budget and capacity requirements for implementing the policy to open up fishing lots for communal are only now becoming evident two years later. DOF needs to assess the resource implications for managing critical aspects of the new system, particularly relating to sanctuaries and protected zones.

**Enforcement is weak and prosecutions and arrests are rare:** There has been poor enforcement of existing regulations relating to the control and monitoring of fishing in sanctuaries and local protection zones.

**Encroachment** on many areas of inundated and mangrove forest; and on public fishing grounds by commercial fishermen is common. Two immediate challenges for fisheries management are the high numbers of people entering the fisheries sector and the competing claims for protected resources - such as flooded forest for rice cultivation and firewood.

#### *Protected areas servicing the fisheries sector*

**Many habitats critical to fish migration, breeding and spawning are not covered by existing protected areas.**

**The criteria for identifying the most appropriate locations for fish sanctuaries are not well developed.** The location of existing sanctuaries and their effectiveness needs to be reviewed against a revised set of guidelines.

**Boundaries of existing sanctuaries and protection zones are not well demarcated** leading to encroachment, illegal activities and disputes. Protected area management can be improved by using technology such as GPS and GIS, and then clear demarcation of boundaries in the field where feasible.

**DOF capacity for protected area establishment and management needs to be enhanced.** The community fisheries system has been implemented without adequate technical support and the legal framework to reinforce local regulations. The original fishing lot system was a mechanism for bringing tighter centralised controls over fishing activity and protection of fish stocks. Now, with more than half of the fishing grounds returned for community use, the system needs to function through highly decentralised management by local communities which often lack the capacity, authority and certainty of long term tenure to ensure protection and sustainable use of stocks. Unless fisheries communities are adequately supported in preventing illegal use and encroachment on public fishing grounds, the new system could lead to even greater misuse of the resource than under the lot system.

There is a community perception that the least valuable fishing grounds (as determined by auction price) were made public. Many of the areas set aside as public fishing grounds are dry for much of the year and no longer productive.

**Fisheries inspectors are uncertain of their own authority in public fishing grounds and in commercial fishing lots.** Confused messages have been sent out by government concerning the role of fisheries inspectors in the new system of public and commercial lot fishing grounds. The DOF will need a strong enforcement capacity and clear authority to set the system in place.

Harvesting fish stocks in one area often depends on key habitat in other (frequently remote) areas under the influence of other communities. In those cases, the government needs to provide incentives for communities to protect fish habitat in the national interest.

#### *Future directions*

Cambodia needs to develop national capacities for managing fisheries resources via two closely related strategies:

1. The development and management of protected areas for natural living aquatic resource conservation and production, and
2. A framework of regulations and incentives for the management and exploitation of fisheries resources in a sustainable way.

From the perspective of the fisheries sector, the objective of protected areas is the protection of spawning stock and nursery habitat to ensure recruitment supply to fishing areas and maintenance of local yields in areas adjacent to protected areas.

Considerations in proposing fisheries oriented protected areas include the size, location, and duration of protected areas (i.e. seasonal or permanent). Ideally, a protected area should be large enough to ensure that the various uses of adjacent areas have little environmental impact on it. This is difficult to achieve in the fisheries sector given the key fish habitat is in the floodplain, which is the most intensely used region of the country. Protected area benefits can be maximised by positioning a closed area so that larval drift and migration of young are most likely to provide resettlement in depleted areas. In particular stability and permanence is critical in any regime of protection in fisheries, if stakeholders are to have the confidence to make long term commitments to sustainable use approaches requiring constraints on exploitation.

Key steps in establishing a comprehensive regime of protection in the fisheries sector are:

*Preparing a national plan for protected areas in the fisheries sector*

DOF and MOE should collaborate to prepare a national plan for the establishment and management of a comprehensive system of protected areas as an essential building block in managing fisheries resources in a sustainable manner. The plan would need to include:

- Guidelines on the kinds of fisheries environment which need to be covered by protected areas;
- A complete listing and mapping of existing fish sanctuaries and other protected areas contributing to the fisheries sector;
- Identification of an initial list of additional sites which should receive highest priority for protection due to their national significance;
- Criteria for the selection of high priority sites;
- Definition of different categories of protected areas to be applied in the fisheries sector and basic management guidelines for each category;
- Guidelines for the identification, establishment and management of protection zones within fishing lots;
- Details of a system of protection financing based on the user pays principle.

First it will be necessary to:

***Review existing and new protected areas in the fisheries sector.*** The review would assess the suitability of existing sanctuaries, their management and location, and identify the location of areas that should receive protection as the highest priority.<sup>65</sup> This review should be undertaken with the involvement of local communities and other stakeholders. It should identify those situations where necessary protection in one area benefits fisheries in other parts of the country.

***Establish protection zones within fishing lots.*** As a condition of use, fishing lot owners should be required to define at least 10 percent of the area as a protection zone, and to manage the zones effectively as critical fish habitat. DOF should work with lot owners in the definition of zone boundaries and the conditions of management and use.

---

<sup>65</sup> DOF has set a target for fish sanctuaries to cover 25 percent of fish habitat in the country.



**Prepare management plans for existing sanctuaries and protected areas benefiting the sector.** The plans need to be prepared by MAFF and MOE with local communities and other stakeholders and include arrangements for collaborative management, zoning and enforcement, prohibitions and allowed uses and clear definition of roles. The plans should be short and may initially cover more than one protected area. Past experience with preparing management plans in Cambodia has shown the difficulties due to lack of capacity to develop comprehensive plans for every protected area.

*Give high priority to establishing a regime of protection covering the floodplain.*

The main concerns relating to the contribution of the floodplain to fisheries productivity are:

- The hazard of creeping degradation due to incremental development including construction of roads, dykes, dams and bunds;
- The resultant difficulty in maintaining deep pools on the floodplain as stocking sites; and
- The resultant difficulty in maintaining the flood pulse (i.e. the highs and lows of water flow over the floodplain) essential to fish ecology.

Protection strategies needed to safeguard the natural functions of the floodplain in fisheries include:

**Ensuring that infrastructure works individually or cumulatively do not impede the functions of the floodplain.** Changed flooding patterns effecting silt and nutrient deposition, water location, level and/or flood intensity and other aspects, negatively influence fish and shellfish ecology and thus negatively affect the floodplain's biological productivity and diversity.

**Protecting deep pools on the mainstream and floodplain from environmentally adverse interventions.**

Overfishing, chemical pollution, isolation from floodplain dynamics and other factors impede the functions of the deep pools as fish and shellfish habitats and so threaten sources of flood plain productivity and genetic diversity. Strategies for protection could include:

- Seasonally or permanently excluding deep pools or parts of them from exploitation and access; and
- Lowered quota for maximum catches.

*Prepare a regulation governing protected areas in the fisheries sector*

Regulation should be prepared under the draft fisheries law and draft law on protected areas setting out the legal framework for managing protected areas in the fisheries sector. The process and collaborative arrangements for management need to have a legal base, which sets out the roles, obligations and authority of different stakeholders. It also should establish the beneficiary or user pays principle as a mechanism for financing protection.

*Introduce a system of financing protection based on the beneficiary pays principle*

**Each lot operator in the fisheries sector should pay a fee for protection of the stocks:** The process of auctioning fishing lots covering freshwater areas and licensing of fishing activities in marine environments provides an opportunity for the user pays principle to be applied in financing protection. Conservation of fish habitat is critical to the survival of the sector and the industrial and medium scale commercial enterprises should be required to invest in maintaining productivity. Already fishers pay for lots. A proportion of this existing concession fee should be set aside as a contribution to the costs of protection of fish habitat within the lots and near by sanctuaries. Also, the overall fee levels for lots and the proportion going for conservation should be adjusted to reflect the potential revenue to be gained from the lot, based on past productivity.

For equity reasons, charges associated with small scale and subsistence fisheries are more contentious, but even at this level, Village Fisheries Communities could be supported in defining forms of payments from small scale and subsistence fishers to create a local revenue stream for monitoring, enforcement and managing protected zones in their area.

For industrial and medium scale fisheries, the protection levy could be 10 percent of the existing licensing and lot charges channelled to protection trust funds managed on a decentralised basis (for example according to defined water catchment areas).

***Pilot decentralised fisheries protection trust funds:*** Often the most difficult issue related to the user pays principle for governments to resolve is how protection funds are managed. It is critical to connect payment directly with better management of the affected resource or area. Under the government's decentralisation policy, local trust funds should be piloted so that managers and fishery stakeholders have a role in deciding how the funds are applied. In Asia, there are already examples of trust funds for individual protected areas, for groups of protected areas and for water catchment areas.

***Provide economic incentives for protection:*** The government should provide economic and technical support incentives in cases where one fishery community must shoulder the burden of protecting critical fisheries habitat for the national good. In those cases, special support programs are needed including training, alternative income generation and credit.

*Undertake a training program for protected area management in the fisheries sector*

Managing an industry according principles of protection rather than maximum production requires special skills and knowledge and a reorientation of roles. The collaborative preparation by DOF and MOE of a national plan for protected areas in the fisheries sector should be accompanied by a training program in protected areas planning and management.

## 12. Water resource management and protected areas

### Current relationship

Cambodia is considered a “water-wealthy” country (Ngo Pin 2002). Yet, it suffers severe and regular drought and throughout the year it is becoming increasingly difficult to access clean water. Cambodia’s protected areas play a vital role in managing and conserving water resources and are an important “quiet partner” in the development of the water sector. National economic planners and policy-makers have been slow to appreciate and account for the hydrophysical contributions made by protected areas to water resource management.

Most protected areas in Cambodia are located in the upper catchments of the country’s various river basins, the most significant being the Mekong River and its tributaries including the Tonle Sap system. They are areas of relative high rainfall and their maintenance is crucial to down stream water uses. These regions and their high forest cover affect the quantity, quality and accessibility of water throughout the country. The large expanse of protected areas across the Cardamom Mountains (i.e. Phnom Samkos and Phnom Aural Wildlife Sanctuaries and the Central Cardamom Protection Forest) includes catchments and watersheds for water flowing north, east and south of the mountain chain. Kirirom and Bokor National Parks in the Elephant Range have a similar function in the south-west, just as Virachey National Park does in the north-east by feeding tributaries running into the Mekong River.

Cambodia’s predominant geographical features are its main bodies of water: the Mekong River and the Tonle Sap Lake and River. In recognition of its fundamental importance to Cambodia’s economy and natural heritage, the region surrounding the Tonle Sap Lake has been declared a multiple use protected area with three core zones (MOWRAM 2001; ADB 2001a). Together, these waterways comprise a unique system supporting agriculture, fisheries, transportation and other development functions for more than 80 percent of Cambodia’s population. Both the upland and low lying protected areas associated with the system are playing an increasingly critical role in maintaining that development contribution – especially as forests, habitats and natural systems linking the protected areas continue to degrade.

The floodplain as a whole is poorly protected and an expansion of the national protected area system to safeguard its hydrological dynamics and aquatic habitats would better serve development objectives.

The coastal protected areas are equally important in nurturing aquatic habitats for fisheries, tourism and transport as well as conventional water supply to many sectors. A significant portion of Cambodia’s shoreline along the Gulf of Thailand is dominated by protected areas, including Ream and Botum Sakor National Parks, Peam Krasop Wildlife Sanctuary and Dong Peng Multiple Use Area. The PAD Review field study of the south-west cluster of national parks (ICEM 2003c) found that the water flowing from Bokor National Park influenced the productivity of all key sectors in the local economy including energy development. While the total contribution to the economy of the coastal chain of protected areas has not been sufficiently studied it is certain to be very significant, largely due to their hydrological functions.

The role of protected areas becomes increasingly significant for meeting local communities water needs as populations grow and immigration and resettlement in the vicinity expand. Only 24 percent of Cambodia’s rural population have access to safe water. Moreover, piped water is not available outside larger towns. Rural dwellers are dependant on ground and surface water sources, including wells, ponds and streams, as well as rainwater in the wet season (MOWRAM 2001). Protected areas recharge ground water reservoirs, filter surface water and extend the periods of water availability through controlled release. These protected area supply and regulatory services are especially important for local farmers as irrigated

land represents only 16.6 percent of the total area under crop production. Consequently, farmers are vulnerable to droughts and have little control over water availability. Crop production varies accordingly.<sup>66</sup>

Protected areas both upstream and downstream of water users play an important if poorly understood role in purification. Contamination of surface water from human activities is difficult to quantify, but non-point source contamination from human and domestic animals is widespread. The lack of controlled waste disposal systems outside of Phnom Penh, as well as the use of agrochemicals, threaten the surface water quality of the Tonle Sap and Mekong systems and linked coastal marine areas in the Gulf of Thailand.

Cambodia also uses its water resources significantly for transportation and navigation, as reflected in the crucial role of Phnom Penh and Sihanoukville ports in the national economy. Recently, Cambodia has commenced implementing plans to exploit its water resources for the production of electricity through hydropower projects. Other key functions of protected areas include flood retention, irrigation, water storage and supply, human recreation and flushing of pollutants. But Cambodia's water resources are threatened with contamination by pollutants, degradation through unsustainable agricultural and fishing practices and upstream damming.

### Institutional arrangements

The Ministry of Water Resources and Meteorology (MOWRAM) was set up in 1999. MOWRAM has wide-spread jurisdiction over the management and development of water resources, including irrigation, flood control and hydropower development.

A draft of Law on Water Resources Management prepared by MOWRAM is currently before the National Assembly. This comprehensive law would prescribe the rights and obligations of water users, proclaim the fundamental principles of water resource management, identify the institutions with authority to implement and enforce the law and to regulate the participation of users in the sustainable development of water resources.

### Key issues

The hydrological functions of protected areas need maintenance and investment. The first step is to clearly identify and define the critical roles protected areas have in safeguarding water quality, quantity and regularity of flow. As the functions become better understood by the sectors which benefit, economic planners can begin to reflect those values in plans and budgets so that adequate investments go to their effective management. There are seven main hydrological functions of protected areas which are of growing development significance and which need to be the focus of well defined investment and management strategies:

1. Water storage and natural flood regulation;
2. Water supply (irrigation, drinking water supply and hydropower);
3. Instream and estuarine fishing;
4. Flushing pollutants;
5. Transportation and navigation;
6. Recreational use of water, including tourism; and
7. Microclimate impacts on surroundings.

---

<sup>66</sup> The SEDP II sets a goal of increasing the total irrigated land to 20 percent at p. 25 and p. 30.

### *1. Water storage and natural flood regulation*

Naturally vegetated watersheds within protected areas provide essential regulation of stormwater and floodwater flow to downstream regions. Maintaining the integrity of (or rehabilitating) such protected areas will reduce flood damage and improve agricultural yields due to more predictable flooding patterns.

### *2. Water supply*

Many protected areas in Cambodia either contain bodies of water or act as natural catchments that are valuable in supplying a water for agricultural irrigation, drinking water, hydropower and aquifer recharge. As Cambodia increases irrigation coverage and hydropower, and the demands for urban and rural water supply increase, adequate investment in the management of upstream protected areas will be needed. That includes setting in place the resources and capacity for effective planning of protected areas as an integrated part of the wider development landscape and adequate environmental assessment to control negative effects of development.

### *3. Instream and estuarine fishing*

All protected areas contribute to fisheries to a greater or lesser extent. The contribution of each protected area to Cambodia's fisheries as nurseries, breeding grounds, refuges and for general habitat conservation has not been well studied or expressed in economic or even ecological terms. They need to be because without effective management based on understanding economic and ecological values, protected area degradation will undermine the economic foundation of the fisheries industry.

### *4. Flushing pollutants*

Seasonal water flows through protected areas to flush out polluted and deoxygenated waters and replace them with fresh, nutrient-rich water. As this function is important for downstream fish and shrimp farming practices, protected areas must be managed to ensure their continued ability to provide this economic benefit.<sup>67</sup>

### *5. Transportation and navigation*

Protected areas and other aquatic areas with key development functions in their natural state have a central role in providing transportation and navigation routes that facilitate communication and trade – especially the Tonle Sap Multiple Use Area and other parts of the Mekong River system. A balance must be struck between developing these waterways for navigation and managing them to secure the hydrological and conservation functions they perform.<sup>68</sup>

<sup>67</sup> The Tonle Sap ecosystem is threatened by declining water quality. While accurate data do not exist for water quality, the following water quality threats combine to degrade wildlife habitat and compromise human health in the lake and its floodplain: (1) uncontrolled waste disposal from humans and domestic animals, particularly those living in the seasonal floating villages on the lake; (2) agrochemical runoff; (3) leakage and spill of fuel and cargo from boats and other forms of transport on the lake; and (4) siltation/sedimentation, especially near the western shore of the lake due to gem mining operations near Pailin and the entrance to the lake at Snoc Trou. MOWRAM, 2001 at 22; World Bank, 1998 at 38.

<sup>68</sup> The Tonle Sap-Mekong system also provides a major source of transportation. The amount of navigable waters decreases by two-thirds in the dry season, and dredging, particularly at the mouth of Tonle Sap Lake, is routinely required to make the waterways passable. The port of Phnom Penh handles 55 percent of Cambodia's general international cargo, and the Tonle Sap River and Lake are used for commercial and non-commercial passenger transport.

### 6. Recreational use of water

While domestic and international tourists have yet to utilise the water resources contained in Cambodia's protected areas in large numbers, as access to such areas improves, the tourist use of coastal beaches, wetlands, lakes, rapids and waterfalls within protected areas will increase and become an important management issue. Visitor management strategies must optimise the economic benefits of these protected aquatic environments while minimising degradation of their natural values.

### 7. Microclimate impacts on surroundings

Research suggests that the existence of forests over large scale landscapes of the kind found over the Cardamom Mountains leads to higher rates of evaporation helping to establish more stable and moist air masses and cloud cover which can provide positive conditions for agriculture in the region. The economic benefits from maintenance of climatic regimes through networks of well managed protected areas connected by forested corridors and natural vegetation will need to be recognised by planners.

## Achievements

While progress in water resource management has been slow, Cambodia can reflect on a number of positive strides in this sector.

**The new Ministry of Water Resources and Meteorology (MOWRAM):** The creation of MOWRAM centralises jurisdiction over water resources policy and management. The ministry is responsible for management of fresh and marine water resources, including defining water resources policy and development strategies to support sustainable use, development, and national and international conservation and protection.<sup>69</sup>

There is growing recognition of the very significant contribution of protected areas to watershed protection and supplying clean drinking water: The 21 percent of Cambodia covered by protected areas coincide with many of the most important watersheds and catchments in the country. The maintenance of those watersheds is critical to the recharge and regulation of ground water resources and to the controlled release of surface water so that wet and dry season peaks and troughs are moderated. These roles are beginning to be acknowledged in the policies and strategies of MOWRAM, as they are in strategies for water supply of the Ministry of Land Management, Urbanisation, and Construction, MAFF and of provincial and municipal authorities.

**National and international cooperation on key wetland protected areas:** The government and the international community have begun to coordinate their efforts to manage important wetlands the Tonle Sap multiple use protected area, to conserve their hydrological values. Reflecting this cooperation are the Tonle Sap Coordination Unit within MOE, development of the National Wetlands Action Plan by MAFF and MOE and various initiatives assisted by organisations such as the UN Food and Agriculture Organisation (FAO) (ADB 2001a).

## Challenges

**Recognition of benefits has not led to investment in protected areas:** So far recognition of protected area hydrological values has not brought with it a flow of investment from the beneficiary sectors to safeguard and enhance watershed functions. This expenditure is being left to MOE and MAFF through its forest management functions. Water pricing systems and other economic instruments to manage water supplies are being considered but as a sector revenue stream and not in payment for the protected area watershed services.

<sup>69</sup> Sub-Decree No. 58 on the Management and Process of the Ministry of Water Resources and Meteorology (MOWRAM), dated 30 June 1999

***The values of protected areas are not understood in economic terms:*** A fundamental constraint is the kind of information that might influence sector investment towards protected areas is not available to planners. There is no appreciation of what hydrological benefits are worth to the economy. Consequently it is difficult to express the level of effort which should go into safeguarding those values in budgetary and staffing terms.

***Despite some positive cases, there is little inter-ministerial coordination on a water catchment basis:*** An

integrated approach to planning and management becomes essential as water demands on protected areas increase and the contributions of their hydrological functions to national development grow in importance. Thailand has been divided into 25 river basins, which have become the fundamental unit for national water resource planning. Vietnam is also attempting to coordinate water management through the definition of cross-sectoral plans for river basins. That kind of approach, which builds protected areas into an overall plan for a development landscape such as a river basin or catchment, is needed in Cambodia.

***A number of important wetland ecosystems are highly vulnerable to conversion to other land uses for short-term economic gain:*** Mangroves and seasonably inundated freshwater habitats are not adequately protected and their hydrological and habitat functions are being lost. The flooded forest and lacustrine grasslands surrounding Tonle Sap are especially threatened. Unless local communities and development interests understand the economic values of these ecosystems to them, the lacustrine grasslands may be converted into fish ponds or rice paddy.

The Tonle Sap Multiple Use Area is beset with a range of inter-related management issues revolving around the hydrological dynamics of the region. These problems include degradation and loss of inundated forest, agricultural encroachment and expansion and maintenance of sustainable freshwater fisheries and acceptable water quality.

## Future directions

*Prepare a joint plan for protected areas and water management.*

MOWRAM, MOE and MAFF need to prepare a comprehensive plan which:

- Identifies the water management values of protected areas;
- Recognises the functions being performed by individual and groups of protected areas;
- Identifies priorities for action in terms of rehabilitation and maintenance of existing protected areas to safeguard their water management functions;
- Identifies locations where new protected areas are needed to provide a regime for the protection of water resources and natural hydrological functions at risk;
- Identifies the regimes of protection needed outside and linking protected areas to better safeguard hydrological functions and the priority locations where actions are needed;
- Sets out a program of activity over a 3-5 year period with government budgetary commitment to it.

The action plan would provide a framework for strategic planning and management to integrate protected areas and water resource management and development. The plan should cover:

1. Core policies;
2. Institutional coordination;
3. Operating procedures;
4. Implementing mechanisms;
5. Monitoring techniques;
6. Grouping protected areas within the same catchments or watersheds;
7. Adopting a user pays approach through legal and economic instruments;
8. Avenues for public participation; and
9. Prioritisation of needs.

The action plan would need to be approved by the Council of Ministers to encourage the participation of all concerned ministries. MOWRAM is taking some steps in this direction, as it is nearing completion of a strategic management plan with regard to the Tonle Sap region (Ngo Pin 2002).

*MOWRAM, MOE and MAFF should collaborate to assess economic values of the hydrological functions of protected areas.*

The initial economic assessments undertaken through the PAD Review need to be developed into a systematic effort to feed into basin or catchment wide water management strategies.

Protected area values in safeguarding hydrophysical processes that lead to high quality and secure water supplies and water resource services need to enter into the economic planning for regions and individual sectors.

*Pilot the user pays approach in specified protected area clusters.*

The protected area and water sectors will need to test the user pays approach so that groups and individuals benefiting from protected area hydrological services invest in their management and maintenance. There should be three main groups of users and each should be treated differently in targeting economic instruments:

- Local communities and subsistence uses;
- Private sector commercial operations;
- Government operations.

Special attention would need to be given to concession holders in fisheries, forestry, agriculture, industrial facilities, energy facilities and irrigation and water supply systems.

*Set priorities for rehabilitation and maintenance:*

Water resource sector planners within MOWRAM need to work with MOE in identifying protected areas that provide these functions and agree on priorities for maintenance and rehabilitation. Also, MOWRAM, MAFF and MOE need to work together to identify important locations with essential hydrological functions which would benefit from the establishment of new protected areas as a framework for establishing systematic management and conservation regimes.



## 13. Energy development and protected areas

### Current relationship

Protected areas have the potential to provide significant energy services and products – but are also very sensitive to exploitation. In some protected areas or zones within them, the long-term development benefits of biodiversity conservation are too valuable to allow energy exploitation. In other protected areas, careful energy exploitation can be sustained. Inevitably hydropower and petroleum development, and even fuelwood harvesting, will have significant negative consequences if schemes proceed in or near centres of biodiversity wealth. The decision by government whether to proceed or not is often a trade-off between development options. The government will need to have the vision to reject energy projects that come at too high a cost to other benefits of biodiversity. For those that proceed, the key is to minimise the negative effects while seeking to maintain all the development benefits provided by biodiversity conservation – the primary purpose of protected areas.

#### *Fuelwood*

Cambodia's primary energy source is fuelwood, which supplies approximately 85 percent of its domestic energy requirements. Fuelwood is predominantly used in rural areas for household needs as well as small industrial activities such as making bricks, refining palm sugar, brewing, smoking fish, bakeries and steaming tobacco. While the extent of forest loss directly attributed to fuelwood collection has not been accurately documented, all protected areas are affected and two regions have been specifically identified as vulnerable to fuelwood harvesting and charcoal production - the Tonle Sap Multiple Use Area and the mangrove forests located on Cambodia's shores (World Bank 1998; ADB 2001a).

#### *Hydropower*

Cambodia generates only one percent of its energy from hydropower (ADB 2001a), but this figure is expected to increase dramatically in the next five years and beyond. The Ministry of Industry, Mines and Energy (MIME) is implementing a number of hydropower projects across Cambodia. The following summarises the current status of these projects:

- The Kirirom Hydropower Rehabilitation Project was completed in 2002;
- The Kamchay hydropower feasibility study was concluded in mid-2002; and
- Hydropower feasibility studies are being conducted for numerous projects, including additional phases in Kirirom, the Battambang River first and second phases, Atai River, Resechrum River and small scale projects at Baatow Mountain and Psa Slap River (Nhep Bunchin 2002).

The Kirirom and Kamchay Projects are located in Kirirom and Bokor National Parks, respectively, and accordingly signal a dramatic change in the use of these areas.

The Kirirom scheme will have a total capacity of 12 MW, supplying 53 GWh of power per year to Kampong Speu province and Phnom Penh. This US\$ 25 million investment is planned to be operational in 2003. The Kamchay hydropower scheme is planned to have an installed capacity of 120 MW, generating 469 GWh output annually to meet the energy demands for Kampot, Sihanoukville and the Phnom Penh corridor. This US\$ 270 million investment is expected to be operational in 2008. The net benefits from electricity sales from both schemes will be US\$57 million each year (ICEM 2003c).

Many other schemes, ranging from minor to large scale, have been proposed for location in or close to various protected areas including Virachey National Park, and Phnom Samkos, Phnom Aural and Lamphat Wildlife Sanctuaries. The government has identified at least 11 sites on the Mekong River and its tributaries for further examination for their hydropower potential, including the Stung Mnam 2 project, a 90 MW joint project with Thailand (MOC 2000).

### Petroleum

Cambodia also relies on petroleum products – for the most part imported – to make up the remaining 14 percent of its energy requirements (World Bank 1998; ADB 2001a). Currently, there is little relationship to speak of between protected areas and petroleum development. The government believes, however, that it can exploit offshore and inland oil and gas reserves. It has identified offshore sites in the Khmer trough and the Pattani trough, onshore sites at Tonle Sap basin, Chung basin, Khorat basin and Preah basin and mixed onshore and offshore areas at the Siam and Mekong Delta basins (World Bank 1998). A Memorandum of Understanding was recently signed between Cambodia and Thailand regarding an area of the contested offshore Overlapping Claims Area and surveys have been commissioned to assess the availability of inland fossil-fuel deposits in the Mekong basin and Tonle Sap (MOC 2000). As a result of these initiatives, Cambodia is poised to pursue significant oil and gas exploration (Dirksen et al. 2002).

### Achievements

**The 1999 Sub-decree on Environmental Impact Assessments** requires an EIA to be completed for hydropower plants exceeding one MW and for all “petroleum mining research.” The EIA Sub-decree thus provides a level of environmental review for energy development projects. The sub-decree is supported by EIA guidelines for hydropower and other energy development proposals prepared by MIME. The question still remains whether the EIA process and capacities within MIME and MOE are adequately to assess negative impacts to protected areas.

**The very significant potential contribution of protected area to the supply of energy through hydropower is recognised:** Cambodia’s first two hydropower schemes are in various stages of planning and development. Both lie inside national parks - Bokor and Kirirom - and are close to the important urban centres of the south-west. Other schemes have been proposed affecting a range of protected areas. The services which protected areas have to offer the energy sector are well recognised even if potential negative environmental consequences and the need for watershed maintenance are not.

**A National Energy Conservation project** is planned to be implemented by MIME to significantly improve energy-use practices over a five-year period (ADB 2001a).

### Challenges

**Protected areas are threatened by Cambodia’s continued reliance on fuelwood as a principal energy source:** For protected areas, the most important consequences of fuelwood harvesting are the degradation and loss of forests. Compounding this problem, no significant effort has been exerted to reduce energy consumption through more efficient technologies despite economic losses and negative environmental repercussions (ADB 2001a). Management systems are not in place to involve users in sustainable harvesting approaches.

It will be difficult to shift the rural population away from its dependence on fuelwood in the short-term. For people living in rural areas, there is simply no alternative. Planned electricity grids are not expected to reach many communities living near protected areas, and alternatives to fuelwood, such as kerosene, are prohibitively expensive. Accordingly, the government expects fuelwood use to continue and probably increase.

**Hydropower will have significant impacts on the primary purpose of affected protected areas:** Hydropower is a renewable energy resource, depending on how effectively the surrounding watersheds are managed. They can also require very significant modification and destruction of other uses and values of protected

areas. Cambodia's existing and planned hydropower projects have the potential to dramatically affect protected areas. Effects generally associated with hydropower schemes include elimination of natural habitat, and alteration of the hydrology and limnology of impacted rivers, the volume and quality of water, aquatic biota and sedimentation dynamics, and the potential displacement of communities residing in the floodplain. As these changes occur, there are typically corresponding effects on the biodiversity of the surrounding areas (World Bank 1998).

Minimising the environmentally harmful effects of hydropower development poses the greatest immediate challenge to the government in harmonising the relationship between protected areas and energy development (Box 6). Considering the rapid growth of Cambodia's economy and the complementary need for increased power supply, including the development of a national power grid (MIME 1999), it is likely that many of the potential hydropower sites identified by the government to date will be developed even on a small scale.

#### **Box 6: Kamchay Hydropower Project (Consortium Pomerleau 1995)**

The pre-feasibility report for the Kamchay Hydropower Project noted numerous potential environmental impacts, including:

- Elimination of 28 sq. km of forest in Bokor National Park by inundation of the reservoir;
- Encroachment into the watershed by farmers, hunters and timber exploiters due to building access roads and the presence of the "new lake";
- Watershed erosion and soil run-off associated with deforestation;
- Decrease in downstream water quality due to suspended sediments;
- Construction hazards, disturbances and pollution;
- Threats terrestrial and aquatic wildlife; and
- Impairment of wildlife movement by construction areas and building transmission lines.

When assessing hydropower proposals, inadequate attention is given to other uses of protected areas, potential environmental impacts and mitigation measures: The experience of the first two hydropower projects has shown that the EIA system in Cambodia is not working effectively, with minimum involvement by the DNCP and protected areas staff at central government and on site. Consequently, the full effects of the projects for other development sectors, such as tourism, and for other values of the host protected areas have not been adequately studied. In principle MIME follows the Asian Development Bank's EIA guidelines and procedures and seeks to develop contracts for work on energy projects on the basis of an EIA report and the mitigation measures it recommends.

Yet, without effective involvement of the agency and staff responsible for protected areas, EIA reports will fail to fully reflect protected area concerns.

Fuelwood harvesting and consumption is the most immediate threat to protected areas in this sector. Yet, the emergence of hydropower and oil and gas development could pose a greater threat if this potential is not planned and managed according to adequate environmental assessment, monitoring and investment in mitigation and conservation.

The commercial extraction of petroleum in or near protected areas could have major consequences for the environment and other development options: protected areas which might be affected include the Tonle Sap Multiple Use Area, proposed marine protected areas or coastal areas such as Ream and Botum Sakor National Parks, Peam Krasop Wildlife Sanctuary and Dong Peng Multiple Use Area. All ecosystems are fragile.

Protected areas would be vulnerable to the common consequences of hydrocarbon development, including oil spills, air pollution, surface disturbances from seismic operations and oil drilling, impacts on the fisheries and tourism sectors and sanitary and domestic waste from drilling sites. Development of the Tonle Sap region's hydrocarbon potential has received greater foreign interest lately due in part to the emergence of new data suggesting the presence of significant reserves (Dirksen et al. 2002).

***There is no mechanism for the energy sector and beneficiaries to pay for the protected area services that they benefit from:*** The economic benefits of the two hydropower schemes will be substantial. Currently the critical role played by protected areas in maintaining the productivity and lifespan of hydropower projects has been taken as freely provided. The sector is not required to invest in the benefits it is receiving.

## Future directions

### *Environmental assessment and standards for protected areas and energy development*

***Establish and implement an effective legal structure for EIA of energy development proposals within protected areas:*** The EIA Sub-decree exists, but implementation has been weak. Confusion between the appropriate roles to be played by MIME and MOE is a contributing factor to the ineffectiveness of the EIA review process (World Bank 1998). MOE should make clear in its draft protected area legislation the obligations of all development sectors when their proposals affect protected areas in any way.

***Prepare MIME/MOE/MAFF protected area and energy EIA guidelines:*** Building on the current MIME guidelines, MIME, MAFF and MOE should work together to prepare a special set of EIA guidelines relating to energy development in or near protected areas.

***A joint MIME/MOE/MAFF decree:*** EIA guidelines should be supported by a joint MIME/MOE/MAFF decree setting standards, roles and obligations of the three ministries, of proponents of energy projects and of other stakeholders in the process. The decree would also set out the arrangements for applying the user pays principle in situations in which energy projects receive benefits from protected areas.

***Initial biodiversity studies and environmental assessments must be undertaken prior to decisions on energy projects:*** The following minimum standards must apply to the initial stage of all hydropower and petroleum related proposals which have the potential to affect protected areas:

- MIME and associated enterprises must ensure that appropriate departments of MOE and MAFF are fully involved from the earliest stage of planning.
- A thorough biodiversity and environmental study must be undertaken of the affected protected area before any further activities relating to the project can proceed.
- All early biodiversity and environmental surveys and studies must involve DNCP and/or relevant MAFF staff and independent specialists.
- Project proponents must treat all environmental investigations work as an opportunity for staff capacity building in MIME, MOE and MAFF and be required to cover all costs of on the job learning experiences.
- No energy proposal should proceed further if the initial biodiversity and environmental study and assessments show potential significant negative effects on the biodiversity of the protected area.
- Affected stakeholders must be involved in the initial biodiversity studies and environmental assessment.
- If no significant biodiversity or environmental impacts are expected to affect the protected area, further exploratory work and development can proceed only on the basis of the detailed mitigation and protection measures stipulated in the environmental studies.

- An energy project can proceed only in parallel with a long-term biodiversity maintenance and enhancement program designed for implementation as part of the overall management of the protected area.
- The project proponent must cover all costs with respect to the initial study and assessment and implementation of the biodiversity maintenance program.

***A decision on the Kamchay hydropower proposal should not be made until a thorough biodiversity study has been undertaken of Bokor National Park:*** The biodiversity study should be funded by the proponents of the scheme and including a strong capacity building component focussing on DNCP and its park staff. If a decision is made to proceed with the scheme, the following actions should be taken:

- The Kamchay hydropower project should be a pilot for the user pays approach to hydropower development within protected areas;
- A Bokor National Park Trust Fund (or south-west cluster trust fund) should be established with the associated system of payments for an effective environmental mitigation program and on going park management.

*Special procedures and approaches for management of fuelwood use.*

The NEAP identifies three strategies for sustainable use of biomass, including fuelwood:

1. Supporting the sustainable use of designated forest areas for fuelwood;
2. Implementing community woodlot and agroforestry systems; and
3. Developing and promoting more efficient, affordable and culturally appropriate energy for household and cottage industries (World Bank 1998).

In this vein, the FAO has funded the Cambodia Fuelwood Saving Project to demonstrate energy efficiency through improved design of cooking stoves (ADB 2001a).

In May 2002, the Prime Minister issued a decision requiring MOE to designate 10 to 30 percent of every protected area as a buffer zone to be co-managed with local communities on a sustainable basis. This important innovation opens the way for the designation of community use areas where the harvesting of fuelwood might continue.

The other critical policy of government in this field is the new Forestry Law under which provides for community uses of concession forests. As a rule it is preferable that communities be given access to production forest rather than protected areas in meeting their fuelwood requirements.

Some protected areas with particularly sensitive natural systems and biodiversity may not have the capacity for more than 10 percent of their area to be co-managed for limited extractive uses. In all cases, co-managed areas would need to be strictly controlled by communities and protected area staff so that uses do not negatively affect the protected areas.

The first two steps should be:

1. To undertake surveys of each protected area and identify appropriate areas for co-management with local communities; and
2. To establish co-management arrangements which define the conditions for harvesting and use and monitoring regimes for fuelwood, and take into account alternative fuelwood sources in nearby forest concessions.

*Introduce a system to finance protection in the energy sector based on the user pays principle*

**Each commercial operator in the energy sector should pay for protection of critical ecosystem services and products which they use:** The concept of a natural resource is that the user should pay for the benefits they receive from all forms of natural resources<sup>70</sup>. Equally important to the concept is that part of the payment should go back to safeguarding the natural resources and systems concerned. Use must be linked to protection in the beneficiary's mind.

**Introduce a system of fees for hydropower schemes benefiting from protected areas:** A hydropower development in or downstream from a protected area benefits from ecosystem services such as regulation and supply of water, erosion control, and other watershed management functions. Without those services, the lifespan of the scheme would be short and unproductive. It is in the user's best economic interest to maintain and enhance those services.

Steps in establishing a user pays system in the energy sector include:

- A joint policy commitment by MIME, MAFF and MOE to apply the user pays principle to hydropower schemes in or downstream from protected areas.
- A legal framework for putting the user pays principle into effect for each hydropower scheme including provisions for:
  - o An upfront payment (as a percent of capital cost of the scheme) to cover the cost of initial biodiversity studies and environmental assessments including a training component;
  - o On-going annual fee (set as a percentage of the revenue from electricity sales) to go to the overall management of the protected area, associated capacity building, and maintenance of the services provided to the scheme;
  - o The establishment of a protected area trust fund (to cover the specific protected area or associated cluster of protected areas) for the management of the funds in accordance with the overall management plan for the area.

MIME, MAFF and MOE should prepare a discussion paper on the user pays system which proposes the level of fees to be paid by energy projects in or affecting protected areas.

#### *Petroleum development*

Petroleum exploration and exploitation needs to be treated differently because the benefits it receives from protected areas are not as clearly defined. The relationship is more of potential negative impacts on biodiversity conservation, and other sectors benefiting from the ecosystem services and products protected areas provide. In other words, petroleum development has the potential to deny the development benefits protected areas provide to other sectors, as described in this report.

Where petroleum development has potentially negative effects on a protected area it should also pay directly for the protection of the area in three ways:

1. A *protection performance bond*, which would be refunded on satisfactory performance of protection requirements when the licence period is completed;
2. A *percentage (e.g. five percent) of the original auctioned price* received for the exploration area to go to mitigation and capacity building;
3. A *percentage (e.g. two percent) of the sale of petroleum* extracted from the license area to go to ongoing management of the protected area.

Payments should be managed through a protected area or cluster wide trust fund, that is directly linked to conservation in the effected protected area(s).

<sup>70</sup> A natural resource tax of this kind operates in Vietnam.

## 14. Tourism and protected areas

### Current relationship

Since the early 1990s, Cambodia's tourism industry has been experiencing significant growth, with the exception of a downturn in 1997-98 due to political turmoil. In 2000, Cambodia hosted 515,000 foreign visitors, up from 412,000 in 1999 and 323,000 in 1998 (CDRI 2001). If the current trends continue, by 2010, Cambodia will attract over three million visitors. In 2000, government revenue from tourism was US\$20 million – which accounted for 6.3 percent of total government revenues – a 37 percent increase on 1996 figures. In 2002, that contribution increased to 10 percent of GDP.

Tourism in Cambodia's protected areas has the potential of becoming a vital source of economic growth, but is currently concentrated on the Angkor temple complex near Siem Reap to the exclusion of other potential tourist draws. The complex is Cambodia's premier tourist attraction and has been a protected area since 1925, when it was designated as South East Asia's first national park (World Bank 1998). Buoyed by the 1997 "open skies" policy allowing international airlines to fly direct to Siem Reap, the number of tourists visiting the Angkor Protected Landscape tripled in 2000 relative to 1999. More direct international flights to Siem Reap are planned. In the same period foreign visitors arriving through Pochentong airport in Phnom Penh increased by 14 percent (CDRI 2001).

As yet, the great potential for nature based tourism in the mountains, rivers and coastline of Cambodia's protected area network has barely been tapped. The number of foreign tourists visiting Cambodia and seeking nature-based experiences has doubled every year since 1999. A handful of other protected areas, including Kirirom, Bokor and Ream National Parks, are beginning to receive regular and growing numbers of tourists but none have been specifically managed or developed with tourism in mind.<sup>71</sup>

During the 1960s, Kirirom and Bokor National Parks both underwent development of roads, accommodation and light industry as their cool climate and scenic forests and vistas attracted affluent Cambodians. During the Khmer Rouge regime and ensuing years of civil unrest, this infrastructure was destroyed. Within the past seven years, however, these protected areas have been the source of renewed interest by both domestic and foreign tourists.

Bokor National Park, in particular, contributes significant revenue from tourism to the surrounding community. The PAD Review field study in Cambodia found that tourism in Bokor generates US\$675,000 a year (ICEM 2003c). That equals the operating budget allocated to the park, although the park authorities see only one percent of that total. More than 95 percent of the tourism income accrues to the 150 or so local hotels, restaurants, food sellers and motorcycle and car operators, which in turn also generate more than \$11,000 a year in local tax revenues. This high tourism value of Bokor National Park also has substantial multiplier effects on trade, income and employment in surrounding areas of Kampot Province (ICEM 2003c). That revenue stream comes primarily from domestic tourists. Currently the park is not marketed as a tourist destination and no facilities or services have been put in place by park authorities to cater for them. The main constraint to tourist numbers is difficulty of access and lack of services. Even modest levels of investment in park roads, trails, camping and accommodation would rapidly increase revenues and reap a greater share of tourism benefits for park management and biodiversity conservation.

<sup>71</sup> Ministry of Environment, Department of Nature Conservation and Protection and the European Commission Support Programme to Environmental Sector in Cambodia, *Guidelines for the Planning and Management of Protected Areas in Cambodia*, at 29-30.

A number of other protected areas and their surrounding regions have been identified as good potential candidates for tourism, including; the Tonle Sap Multiple Use Area, Phnom Kulen National Park, Aural and Phnom Samkos Wildlife Sanctuaries and protected areas in Ratanakiri and Mondulakiri provinces such as Virachey National Park and Lomphat Wildlife Sanctuary (CDRI 2001).

### Key issues

Nature-based tourism can be an effective means to establish a reliable revenue source for protected areas and the communities that surround them. Cambodia is in the unique position of having a large protected area system yet to be tapped for tourism. It can take a leading role within the region by setting in place the capacities and framework to develop tourism for a network of protected areas in a way that is sustainable and profitable for local communities and businesses. A number of key issues will need to be addressed for promoting nature-based tourism.

#### *Building capacity to manage tourism development.*

Emerging responsibilities for tourism management and the facilitation of conservation and development programs is placing additional demands on protected area staff who may have some training in forestry and protected area management but not in tourism. Protected area managers also have insufficient authority to influence higher-level tourism development decisions that may be incompatible with protected area management and conservation objectives. The issue of capacity is a major constraint to meeting the conservation, community development and economic goals of tourism development in protected areas.

#### *Clarifying roles and responsibilities for tourism management.*

Allocating and sharing tourism management and development responsibilities between protected area and tourism authorities should be clarified at an early stage to ensure effective cooperation.

MOE should have the primary role for ensuring that tourism development associated with protected areas reinforces biodiversity conservation objectives and safeguards the natural values which tourists come to enjoy. MAFF also has an important role to play in this respect.

The Ministry of Tourism (MOT), the Angkor complex management authority, MOE and MAFF need to collaborate to systematically plan for tourism development in protected areas. Other governmental entities such as village development committees, commune development committees, provincial rural development committees and the newly created commune councils, should also have valuable input into the planning process. An issue to be resolved in this process will be the formula for sharing tourism revenues.

Also, the relative contributions of private and public sectors must be clarified. Situations where protected area staff become closely involved in implementing tourism operations and are unable to perform their core duties, or where protected area staff need to monitor the impacts of tourist activity but also rely on tourism revenue should be avoided. Mechanisms are needed such as concession systems, for separating the management of tourism development from park management functions while maintaining the flow of financial benefits to protected areas.

#### *Promoting equity in community based tourism*

Tourism can provide communities with an immediate and significant source of much needed income, education and skills. However, these benefits do not automatically accrue to all members of the host community. Tourism can exacerbate inequities and precipitate conflict. Active intervention may be necessary to assist a community to distribute benefits and impacts of tourism development.



Also, a balance must be found between tourism activity and other economic opportunities. Communities that become highly dependent on tourism benefits may do so at the expense of maintaining other important subsistence and economic activities. Tourism should be developed in conjunction with other sectors such as health, education, natural resource management and agricultural food security, helping to diversify and strengthen a community's economy. It will also assist the community to build its social capacity to more effectively manage tourism development.

#### *Protected area zoning for tourism development*

Multiple use zoning of protected areas through a participatory process is probably the most basic and effective strategy for managing tourism development in protected areas. The primary function of zoning is to identify areas where higher levels of tourism impacts can occur without harming areas of ecological significance in accordance with the primary objective of biodiversity conservation. In addition, zoning for tourism development in areas of lower conservation value outside the protected area provides a management opportunity to redirect tourism development and high visitor numbers away from more sensitive or stressed sites inside the protected area.

#### *Harnessing funds from protected area tourism*

Methods of increasing revenue range from direct pricing and charging on a user pays basis to indirect taxes and charges on goods and services associated with the tourism trade. Entry fees for protected areas are usually much lower than visitors are prepared to pay. This is especially the case for international tourists. There is significant scope for increasing fees, creating a revenue stream that can be used to support infrastructure development and cover management costs. Various other kinds of tourism related charges can be applied to fund protected area management. Commercial operators should be required to pay commercially realistic fees for leases and concessions. Rights to operate within protected areas may be offered to the private sector on a competitive auction basis, to raise capital funding for environment protection.

Governments should recognise the economic significance of interesting landscapes and ecosystems as a strong attraction for nature-based tourists in the region. Instead of diverting funds raised from tourism to consolidated revenue they should be allocated specifically for the purpose of establishing, enhancing and maintaining protected areas themselves.

#### *Visitor management*

Tourist activity can also impact on the quality of the visitor's experience. Many ecotourists are sensitive to perceived over crowding or environmental impacts such as littering and noise pollution. Important locations within protected areas can quickly degrade unless visitation is carefully planned and managed. Dissatisfied visitors through 'word of mouth' are likely to erode the reputation of a protected area as a quality tourism destination resulting in a reduction in tourists and loss of economic benefits.

#### *Infrastructure development*

The design and location of infrastructure can have a severe impact on conservation objectives. Common forms of infrastructure associated with protected areas are visitor centres, toilets, lodges and trails. Many organisations have prepared guidelines for tourism infrastructure development in protected areas. These usually advocate use of local materials and labour, minimal impact technology and recycling. The use of new technologies, such as solar panels and composting toilets, can be expensive to install but they are relatively cheap to maintain. A soft loan or government subsidy could be considered to fund initial costs.

### *Enforcement*

Government is responsible for disseminating regulations and monitoring compliance by the private sector, guides and tourists. Some form of enforcement and deterrent is needed when regulations are directly violated, such as warnings, direct fines, and a cancellation of concessions or licenses to operate in the protected area or a forfeiture of performance bonds.

All contracts and Memoranda of Understanding between the private sector, communities and public sector should include consensus-building mechanisms for resolving conflicts and ensuring compliance to agreements. The NGO community too has an important role to play in monitoring government performance and adherence to policies, laws and relevant international agreements.

### *Developing partnerships with NGOs*

Protected area managers, communities and local private operators may not have sufficient funds, capacity or knowledge to be able to develop, manage and market sustainable tourism products without external assistance. NGOs have a valuable role to play in building the capacity of all stakeholders. Many successful community-based ecotourism projects in the region have been strongly supported by NGOs, sometimes in partnership with the private sector.

### *Developing partnerships with the private sector*

The private sector is an essential partner in the development of nature-based tourism in protected areas. They can contribute to the capital investment required for the development of products, to build capacity of communities and small scale local operators to manage tourism through joint ventures, to train guides, to market and promote, and to monitor of impacts. In an unregulated environment, however, a proliferation of tourism operators interested only in financial gain threatens the sustainability of tourism development. This can be managed through the allocation of concessions or licenses to operate in protected areas, by binding private operators to regulations and codes of conduct, by applying performance bonds, and by accreditation or certification schemes to ensure that reputable enterprises are given priority in allocating concessions to operate in protected areas.

### *Legal framework for tourism in protected areas*

A priority for Cambodia is to review and strengthen the legal framework for protecting communities from exploitation and enabling them to participate in and benefit from tourism development associated with protected areas. This is very much linked to the allocation of land and resource use rights to communities living in and around protected areas. Legislation should confer the right to ethnic communities to develop tourism businesses on their customary lands and to retain revenue from those businesses. Importantly, legislation should give the right to communities to refuse tourism development or terminate contracts with private operators.

### *Achievements*

Tourism has been growing rapidly in Cambodia and is becoming a significant part of the economy. Due to this rapid growth, a lack of resources and a limited management framework, ecological protection of tourism sites is minimal. But some progress is being made. Cambodia has invested heavily in restoring historic temples across the country, especially in the Angkor region (CDRI 2001). Moreover, APSARA is now trying to address the physical impacts in the Angkor temple complex.

***The National Tourism Policy includes the development of infrastructure and conservation of touristic values in protected areas:*** MOE and MOT have embarked on a cooperative initiative to develop a master plan for selected protected areas to promote eco-tourism. The MOT has a staff of 1030 and is an important potential resource for the sensitive development and management of protected areas. Once the collaborative master plan is completed, the ministry should identify protected areas as a key development strategy for tourism and invest in them accordingly.

**Local government and communities are recognising the broader development values of protected areas, especially relating to tourism:** Already in some parks tourism is bringing in significant revenue for local communities.

**MOE has made initial investments in infrastructure in some parks:** In Kirirom National Park, some roads have been renovated, a park information centre and accommodation facilities have been established and information boards set in place. Also, some basic equipment has been purchased such as fire-tankers, trucks for rubbish collection and rubbish bins. These initiatives have contributed to increasing local and international tourists to the park.

**NGOs are beginning to assist in eco-tourism development:** In Ratanakiri, NGOs are trying to help communities establish more traditional money distribution systems for tourism revenue to maintain community cohesiveness (PPP 2002a).

## Challenges

**Stakeholder participation:** Perhaps the most significant challenge for government will be achieving thoughtful collaboration of stakeholders in planning and managing tourism in protected areas.

**Collaboration between government agencies:** The government entities with authority in protected areas and the tourism sector will have tough decisions to make in coordinating their efforts to develop long-term plans. Sustainable and eco-friendly tourism can only be achieved if the policy makers come to a consensus on major issues such as infrastructure, minimising environmental impacts on the areas, tour operator standards and revenue-sharing.

**Physical degradation of protected areas:** Tourism can have both direct and indirect negative impacts on protected areas. Direct impacts are those that are caused by the presence of tourists, and indirect impacts are those caused by the infrastructure built in connection with tourism activities (Ceballos-Lascurain, 1996; ICEM 2003a). The Angkor temple complex has experienced significant air and water pollution problems due to a lack of waste receptacles, toilets and other facilities. The river in Siem Reap town suffers from similar pollution woes, owing largely to waste water from hotels, restaurants and other businesses (CDRI 2001).

**Maintaining indigenous culture:** Tourism can also affect the cultural fabric that binds communities together. As tourism exposes villages to visitor pressures, local communities are at risk of losing traditions. Also tourism has the potential to provide some, but not all members of a community with financial gain, thus disrupting community solidarity (ICEM 2003a).

## Future directions

The Angkor Protected Landscape currently serves as an experiment for Cambodia in its planning and managing tourism in protected areas. Cambodia has the opportunity to learn from this experience and the lessons of its neighbours in preparing a tourism plan for protected areas that helps sustain the natural resources and livelihoods of the concerned communities. As the Minister of Tourism, H.E. Veng Seryvuth, has pointed out, "Because of the war we have started tourism later than other countries. We must use this to our advantage by avoiding their mistakes. If you destroy the environment, everyone will lose out" (PPP 2002a).

The Regional Report on Protected Areas and Development in the Lower Mekong River Region drew from Cambodian experience as well as lessons of other riparian countries in defining a common set of priority actions that need to be taken at national and local level (ICEM 2003). Those strategies are given below in Box 7 as an agenda for action in Cambodia for tourism development associated with protected areas.

### Box 7: National and local nature based tourism strategies (ICEM 2003a)

#### **1: Building professional expertise and community understanding**

1. Review the institutional framework for managing tourism development in protected areas to ensure that protected area management agencies take the lead role in planning and coordinating other agencies.
2. Mobilise stakeholder boards and a national technical advisory group to support tourism planning.
3. Develop a national protected area management training curriculum and provide training to protected area staff in protected area planning and zoning for tourism.
4. Develop guidelines and criteria for conducting pre-feasibility assessments for community-based tourism and ensure that assessments are undertaken before communities are involved in tourism development.

#### **2: Planning early for tourism in each protected area**

1. Require land use planning and zoning to precede all tourism development in protected areas.
2. Develop tourism management plans for all protected areas that provide clear direction for balancing conservation and social needs with tourism development.
3. Confer legal rights to ethnic communities to develop and benefit from tourism development on customary lands.
4. Involve all member groups of a community from an early stage.
5. Develop strategies and guidelines to involve women, children and older village members in the planning process.
6. Inform communities of the potential costs and benefits before proceeding with tourism development.
7. Establish a stakeholder forum to oversee the implementation of tourism management plans, to promote transparency and accountability in decision-making and ensure that objectives are met.

#### **3: Developing funding strategies for protected area tourism**

1. Provide protected area and tourism managers with simple and standardised methodologies for evaluating and presenting the economic benefits generated by tourism development.
2. Develop mechanisms to ensure local communities and protected area managers retain some income from tourists.

#### **4: Developing strategies to manage impacts**

##### Visitor management

1. Develop codes of conduct on culturally appropriate behaviour, noise pollution, litter, vandalism, taking of flora and purchase of wildlife products.
2. Encourage tourists to be accompanied by trained guides when visiting sensitive ecosystems.

##### Infrastructure

1. Locate infrastructure outside the protected area wherever possible.
2. Review the environmental impact of any proposed development, either through a formal Environmental Impact Assessment or, in the case of small scale interventions, a simple checklist to assess such things as visual impact, social change, noise and ecological disruption during construction and after the facility is in service.
3. Establish a soft loan facility to fund the purchase of solar panels, composting toilets and other minimal impact technology that can be repaid through user charges.

### Monitoring

1. Establish monitoring protocols for inclusion in all protected area tourism management plans.
2. Establish a national level environmental and socio-economic auditing process for protected area tourism development using standardised performance indicators (to be informed by site level monitoring protocols).

#### **5: Developing partnerships with NGOs and the private sector**

1. Identify NGO and private sector partners to facilitate product development and build capacity of local communities.
2. Develop legally binding contracts for private operators that protect community rights and stipulate mechanisms for returning economic benefits to communities.
3. Establish a forum for resolving disputes between communities and tourism development partners facilitated by local authorities.

### *A national tourism and protected area plan and demonstration project*

**The MOT and MOE need to complete and implement the National Plan for Tourism Development associated with protected areas:** MOE and MOT have agreed to prepare a national tourism plan for protected areas. This work is critical for both ministries and should be given high priority. The potential for MAFF to join in important strategic initiatives should be explored. A formal request for support should go to appropriate international organisations so that lessons and best practice can be reviewed and policies can be based on adequate field studies and tourism analyses.

**MOE, MOT and MAFF should plan and implement a pilot tourism development plan for a specific cluster of protected areas with tourism potential as demonstration:** In situations of scarce resources, it is not possible to take action everywhere at once. Priorities need to be set to focus efforts and optimise chances of success. Demonstration projects in promising locations are needed to guide action in other areas as additional resources become available.

The national plan for tourism and protected areas should identify priority clusters of protected areas with special promise for tourism and appropriate sites for demonstration projects. A high priority should be the south west cluster of national parks which already attracts tourists, has ready access and a diversity of protected area “products” which could be marketed as a package.

### *Financing and managing tourism investments*

**Review the current arrangement for charges and other economic measure associated with protected areas and tourism:** Studies indicate that tourists, even “backpackers” travelling on limited budgets, are willing to pay significant tariffs for nature-based experiences if the funds go to conservation and community development in the areas visited. Sources of financing from tourism could include:

- Entry fees for protected areas;
- Licensing, leases and concessions for commercial tour operators using protected areas;
- Taxes on goods and services used for nature-based tourism;
- Donations; and
- Allocations from the national or sector budgets.

A review of current financing arrangements should recommend a framework of economic instruments to apply to tourism in the protected area system.

***Pilot at least one protected area cluster trust fund which supports and is fed by tourism activities:*** Trust funds for clusters of protected areas can facilitate decentralisation, help build capacity and ensure that revenues from tourism are used for protected area core objectives. A cluster trust fund encourages resources to be shared between protected areas that have varying potentials for tourism and varying significances for biodiversity conservation.

#### *Capacity building of protected area managers and local communities for tourism*

MOE and MOT should work together to develop and conduct tourism training courses for protected area managers, tour guides and local community leaders. In protected areas that are deemed suitable for tourism, protected area managers will need to collaborate with and mediate between tourism officials, the private sector and local communities to ensure that tourism development in the protected area is equitable and remains consistent with the underlying protected area's conservation objectives. A framework of tourism management mechanisms, standards and services will need to be developed and applied. All this will require new skills and approaches. Equally, local communities will require training and technical support of their new roles as tourism entrepreneurs, service providers and managers. MOE and MOT should seek support from the tourism industry, and the international NGO and donor community in implementing a program of training workshops in selected locations.

#### *Establishing community management structures for local participation in tourism development*

Strong community involvement is important for the long-term sustainability of nature-based tourism and community development. The establishment of cooperative management committees in these communities can provide a transparent and equitable system for managing tourism initiatives and distributing tourism revenues. Already, MOE is committed to establishing community committees for co-management of special multiple use zones within each protected area. Options should be explored for using these or similar structures to facilitate community involvement in planning and managing tourism development in and around protected areas.

#### *Building partnerships between government, NGOs and the private sector*

MOE and MOT should use demonstration projects to build a collaborative framework with NGOs and the private sector. The private sector is a key player in protected area tourism development. Investors, tourism operators and a range of businesses make it possible for tourists to access and experience the protected areas. Also, the private sector can be instrumental in building the capacity and economic development of protected area managers and local communities. NGOs can play a critical role in facilitating poverty alleviation through tourism. They can provide essential capacity building and organisational support to communities to assist them in becoming a partner with the private sector and government in developing tourism.

MOE and MOT need to pilot mechanisms and demonstrate way that all three groups can work together in a coordinated effort to build a sustainable system of nature-based tourism in and near protected areas.

## Part 6: Strategies for Protected Areas as Engines for Development

### 15. Priorities for action

The PAD Review has shown that protected areas are vital development assets – they are centres of development services and products essential to Cambodia’s growing economy. Only by managing protected areas as productive parts of wider development landscapes, will resource users appreciate the benefits of conserving their natural qualities.

To succeed, protected area managers will need to understand and express those qualities in economic terms. Protected areas need to be promoted and marketed, because this is the only way they will ever be effectively integrated into Cambodia’s national accounts and socio-economic development plans.

While it is essential to increase demand for protected area products, managers need to ensure that the uses of them are sustainable and appropriate. In other words, the natural capital held in protected areas must not be degraded – it must be maintained and enhanced – because that will bring the greatest development returns over the long term.

This national report has examined protected areas from the perspective of local communities and development sectors. The relationships between protected areas and resource users have been assessed and management strategies defined which increase protected area development contributions while better conserving them. The many recommended strategies relating to each field of development can be distilled into five main priorities for action:

1. National policy framework for protected areas;
2. Protected area trust funds and financing;
3. Pilot demonstration project in the south-west cluster of protected areas;
4. Economic analysis of protected areas;
5. Protected area training program.

#### 1. National policy framework for protected areas

A form of land and water tenure expected to cover 25 percent of national territory must have its own policy framework. Protected areas will become the single most important form of tenure within Cambodia, covering the nation’s watersheds, largest expanses of remaining natural forest, most significant fish habitats and biodiversity wealth, key energy resources and the main source of subsistence products for poor communities.

An effective policy framework includes an overall strategy underpinned by national legislation, and individual plans for each relevant sector. The strategy and sector plans should be regularly reviewed and revised in keeping with the government’s three and five yearly development planning cycle.

##### *Cambodia national protected area strategy*

The national strategy should address the needs of Cambodia’s national protected area system, covering all forms of protected area, including those managed by MOE, MAFF and different levels of government. While several agencies can fruitfully have a role in establishing and conserving protected areas, there needs to be one umbrella policy framework which views protected areas in terms of their national contribution to development and biodiversity conservation and brings consistency in management.

The national protected area strategy should build on the analysis in this report and include:

- A definition of the national protected area system and its categories;
- A statement of development and biodiversity conservation goals and objectives through protected areas;
- A confirmation of institutional roles and responsibilities (especially of MOE and MAFF);
- Adoption of the user pays policy and other innovative systems of protected area financing.

It should also include goals, priorities and broad guidelines relating to:

- Poverty alleviation;
- Migration and demobilisation;
- Decentralisation;
- Regional (“protected area cluster” or “landscape”) planning approaches;
- Local protected area establishment and management;
- Co-management and zoning;
- EIA of development affecting protected areas;
- Monitoring and reporting.

The national strategy should be a short document of key principles and policies and be prepared by a task force of MOE and MAFF in consultation with other relevant bodies. It should be regarded as a more focussed and detailed set of policies giving expression to the governments overall policies on biodiversity, poverty and development.

#### *Sector protected area plans*

This report identifies the six main sectors needing a systematic policy approach to protected areas:

1. Forestry
2. Agriculture
3. Fisheries
4. Water resources
5. Energy
6. Tourism

Protected areas and regimes of protection are becoming increasingly important to continued productivity and development in each of those sectors. Each sector will require a tailored plan reflecting the unique relationship with protected areas, providing policy direction and guidelines. Sectoral plans should:

- Recognise the development contribution of protected areas to the sector;
- Identify existing and potential protected areas contributing to the sector;
- Identify regimes of protection needed outside and linking protected areas to better safeguard protected area development benefits;
- Identify locations where new protected areas may be needed;
- Recognise the user pays principle as a policy and apply the system to the sector;
- Identify planned and existing sector developments potentially affecting protected areas and set appropriate environmental standards;
- Identify priorities for action in terms of rehabilitation and maintenance of existing protected areas to safeguard benefits;
- Define a program of protected area related activity over a three to five year period and the sector budgetary commitment to it.



Each department and ministry concerned will need to take the lead in preparing their plans in collaboration with MOE and MAFF. Already MOT is working with MOE to prepare its protected area plan for tourism so this initiative should receive priority as a pilot exercise to guide other sectors. The energy sector is also a high priority given plans to extend the hydropower network and fossil fuel exploration, and the increasing fuelwood demand. MIME, MOE, MAFF and other relevant ministries would need to be involved in preparing this sector plan.

The first round of plans should be short and relate only to critical issues. The sector plan can be reviewed against the National Protected Area Strategy in the next development planning cycle.

## 2. Protected area trust funds and financing

As the decentralisation process takes hold, stable and long-term mechanisms for funding conservation priorities are needed which are locally managed and disbursed. Long-term funding commitment with interventions made consistently at a low level are the most appropriate for conservation and in the early stages of community development associated with protected areas. Funding strategies should not exceed or corrupt the capacity of communities and institutions to sustain the results of the interventions, and should continue funding essential activities even after the aid intervention has ended.

Trust funds can be an important way of ensuring long-term funding for protected areas. They can take a number of different forms. Some funds are established in the form of capital endowments in which only the interest on the capital is used for the fund's stated purpose. Others are draw-down or sinking funds, in which the capital is drawn down over a period of time. Some are revolving funds where expenditure is balanced by income, usually in the case of support to productive activities.

Getting fund governance right is critical to their success. They must be transparent, and include adequate representation from stakeholders and recipients of the fund's support. Ideally, trust fund governance structures should have representation from government and civil society and, where appropriate, the funding organisations.

Such funds can also become the repository for financial contributions from various sources as discussed below, especially as the user pays policy is progressively introduced. The user pays approach would link use of development services and products from protected areas with their maintenance. One option for this flow of funds is for it to go to national consolidated revenue. Another option is to keep those funds for direct management and use at the locations where they are generated. In most chapters of this report, linking the user pays policy with protected area trust funds is promoted as a way of facilitating the government's decentralisation policies, building capacity in fund management and bringing commitment to protected area conservation.

This report recommends the establishment of two protected area trust funds during the current three year planning period:

1. A national protected area trust fund;
2. A pilot protected area cluster trust fund covering the four national parks in the south-west region.

### *A national protected area trust fund*

A project to establish a national protected area trust fund should be initiated by MOE in collaboration with the Ministry for Economics and Finance and MAFF. MOE should seek support for the project through the Global Environment Facility with the help of one or more of the implementing agencies with programs in Cambodia (i.e. UNDP, the World Bank, and Asian Development Bank). A GEF Block B grant can be received to develop the full trust fund proposal for subsequent GEF consideration. This is the recommended path. The initial GEF support would allow for broad consultation on the fund concept, the institutional and disbursement arrangements and explore other sources of funding.

GEF is a co-financing facility so additional sources of funding will need to be explored. Four sources have special promise:

- A debt for nature exchange;
- Kyoto Protocol options;
- Bilateral aid contributions;
- Government contribution through existing and proposed budgetary commitments (including bank loans).

Debt exchanges are based on identifying components of a country's debt portfolio that are non-performing, i.e. where the debtor country is experiencing difficulties meeting its interest and capital repayment schedule. In such cases, it is in the interest of both the creditor and debtor country to retire the debt. The creditor country is willing to retire the debt against partial payment in a negotiated settlement involving additional funding for protected areas over and above existing aid commitments.

Capitalising the national protected area trust fund through a debt exchange enables the trust fund to be established at a level that permits impact and flexibility. Also, it helps relieve Cambodia's debt burden, thus improving the economic indicators of both Cambodia and the former creditor country.

A study should be undertaken of Cambodia's debt – with special focus on ODA and other bilateral debt – with a view to identifying debt stocks that are eligible or potentially eligible to be exchanged. This study should inventory policies of creditor countries in respect of debt exchanges and recommend a limited number of initial targets for debt exchange.

Under the Kyoto Protocol (of the Framework Convention on Climate Change), negotiated in 1997, rich countries (known as the Annex 1 countries) agreed to specific targets for emission reductions, against a set schedule. The protocol allows them to meet their targets in a variety of ways. They can reduce emissions in their own countries. They can also help non-Annex 1 countries reduce their emissions. Or they can support projects that convert or "fix" atmospheric carbon, usually through reforestation or other forms of increasing natural biomass.

Cambodia is well-placed to benefit from the flexible mechanisms recognised under the Kyoto Protocol. With the help of interested donors, it should explore the options relating to emissions trading and the Clean Development Mechanism.

### *Pilot protected area cluster trust fund*

The pilot protected area cluster trust fund would be one component of the cluster demonstration project recommended for the south-west region. The fund would need to be capitalised from a donor contribution with replenishment funds from pilot application of the user pays policy to the two hydropower schemes operating or proposed for the region, and various tourism licences, concessions and charges. A link between the national protected area trust fund and this decentralised fund could be explored with the two being established at the same time and sharing fund sources.

The key attribute of the protected area cluster trust fund is that it be managed locally and disbursed according to a cluster wide plan which defines problems shared by the four parks and sets priorities for action. The fund is intended to promote a landscape approach to protected area planning, a recognition of the development benefits of the four parks, and a long term and consistent management response to the main conservation needs in the region. The primary focus of the trust fund would be conservation of the four parks. Yet, a proportion of the funds would go to community development initiatives consistent with the conservation and sustainable use objectives of the parks.

The detailed institutional arrangements would be set during the project design but the fund management committee should include the four park directors and senior staff from DNCP.

A trust fund covering the Cardamom Mountains cluster of protected areas is being considered with support from Conservation International. There is an important opportunity for exchange and coordination between these linked landscapes – i.e. the Elephant and the Cardamom Mountain Ranges – through the two pilot trust funds and cluster wide projects.

### 3. Pilot demonstration project in the south-west cluster of protected areas.

Many of the strategies set out in this report require innovation in protected area planning and management and a reorientation in conservation and development budgets within the major resource development sectors. A phase of piloting and demonstrating these new approaches is needed targeting a group or cluster of protected areas in a region of development growth and population pressure.

Cambodia's national biodiversity planning process identified the south-west region including two protected area clusters for priority attention. Priority setting criteria included the level of development pressure and opportunities to have protected areas recognised as significant development assets in local economies through effective conservation of their natural systems. The cluster demonstration project would focus on the landscape linking the four national parks of the Elephant Range which are dominant features framing the southern portion of the Phnom Penh to Sihanoukville development corridor.

Key components of the south-west cluster demonstration project would be implemented on the basis of a cluster landscape management plan including:

- A poverty reduction strategy and program;
- Operation of a cluster protected area trust fund;
- Economic valuation and application of the user pays policy;
- A program of conservation planning and management;
- A program of training in protected area planning and management;
- A monitoring and reporting program.

The cluster demonstration project would promote a “one region one plan” approach to integrating protected areas into the wider socio-economic development landscape as described in Chapters 1 and 6. All sectors would be part of the planning process leading to their collaborative adoption and implementation of the plan. The goal is to have biodiversity managed on a regional basis, using natural boundaries to facilitate the integration of conservation and production-oriented management, through the preparation and implementation of a cluster landscape plan. The planning process will identify mechanisms to ensure all levels of government cooperate and coordinate their activities. Special emphasis would be given to the role of local government and communities.

A number of landscape-based protected area projects are either underway (e.g. the Cardamom Mountains, Virachey National Park and surrounding landscape and Tonle Sap Multiple Use Area) or in the pipeline (e.g. northeastern dry forest plain landscape and Kulen Promtep Wildlife Sanctuary northern plain landscape). A forum for exchange between protected area landscape projects would provide a valuable

opportunity for exchange and collaboration to ensure an appropriate level of consistency and to optimise capacity building and institutional strengthening within the national protected area system.

#### 4. Economic analysis of protected areas

The PAD Review field study in the south-west cluster of protected areas demonstrated the importance of valuation for integrating protected areas into socio-economic development planning and budgeting. This work should be expanded in other high priority clusters within the national protected area system so that economic planners and protected area managers have a greater body of information to feed into the budgetary and development planning process.

The valuations will identify, assess, value (where possible), and demonstrate in practical terms the environmental products and services provided by selected groups of protected areas to support development. They will apply and demonstrate rapid assessment methods as a basis for economic appraisal and valuation of the relevant benefits. Finally, they will prepare guidelines and field manuals setting out methods for rapid protected area valuation for use by protected area managers in their day to day work.

The valuation work will continue as a component of the demonstration project in the south-west cluster of protected areas, which will include:

- More comprehensive valuations of the environmental products and services provided by the four national parks to support development in the region;
- Linking those benefits to individual sectors;
- Developing a framework of economic and management instruments to apply the user pays policy to the beneficiary sectors;
- Working with the sector to test the user pays system and linking it to the cluster trust fund;
- Working with the sector to prepare national procedures and a legal framework to apply the demonstrated system nationally.

#### 5. Protected area training program

Every chapter in this report identifies areas where capacity in staff and institutions needs to be strengthened if the approaches described are to be effectively implemented. Rather than addressing this priority in a piecemeal fashion, MOE will seek to mount a three year program of short-term in country training for protected area staff and their sectoral counterparts at central, local and field level, as well as local communities. The theme of the training program would be "linking protected areas to sector and community development". Training components could include:

- Tourism management for protected area managers, tour guides and local community leaders;
- Developing collaborative management capacity for protected area managers, local government and communities;
- Applying the user pays policy in protected area financing.

While MOE should seek government support for such a program, it will require the backing of international partners both in terms of funding and technical support from protected area organisations in other countries. DNCP will begin exploring the opportunities for designing and implementing such a training program.

As far as possible the program should work through and strengthen local training institutions and lead to the establishment of a national training centre for protected area planning and management. Wild Aid is supporting the renovation of buildings in Bokor National Park as a training centre. The south-west cluster of protected areas demonstration project should seek to build on this initiative and explore further developing the Bokor training facility as a national centre of excellence for protected area training.

## Conclusion

The story of forest degradation in Cambodia, followed by deterioration of fisheries and the quality of waterways has sent strong alarm signals through government and the international community. The past five years has seen a steady eating away at the quality of natural systems within protected areas and the surrounding environment, by major government and private development interests and local communities. Those degrading incursions are continuing. New systems of management are being put in place. The main constraints are institutional capacity and resources to see those policy and management frameworks applied in practice.

Protected areas are not yet fully recognised as productive units of the economy so are not taken into account when the government defines its development strategies or national and sector budgets. Cambodia is facing a potential scenario of a protected area system that diminishes in quality as it grows in size. Its value fades both as a conservation and development asset.

The first challenge in overcoming this situation is to show that protected areas have significant economic value when managed and used sustainably in their natural state. The PAD Review fields study has made a good start in this critical step.

Protected areas need to be placed much higher on the government's list of priorities and to receive higher levels of investment accordingly. One important way to increase that flow will be by adopting the user pays principle. Whether they are government sector users such as water supply or irrigation agencies, private sector developers associated with hydropower schemes or tourism, or even local communities – if they use protected area services or products, they should pay for the privilege. This is a central theme of the report.

The PAD Review provides strong arguments for protected area conservation to be considered a priority in local and sector planning and development. Sectors and local government need to appreciate the benefits they receive from protected areas and to invest in their maintenance. The future of protected area management in Cambodia is not in building strong armies to hold development forces at bay, but in having those forces invest in conservation because they see that it is in their best interests to do so and they recognise protected areas as a vital development strategy.

## References

- ARD. April 1998. *Forest Policy Transition Paper for Cambodia*. Final Report of the Forest Policy Reform Project.
- Ashwell, D. 1997. *Cambodia – A National Biodiversity Prospectus*, IUCN/MOE, Phnom Penh, Cambodia.
- Asian Development Bank. 2000. *Cambodia: Enhancing Governance for Sustainable Development*. Phnom Penh.
- Asian Development Bank. February 2001a. *Environments in Transition, Cambodia, Lao PDR, Thailand, Viet Nam*. Manila.
- Asian Development Bank. April 2001b. *Key Governance Issues in Cambodia, Lao PDR, Thailand, and Viet Nam*. Manila.
- Asian Development Bank. December 2001c. *Participatory Poverty Assessment: Cambodia*. Phnom Penh.
- Asian Development Bank. December 2001d. *Cambodia Financial Sector Blueprint for 2001-2010*. Phnom Penh.
- Baltzer, M.C., Nguyen Thi Dao, and R.G. Shore (Eds). 2001. *Towards a Vision for Biodiversity Conservation in the Forests of the Lower Mekong Ecoregion Complex*. WWF Indochina/WWF US, Hanoi and Washington D.C.
- Buddhist Institute. 1999. *Cry From the Forest*, Phnom Penh, Cambodia.
- Carew-Reid, J. (Ed). 2002. *Biodiversity Planning in Asia*. IUCN, Sri Lanka.
- Cambodia Council of Ministers. 11 August 1999. *Sub-Decree on the Environmental Impact Assessment Process*. Phnom Penh.
- Cambodia Development Resource Institute. August 2001. *Cambodia's Annual Economic Review 2001*. Phnom Penh.
- Ceballos-Lascurain, Hector, 1996. *Tourism, ecotourism, and protected areas*. IUCN. Gland, Switzerland.
- Chea, V. and Sean, K. 2001. *Fisheries Preservation in the Mekong River Pools in Stung Treng and Kratie Provinces*. MRC/DOF/Danida Fisheries Project in Cambodia. Department of Fisheries, MAFF, Phnom Penh.
- Consortium Pomerleau – Hydro Quebec – Experco. November 1995. *Prefeasibility Report for the Kamchay Hydroelectric Project*. Canada.
- Dirksen Flipse Doran & Le (Cambodia) Ltd. 2002. *Cambodia Investment Guide*, Phnom Penh.
- Gilmour, D., and Nguyen Van San. 1999. *Buffer Zone Management in Vietnam*. IUCN Vietnam.
- Global Witness. May 2001, *The Credibility Gap – and the need to bridge it*. Global Witness. London, UK
- Global Witness. July 2002. *Deforestation without limit*. Global Witness. London, UK
- Henderson, Doug. April 1999. *Report to JICA: The Forest Sector in Cambodia*. JICA. Phnom Penh.
- ICEM, 2001. *The Contribution of Protected Areas to Sustainable Economic Development in Cambodia*. PAD Review Sector Background Paper, Phnom Penh, 24 October 2001

- ICEM, 2003a. *Protected Areas and Development in the Lower Mekong Region: Regional report*. Review of protected areas and development in the four countries of the Lower Mekong region, Indooroopilly, Queensland, Australia.
- ICEM, 2003b. *Lessons learned in Cambodia, Lao PDR, Thailand and Vietnam*. Review of protected areas and development in the four countries of the Lower Mekong region, Indooroopilly, Queensland, Australia.
- ICEM. 2003c. *Field studies in Cambodia, Lao PDR, Thailand and Vietnam: Economic benefits of protected areas*. Review of protected areas and development in the four countries of the Lower Mekong region, Indooroopilly, Queensland, Australia.
- IUCN. 1997. *The conservation and sustainable use of biological resources associated with protected areas of southern Cambodia - The parks, people and biodiversity project: A concept paper*. Phnom Penh, Cambodia
- IUCN. 1994. *Guidelines for protected area management categories*. CNPPA with assistance of WCMC, IUCN, Gland, Switzerland.
- Kingdom of Cambodia. *Constitution of the Kingdom of Cambodia*, September 21, 1993, and as amended March 4, 1999.
- Kingdom of Cambodia, *Law on Administration of Communes*, March 19, 2001.
- Kingdom of Cambodia. *Law on Environmental Protection and Natural Resource Management*, December 24, 1996.
- Ministry of Agriculture, Forestry and Fisheries, May 2000a. *Agricultural Strategies and Policy Framework for Sustainable Food Security and Poverty Alleviation*. Phnom Penh.
- Ministry of Agriculture, Forestry and Fisheries. 2000b. *Fisheries Report in 1999 and planning for the year 2000*. Department of Fisheries, MAFF, Phnom Penh.
- Ministry of Agriculture, Forestry and Fisheries. December 13, 2001. *Prakas on Suspension of Forest Concession Logging Activities*. Phnom Penh.
- Ministry of Commerce. 2000. *Cambodia Business & Investment Handbook 2000*, Phnom Penh
- Ministry of Environment. 2000. *Guidelines for the Planning and Management of Protected Areas in Cambodia*. Department of Nature Conservation and Protection and the European Commission Support Program to Environmental Sector in Cambodia, Phnom Penh.
- Ministry of Industry, Mines and Energy. January 1999. *Cambodia Power Sector Strategy 1999-2016*. Phnom Penh.
- Ministry of Planning. 1999. *Cambodia Socio-Economic Survey 1999*. National Institute of Statistics, Phnom Penh.
- Ministry of Planning. 2001. *Cambodia Statistical Year Book 2001*. National Institute of Statistics, Phnom Penh.
- Ministry of Water Resources and Meteorology Steering Committee. 2002. *National Workshop on Water, Public Awareness and Sustainable Development – Develop National Water Vision and Framework for Action*. March 19-20, 2002.
- Ministry of Water Resources and Meteorology. July 2001. *National Water Sector Profile: Kingdom of Cambodia*. with the assistance of Sir M. MacDonald & Partners and BCEOM Societe francaise d'ingenierie.

- Mok Mareth. 2002. *Opening speech to the Second Regional Workshop*, 17-18 October 2002 Review of protected areas and development in the four countries of the Lower Mekong River region, Minister for Environment, Cambodia ([www.mekong-protected-areas.org](http://www.mekong-protected-areas.org))
- Nao Thuok and Nicolaas van Zalinge. 2000. Challenges in managing Cambodia's inland fisheries – How can we meet them? in Van Zalinge, N.P., T.Nao and S. Lieng (Eds), 2000. *Management aspects of Cambodia's freshwater capture fisheries*. MRC and MAFF, Phnom Penh, pp 10-22
- Nhep Bunchin, 2002. Speech at *World Water Day Conference*, March 22, 2002. Secretary of State for the Ministry of Industry, Mines and Energy, Phnom Penh
- Ngo Pin, Secretary of State, Ministry of Water Resources and Meteorology. 2002. Speech at the *National Workshop on "Water, Public Awareness and Sustainable Development" – Water and Sustainable Development in Cambodia*. March 19-20, 2002. Phnom Penh.
- Phillips, A and Harrison, J. 1997. *The framework for International Standards in Establishing National Parks and Other Protected Areas*. The George Wright Forum, Vol. 14, No 2
- Phnom Penh Post. 2002a. *Scaling the eco-tourism ladder in Ratanakiri*. February 15-28, 2002.
- Phnom Penh Post. 2002b. *The PRSP: Ready or not, an end to poverty?* September 27 – October 10, 2002.
- Pich, S.A.. 2002. *Rural and Community Development and Protected Areas*. Ministry of Rural Development, Unpublished.
- Pirot, J-Y., Meynell P.J. and Elder D. 2000. *Ecosystem Management: Lessons from Around the World. A Guide for Development and Conservation Practitioners*. IUCN, Gland, Switzerland and Cambridge, UK.
- Poulsen, A.F. & Valbo-Jorgensen, J. 2001. *Deep Pools in the Mekong River*. Mekong Fish Catch and Culture of Mekong Fisheries Network Newsletter. 7:1-16
- Ray N. 2000. *Cambodia – Lonely Planet*. Lonely Planet Publications. Melbourne, Australia.
- Rendall, Matthew. 1999. *The Constitution and Government of Cambodia*. University of San Francisco School of Law, Cambodian Law and Democracy Project, November 1999.
- Royal Government of Cambodia. 2001. *Governance Action Plan*. Council for Administrative Reform, Phnom Penh
- Royal Government of Cambodia. 2000. *Interim Poverty Reduction Strategy Plan (IPRSP)*, Phnom Penh
- Royal Government of Cambodia. April 2002. *National Biodiversity Strategy and Action Plan*, MOE, Phnom Penh.
- Royal Government of Cambodia, August, 2002. *Poverty Reduction Strategy Paper [First Draft] (Draft PRSP)*, Phnom Penh.
- Royal Government of Cambodia. October, 2001. *Second Five Year Socio-Economic Development Plan 2001-2005*. National Economic Growth and Poverty Reduction Strategy [Draft] (Draft SEDP II), Phnom Penh
- Sayer, J. 1999. *Rainforest Buffer Zones: Guidelines for Protected Area Managers*. IUCN, Gland, Switzerland.
- Smith, J.D. (Ed.) 2001. *Biodiversity, The Life of Cambodia. Cambodian Biodiversity Status Report 2001*. Cambodia Biodiversity Enabling Activity. Phnom Penh, Cambodia.
- Sok Siphana and Sarin Denora. 1998. *Legal Aspect of Doing Business in Cambodia*. The Cambodian Legal Resources Development Centre, Phnom Penh.



Sverdrup-Jensen, S. 2002, *Fisheries in the Lower Mekong Basin: Status and Perspectives*. MRC Technical Paper No. 6, Mekong River Commission, Phnom Penh.

Tep, B., Sim, B., Em, C., Dy, C., Hak, S., Om, S., Ros, S., Mak, S., Chin, V., Dixon, Ben., Trent, S., Williams, J. 2000. *Feast or Famine? Solutions to Cambodia's fisheries conflicts*. A report by the Fisheries Action Coalition Team (FACT) in collaboration with the Environment Justice Foundation. c/o NGO Forum on Cambodia, Phnom Penh.

United Nations Development Programme, 2000. *Annual Report 2000, Cambodia*. UNDP, Phnom Penh, Cambodia.

United Nations System in Cambodia. May 2000. *United Nations Development Assistance Framework for Cambodia (UNDAF) 2001-2005*. Phnom Penh.

World Bank. February 1999. *Cambodia: A Vision for Forestry Sector Development Background Note*, Phnom Penh.

World Bank. January 1998. *National Environmental Action Plan 1998-2002*, Phnom Penh.

World Bank. East Asia and Pacific Region, January 1999. *Cambodia Public Expenditure Review – Enhancing the Effectiveness of Public Expenditures*, Volume Two: Main Report, Phnom Penh.

World Bank. 2000. *Cambodia – Country Assistance Strategy– Building the Foundations for Sustainable Development and Poverty Reduction*. South East Asia and Mongolia Country Office.

WWF. 2001. *The Forests of the Lower Mekong Ecoregion Complex*. Printing Enterprise No.1 Cartographic Publishing House. Hanoi, Vietnam.

WWF International. July 2001. *Guidelines for Community-Based Ecotourism Development*. Gland, Switzerland

## Acronyms

ADB	Asian Development Bank
CDRI	Cambodia Development Resource Institute
DFW	Department of Forestry and Wildlife
DNCP	Department of Nature Conservation and Protection
DOF	Department of Fisheries
EIA	Environmental Impact Assessment
FAO	Food and Agriculture Organisation
FDI	Foreign Direct Investment
GAP	Governance Action Plan
GDP	Gross Domestic Product
IPRSP	Interim Poverty Reduction Strategy Plan
IUCN	The World Conservation Union
MAFF	Ministry of Agriculture, Forestry and Fisheries
MEF	Ministry of Economy and Finance
MIME	Ministry of Industry, Mines and Energy
MOC	Ministry of Commerce
MOE	Ministry of Environment
MOT	Ministry of Tourism
MOWRAM	Ministry of Water Resources and Meteorology
MRD	Ministry of Rural Development
NBSAP	Nation Biodiversity Strategy Action Plan
NEAP	National Environment Action Plan
NGO	Non-governmental organisation
NTFP	Non-timber forest product
ODA	Official Development Assistance
PAD Review	Review of protected areas and development in the four countries of the lower Mekong River region
PRSP	Poverty Reduction Strategy Plan
PPP	Phnom Penh Post
RGC	Royal Government of Cambodia
SEDP	Socio-Economic Development Plan
SEILA	Social Economic Improvement Agency Program
UN	United Nations System in Cambodia
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNICEF	United Nations Children's Fund
UNTAC	United Nations Transitional Authority
VAT	Valued Added Tax
NTFP	Non-timber forest product
WTO	World Trade Organisation
WWF	World Wild Fund for Nature

## Annex 1: The budget process

- 1. June** of the year preceding the target budget year – The Ministry of Economy and Finance (MEF) establishes a macro-economic framework of the budget through a review of the macro-economic limitations on the budget and forecasts of GDP growth and tax and other revenues based upon the previous budget year.
- MEF undertakes a policy-making process involving a review of the available funds against broad spending objectives. The final outcome of this stage is MEF's determination of the availability of resources for domestically funded spending.
- MEF prioritises the funds between the key sectors and prepares a first draft of a budget by broad strategic sectors, and sets ceilings for expenditure for each ministry and the major expenditure chapters of the budget. These indicative shares are based upon the priority themes established by the RGC. The proposed broad sector shares are then submitted to and approved by the Council of Ministers.
- 4. July until early August** – The sector shares set by MEF and the Council of Ministers are then translated into detailed spending programs for each line ministry. To accomplish this, MEF issues a technical budget circular to each line ministry that requests each ministry to present detailed bids for funding both the central administration and provincial departments of the ministry. Detailed estimates of budget receipts are also prepared at this time. Line ministry funding bids are prepared for submission to the MEF by August 15. Bids are heavily influenced by historical budgeting outlays for each particular ministry.
- 5. Late August** – MEF performs a technical analysis of the line ministry budget proposals. This includes checking compliance with the medium term plan, accuracy of costings and consistency with initial ministry ceilings.
- 6. September** – Conflicts between the initial MEF budget proposal and the line ministries' bids are resolved. Meetings between the MEF and line ministry officials occur, with occasional involvement of the Minister of Economy and Finance and line ministers.
- 7. October** – The Prime Minister resolves any final budgeting disputes. A draft budget is then submitted to the Council of Ministers for approval.
- The Council of Ministers then prepares a budget bill that is presented to the National Assembly. The budget law is signed by the President of the National Assembly and promulgated by the King.

The MEF issues a *praka* (proclamation) to line ministries that outlines the funds budgeted for them. Line ministries are then tasked with internally distributing the funds.

## Annex 2: Map data derivation and sources

Protected areas:	Ministry of Agriculture Forestry and Fisheries (2000)
Proposed protected areas:	Ministry of Agriculture Forestry and Fisheries (2000). Digitised by ICEM from preliminary maps prepared by the Ministry of Agriculture, Phnom Penh, Cambodia.
Roads and railways:	Ministry of Planning (1999)
Provinces:	Ministry of Planning (1999)
Cities:	UNEP (1999)
Ecoregions:	WWF (2000)
Energy:	Ministry of Mines and Energy (2002). Digitised by ICEM from preliminary maps prepared by the Ministry of Mines and Energy, Phnom Penh, Cambodia.
Land use:	Mekong River Commission (1993 & 1997)
Population:	Ministry of Planning (1999)
Migration:	ICEM (2002). Generated by ICEM using statistics from: Ministry of Planning (1998). <i>General Population Census of Cambodia 1998</i> . Phnom Penh, Cambodia.
Poverty:	UNEP (1999). Poverty indices data were supplied by UNEP based on work performed by the Stockholm Environment Institute. In Cambodia, they were developed at district level and the ranking was based on literacy, access to electricity, access to water supply among other factors. Refer to the SEI report for further details: Strategic Environmental Framework for the Greater Mekong Subregion. PP57 Volume 1. SEI, ADB. March 2002.
Land cover:	Mekong River Commission (1993 & 1997)
10km zones of influence:	ICEM (2002)
Villages:	Ministry of Planning (1999)
Wetlands:	Mekong River Commission (2000). Wetlands data was generated by ICEM by integrating the Mekong River Commission regional inundation dataset for October 2000 with of national datasets of waterbodies, rivers, and lakes.
Dams:	UNEP (1999)
Wildlife Trade:	ICEM (2002). Digitised by ICEM from expert opinion.

## Land use

Land use categories for each country have been generalised to achieve cross-country land use categories. These are detailed below:

<b>Old land use</b>	<b>New land use</b>	<b>Old land use</b>	<b>New land use</b>
Agricultural hill fields	Agriculture	Mixed broadleaf & coniferous forest	Forest
Agricultural land	Agriculture	Mixed mosaic	Other vegetation
Agricultural plantation	Agriculture	Mixed timber and bamboo	Other vegetation
Agricultural wetland rice	Agriculture	Natural mangrove	Wetland
Bamboo	Other vegetation	Natural regeneration forest	Forest
Barren	Barren	Other	Unclassified
Barren land	Barren	Other agriculture	Agriculture
Cloud	Unclassified	Plantation forest	Plantation
Coniferous forest	Forest	Plantations	Plantation
Cropping mosaic, cropping area <30%	Agriculture	Pure bamboo	Other vegetation
Cropping mosaic, cropping area >30%	Agriculture	Regrowth	Other vegetation
Deciduous	Forest	Regrowth, inundated	Wetland
Deciduous forest	Forest	Rice paddy	Agriculture
Deciduous mosaic	Forest	Rocks	Barren
Dry dipterocarp	Forest	Sand dunes	Barren
Evergreen forest	Forest	Savannah	Other vegetation
Evergreen mosaic	Forest	Scrub	Other vegetation
Evergreen, high cover density	Forest	Scrub with scattered trees	Other vegetation
Evergreen, medium - low cover density	Forest	Seasonally inundated grassland	Wetland
Forest plantation	Plantation	Semi-deciduous forest	Forest
Grassland	Other vegetation	Semi-natural melaleuca	Forest
Habitat mosaic	Other vegetation	Swamp	Wetland
Industrial crops	Agriculture	Unclassified	Unclassified
Inundated	Wetland	Unstocked forest	Forest
Inundated mosaic	Wetland	Upland agriculture	Agriculture
Limestone forest	Forest	Upper mixed deciduous forest	Forest
Limestone karst without forest	Barren	Urban	Urban/industrial
Lower mixed deciduous forest	Forest	Urban or built-over area	Urban/industrial
Lower-dry evergreen forest	Forest	Urban/industrial	Urban/industrial
Mangrove	Wetland	Water	Water
Mangrove plantation	Plantation	Water body	Water
Melaleuca forest	Forest	Wetland	Wetland
Mixed (evergreen and deciduous) medium - low cover dens	Forest	Wood- and shrubland, dry	Other vegetation
Mixed (evergreen and deciduous), high cover density	Forest	Wood- and shrubland, evergreen	Other vegetation
		Wood- and shrubland, inundated	Wetland



MINISTRY OF  
ECONOMY AND FINANCE



MINISTRY OF  
ENVIRONMENT

The Review of Protected Areas and Development (PAD Review) examines the growing tensions between economic and conservation objectives in the four countries of the lower Mekong River region: Cambodia, Lao PDR, Thailand and Vietnam. It identifies the many development benefits flowing from protected areas and the need to reflect them in the plans and budgets of forestry, agriculture, energy, tourism, fisheries and other key economic sectors. The lessons of more than a decade of protected area management experience in the region are related to new and innovative approaches elsewhere in the world.

The PAD Review was undertaken by key government ministries in Cambodia, Lao PDR, Thailand and Vietnam through a partnership with the International Centre for Environmental Management, IUCN – the World Conservation Union, the Worldwide Fund for Nature, Birdlife International, the United Nations Development Programme, the Mekong River Commission, the New South Wales National Parks and Wildlife Service and the Tropical Forest Trust. The review was sponsored by Danish International Development Assistance, the Australian Agency for International Development, the Swiss Agency for Development Cooperation, the Asian Development Bank, the Royal Netherlands Government and the Mekong River Commission.

This volume is one in a series of eight publications resulting from the PAD Review (which also includes a CD-ROM):

- **Cambodia National Report**
- Lao PDR National Report
- Thailand National Report
- Vietnam National Report
- Regional Report
- Lessons learned in Cambodia, Lao PDR, Thailand and Vietnam
- Lessons from global experience
- Field Studies: The Economic Benefits of Protected Areas

A Report in the PAD Partnership Series



[www.mekong-protected-areas.org](http://www.mekong-protected-areas.org)