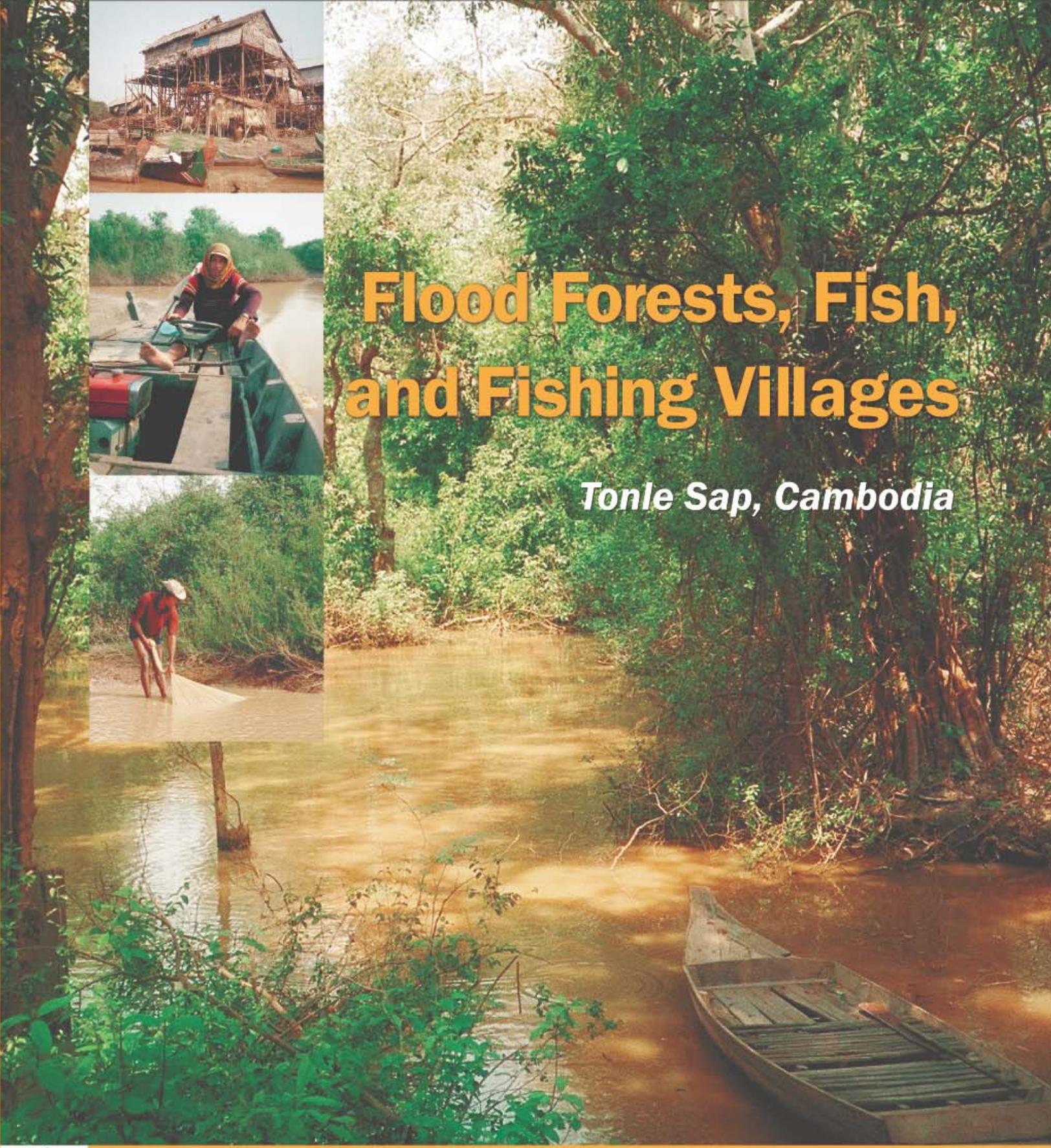




Flood Forests, Fish, and Fishing Villages

Tonle Sap, Cambodia



COMMUNITY FOREST MANAGEMENT TRENDS IN SOUTHEAST ASIA

Asia Forest Network supports the role of communities in protection and sustainable use of natural forests. AFN is comprised of a coalition of Asian planners, foresters, and scientists from government agencies, universities, and non-government organizations. Solidarity of AFN members is based on a common commitment to exploring alternative management strategies for Asia's natural forestlands. AFN's research emphasis includes the ecology of natural regeneration, the economics of non-timber forest product systems, and the community organizations and institutional arrangements that support participatory management. Lessons stemming from this research are used to inform field implementation procedures, reorient training, and guide policy reform.

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Flood Forests, Fish and Fishing Villages

T O N L E S A P, C A M B O D I A

A Collaborative Study

by the

Food and Agriculture Organization of the United Nations, Siem Reap

and

Asia Forest Network



Patrick T. Evans

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Foreword to the Regional Series

In the face of rapid deforestation, and the resulting loss of upland bio-diversity, torrential downstream floods, and disruptive urban brown-outs, Southeast Asian governments, city dwellers, and rural communities have grown increasingly concerned over the deteriorating state of their forests and watersheds. National media are widely documenting and disseminating information through TV, newspapers, and radio regarding continuing forest destruction. Urban people and villagers across the region are increasingly aware of the need for forest conservation and more sustainable use. This concern is reflected in recent laws and policies to protect the environment and involve communities in management.

Throughout the 1990s, many Southeast Asian nations have been actively engaged in exploring innovative approaches to community-based resource management, attempting to integrate traditional resource stewardship practices into modern governance structures. This process of devolving management rights for public forest lands to local populations is being supported through a variety of policy initiatives and legal instruments including decentralization acts and local governance ordinances, as well as new forest and environmental laws. Further, a number of governments have formulated specific community forestry sub-decrees, government orders, and guidelines to facilitate the transfer of stewardship authority to local groups. Many international development agencies consider community-based natural resource management a priority component of their assistance strategies.

In 2001, with support from the European Commission's Tropical Forest Budget Line and the United States Agency for International Development's East Asia and the Pacific Environmental Initiative, the Asia Forest Network with Community Forestry International initiated the Community Forest Management Support Project (CFMSP) for Southeast Asia to facilitate forest sector transitions underway in the region. The project was designed to respond to needs at the community, national, and regional level through a variety of interventions. At the regional level, CFMSP organized a series of workshops and cross visits to stimulate exchange between countries engaged in developing community forest management policies and programs. At the national level, CFMSP provided financial and technical assistance to country working groups, NGO networks, and donor dialogues that were developing policy frameworks and national strategies to encourage forestry sector transitions that engaged communities as principle partners. At the field level, CFMSP worked with partner organizations implementing community forestry initiatives, by providing small grants, technical assistance, and support with documentation.

One component of CFMSP was to collaborate with field project partners to produce one case study from each of the five participating Southeast Asian countries: Cambodia, Indonesia, the Philippines, Thailand, and Vietnam. The case studies were designed to capture the experiences of communities and project team members as they moved through a cycle of dialogue, diagnostic assessments, organizational development, negotiation with national government, resource mapping and decentralized management planning, and the formalization of management agreements. While the strategies reflected in each case study are unique, reflecting the socio-cultural context, policy and political environment, community history, and human ecology of the site, they all involve a similar set of activities oriented to building the capacity of rural communities to take on new management responsibilities and encouraging local governments to support their efforts.

The creation of resource management partnerships linking communities and local governments is a strong theme in each of the five case studies. So too is the process of building community abilities and confidence to protect and regulate access to their natural resources. The case studies primarily examine changes occurring in the past five years. For the most part, the progress made in stabilizing local resources, building community institutions, resolving conflict with local government and neighboring villages, and in establishing a sustainable system of management has been dramatic. These experiences from five corners of Asia indicate that the trust planners, NGOs, development agencies, and the larger civil society is gradually placing in region's rural villagers is not misplaced. At the same time, as is apparent from each of the cases, the need for financial, technical, and political support are vast. A great deal of damage has been done to the region's forests in recent decades due to national policy, as well as field-level management failures. An equally extensive effort will be needed to restore these critical ecosystems and community relationships with them. The case studies suggest that a long term investment in building the capacity of communities and local governments to sustainably manage much of Southeast Asia's forests would be a strategic one.

The Asia Forest Network and Community Forestry International would like to thank the European Commission and the United States Agency for International Development for their support. We would also like to express our appreciation to our partner organizations who are engaged in implementing a new generation of community forestry laws, policies, and programs. Finally, we want to emphasize the tremendous effort being made by thousands of rural communities across Southeast Asia that contribute to forest protection, conservation, and the sustainable management of the planet's natural ecosystems. They continue to require the support of national governments and the international community.

Dr. Mark Poffenberger
CFMSP Regional Director

Executive Summary

The Great Lake or Tonle Sap is the heart of mainland Southeast Asia, fed by the mighty Mekong River and sheltered by vast tropical forests that have covered the surrounding hills and plains for millennia. The Great Lake has played a central role in the evolution of human civilization and continues to be a key factor in the Cambodian economy. In 2000, the estimated value of the annual fish catch of over 200,000 tons was US\$ 100 million, representing a major food source for the people of Cambodia, as well as neighboring Thailand and Vietnam. Studies indicate that over 500 species of fish inhabit the Mekong River system in Cambodia, including the 300 kilogram giant freshwater catfish (*Pangasianodon gigas*) and the freshwater Irrawady dolphin¹.

Forests play a critical role in sustaining the aquatic ecology of the Great Lake. In the upper watersheds, temperate montane and tropical rainforests slow water run-off and greatly reduce erosion and downstream sedimentation. Around the Great Lake, flood forests protect the Great Lake core during the dry season, and act as an immense hatchery during the rainy season. The health of the Great Lake is also closely linked with the flow of the Mekong River. During the wet season, the Great Lake expands from four to five times its dry season size, and its average depth increases seven to nine times, with an estimated 60 percent of the additional water flowing down the Mekong River, then turning north and reversing its flow into the Tonle Sap River. Ecologically and economically, the Tonle Sap and the Mekong River are among the most important hydrological systems in the world, yet their ability to continue to function as they have in the past is in question.

A number of factors threaten these natural resources and the populations that depend on them, including deforestation around the lake and in upland watersheds, as well as dam construction. Deforestation in the flood forests around the lake has destroyed extensive tracks of wet-season fish habitat. Logging in upper watersheds sends silt downstream clogging the mouth of the lake. Commercial logging in China, Burma, Laos, and Cambodia has degraded forests in many parts of the region that drains into the Mekong River, which in turn feeds the Great Lake. Clearing of over 50 percent of the flood forest that surrounds Tonle Sap, has reduced the riparian buffer that limits the influx of sediment, and substantially lessens fish breeding grounds. In recent years, major dams built on the Mekong include the Mandwan Dam in China, the Pak Mun Dam in Thailand, and the Nam Theun Dam in Laos, with another dozen major dams along the Mekong under construction or being planned. These dams have the potential to drastically alter water flows and fish movement, threatening aquatic functions hundreds of kilometers downstream.

Rising population pressures in rural Cambodia, rapid policy and political changes, and the introduction of new technologies and markets have overwhelmed traditional systems of flood forest and fisheries management. Overextraction has drawn down fish populations to a point that threatens many species, while undermining the livelihood of thousands of communities that reside around the Great Lake and along the river. There is increasing recognition by communities living along the Mekong River and around the Great Lake that these resources are under growing pressure and require careful management. Fortunately, the Government of Cambodia has recently passed new policies and laws to allow villages more rights and responsibilities to protect and manage these resources. While sustainable forest and fishery management at the community level alone cannot stabilize long-term changes impacting the Great Lake, they are important starting places. This report documents the efforts of communities and the Provincial Departments of Forests

and Fisheries, in conjunction with the FAO project entitled “*Participatory Natural Resource Management in the Tonle Sap Region*,” to develop and ratify village-based resource management systems around the Great Lake.

The study describes the experiences of Kompong Phluk, a Khmer community that has been attempting to protect its flood forests and fishing grounds for the past fifty years. The authors examine how the community, assisted by the FAO project, has developed a resource management organization, formulated rules and regulations, sought government approval, and designed a comprehensive resource management plan. The report also details some of the challenges and issues that they have faced in the process. The report begins with a brief description of the history of the Tonle Sap, its biophysical setting, and traditional resource use practices, then discusses how the community has moved to formalize indigenous forest management systems by building on national policy reforms that are shifting authority for commercial fishing grounds around the Great Lake from private sector control to community management. This process of formalizing resource management systems is being facilitated through the FAO project. The steps involved in developing and operationalizing the formal management plan include meetings with stakeholders, participatory diagnostic assessments, analyses workshops, boundary demarcation, formulations of rules and regulations, management plan formulations, implementation, and monitoring and evaluation. This report describes how these activities were implemented in Kompong Phluk, and their prospects for further extension around the Great Lake and Tonle Sap River.

Table of Contents

Foreword	i
Executive Summary	iii
Table of Contents	v
List of Maps, Figures & Tables	vi
Acronyms	vii
I. Introduction	1
II. Managing the Fisheries and Flood Forests of the Tonle Sap	3
Biophysical Setting	3
History of Tonle Sap and its People	3
Fisheries Management: An Overview	3
The Need for Resource Management	6
Livelihoods and Communities	7
Management Issues	7
III. Community Fishery Reform Process	9
Policy Context	9
Community Fisheries Sub-decree	9
FAO Community Fisheries and Flood Forest Support Strategy	11
IV. Resource Management Transitions in Kompong Phluk	13
Livelihood Activities in Kompong Phluk	13
History of Flood Forest Management	13
Changes in Fish Harvest and Technology	15
Resource Management Issues in Kompong Phluk	16
V. Planning for Community Forestry and Fisheries Management in Kompong Phluk	19
Developing Community Organizations for Natural Resource Management	19
Formulating a Community Forestry Plan—1999–2002	20
Formulating a Community Fisheries Management Plan—2003 onwards	21
Formalizing Community Management Agreements	27
Learning from Kompong Phluk	28
VI. Reflections on the Process	31
Conclusion	32
References	35
Annex	37

Maps

Map 1	Tonle Sap	4
Map 2	Community Fisheries in Siem Reap	12
Map 3	Sub-block for Production Forest for Rotational Harvesting	24
Map 4	Patrolling Zones and Protection Plan for Kompong Phluk	26

Figures

Figure 1	Structure of the Kompong Phluk Community Fisheries Organization	20
Figure 2	Structure of Patrolling Teams and Communication Process	27
Figure 3	Approval Process for Management Plans	28

Tables

Table 1	Timeline for Creating New Fisheries Policy	10
Table 2	Livelihood Activities within Kompong Phluk	14
Table 3	Timeline of Flood Forest Management in Kompong Phluk: 1930-2003	15
Table 4	Community Perceptions of Changes in Fish and Forest Resources in Kompong Phluk	16
Table 5	CF Management Planning Steps and Expected Outputs	22
Table 6	Calendar of Illegal Fishing Activities in Blocks 1 & 2	25
Table 7	Village Management Issues and Strategies	30

Acronyms

ADB	Asian Development Bank
CBFM	Community-Based Forest Management
CC	Commune Council
CFCC	Community Fisheries Central Committee
CFDO	Community Fisheries Development Office
CFM	Community Forest Management
CFMP	Community Fishery Management Plan
CFMSP	Community Forest Management Support Project
DAFF	Department of Agriculture, Forestry and Fisheries
DoF	Department of Fisheries
DG	District Governor
FAO	Food and Agriculture Organization
NGO	Nongovernmental Organization
NTFP	Non-timber Forest Product
PFO	Provincial Forestry Officer
PG	Provincial Governor
RGC	Royal Government of Cambodia

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Tonle Sap, Cambodia

Introduction

Decentralized approaches to natural resource management are becoming widely endorsed by developing country governments and donor groups as a means to ensure community livelihood and environmental protection. In Cambodia, this approach has taken the form of a number of new natural resource laws and decrees which endorse community participation and recognize the role communities play in resource management. In October 2003, the Royal Government of Cambodia approved a Community Forestry Sub-Decree extending new rights and responsibilities to communities for the management of state forest lands under the Forest Administration. Two other legal

initiatives nearing approval in Cambodia are the Fisheries Law and the Community Fisheries Sub-Decree, both of which empower communities to manage fisheries and flooded forests under the Department of Fisheries. In addition to laws and policies supporting community-based management, a growing body of grassroots experience is emerging in Cambodia based on village level efforts to strengthen traditional, as well as newly established, resource management systems. In many cases these efforts have been encouraged by NGOs and rural development projects.

The purpose of this case study is to provide the reader with an overview of community-based natural resource



Fishing is a primary source of cash income for Kompong Phluk's families. Over 500 species of fish have been identified in the lower Mekong Basin. Dozens of species are caught in the village utilizing a wide-range of dipnets, gillnets, castnets, lines, traps, spears, and other techniques.

issues in Cambodia, with a focus on one community that is reliant on flooded forest resources in the Tonle Sap Great Lake. This case study chronicles the experiences of Kompong Phluk as the community assessed their natural resource needs, formulated management plans, and received final agreement from the Provincial Government, all within the context of the changing legal and policy environment of Cambodia's fishery sector.

Part II provides the reader with the context of the Tonle Sap, including an explanation of the biophysical setting and the history of the lake and its cultures. An overview of resource management practices is also given, along with the livelihood challenges currently facing villages that surround and reside upon the lake. Part III examines the Fisheries Reform process that has affected fishers throughout Cambodia. An examination of the national policy environment, along with the specific Fisheries Reform process is detailed. The strategy used by the Food and Agricultural organization of the United Nations (FAO), who is facilitating a process of community-based management around the Tonle Sap is detailed.

Part IV reviews the specifics of resource management in one commune or village administrative unit, Kompong Phluk, which includes three residential hamlets. A description of the village setting, along with the actors that affect resource management in the area, is given. The history of resource management in the area is considered, as well as the management issues that villagers face in Kompong Phluk. Part V examines the process of community fisheries management within this



Kompong Phluk's main street in the wet season is fully flooded, with all traffic moving on boats and barges. Each house becomes an island. The waters of the Tonle Sap begin to rise in June and reach full flood in early October.



Kompong Phluk's main street in the dry season after the lake's waters have receded.

village. Management issues, along with the strategies that villagers use, are explored in order to analyse what villagers are able to do on the ground once their plans are in place. Part VI is a synthesis, providing a reflection on the process of community-based management in Siem Reap, Cambodia, and the prospects for its extension across the lake under expanded program support provided by the Asian Development Bank.

Managing the Fisheries and Flood Forests of the Tonle Sap

The Tonle Sap is one of the world's most ecologically diverse and hydrological complex great lakes. The fresh water flooded forests that surround it, the intricate movement and migration of over 200 species of fish through the forests and upstream to spawn, all support a cycle of productivity that has sustained large human populations and elaborate cultures for centuries. Currently, resource management systems are undergoing change, with rural communities vested with new authority to act as stewards of this unique silvi-aquatic environment. The success of this effort will play an important role in determining the future of the Tonle Sap's environment. This section provides an explanation of its biophysical setting, history and culture. An overview of resource management practices, livelihood issues, and challenges currently faced by the villages that surround and reside upon the Tonle Sap's waters are also explored.

Biophysical Setting

Tonle Sap, or the Great Lake, is a huge inland water body and one of the largest and richest freshwater fishing areas in South East Asia, supporting the livelihood of more than one million Cambodians. The Tonle Sap lies in the flat, fertile plains in the center of the country (Map 1). The lake is extraordinarily rich in biodiversity, with close to 200 different species of fish. Many of the fish arrive with the monsoon floodwaters of the Mekong River, migrating with the flood waters during the wet season (June to October) to spawn in the protected, nutrient-rich waters surrounding the flood forests. As the Mekong rises, the waters flow backwards, filling the Tonle Sap and inundating the dry land. The Tonle Sap expands four to five times its dry season size, growing from 2,500–3,000 km² to 10–15,000 km², and increases in average depth from only one meter to 7–9 meters.¹ As the water recedes (November to May) it drains, revealing the forest once again and stranding fish in ponds and pools. Although the flood forests play a crucial role in maintaining the health of the fisheries, much of these forests have been cut and converted for agricultural purposes including rice

cultivation and mung bean farms. By 1997 only 450,000 hectares of flood forest habitat remained compared with 1 million hectares of flood forest found in 1973.²

History of the Tonle Sap and its People

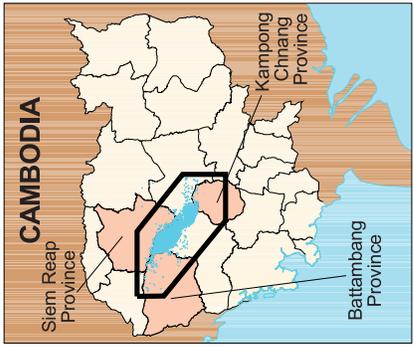
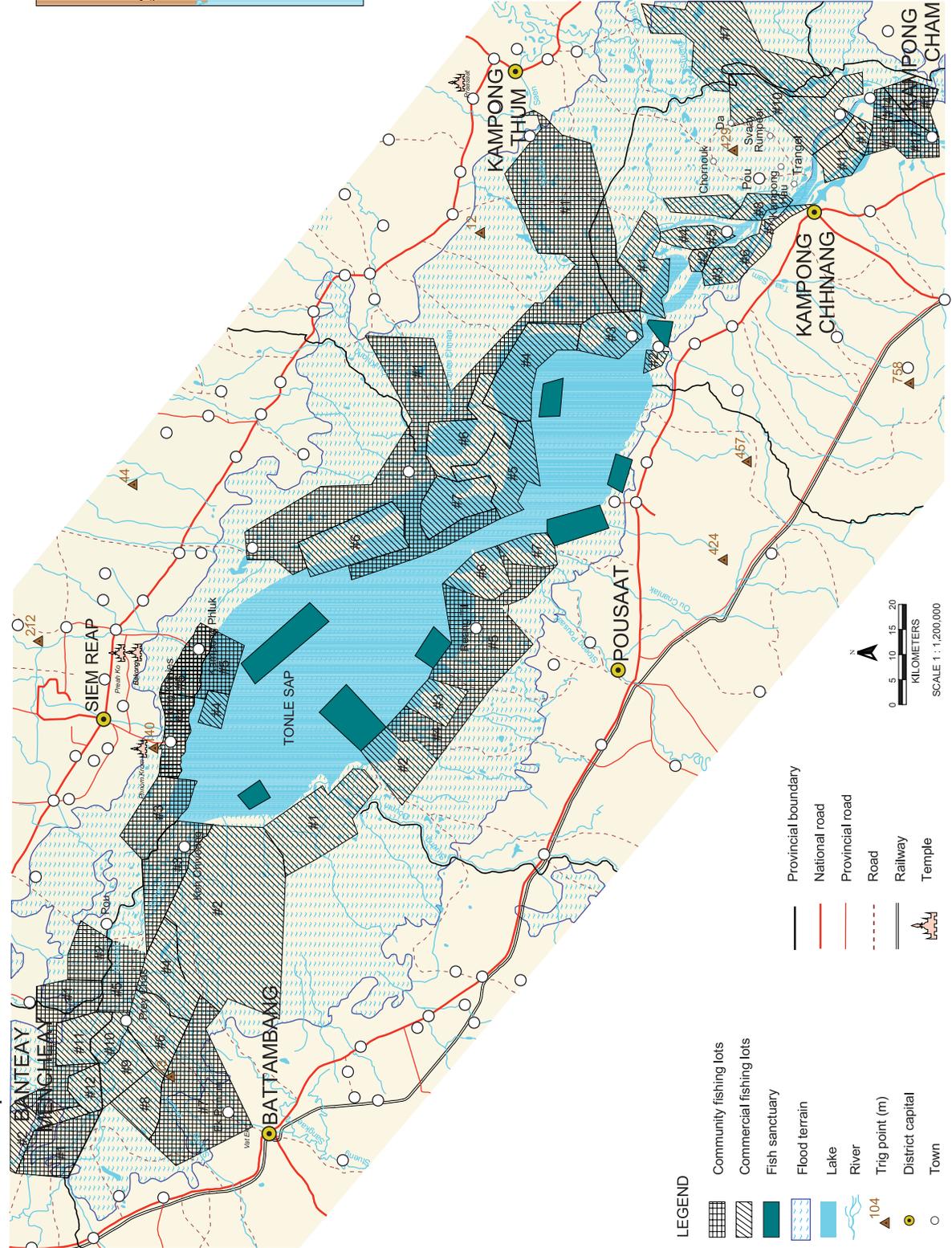
Prehistoric evidence indicates that Cambodia has been inhabited for at least 6,000 years. Over millennia, the Khmer people developed indigenous systems to manage the forest and fishery resources of the Tonle Sap through the rainy and dry seasons. These fertile flood plains that surround the lake were ideal for developing farming systems, managing fish resources, and manipulating water flows. Most Cambodians lived in villages, and around the navigable, seasonal floodwaters of the Tonle Sap. These villages were called *kompong* after the Malay word meaning “landing place.” *Kompong* villages were in touch with each other and with the rice-growing villages that surrounded them. They were also indirectly linked with the capital and the royal court and so had an awareness of regional and national events.

The huge productivity of the Tonle Sap sustained a Khmer empire at Angkor from 802 C.E. until the fifteenth century after which Angkor's predominance as an empire declined. During the Great Angkor Empire, there was a seasonal migration of lake dwellers with the rising and falling of the Great Lake water. Such migrations were recorded by a Chinese envoy, Chou Ta-Kuan in 1296.³ As the lake started to recede, the Water Festival was held marking the end of the rainy season and the start of the rain-fed agriculture harvest period, a tradition that continues up to the present time. In 1850, the Angkor temple complex and its many active monasteries were “re-discovered” by the French after being covered by vegetative overgrowth for several centuries.

Fisheries Management: An Overview

With the French colonization of Cambodia, the management of resources in the Tonle Sap changed. The lake was divided into privatized fishing concessions or “lots.” These were auctioned off to the highest bidder who would

MAP 1: Tonle Sap



SOURCES:
 Community Forestry and Fishery Sites, Siem Reap Province
 FAO-SR GIS Unit 2002 (For Lot #4 and #5)
 Natural Resources and Rural Livelihoods in Cambodia (Baseline Assessment)
 Tourist Map of Cambodia
 Scale 1 : 500,000 (National Geographic Institute - France)

PREPARED BY:

LEGEND

- Community fishing lots
- Commercial fishing lots
- Fish sanctuary
- Flood terrain
- Lake
- River
- Trig point (m)
- District capital
- Town
- Provincial boundary
- National road
- Provincial road
- Road
- Railway
- Temple

then have exclusive fishing rights over that section of the Great Lake. Such arrangements, including the auctioning of fishing lots for commercial exploitation, date back to the reign of King Norodom (1859–97). The French Protectorate formalized these concession arrangements in order to generate revenue for the colonial administration. This system continued through independence, until the rise of the Khmer Rouge (1975–79). While the impact of the concession system on indigenous Khmer systems of fishery management is difficult to document, it is likely that it contributed to the displacement of traditional forms of resource stewardship and a concentration of control of the lake's fishery in the hands of a smaller group of politically and financially powerful people.

During the Khmer Rouge era, fishing resources were neglected in favor of agricultural development, which involved widespread clearing of the flood forests. Between 1975 and 1979, the Khmer Rouge massacred the Irrawady dolphin population of the Tonle Sap River and Great Lake, using the oil contained in the flesh as an engine lubricant. From 1979–1987, the fishing lots on the Tonle Sap Great Lake operated via *krom samaki*, a solidarity group based on Communist development principles. In 1985, the Vietnamese-controlled government introduced a policy of wide spread forest clearing to root out the deposed Khmer Rouge but also to increase agriculture production. Since the late 1980s, the government has returned to the concession system in order to raise revenues.

Evans further explains this system of concession management and how it looked in the late 1980s and 1990s:

It was a system designed to extract revenue from the Great Lake while providing some degree of protection to the inundated forest habitat. However, in practice the system was managed to generate maximum revenue, which involved sub-leasing and sub-sub-leasing of a given fishing lot. The large amounts of money involved dictated a total harvest mentality. For years, armed militias jealously guarded fishing lots and a tense armed atmosphere prevailed around the Great Lake. Consequently, the thousands of fishermen living on the Great Lake or along its borders were subjected to threats, intimidation and gunfire when straying too close to fishing lot boundaries. By the late 1990s, some 80% of the entire dry season lakeshore was under the control of 18 fishing lots.⁴

By the late 1990s, fish management in the Tonle Sap involved a complex array of formal and informal

arrangements governing fishing access, rights, and practice. Fishing lot owners continued to have exclusive fishing rights and were entrusted to protect the inundated forests growing in their lot. Such arrangements caused tension between lot owners and the local community. Although the flooded forests provide habitat and food sources for fish, the fish could not be utilized by anyone but the lot owner. This provided little incentive for the local community to protect the flooded forests. Between 1980 and 1998 50% of the inundated forests around the Tonle Sap Lake were deforested.⁵

In 1999, the Royal Government of Cambodia (RGC) designated all the larger fishing lots as “research areas,” awarding 4-year contracts to important concessionaires without auction. This encouraged the larger operators to further extend their lot boundaries, encroaching on open access waters that had previously been used by communities around the lake for subsistence and local trade. At the same time, growing political stability in the country and increasingly democratic systems allowed rural people to voice their objection to the injustices of the fishing lot system. Through this period, conflicts between fishing lot operators and communities grew rapidly. By 2000, the inequities and conflicts emerging around the lake gained increased attention of the donor community, including working groups established to guide the development of resource management policies in Cambodia. In turn, this triggered a focused dialogue between the Government of Cambodia and representatives from development agencies and projects in an effort to address concerns over the social and environmental consequences of fishery and flood forest management policies.

In response to increasing conflicts between fishing lot operators and local fishermen, as well as growing concerns from the donor community, the Prime Minister initiated a fishery reform process in October 2000. This process involved dialogue between a delegation of senior officials and local communities around the Tonle Sap and the Mekong River system to resolve conflicts between the communities and fishing lots. The result of several months of discussion and negotiation was the reduction in size of numerous fishing lots and the cancellation of others, in which case the concessionaires were given until May 31, 2001 to complete their activities. The Prime Minister also decided to remove all Department of Fisheries field staff from the Great Lake, sending them back to their offices for the months of February to May 2001, in an effort to facilitate a transition to a new

management framework. The impact of this decision, however, was to create an open access resource, with no authority present to regulate use or prevent illegal fishing practices. According to Evans:

Everyone went fishing. People who had never fished before were down on the Great Lake with their batteries. Push nets mounted on the fronts of large boats became the standard and emptied the fish sanctuaries. Within the fishing lots to be released, this was their final fishing season and therefore, a “take everything” attitude prevailed. The Great Lake has never been fished so thoroughly as February through May 2001.⁶

Urban-based concessionaires reaped windfall profits, while local fishing communities saw one of their most important natural resources rapidly depleted and their livelihoods threatened. Many communities requested urgent assistance from provincial and district offices, as well as from the FAO project, to help them reestablish access controls and management systems, setting the stage for a new era in community fisheries management in Cambodia.

Recent political history has greatly undermined traditional systems of fishery stewardship and consequently community management systems have to be re-established. Educational outreach to highlight the need for protection of the flood forest as well as pollution and health issues is taking place to lay the foundation of community resource management. Since the transfer of concessions to community fishery management groups, including responsibility for flood forests, is recent, it is premature to attempt to evaluate community capacity to sustainably manage the resources. Nonetheless, emerging experiences from communities such as Kampong Phluk suggest that Cambodian fishing villages have the potential to establish effective management systems when technical, financial, and legal support is provided.

The Need for Resource Management

The Tonle Sap is one of the most productive fresh water fisheries in the world. The lake provides economic revenue for a large rural population. Fish and other aquatic products such as shrimps, snakes, eels and shell fish are a primary source of food and income. Seasonally inundated forests, 80 per cent of which are located around the Great Lake⁷, provide firewood and building material and

are critical breeding habitats for fish. Decades of political conflict and centralized, poorly enforced fisheries policies has led to over-fishing, forest clearing and conflict between fishing communities and owners and leasers of private fishing lots. To counteract the hostility and promote sustainable resource use, new multi-stakeholder policy methods are necessary.

The need for community involvement when developing strategies for resource management is well documented in the literature.⁸ The call for community resource management is reinforced by the fact that a random sample of 5,117 households in Cambodia found that 92% depend on the products and benefits derived from common property resources.⁹ Such common property resources include the fishing grounds and inundated flood forests of the Tonle Sap. In recognizing the value of common property resources to rural communities, the pursuit of conventional, often environmentally costly, public works projects such as dams, need to be re-assessed. Such large-scale projects are justified in terms of economic development, but fail to account for the loss of livelihood to rural communities who are dependent on the very resources negatively impacted upon by the public project. As greater recognition is given to the benefits of natural resources for poor rural communities, there will be greater opportunities to design community-oriented policies and projects that will directly enhance community livelihoods and the sustainable management of their natural resources.

The fishing lot system, combined with poor enforcement of fishing and forestry regulations and population growth, have led to enormous pressures on the natural resources, unsustainable fishing practices, and forest



Small stores like this one provide community members with basic requirements such as oil, salt, sugar, tea, matches, batteries, and candies.



The economy of Kompong Phluk is gradually moving from a subsistence to a cash orientation. Raising pigs in pens floating on rafts is an increasingly popular way to generate income. Other domesticated animals include chickens, fish, ducks, and crocodiles.

clearing. Community management can help develop more sustainable practices of resource use, relieve the need for enforcement by over-stretched government officials, and increase food security for the rural population. In an attempt to promote sustainable resource use, the RGC has recently drafted legislation to promote community fisheries and forestry management (see Part III). While progressive policies designed to empower rural resource user groups is an important step to the establishment of more sustainable fisheries management, the deterioration of community structure, lack of trust, and lost technical knowledge resulting from decades of conflict, may slow the transition to community-based fisheries management in Cambodia.

Livelihoods and Communities

The seasonally aquatic environment of the Tonle Sap shapes the lifestyle and resource use patterns by the communities living around the lake. Seasonal migration to the edge of the lake as it falls and rises, defines the transitional lifestyle of floating villages where villagers live in floating houses and on houseboats. Other villagers live on elevated houses, where floodwaters rise to the base of the houses and later falls exposing the long stilts

on which the houses are perched. Most Cambodians are small-scale fishers, and are allowed to fish throughout the year in open access water, provided they use only simple fishing gear.

More recently, communities on the lake have experimented with rearing pigs, ducks, chickens, and crocodiles. During the wet season, pigs are fed hyacinths and fish harvested from the lake, and are kept in floating pens over fish cages, their waste providing fish food. Aquaculture practices are also expanding, including traditional pen and cage culture of native fish rearing. While aquaculture may help respond to the problem of declining fish stocks, it may also exacerbate the problem if fish pens are stocked through the indiscriminant capture of native juvenile fish. The poorer members of the community, without access to the finances and technology required to develop aquaculture systems, would suffer most by any interference with the wild fish populations.

Management Issues

The Tonle Sap is confronted by many resource management challenges at the policy and the

implementation level. Formal management systems for the fisheries are defined under the fisheries law and subsequent reforms. This law determines access rights, licensing, and types of gear allowed, depending on whether fishers are subsistence or small-scale or whether they are commercial (middle or large-scale). While policy shifts from annual auctions of fishing concession lots to community management are underway, presenting opportunities for more sustainable use, the comprehensive implementation of these policies remains a distant goal.

The Tonle Sap fishery is also threatened by a variety of illegal and destructive practices. These include electro-shock fishing and large push nets. There is also an extensive use of fine mesh nets (including mosquito nets) and other illegal fishing gear, as well as commercial medium or large-scale gear used out of season. Water allocation conflicts between rice growers and fishers are increasingly common in some provinces like Kompong Chhnang, where farmers pump water from ponds that provide a refuge for fish during the dry season. In part, such practices are a function of an underfunded, over-stretched, and poorly paid Department of Fisheries staff unable to systematically enforce management rules. Local government officials receive only US\$18 a month, thereby making living difficult and increasing the temptation for being bribed by fishers to turn a blind eye to the use of illegal or out of season gear.

In Siem Reap Province, the socio-political pressures and inequities associated with the concession system resulted in the release of 62,000 hectares of commercial fishing grounds for community fisheries management in 2001. The release of concession lots caused a widespread movement around the lake, with a growing number of fishing hamlets demanding community management of concession lots. It also spurred the government to release a total of 536,000 hectares nationwide and initiated the drafting of a Community Fisheries Sub-decree. This rapid transition from concession to community management of the fisheries has caused a massive scramble within the GO and NGO communities to organize and assist communities to develop management plans for their resources. Aside from Khmer fishing communities, many ethnic Vietnamese and Cham people are also highly dependent on fishing. Many of the 83,000 people living in the floating villages on the Tonle Sap are ethnic Vietnamese.¹⁰ Vietnamese tend to fish for long hours and bring home large catches, which is a source of tension within the Khmer fishing community. In addition, the Vietnamese fishers often have more capital, and consequently use larger-scale fishing gear, allowing them to out-compete Khmer fishers. Because these non-Khmer communities are an important part of the management picture around the Tonle Sap, they need to be integrated into discussions establishing and maintaining more sustainable fishery systems.

Community Fishery Reform Process

According to the 1987 Fisheries Law, all lands that fall under water, either permanently or seasonally are classified as “fisheries domain” under the jurisdiction of the Department of Fisheries (DoF). DoF is responsible for the all the resources up to the high watermark at peak flooding. This means that the flood forest is included within DoF jurisdiction and, since this land belongs to the state, villagers cannot buy or sell land in this area. The Ministry of Environment, however, also has jurisdiction over the resources over the lake, due to recent status of the Tonle Sap Lake as a biosphere reserve. Since the responsibilities of two Ministries are not clear (the DoF falls under the Ministry of Agriculture, Forestry and Fisheries), jurisdictional conflicts often arise between these government bodies. This section outlines the policy context for community fisheries in Cambodia. The 1987 Fisheries Law is reviewed, along with the consultation process that has taken place on the Community Fisheries Sub-decree. The approach of the FAO project is examined in terms of supporting community-based management.

Policy Context

The freshwater fisheries sector in Cambodia has experienced a remarkable policy shift over the past five years. The changes reflect a transition from commercially-oriented management based on the annual auctions of fishing lots and state revenue generation to a decentralized system based on community management organizations. While this new management system is still in an early phase of implementation, the policy framework that supports it is well articulated and moving towards formal ratification. This section explores how policies are being developed to facilitate the transition and the role of the FAO project in supporting this process.

In 1987, a comprehensive Fisheries Law was drafted and approved. The Law recognizes three categories of fishing based on gear type, simply defined as small, medium, and large scale fishing gear. Large-scale fishing operations, initiated under French colonial rule, remained the government’s primary tool to control the resource and generate revenue for the state. Large-scale fishing involved the leasing of specific physical areas to selected individuals

as “*fishing lots*” with resource management activities defined in “burden books”. Large sums of money were involved in this business and the most productive fishing grounds came under this type of lease arrangement. In the mid-1900s, nearly one million hectares were controlled by 135 fishing lot operators.

Outside of the fishing lots and fish sanctuaries,¹¹ medium scale fishing could be practiced with a fishing permit issued by the DoF and within the defined fishing season of October 1 through May 31. Medium scale fishing typically involves passive fishing gear with extensive bamboo fences that direct fish into the traps. The vast majority of fisherfolk, however, come under the small-scale fishing category which essentially is subsistence, family-scale fishing practiced year round in open access areas and within the fishing lots during the closed fishing season.

The fishing lot system controlled the most productive fishing grounds and severely limited local fishing communities’ access to fishery resources. With the cessation of armed conflict in the country in early 1998, people started to speak out against the injustices of the system and the number of reported conflicts escalated exponentially. In 1999, the RGC issued Proclamation #2 on the “Management and Elimination of Anarchy in Fisheries.” The shortcomings of the 1987 Fisheries Law were well recognized and the government sought World Bank support in 1999 to draft a new Fisheries Law. This new draft law was completed in late 1999 and was meant to strengthen and support the fishing lot system with little regard for local fishing communities. The new draft Fishery Law is still undergoing revision and debate.

Community Fisheries Sub-decree

The fisheries reform began in 2000, when the Prime Minister visited Siem Reap on a mission to provide aid to flood victims (Table 1). After discussions with local officials regarding local conflicts between fishers and fishing lots, the Prime Minister decided to release 8,000 ha. of fishing grounds (from the 84,000 ha. under fishing lots in Siem Reap province) for community management. A complaint

TABLE 1: Timeline for Creating New Fisheries Policy

Year	Policy Work
1999	A new Fisheries Law is drafted.
2000	<p>Fisheries Reform:</p> <ul style="list-style-type: none"> ◆ An initial proposal to release 8,000 hectares from fishing lots for community management in Siem Reap sparks nationwide reform; ◆ In total, 536,000 hectare was released from the commercial fishing lot system for local management as community fishing grounds (56% of the area that came under the fishing lot system).
2001	<p>Fisheries Reform continues:</p> <ul style="list-style-type: none"> ◆ DoF adds a new department, the Community Fisheries Development Office. ◆ In early 2001 the communities gains access to fishing grounds at the end of the fishing season, 1 June 2001. ◆ Consultations throughout Cambodia, with NGOs, fishers and government staff to draft a sub-decree on community fisheries (the Fisheries Law remains in draft stage within DoF with the focus of energy being on the new Community Fisheries Sub-Decree). ◆ Final consultations in mid-2001 in Phnom Penh on the Community Fisheries sub-decree; a CF Sub-Decree gets drafted in August 2001.
2002	CF Sub-Decree within the Ministry of Agriculture, Forestry and Fishing undergoing revisions, is completely re-written, and not presented for comment until 2003.
2003	<p>Another round of consultations begin with the revised sub-decree in early 2003 with the donors, NGOs and DoF staff; Contested issues remain including:</p> <ul style="list-style-type: none"> ◆ The rights of communities to generate revenue. ◆ Community rights to control access of outsiders. ◆ Community authority to stop illegal activities. ◆ Local right to decide the types and locations of fishing gear that are permitted in their community fisheries.

against this decision from the Director General of Fisheries resulted in his removal and a commission was sanctioned to conduct a more thorough review of conflicts within the inland fishery sector. This commission held meetings with fishing communities in Siem Reap and later around the entire Tonle Sap to resolve conflicts between local communities and the fishing lot operators. Most small fishers were opposed to the fishing lot system and requested increased access to fishing grounds. After the commission was formed to meet with fishing communities around the lake, the growing popular demand for reform led to a decision in early 2001 to release 536,000 hectares of fishing lots, representing 56 percent of Cambodia’s commercially-zoned fishing area, to communities.¹²

In early 2001, communities gained immediate access to fishing grounds taken from lots that were reduced in size. For lots that were to be abolished entirely, the lot owners were permitted to fish out the season and these areas were officially given over to local communities on June 1, 2001. This decision was significantly influenced by the success of the FAO project entitled “Participatory Natural Resource Management in the Tonle Sap Region,” that had been

pioneering approaches to community-based flood forest and fisheries stewardship since 1995.

With the release of fishing grounds for local management, the Prime Minister instructed the DoF to prepare a sub-decree for community fisheries. The DoF established a new Community Fisheries Development office (CFDO) and with Oxfam support, extensive consultations were conducted around the lake to draft a sub-decree. The sub-decree was finalized in late 2001 and sent to the Ministry where it was subjected to extensive revisions. In early 2003, a second round of regional and national consultations were held to seek input on the latest version of the sub-decree. In mid-2003, final discussions were held and it is expected the sub-decree will be finalized in the near future.

Drafting the sub-decree on Community Fisheries was a time-consuming process, with diverse opinions regarding the operations of community fisheries. In part, due to the limited experience of DoF staff with community-based management systems, the policy development process was constrained. Policies drafted in Phnom Penh do not necessarily reflect the needs of fishers in isolated lakeside communities. This explains, in part, some of the frustration experienced by NGO and international organization (IO)

staff contributing to the formulation of the community fisheries sub-decree. At the same time, the DoF officials that have agreed to a multi-stakeholder dialogue around the development of the policy, have struggled with ongoing and open criticism of their efforts to articulate the new policy. Policy reform and consultation is new in Cambodia, and it remains to be seen how much outside advice the government is willing to take, and ultimately whether the sub-decree will be passed in a form that will adequately support community fisheries.

Despite the difficulties in formulating and approving the Community Fisheries Sub-Decree, in late 2002 the government made a firm commitment for development of community fisheries by taking out a loan from the Asian Development Bank (ADB) for the implementation of the Tonle Sap Environmental Management Project in the five provinces surrounding the Great Lake.

The government currently lacks both human and financial resources to ensure the sustainable management of natural resources. Government-held natural resources are generally considered to be open access resources and are subjected to over-exploitation and encroachment. Community empowerment for natural resource management is becoming recognized as an essential tool for the protection and conservation of natural resources in Cambodia. The provincial government in Siem Reap recognizes the value of community-based natural resource management and is actively promoting the expansion of both community forestry and community fisheries within the province. It is apparent that not only can community based natural resource management protect and conserve natural resources, but active management also contributes directly to food security and poverty alleviation that are central priorities within the government's socioeconomic development plan. Due to the provincial government's active support of the community fisheries and community forestry initiative in Siem Reap, the program has expanded rapidly despite delays in the final approval of the Community Fisheries-Sub-Decree.

FAO Community Fisheries and Flood Forest Support Strategy

The project "Participatory natural resource management in the Tonle Sap region" is funded by the Government of Belgium and implemented through the Food and Agriculture Organization of the United Nations (FAO) within the province of Siem Reap. This project was first formulated in 1994 to address natural resource management problems within the inundated forest ecosystem. Working through the provincial departments of forestry, fisheries and environment, the first phase concentrated on data collection and staff capacity building. The second phase focused on development and implementation of community-based natural resource management both on the shores of the Tonle Sap Great Lake as well as in the upland forest areas.

Now ending its third phase, the project has established community management systems covering 110,000 ha. of flood forest and open lake water under the authority of 116 villages. In addition, the project has assisted another 84 villages to establish 20,000 ha. of community managed upland forests. Considered to be a model for community-based natural resource management in Cambodia, the ADB will use the project's experiences to expand community fisheries around the entire lake starting in 2004, while the Belgian Government has agreed to expand the project's community forestry activities within Siem Reap and to neighboring provinces. Much has been learned through the implementation of this project and it continues to have a strong influence on both policy and legislation at the central level.

While the FAO project has been operating for nearly a decade, it has gained a great deal of momentum in the past three years since the project team, working closely with the provincial forestry and fisheries agencies, developed a strategy to facilitate flood forest and fishery management transitions in Siem Reap Province. As recently as late 2000, the project was only working with seven fishing communities in the process of taking control of 10,000 hectares of flooded forest land. The national fishery sector started to undergo rapid change three years ago with the fishery reforms of late 2000 and early 2001. The project area targeted for community management was increased significantly with some 62,000 hectares of fishing lots in the area released for community control (Map 2).

MAP 2: Community Fisheries in Siem Reap



LEGEND

- Community fishing lots (hatched pattern)
- Commercial fishing lots (diagonal lines)
- Fish sanctuary (solid green)
- Environmental Station (red circle with 'E')
- Community Forestry Supported by FAO (green circle with 'F')
- Flood terrain (hatched pattern)
- Lake (blue)
- Provincial boundary (dashed line)
- District boundary (dotted line)

SOURCES:

- Community Forestry and Fishery Sites Siem Reap Province
- FAO-SR GIS Unit 2002
- Natural Resources and Rural Livelihoods in Cambodia (Baseline Assessment)
- Tourist Map of Cambodia Scale 1 : 500,000 (National Geographic Institute - France)

PREPARED BY:

Resource Management Transitions in Kompong Phluk

Kompong Phluk is a small commune in Prasat Bakong district, Siem Reap Province. The commune is 12 km south of the district headquarters and about 16 km southeast of Siem Reap town. It is made up of three villages, Dey Kraham, Thnot Kambot and Kok Kdol, with a total of 425 families representing a population of around 2800 people. The main occupation in the commune is fishing involving 94 per cent of all households, of which 80 percent are engaged in small- or subsistence-scale fishing, with the remainder medium-scale or commercial-scale fishing. The commune is surrounded by the floating villages of Chong Khneas commune to the west, the larger agriculture and fishing commune of Kompong Khleang to the east, and the Prasat Bakong district headquarters to the north. To the south lie the mature, denser parts of the flood forest and, beyond the forest, the open waters of the Tonle Sap Great Lake. The population is entirely Khmer, and together with the small size of the commune and uniform occupation as fishers, this homogenous ethnicity contributes to more effective community organizing and resource management.

The villagers live within the floodplain of the Tonle Sap in permanent houses built on stilts. As a consequence, they do not migrate inland as the water rises, as some lake communities do. During the driest months, however, many families migrate out onto the open lake and establish temporary housing from where it is easier to care for their cages of fish or crocodiles, as well as perform their daily fishing activities. During the dry season, the houses in the village are perched up high on wooden stilts and occupied by some families and elderly people. As the lake starts to rise in June, the entire population returns to their villages. During the course of the wet season, floodwaters from the Tonle Sap slowly inundate the villages and the water level creeps up to the base of the houses. During the wet season the houses become individual islands, reachable only by boats, and the main street is submerged under several meters of water.

Livelihood Activities in Kompong Phluk

While most people are fishers in Kompong Phluk, further analysis of livelihood activities within the

commune illustrates the range of fishing activities that can take place, from fish processing to working as hired labor. Other livelihood activities are also pursued in the commune, depending on seasonality and a households' access to capital. For example, some households practice pig-raising and home gardening during the dry season. Other households earn extra money through repairing televisions or cutting hair. In most cases, various household members contribute to the family livelihood.

Table 2 summarizes the discussion that took place about livelihood activities with twenty members of Kompong Phluk commune in September 2003.¹³ It illustrates the breadth of livelihood activities. Understanding different livelihood issues helps to see who in the community will most benefit from community-based natural resource management and who might find these activities threatening, such as those practicing illegal fishing. Often it is those families that make a decent living who are able to more actively participate in resource management mechanisms.

History of Flood Forest Management

One unique characteristic found in Kompong Phluk commune is the history of local resource management. Elders recall learning about the importance of forest protection from their elders:

Old people knew. They knew a lot. Old people knew that fish lived in the forest... and that the forest helps to protect the village, especially in the flood season, from water, waves and storms. Protecting the forest meant that they were protecting the fish breeding grounds. This meant that there was enough food.¹⁴

Elders remember working together to find a common strategy for resource management. Motivated to protect their homes from storms and winds, they agreed to stop farming watermelons near their villages in the late 1940s and to let the forest naturally regenerate.

This regenerated forest helped to protect their homes from storms and winds, in addition to providing a home for fish. Villagers were motivated to continue these forest protection practices, especially near their villages. The former water-melon patch is now the high-density forest that surrounds the commune. Figure 5 depicts the history of resource management in Kompong Phluk.

As Table 3 highlights, there is a history of resource management and flood forest protection in Kompong Phluk.¹⁵ The villagers of Kompong Phluk decided to start protecting the surrounding flood forests in 1948. According to the recollections of village elders, there was concern that the gradual expansion of agriculture would eventually result in the elimination of the forests that had surrounded the village. The community realized that without forests they would be exposed to the often violent rainy season storms that occur periodically during the monsoon. The elders hoped that by protecting village forests they could maintain a buffer of forest trees around the villages to shelter the village from strong storms, winds, and wave action. Although parts of this area had been cleared, the area remained rich with fish and wildlife.

Elders remember that many species were abundant: fish (catfish, giant catfish, giant barb), dolphins, reptiles (python, poison snakes), birds (heron, stork, pelican, adjutant, fish-eagle, sarus crane, crow) and wild animals (otter, monkeys, elephants etc.).

In the late 1950s or early 1960s, villagers from other communes came into the flood forest areas near Kompong Phluk to clear some forest areas for watermelons and mung bean farming. Other crops were also experimented with: pumpkin, cucumbers and other vegetables were grown near the village. Villagers in Kompong Phluk recall being concerned about the number of people using the flood forest areas and by

outsiders who were destroying their forest areas. At the same time, as surrounding forests were cleared, fisheries resources were declining. By the 1960s, fishing lot operators also cut down flood forests to make brush parks and introduced fishing gear that was more efficient, and less environmentally benign, to harvest fish.

In the 1970s, the use of more efficient fishing gear, along with slash and burn activities in the flood forest, declined sharply because of civil war (1970–75). People were forced to move away from Kompong Phluk, and farms in the forests were abandoned enabling forests to regenerate, and fish and wild-life populations to flourish. The Khmer Rouge (KR) regime emphasized agriculture production and ignored fisheries resources. After the KR regime in the late 1970s, an influx of upland immigrants returned to the area bordering the Great Lake and started shifting cultivation. Throughout the 1980s and 1990s, there was an increase in mung bean farming, and other types of farming, both by villagers and outsiders. As new farmlands were opened there was a steady encroachment by upland farmers into the flooded forest areas.

Natural population growth and the resettlement of post-Khmer Rouge refugees combined with declining fish stocks due to rapid over-fishing led the community to re-think their resource management strategies.

In 1995, more than 100 people from Kompong Phluk demonstrated against mung bean farmers who were expanding their mung bean cultivation by cutting and burning flood forests. In 1997, the community was also confronted with the expansion of fishing lot boundaries, further reducing their available fishing grounds. Such developments helped Kompong Phluk village leaders and members to recognize the need to strengthen their capacity to protect their flood forests

TABLE 2: Livelihood Activities within Kompong Phluk

Livelihood Activity
Fishing
<ul style="list-style-type: none"> • Gill net • Hook and long line • Traps • Small brush park • Small vertical slit trap • Fence net • Spear • Collect clams
Raise animals
<ul style="list-style-type: none"> • Chicken • Crocodile • Fish • Pig • Duck
Smoke Fish
Laborer
Collect fuel wood
Collect water lily
Selling something from home
Fish processing
Carpenter
Clothes maker
Hairdresser
Boat driver
Middleman
Home gardening
Doctor and teacher
Government officer

and control destructive fishing. Although, historically, flood forest protection in Kompong Phluk was based on oral agreements between communities and local government support, by the late 1990s resource management mechanisms needed to be formalized through written rules, regulations, and agreements supported by the forestry and fisheries departments and the Siem Reap governor.

In 1998, Kompong Phluk village leaders requested the FAO project and the Siem Reap and Provincial Fisheries Office to help them form a community forestry organization. In 1999, Kompong Phluk was authorized to manage some 979 ha. of flood forests surrounding their village after formulating a management committee and rules and regulation with help of FAO and Provincial Fisheries Office. The first community forest management plan was prepared in 2000, focusing on protection and management of flood forests and fisheries. Meanwhile, the RGC abolished fishing lots 4 and 5 and released the area for community fisheries. As a result, Kompong Phluk communities

gained nearly 15,000 ha. of fisheries domain for community fisheries management. In 2001, they were reorganized as Kompong Phluk Community Fisheries, elected a new management committee, and drafted new rules and regulations. The rules and regulations were approved by the provincial governor in late 2001 and implemented since then.¹⁷

Changes in Fish Harvest and Technology

In order to better understand community perceptions of changes in natural resource management and economic conditions, a series of participatory rural appraisals were conducted with members of Kompong Phluk. The historical transitions in fish harvest levels, flood forest cover, and fishing technology described by the committee members, is presented in Table 4. Changes in fish harvest per family and flood forest cover reflect changes in population of Kompong Phluk between 1950 and the present time, as well as technical changes in fishing technology. Population changes, in turn, reflect major historical events including the civil war which caused the

TABLE 3: Timeline of Flood Forest Management in Kompong Phluk: 1930-2003¹⁶

Date	Description
1930s-1940s	<ul style="list-style-type: none"> ◆ Wind and storms affecting village ◆ Parts of forest cleared for watermelon cultivation
late 1940s	<ul style="list-style-type: none"> ◆ Villagers protest and organize ◆ Watermelon cultivation stopped ◆ Reforestation was encouraged and cutting of the inundated forest was limited
1960s	<ul style="list-style-type: none"> ◆ Some forest cutting of mung bean cultivation ◆ Pumpkin, cucumber and other vegetables are grown near village
Khmer Rouge	<ul style="list-style-type: none"> ◆ Mung bean cultivation greatly expands; no rules or regulations ◆ Other resources protected
Early 1980s	<ul style="list-style-type: none"> ◆ Collective farming: mung bean farms divided between 300 families living in Kompong Phluk
1987/1988	<ul style="list-style-type: none"> ◆ Administrative reshuffling: Kompong Phluk commune transferred into another district. District authorities hand over mung bean farms to upland communes
Early 1990s	<ul style="list-style-type: none"> ◆ Slash and burn of the flooded forest area, especially bordering other communes, for conversion into mung bean farms
1994	<ul style="list-style-type: none"> ◆ Fire, possibly from careless fishers in upland areas, burned 200 hectares of flooded forest, enraging villagers and serving as a catalyst for further protection
1998	<ul style="list-style-type: none"> ◆ Community requests assistance to expand community forest area and stop encroachment of mung bean farming ◆ Replanted 50 ha of former farmland with provincial Department of Fishery support
1999	<ul style="list-style-type: none"> ◆ Several hundred more hectares of farmland being allowed to regenerate naturally
2001	<ul style="list-style-type: none"> ◆ With freshwater fishery reform, the community expands the boundaries of their community forest/ community fisheries grounds to cover a total of 8,733 ha.
2002–2003	<ul style="list-style-type: none"> ◆ Community is in process of establishing a Fisheries Management Plan, one of the first in Cambodia
2003–2004	<ul style="list-style-type: none"> ◆ Kompong Phluk ratifies management plan and begins implementation activities

population in Kompong Phluk to drop from around 500 households in 1950 to only 50 households in 1975, during which time the fish harvest per remaining family and forest cover increased. The Khmer Rouge government ignored fish resources in order to pursue sweeping rice cultivation, thereby allowing fish stock to grow. When the Vietnamese-backed government replaced the Khmer Rouge, the population of Kompong Phluk expanded rapidly through returnees and natural growth. Subsequently, forest cover and fish harvest dropped with more people harvesting fish and forest resources.

From 1987 to 1999, the introduction of motorized boat transportation resulted in an increased pressure on fish resources, reflected in lower harvests. Throughout this period there was also an increased use of illegal gear including electro shock (where some fishers used car batteries to stun fish) as well as very small mesh nets. These methods resulted in the death of small fish fry, depleting future stocks. Also, during this time, deforestation for shifting cultivation of mung beans reduced the forest cover to 40 percent. With the ban on mung bean cultivation that began in 1999, however, the flood forest cover near Kompong Phluk increased to 70% of its original size. The regeneration of flood forests, along with the creation of community-designated fish sanctuaries, has contributed to greater fish harvests.

With the Fisheries Reform, in early 2001, there was a devastating harvest associated with uncontrolled access to fish resources prior to transferring fisheries management to the communities. As a consequence, fish stocks around

the lake plummeted during this year. Rampant overexploitation raised the awareness of communities on the importance of strengthening community-based management for the protection and management of the forest and fisheries resources. According to the Kompong Phluk Fisheries Committee, returning fishing lot areas to community management in 2002, which in the past were usually fished-out with modern and highly efficient gear, has also enhanced fish stocks.

Resource Management Issues in Kompong Phluk

While the three hamlets that comprise Kompong Phluk administrative village have a strong commitment to sustainable resource management through community institutions and controls, they continue to face external pressures on their natural resources from all directions.¹⁸ In the North, the most immediate pressures stem from Bakong town and surrounding villages, but can come from communities as far as 20 km away. During the dry season, these pressures take the form of 400 to 500 people actively involved in fishing and collecting fuelwood within Kompong Phluk's flooded forests. Some establish seasonal camps in the flood forests and others come each day on foot or on bicycles. Pressures are heaviest during the dry season when little agricultural work is available. The fishers coming from the north tend to use small-scale gear, such as throw nets and small traps. Roughly 20 percent fish with illegal gear such as electric fishing

TABLE 4: Community Perception of Changes in Fish and Forest Resources in Kompong Phluk

Historical Event	# of HHs	% Forest Cover near Communes	Fish Harvest (/HH unit)	Fishing Gear
1950-1970 Independence to Civil War	450-525	Reduction from 90% to 80%	Moderate	Traditional fishing gear
1971-1975 Civil War to Khmer Rouge	100-150	Increase from 80% to 90%	No Fishing	
1975-1979 Khmer Rouge Era	50-70	Increase from 90% to 100%	Abundant	Traditional fishing gear
1979-1987 Viet Nam-led government & national coalition government	280-300	Decrease from 100% to 60%	Moderate	Introduction of motor boats
1987-1999 Concession managed fisheries	300-390	Decrease from 60% to 40%	Scarce	Increased use of illegal gear and modern gear
1999-2002 Establishment of Kompong Phluk community forestry/fisheries	390-437	Increase from 40% to 70%	Moderate	Community prohibits use of illegal gear



Community members take their boats and enter the flooded forest to fish, collect non-timber forest products, and to relax. Floating among the tree tops is a unique experience for outsiders and provides opportunities for eco-tourism that the community fisheries committee is beginning to explore.

or u-nets or pumping water to drain fish holes.

In the west, pressures have eased with FAO facilitation to clarify territorial boundaries between the communities of Chong Khneas and Kompong Phluk. In the east, forest tends to be cleared for agricultural activities such as mung bean farming, generally by villagers from Kompong Khleang, although this too is stabilizing as community leaders, local government, and FAO project staff facilitate discussions to resolve land boundary issues. In the south, commercial fishers on the open lake tend to fish in the community fishing area, using large destructive gear such as push nets and seine nets.

Villagers in Kompong Phluk feel that not all communities are managing their community fishing areas well. The community sees an ongoing need to educate their neighbors regarding the importance of forest protection and the need to use only legal fishing gear. The cultivation of fast growing crops, including mung beans, watermelons and cucumbers during the three months where land is exposed, has been, and continues to be, the main deforestation pressure facing the flood forest in the area. In summary, the primary management issues facing Kompong Phluk villagers include: (a) illegal fishing gear; (b) forest

conversion for agriculture; (c) fuel wood harvesting by outsiders and (d) brush parks.

Although the majority of fishers in Kompong Phluk do not use illegal fishing gear, such as push nets, electro-fishing, and long bamboo traps, even limited use can disproportionately impact the fishery. Flooded forestland has always been cleared for mung bean farming, but the problem is one of increasing scale of clearing. Through FAO facilitation and a recent government crackdown on mung bean farmers, expansion within the community fisheries area has stopped, though it remains a problem in many communities around the Great Lake. Fuelwood collection is mostly for subsistence use, with people cutting 30 kg of wood per trip and carrying this supply to their homes on their bicycles. This will supply a household for a week. People in Kompong Phluk harvest their fuelwood by boat when the water is high. Since many flood forest species coppice vigorously, there is quick regeneration.

While fuelwood cutting may constrain forest succession to older growth, it sustains a scrub forest environment that provides better cover for fish fry and may, therefore, be a positive form of management in terms of enhancing fish production. The primary challenge is establishing a

fuelwood harvesting cycle that is sustainable. Another major problem is the construction of brush piles in the lake. The wood is illegally collected from the flood forest and brush piles left in the lake can increase the rate of sedimentation. Compared to other illegal fishing gear, the environmental impact of brush piles is minimal, and it tends to be small-scale fishers that utilize this practice.

The communities of Kompong Phluk know there are advantages in protecting the flood forest, including being able to collect firewood, protection from storms off the Great Lake, creating a spawning habitat for fish, and providing posts to support their houses. The initial motivation for protecting the original 48 hectares of flood forest was specifically to protect the village houses from wind and wave action that could damage the hamlets. It is apparent that more recently, with the initiation of outreach support and education from FAO and the Department of Fisheries, the community has developed a greater level of understanding of the role flood forests have in keeping the fisheries healthy. According to one elder:

Long before the committee was set up, people loved and took care of the forest. It was not perfectly managed, though, especially in recent times. So, it was good timing to work with FAO, for them to help us. We wanted to stop the mung bean farming, which started in 1993, near our commune.

Mr. Tep Phearo is a fisher and one of ten extension members of the Community Fisheries and Flood Forest Committee. He has been a member since 1999. His role is to raise community awareness about the advantages of the flood forest. He is 56 years old and has lived in the village all his life. His ancestors also lived here in the village.

He fishes locally in the open access areas within the protected forest during the rainy season because he is afraid of the wind and the waves of the Tonle Sap. In the dry season, he travels to more remote areas of the Great Lake to fish. His catch varies depending on the season. He says there are more fish this year compared to last year because of the fish sanctuary, but there are overall fewer fish in the Great Lake. When he was young, there were more fish. People didn't fish to become rich when he was young. But now, people fish as much as they can in order to get more money at the market.

He also attributes the decline in fish catch to modern fishing gear and the Vietnamese using illegal fishing gear. Before, people would use only lay nets, set bamboo traps and hook-lines. Now people use bush nets and modern fishing gear that catch the small and young fish and make the water turbid.

Villagers in Kompong Phluk were aware of different resource management issues when they began working on resource management with FAO-Siem Reap. Aside from controlling flooded forest cutting near the commune for mung bean cultivation, villagers wanted to stop illegal fishing practices near their commune. The community is aware of reasons for declining fish stock, including the use of modern fishing gear. Mr. Tep Phearo, a community leader notes that there is growing support in Kompong Phluk for a formal, community-based regulatory committee to ensure the sustainable management of their fishery and forests.

Kompong Phluk illustrates how a fifty year old tradition of flood forest protection has gradually developed into a formal system of community-based resource management, with an elected managing body, written rules and regulations, a well-developed utilization plan, and approval of the provincial government. Part V details the process and experiences of the Provincial Fisheries and Forestry Departments and the FAO project staff, as they worked with the community to design a formal system of management.

Aside from eating and selling fresh fish, Tep Phearo and his family make fish paste. They used to smoke the fish but now they don't because they can't get the firewood from the protected forest. For cooking, he and his family collect dead firewood from the area and try and conserve firewood by collecting floating wood and using less. He thinks that protecting the forest will help to increase the number of fish in the Great Lake. The people in this commune are united in protecting the flood forest. He believes the committee will be successful in protecting the fisheries and flood forest so that there will be enough fish left in this area for his children. He says his children will also protect the flood forest because they understand how important the forest is to the community.

According to Mr. Tep Phearo: "The committee is highly motivated to protect the flood forest and it appears many villagers in the commune are aware of the activities of the committee and support them. This motivation is, in part, because the community clearly sees the role of the flood forest in supporting their livelihood, which is almost exclusively fishing, and in part because the community has the benefits of a mature flood forest, and this inspires them to protect less spectacular scrub forests".

Planning for Community Forestry and Fisheries Management in Kompong Phluk

This section outlines the community resource management planning process that the FAO-Siem Reap project and the Provincial Department of Fisheries facilitated with fishers in Kompong Phluk commune. The section begins by reviewing the history of community organizing in Kompong Phluk, highlighting the evolution from a community forestry committee first developed in 1999 to a community fisheries committee. The authors then review the resource management planning process from the original community forestry plan developed in 1999, to the ratification of an integrated community fisheries management plan in early 2004. This section concludes with a discussion of lessons emerging from Kompong Phluk.

Developing Community Organizations for Natural Resource Management

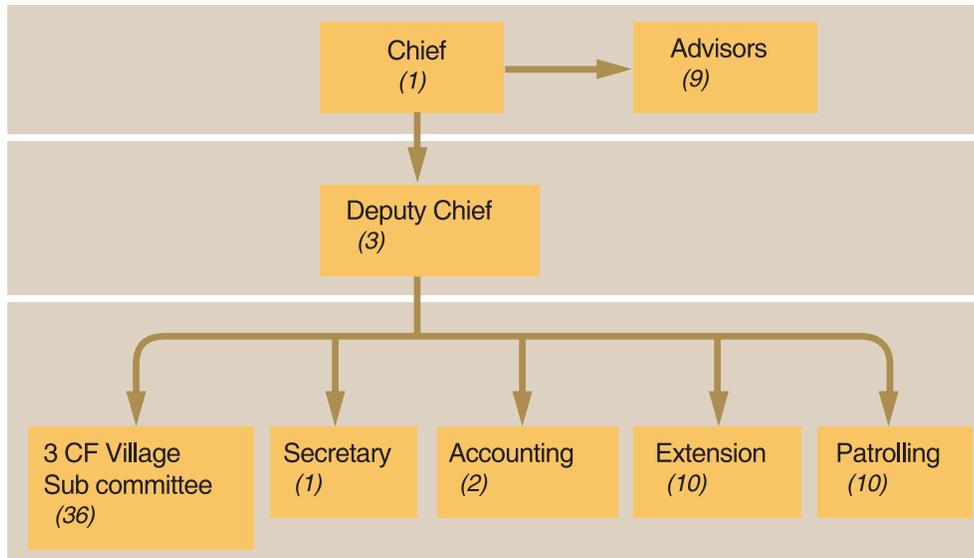
In 1999, a Forest Management Committee was formed in Kompong Phluk, with the assistance of the Provincial Department of Fisheries and the FAO project. The roles of the Forest Management Committee included identifying problems in the community and resolving them in collaboration with local government, demarcating boundaries of the protected forest area, setting signposts around the protected area, conducting community forestry extension, and preparing a forestry-fisheries management plan and monitoring and evaluating its implementation. In 2000, the community developed a management plan for the flood forest and fisheries resources surrounding the commune. The plan was designed to cover a total of 979 hectares for a five-year period from 2000–2004. The provincial fisheries office, which has jurisdiction over the flood forests, approved the management plan. With the policy changes supporting the reform of the inland fisheries sector in 2000, however, the total area under community management in Kompong Phluk increased dramatically to 15,906 ha. With the

introduction of the new community fisheries policy, the committee renamed itself the Community Fisheries and Flood Forest Committee.

In August 2002, the Siem Reap Provincial Headquarters officially recognized the committee which is now identified as the Kompong Phluk Community Fisheries Committee, dropping flood forest from the title, but not from its management objectives. The former community forestry plan has undergone an extensive adaptation process. Kompong Phluk was used as a ‘learning site’ for community fisheries management planning as community members and community fisheries facilitators (DoF staff) worked together to discuss issues and to create a management plan for Kompong Phluk. This is the first time that such an extensive plan has been devised for resource management in the Tonle Sap Great Lake, and it is proposed that the process be repeated with other community fisheries around the Tonle Sap.

In order to design rules and regulations or to draft a community fisheries management plan, the structure of a committee needs to be clarified and roles and responsibilities of community members need to be clearly defined. The initial Community Forestry Committee was established through an election procedure during a workshop sponsored by FAO in 1999. Three representatives from each of the three villages of the commune were elected to the central committee. In 2001, sub-committees were formed with the application and participation of 30 community members to what was then called the Fisheries and Forestry Committee. The community fisheries central management committee was elected, with the responsibility to manage and protect natural resources in the community fisheries area. Four units were created including the secretary, accounting, extension and patrolling components, all of which fall under the central committee. In addition, each of the three hamlets formed a sub-committee to bring special village issues to the general committee. An advisory committee was created to help with the

FIGURE 1: Structure of the Kompong Phluk Community Fisheries Organization



management process. The local community elects the central committee members in three-year cycles. The structure of the Community Fisheries Management Committee is as shown in Figure 1.

Formulating a Community Forestry Management Plan—1999-2002

Since 1948, the protection of the flood forest in Kompong Phluk was achieved through informal community agreements and practices until management was formalized with the drafting of formal rules and regulations in the late 1990s. Traditional management involved the establishment of a verbal regulation on forest protection around the commune. With the transition of management from informal to formal rules and regulations, a community forestry committee was formed and educational outreach, otherwise known as extension, undertaken with the community.

The original Community Forestry plan, devised in 1999, emphasized the protection and management of the flood forests, based on the assumption that forest management would enhance the productivity of the fishery. The management plan identified the primary forest user groups as (a) fishing groups who use the forest as fishing grounds, and (b) fuel wood groups who collect

the forest timber for cooking. In Kompong Phluk, community members use the forest for both activities. Thus, the management plan emphasized activities aimed at sustainably managing and conserving NTFP, fish and other aquatic resources, and wildlife to satisfy people’s needs. The historical uses of the forest suggested a block division management system for the area.

The focus of the management plan is biodiversity conservation, sustainable use and benefit sharing of natural resources existing in the protected area to improve rural livelihoods. The area, 979 hectares, was divided into five blocks on the basis of participatory forest cover classification including forest density, species, soil conditions, area and regeneration, as well as land use, aerial photography, and income-generation activities. The main flood forest species present in the protected area are *Barringtonia acutangula*, *Diospyros cambodiana*, *Coccoceras anisopodum* and *Crataoiva volisiosa*. For each block, management objectives were identified, and permitted user activities for each year specified. Activities included the collection of wood for minor construction, collection of dry fuelwood, fresh (thinning) fuelwood, collection of medicinal plants, fishing, wildlife hunting, collection of wild vegetables, NTFP collection and

Mrs. Sam Reth buys dry fish to mill for frog and chicken feed, last year she also bought fish paste to sell to the commune. She is 54 years old and has lived in this commune all her life. She has six children that also live in the commune; one of them is a teacher and one is a business trader. Her husband passed away five years ago. Although she is not a member of the Community Fisheries and Forestry Committee, she understands the role it plays in educating the community about flood forests. The activities of the committee in protecting the flood forest and fisheries help her to buy more fish and also help future generations because the forest protects the villages from wind and waves. She does not participate in the committee meetings but she did vote for the committee representatives. She travels to a remote area to collect her firewood, 5–6 km from the village. She has a boat and is helped by her children. Sometimes she buys wood from them.



Community Fisheries Committee members relax after a participatory rapid appraisal activity that included sketch mapping, resource inventories, and problem identification. Based on extensive discussions, the village has formulated a Community Fisheries Management Plan (CFMP) in 2003.

ecotourism. Not all activities were allowed in all blocks, or apply to all blocks, and wildlife hunting is prohibited throughout the area.

Formulating a Community Fisheries Management Plan—2003 onwards

With the recent allocation of commercial fishing areas, representing 60 per cent of the area previously contained in fishing lot number 5 to Kompong Phluk commune, the community forestry management plan underwent a revision process in early 2003. This revision process built upon the community forestry plan, with a greater emphasis on fishing, specifying types of gear, size, seasonality, location and income generating activities. The new draft management plan was completed in early 2004.

The Community Fisheries Management Plan (CFMP) is an essential element in the process of developing the community fisheries system. The process is designed so that local communities will prepare the management plan themselves, with facilitation support from Community Fishery

Facilitators. These Facilitators are from the provincial DoF, and have had extensive training with the FAO project on community fisheries, facilitation, and management planning development. The CFMP focuses on how local communities can conserve and utilize their natural resources in a sustainable manner over a fixed time period (currently in fixed, 5 year blocks). Once approved by the Commune Council, District Governor, provincial DoF, and finally by the Provincial Governor, the plan may then be implemented.

The CFMP in Kompong Phluk took several months to draft with villagers from Kompong Phluk commune and the Community Fisheries Facilitators taking part in this process. Since Community Fishery Management Planning is a new process in Cambodia, a key principle of management planning is *learning by doing*. Consequently, the facilitators and the villagers worked together to learn how to prepare management plans. The goal of the planning process is to enable communities to prepare their plan in such a way that they have a clear understanding and strong consensus regarding its contents, allowing the plan

TABLE 5: CF Management Planning Steps and Expected Outputs

Steps	Activities	Expected Outputs
1. Preparation of Fieldwork	<ul style="list-style-type: none"> ◆ Gather/review existing information ◆ Identify any traditional management systems ◆ Collection of aerial photos, graphs, maps, etc. 	<ul style="list-style-type: none"> ◆ Collected existing information ◆ Recognized new information needs
2. Meeting with Community	<ul style="list-style-type: none"> ◆ Meeting with CFCC members, sub-committee members, Commune Council, Village Chiefs and other stakeholders at local level ◆ Review the management planning process with preparation team and all stakeholder representatives including elder in the community 	<ul style="list-style-type: none"> ◆ Formed a Community Fisheries Management Plan (CFMP) preparation team ◆ Reviewed the CFMP planning process
3. Training the Team	<ul style="list-style-type: none"> ◆ Discuss key concepts/steps of CFMP and its importance for CF development; ◆ Roles/responsibilities of community related to management planning, ◆ Familiarize important PRA/RRA tools 	<ul style="list-style-type: none"> ◆ Familiarized on concept and importance of CFMP, its process (steps), roles and responsibilities, PRA tools
4. Socio-economic Conditions	<ul style="list-style-type: none"> ◆ Discuss socio-economic profile of village ◆ Discuss issues, problems and illegal activities ◆ Discuss traditional uses and practices of resource management 	<ul style="list-style-type: none"> ◆ Socio-economic data about resources use, demands, issues and problems
5. Participatory Resource Mapping	<ul style="list-style-type: none"> ◆ Map out important locations and their uses ◆ Define criteria for block division, ◆ Divide areas into blocks and sub-blocks, defining block objectives separately ◆ Verify blocks by transect walking with GPS ◆ Prepare final block and sub-block maps with GIS systems 	<ul style="list-style-type: none"> ◆ Mapped CF area, blocks and sub-blocks according to management objectives ◆ Verified blocks/sub-blocks ◆ Prepared related maps of CF area
6. Natural Resource Inventory	<ul style="list-style-type: none"> ◆ Prepare simple inventory methods to define resource status within blocks ◆ Data collection ◆ Analyze data/describe forest structure/status ◆ Describe other features i.e. soil condition, availability of NTFPs 	<ul style="list-style-type: none"> ◆ Developed methods for participatory assessment of natural resources ◆ Data collected and analyzed
7. Discussions of Field Results	<ul style="list-style-type: none"> ◆ Review results of inventory ◆ Discuss management options according to blocks and activities ◆ Discuss operating budget for implementation for CFMP annually ◆ Discuss benefit sharing, fish sanctuaries, controlling illegal activities and other issues ◆ Discuss PM&E including indicators ◆ Define roles and responsibilities stakeholders for implementation 	<ul style="list-style-type: none"> ◆ Review analyzed data ◆ Discuss different management options needed to include in the plan for 5 year period ◆ Discussed annual action plan and annual operating budget for all activities
8. Draft Management Plan	<ul style="list-style-type: none"> ◆ Compile each component of CFMP together into agreed format and ◆ Prepare annual action plan 	<ul style="list-style-type: none"> ◆ Drafted management plan and action plan
9. Finalize Management Plan	<ul style="list-style-type: none"> ◆ Review draft plan together (CFMP team/facilitators) ◆ Discuss with CFCC, Village Sub-committee and different interest groups ◆ Organize local stakeholder workshop ◆ Prepare final plan, incorporating comments 	<ul style="list-style-type: none"> ◆ Review draft plan with team, committees, and local users ◆ Received feedback from multistakeholders ◆ Final plan prepared
10. Approve CF Management	<ul style="list-style-type: none"> ◆ Approval of plan from Commune Council ◆ Get approval from higher levels i.e. District Governor, Provincial DoF and Provincial Governor 	<ul style="list-style-type: none"> ◆ Approved CF management plan with recognition from all stakeholders

to be fully implemented by the community. Based on the experiences from Kompong Phluk and other communities participating in the FAO Siem Reap project, a management planning process is evolving that may be standardized after several years of experience with field implementation. This process is presented in Table 5.

The Community Fisheries Management Plan will encompass the former community forestry site, with the additional area of nearly 15,000 hectares expanding over inundated forest and open lake. The community fisheries site consists of inundated flood forest for six to eight months annually, with the back flow from the Mekong River rising steadily until the water rises to the base homes in Kompong Phluk. As shown in Map 4, much of the 15,906 hectares of land in the management area is low density regenerating forest (5,958 hectares). This area is largely scrub forest that can be used for producing fuelwood and as a fish hatchery. Another 5,378 hectares of the territory is open lake that will be managed as a community fishery area and routinely patrolled. Other significant land use areas include the high density and medium density protection forests along the edge of the lake that buffer the community from storms and act as a significant fish and wildlife refuge.

Currently there is a Khmer version of the Rules and Regulations for the extended community managed area covering a total of 15,906 hectares. This document is entitled *Rules and Regulations of Kompong Phluk Community Fisheries* (2001) and forms the official agreement between the Provincial Fisheries Office and the Kompong Phluk Communities Fisheries Committee. The document outlines the roles and responsibilities of the fisheries department and the committee, and is signed by both parties making this a legal document. The Committee and Fisheries Office will later amend this document with the passing of the *Communities Fisheries Sub Decree* by the Council of Ministers. This new document will replace the previous Rules and Regulations document created for the 979 hectares initially allocated for community forestry management in 1999. This rules and regulations document is what the community fisheries management plan is based upon and further expands.

While the original community forestry management plan focused explicitly on flooded forest resources, this new management plan is far more

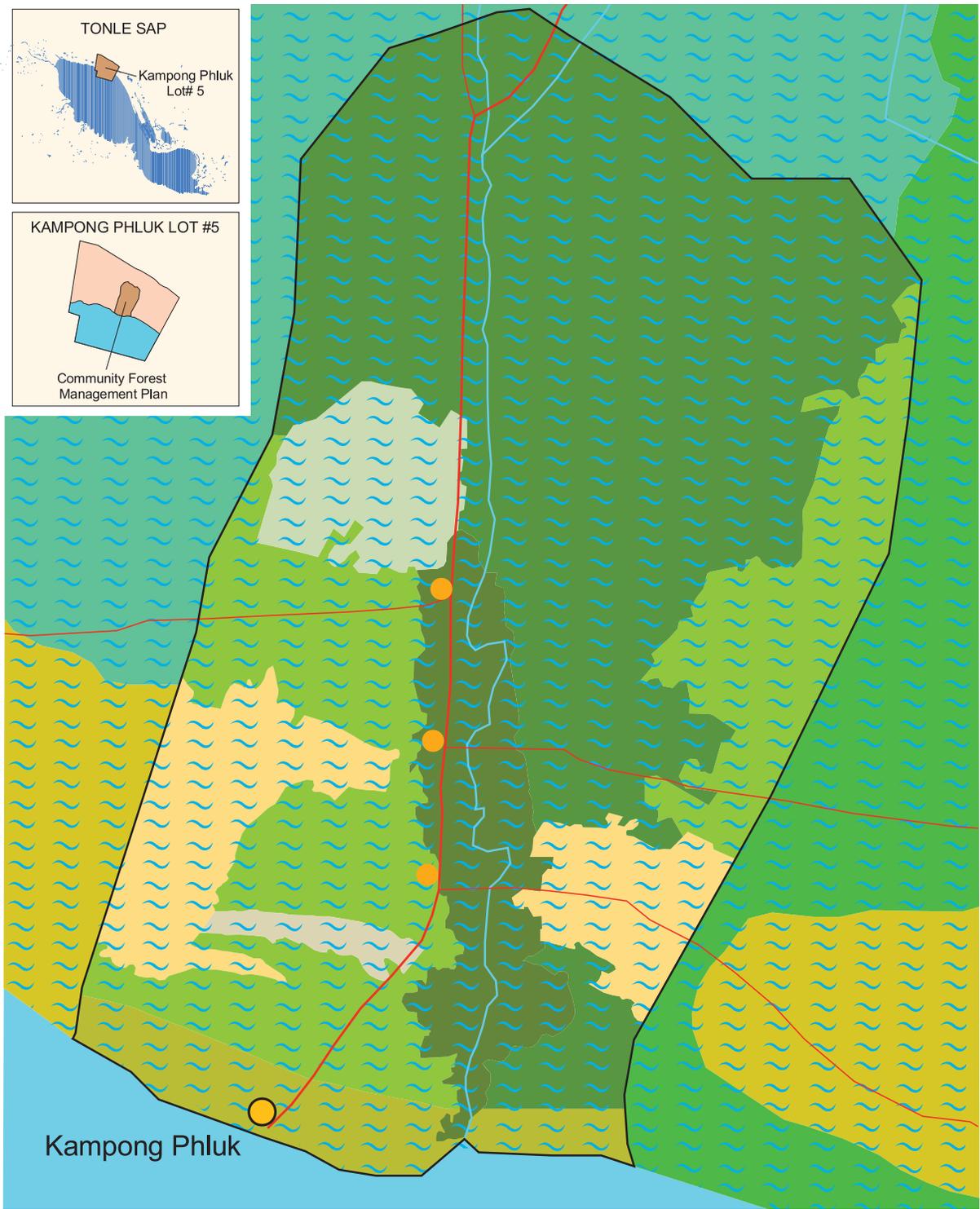
extensive, also focusing on fishing practices (legal and illegal) along with potential income generating activities such as ecotourism and permitting systems. The objectives of the CFMP in Kompong Phluk include the following:

- To protect and manage flood forest for a regular supply of daily needed forest products and provide habitat to fish for spawning and nourishing,
- To conserve flooded forests to provide shelter for aquatic life (conserve aquatic biodiversity).
- To conserve forests to protect villagers from storms.
- To develop sustainable fishing practices for livelihood improvement of fishers in Kompong Phluk.

This management plan is extensive. It defines the area and the resources to which these regulations apply, the permitted and banned uses of the resource, the organizational structure of the committee and their roles, the community's roles and responsibilities, allowable harvest amounts of forestry products, fishing gears, size and season, illegal gear used in the community fishing area, specifications on budgetary uses, and fines for prohibited activities including clearing of the flood forest, catching of wild animals and use of illegal fishing gear. The plan also includes guidelines for income generation from the community fisheries, including membership fees, fishing permits, permits for mung bean farmers, fish harvesting for community fishery management support, income from eco-tourism, service charges and fines from offenders.

Within this management plan, therefore, there is an emphasis on both areas where the forest or fishery is strictly protected and flood forest and fishery utilization areas where extractive activities are permitted. For example, conservation strategies include protection of the flood forests near the villages and protection of the fish sanctuary. For the flooded forest areas near the village, only dead wood can be collected, banning the cutting of green shoots for firewood, while in the utilization zones, a rotating system of cutting is devised to ensure access to fuel wood in a sustainable manner (Map 3). For the fishery, during the rainy season the community allows small brush parks for shrimp collection. Utilization

MAP 3: Production Forest Sub-blocks for Rotational Harvesting



LEGEND

- | | | |
|---|---|------------------|
| Community Management Area (Granted 1998) | Planned Plantation Enrichment - 45 ha | Lake |
| Planned Flooded Forest - High Density (Protection - Ecotourism - 82 ha) | Planned Plantation (Grassland Enrichment - 10 ha) | Flooding terrain |
| Planned Flooded Forest - Regeneration (Protection - Ecotourism - 49 ha) | Planned Mung Bean Field - 97 ha | River |
| Planned Flooded Forest - Medium Density (Fuelwood Collection - 434 ha) | Dense Forest | Provincial Road |
| Planned Flooded Forest - Low Density (Natural Regeneration - 239 ha) | Open Forest | Municipal Road |
| Seasonal Agriculture | Village | Commune |



SOURCES

Image Map of Chong Khneas and Kampong Phluk (FAO - Siem Reap GIS Unit 2002)
 Current Status of Community Fisheries Siem Reap Province, Cambodia (FAO - Siem Reap GIS Unit 2001)
 Tourist Map of Cambodia Scale 1 : 50,000 (National Geographic Institute - France)

PREPARED BY:



TABLE 6: Calendar of Illegal Fishing Activities at Blocks 1 and 2

ITEMS OF ILLEGAL ACTIVITIES	ILLEGAL ACTIVITIES BY MONTHS											
	1	2	3	4	5	6	7	8	9	10	11	12
Electro-fishing												
U-shaped fishing gear												
Brush Parks for fishing												
Snakehead fish fingerling collection												
Sine nets for catching eels and snakes												
Bamboo fences across the streams												
Firewood collection; cutting branches for gear												
Catching water birds												
Pumping out water from ponds												

strategies include defining the type, size and season of fishing gear and penalties for those who break these regulations. The CFMP focuses on the following strategies for implementing community fisheries:

- Strategy of controlling illegal activities (enforcement, patrolling).
- Strategy for resource protection (protection blocks, fish sanctuary).
- Strategy for sustainable resource harvests (fisheries and forestry resource harvesting strategy).
- Strategy for dry season agriculture practices (eliminating dry season rice cultivation; mung bean cultivation).
- Strategy for ecotourism development (establish a visitor center; build resting huts in flooded forest; build floating fish culture cage).
- Strategy for institutional development (identify options for income generation; set up office and communication system; transparent accounting).

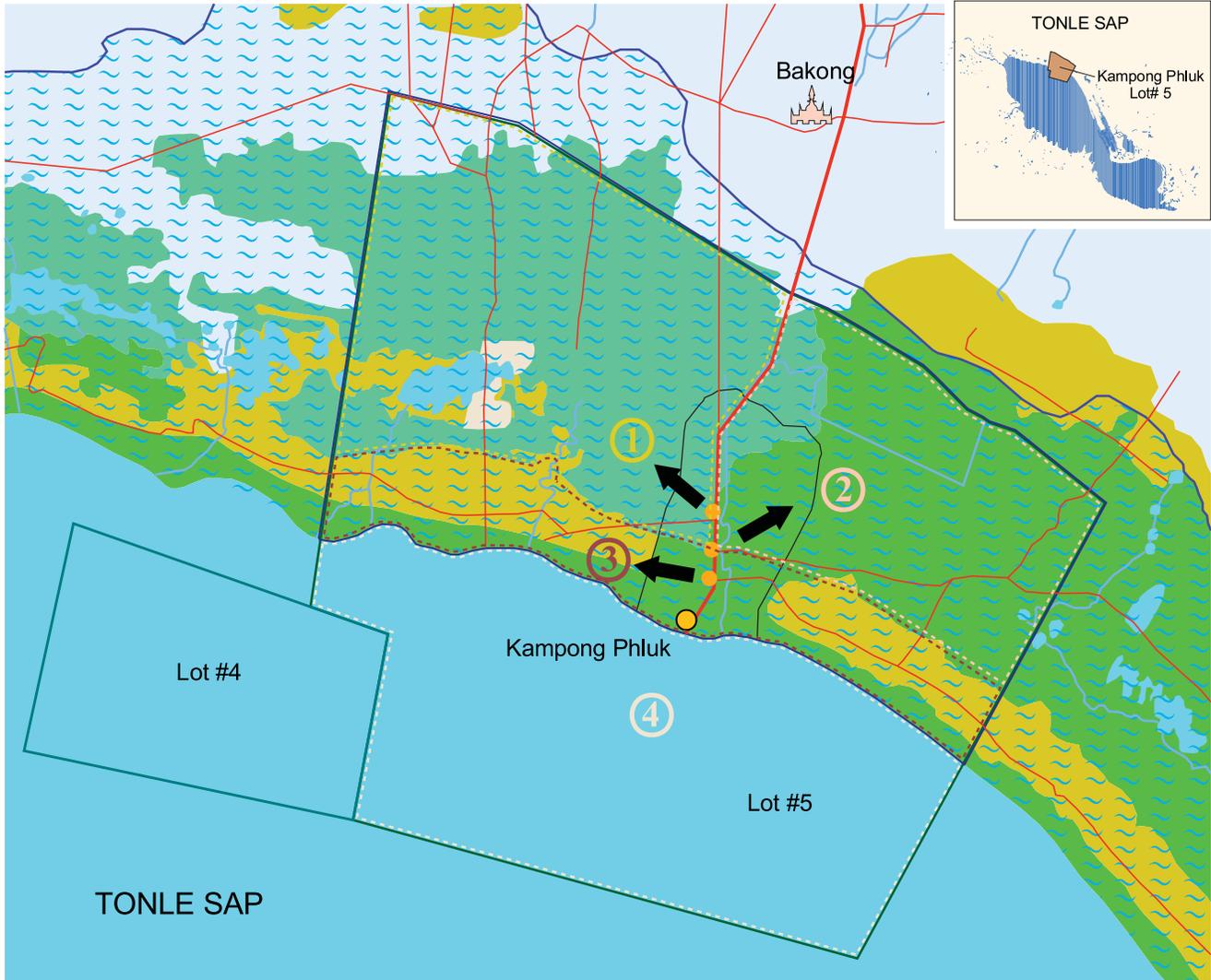
Protection and production are integrally linked in the management plan. Kompong Phluk fishers believe that they can catch more fish in 2003 than in previous years, and attribute this increase to patrolling activities and protection activities, such as the creation of fish sanctuaries. As resources increase near Kompong Phluk, however, the community anticipates that additional pressures will be placed on the fishery

from outsiders and from an increase in illegal activities. Therefore, strong protection mechanisms are an important component of any community fishery strategy. In order to establish controls over the fishery in Kompong Phluk, the community has divided the fishery area into four different blocks, with protection responsibility for each block assigned to one of the three village patrol teams, and the fourth block being patrolled jointly. Villagers organize their patrolling and enforcement activities according to seasonal and spatial pressures by designing strategies to address illegal activities. Map 4 shows how these blocks were devised.

Map 4 also outlines the patrol area for each village (1-3), along with the communal patrolling area (4). Since villagers are already experienced in flood forest protection, this patrolling strategy builds upon local knowledge and practices. Given the large amount (5000 hectares) of open lake, the commune has decided to work together to patrol this area. Since illegal activities happen seasonally, villagers have also prepared a calendar of different illegal activities that take place within their community fishery. Table 6 highlights illegal activities that take place in fishing blocks one and two by month. This table will help the patrolling committee target their enforcement more effectively.

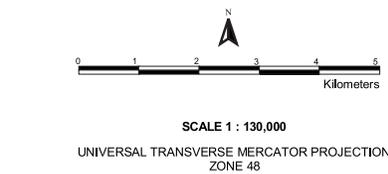
The CFMP also outlines the structure of the patrolling committee, as outlined below. Part of patrolling work is to establish a clear, effective communication process, enabling villagers and the patrol team to work together to protect natural

MAP 4: Patrolling Zones and Protection Plan for Kompong Phluk



LEGEND

- Community Management Area (Granted 1998)
- Community Management Area (Granted 1999)
- Community Management Area (Granted 2003)
- New Commercial Fishing Lot
- Village Protection Responsibility
- Lake
- Dense Forest
- Open Forest
- Seasonal Agriculture



- Ricefield
- Grassland
- Floodline
- Flooding terrain
- River
- Provincial Road
- Municipal Road
- Temple
- Village
- Commune

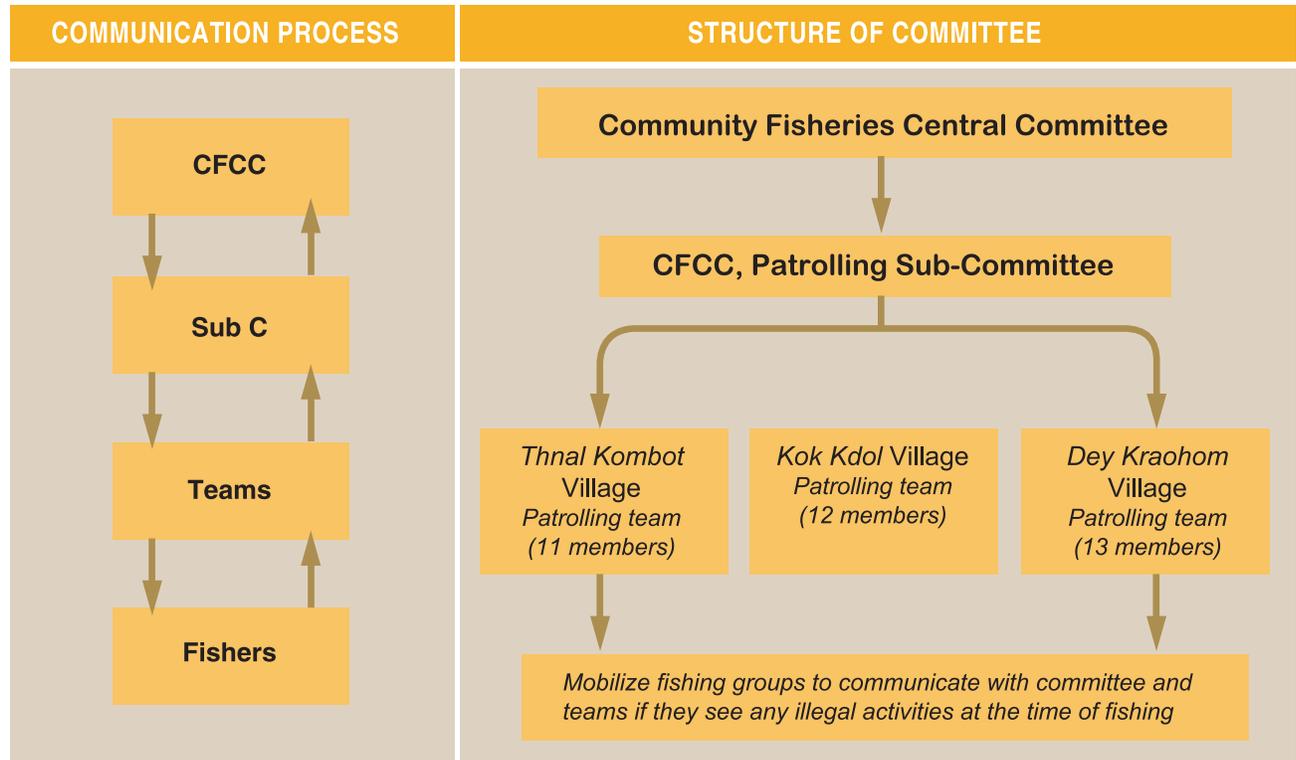
SOURCES

Image Map of Chong Khneas and Kampong Phluk (FAO - Siem Reap GIS Unit 2002)
Blocks Map for Protection Responsibility Kampong Phluk Community Fisheries (FAO - Siem Reap GIS Unit 2002)
Current Status of Community Fisheries Siem Reap Province, Cambodia (FAO - Siem Reap GIS Unit 2001)
Tourist Map of Cambodia Scale 1 : 50,000 (National Geographic Institute - France)

PREPARED BY:



FIGURE 2: Structure of Patrolling Teams and Communication Process



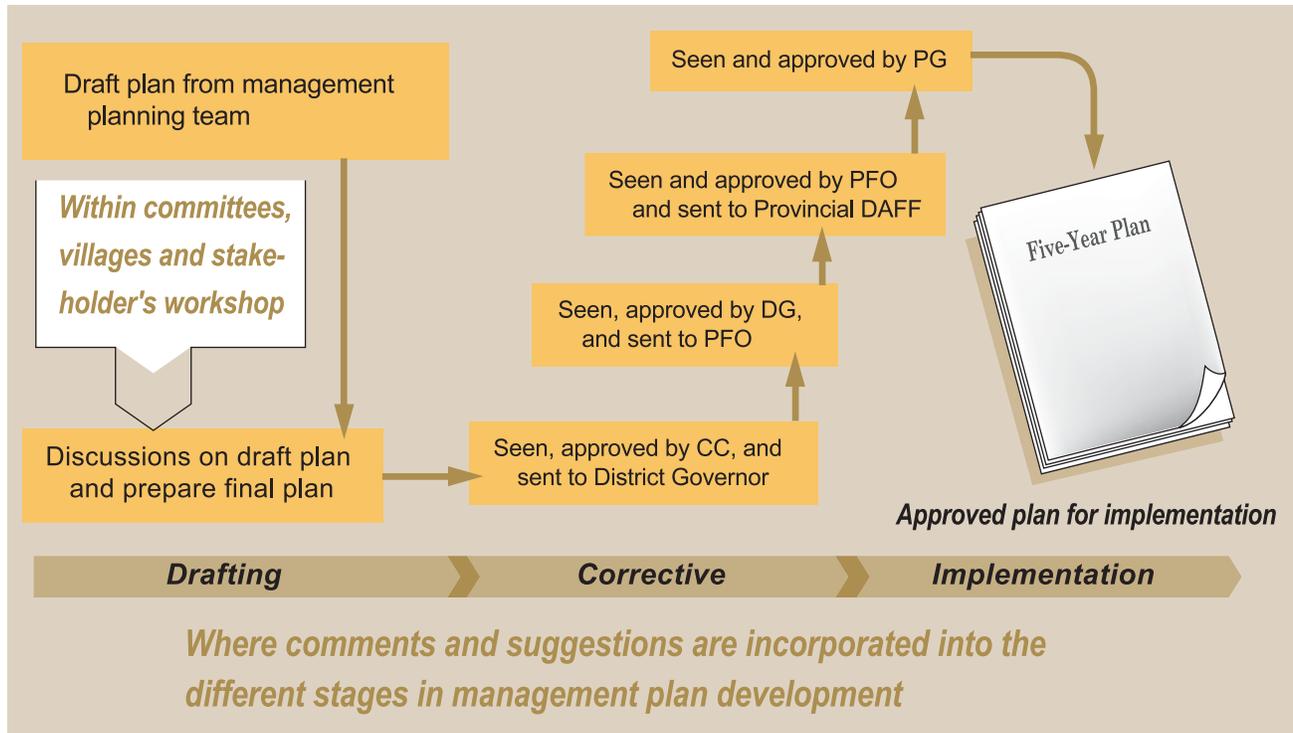
resources in the area. Within this framework, the entire community is mobilized to watch for illegal activities, with the patrol team doing the enforcement activities and levying fines (Figure 2).

The committee patrols the open water fishing grounds to help prevent illegal fishing activities and insure that no one is cutting the flood forest. Often, fishing offenders hide their illegal gear to prevent the joint patrols from obtaining evidence of illegal operations. In July 2002, the committee caught people cutting trees in the flood forest. Rather than fining them, the committee attempted to explain the forest protection and management strategy to them, a common approach with first time offenders. The committee believes education can be the most effective method of ensuring that violators do not repeat their illegal actions. The problem is that new offenders come. "You educate Mr. A, but Mr. B comes and cuts next," exclaimed a committee member. The offenders are not from the commune, but come from upland areas or neighboring communes. In the future, the committee hopes that the forest will improve because local people will use poles purchased from the upland areas, rather than cutting the protected flood forests.

Formalizing Community Management Agreements

A critical step in establishing effective community management systems is formalizing them through written agreements with local government authorities. Without this action, management plans and community organizations lack the legal authority to implement their stewardship strategies. In the case of Kompong Phluk, a CFMP preparation team was formed with representation from all stakeholder groups including the management committee, sub-committees, commune council, villagers (women and men) and elders. This team prepared a draft plan through open discussions about critical issues, engaging as many community members as possible during the planning process to ensure everyone has a clear understanding of the issues and management provisions. When the first draft was finished, the planning team, with the support of the community fisheries facilitators, revised the plan before submitting it to community fisheries management committee. The community fisheries management then revised the plan and prepared a final draft for public discussion.

FIGURE 3: Approval Process for Management Plans



After preparing a draft, extensive discussions were conducted among community fisheries members. A joint stakeholder workshop was organized among community members and representatives from the commune council, the local police, the district governor’s office, the provincial fisheries office and the provincial governor’s office. The purpose of the workshop and discussions was to familiarize all stakeholders on provisions included within the draft management plan and to get feedback on this plan. This step ensured the approval of the management plan from local authorities and the provincial fisheries department and encouraged them to take greater responsibility for implementing such a plan.

Typically, the planning team prepares the final plan after incorporating all comments and suggestions and pushes for approval. The approval process begins with the commune council (CC). Once the plan is approved, it is sent to the District Governor’s office. If CC finds that it needs to be reviewed and revised, it is sent back to the planning committee with suggestions. The plan is sent again to the CC after the planning committee incorporate its comments and suggestions. Finally the CC approves and forwards it to the district governor’s office with its recommendations.

The District Governor’s office follows the same

process as the commune council has followed. The plan is also sent back to the planning committee, or from the District Governor to the CC, if it is to be revised. Otherwise it is seen, approved and sent to the provincial DoF. The DoF office follows the same procedure as the District Governor. The plan is also seen, approved and sent to the provincial department of agriculture, forestry and fishery (PDAFF). After approval from the PDAFF, it is passed to the Provincial Governor’s office. The management plan is approved, finally, by the Provincial Governor for a five-year period, and is then ready for implementation (Figure 3).

Learning from Kompong Phluk

While Kompong Phluk has a tradition of flood forest protection that has been operating for more than 50 years, the community’s approach to natural resource management over the past five years has changed dramatically. Facilitated by the support of the FAO program and Provincial counterparts, and driven by fisheries sector reforms that decentralize commercial lot management, the process has allowed community leaders and their emerging institutions to formal responsibility for a larger management area and is requiring them to design more complex modes of fishery and forest stewardship. The Fisheries Committee and its members

are faced with developing acceptance of the management plan among community members, as well as with people from neighboring and more distant communities, who also use the resource. Aside from winning public acceptance of the nascent management plan, the Committee faces a number of other problems including financing its operations, balancing sustainable production with growing demands, coordination with government agencies, and managerial capacity.

An important constraint to the implementation of the Community Fisheries Management Plan is a lack of financial resources. This is why part of the CFMP focuses on identifying income-producing options. A variety of strategies have been identified in the CFMP to generate revenues including: charging membership fees, issuing fishing permits to outsiders according to fishing gear type, and issuing annual permits to mung bean farmers. Management support for fish harvesting and entrance fees for tourists are main income generating sources also explored in the plan. The CFMP has ruled that all community fisheries members should register with the community fishery central committee, an action that will help build capital resources while excluding outsiders from free access to community resources. While fees, fines, and other revenues will help cover some of the committees operating costs, the development of a management infrastructure will cost much more.

The CFMP also proposes office construction, the purchase of two motorized patrol boats, and establishing

radio communication. At present, the community fisheries central committee relies on the commune office, but should soon be able to perform their activities from their own office. Patrol boats and a communication system will help to reduce illegal activities. Also, many extension sessions are planned for community members and upland communities to strengthen their capacity to implement rules, regulations and management plan activities. The community would like to use additional funds to construct a public toilet near the pagoda. Also, part of the money could be used for rural credit for community members to engage in pig raising, vegetable farming, purchasing small-scale fishing gear, and establishing other small businesses to improve their livelihood.

Transparency of financial interactions will be assured by maintaining an accounting book that will be disclosed to all community members and higher authorities on a monthly basis. The account officer and chief of community fisheries are responsible for balancing the books. In 2004, the community plans to open a bank account so it can earn interest on their savings. These are examples of the activities planned in the draft community fisheries management plan in Kompong Phluk, and will serve to strengthen community fisheries institutions and the managerial capability of the communities.

Yet, while the Committee has ambitious plans and is building management capacity for the future, financing them remains an ongoing concern. Support

from the FAO project is by its nature, time-bound and few mechanisms exist to direct needed resources to newly emerging community fisheries groups.

While villagers have been engaged in an extensive planning process for over the past year, they have also continued to protect their fishery and forests as this planning process has evolved. The community certainly benefited from past experience with resource management as they devised a plan that addresses their needs for the protection and productive use of their forests and fish resources. Nonetheless, the hamlets of Kompong Phluk, like many others in Cambodia, are challenged by



Community Forestry Committees in upland areas of Siem Reap province are now harvesting poles like these under sustainable management plans, and selling them to lakeside communities for use in house and fishing platform construction.

the need to increase their incomes while sustaining the natural resources upon which their livelihood depends. In practice, a mix of strategies, from protection to changing livelihood practices, are currently used by villagers to ensure flooded forest and fish protection. Table 7 highlights some examples of village management strategies.

As Ros Norn comments, “We know that we cannot handle all of our problems, but we can solve some of them.” The fisheries management committee is realistic about what they can and cannot tackle, and are trying to devise systems that will work for their community. One fisheries committee member explained specifically what they do when they get a report from a community member about an illegal activity:

After the report from a commune member, the committee goes quickly and confronts the offender and warns him. We try to explain our reasons for protecting the area and establishing rules. On the second and third offense, we fine him. But some people have no money, as they are poor people who live far away. In that case we let him go.

This example highlights the awareness of the

committee about why resource destruction occurs and its sensitivity to those poor families who are trying to earn a livelihood. Finding a balance between strict enforcement and education is seen as important to their work. Considering that these activities are taking place in a legal vacuum (the Community Fisheries Sub-Decree which would give communities the right to organize around their resources, and specify a role for technical departments is still not passed), the belief of communities in resource protection and management is even more impressive. Another member commented:

By the time they issue their law, there will be no fish left. Please do what you can to urge the policy makers to approve the Community Fisheries Sub-decree. We need the support of the government to effectively protect and manage the flood forest and fisheries.

The Fisheries Committee recognizes that they need more support from government if their activities are to be sustainable in the future. More and more policy makers from Phnom Penh, and elsewhere, are being encouraged to visit Kompong Phluk to learn from villagers about how local resource management can work.

TABLE 7: Village Management Issues and Strategies¹⁹

Management Issue	Policy Work
Flooded forest cutting	Committee uses villagers from each village to manage specific parts of the forest, reporting any illegal activities to the committee who then investigates and tries to solve the issue.
Illegal fishing gear (push nets, electro fishing, long bamboo traps) and theft	Patrolling for illegal gear; discussions with other communes about Kompong Phluk’s rules and regulations; community activities and monitoring of their own fishing practices.
Declining resources	Creating of a 1 km ² fish sanctuary; educating people about the rules to the community; encouraging villagers to collect floating wood for firewood and to collect fuel wood outside of mature forest areas.
Farmland encroachment	Working with provincial authorities to stabilize encroachment.
Other activities	Supporting poor villagers in times of need i.e. funerals

Reflections on the Process

“Without community protection and management, the natural resources will disappear”

When the FAO project started in 1995, Cambodia was in a state of turmoil. The country had two Prime Ministers each controlling loyal military forces living in a tense, unsteady relationship, as well as the remnants of the Khmer Rouge who were still actively fighting both sides from their base just to the north of the project area. There was a genuine sense of uneasiness and fear within rural communities. Society was heavily armed, although weary of war. The project was assigned a “pilot unit” of some 2,600 hectares in 1996 to use for community-based management. In Cambodia, participatory resource management was an entirely new concept and the project was more tolerated rather than encouraged. The “pilot unit” was under the jurisdiction of the Department of Fisheries who was concerned about the loss of flood forest habitat and the subsequent threats to fish productivity.



The management plan allows for a rotational harvesting of areas under scrub forests, providing a source of fuelwood for Kompong Phluk families as well as outside households who secure cutting permits.

The government wanted to simply stop the conversion of flood forest ecosystem for agriculture and they wanted the project to do reforestation of old agriculture lands within the flood forest zone. Reforestation was undertaken in 1996 and 1997, but it was soon realized that the flood forest regenerates better naturally and the real issue was to involve local people in its protection and management. The project strategy was to develop proper community-based natural resource management where the responsibility for protection, management and utilization of a given resource is transferred to the local community. Developing and building support for such an approach, however, was a slow process as no government staff had experience with participatory management, and government officials were very wary, and even distrustful, of communities’ ability to manage forest or fishery resources.

The project focused on training staff in the early years and sent many counterpart staff to neighboring countries to learn about community-based management, as well as other development issues. Simultaneously, the project experimented with different approaches to facilitating for community involvement in natural resource management by engaging villagers in a participatory learning process. After the first site at Thnal Dach was well underway with a management plan completed in late 1997, the staff initiated work with a commune to the north in the upland forest area. In early 1998, wide-spread land grabbing began to take place with the collapse of Khmer Rouge resistance. Communities perceived a threat to their forestlands and began requesting assistance from the FAO project to help them

protect their forests from some members of the military and other outside actors that were attempting to claim forest lands in the area. Consequently, community forestry started to expand in the upland areas at the same time as communities were taking control of their flood forest and fishery resources near the Great Lake. The work accelerated as the project successfully involved provincial and district authorities in numerous community workshops and meetings. The strategy was to be open and transparent throughout the process so everyone, including the military and police, understood what was happening and why. By continually keeping everyone informed and involved, the project minimized conflicts and steadily gained the trust and support from local and provincial authorities, achievements that were essential to the establishment of a community based natural resource management program.

Today, some 110,000 ha are under management by 116 villages organized into 10 central community fisheries organizations. In the upland areas more than 20,000 ha. are being protected and managed by 84 villages grouped into 44 community forestry organizations. All sites are officially recognized at the provincial level and have been included within the provincial fisheries and forestry departments' annual work plans as well as within their respective communes, districts, and the provincial planning framework. The commune and district development planning process in 2002, under the new Commune Administration Law, has resulted in an additional 60 requests for assistance to establish new community forests.

The community forestry and fishery strategies supported through this project have made a substantial impact on improving resource management in Siem Reap Province, as well as improving local livelihood and building community governance capacities. This is due to the fact that the project was in the right place at the right time and has had the opportunity to work for 8 years, enabling the establishment of trust and support with both communities and local officials. Considerable time and effort has been spent on training government counterparts who now staff the community forestry and community fisheries' units that have been established by their respective provincial departments. Many constraints and issues remain to be resolved in both the forestry and fisheries sectors as legislation is still lacking, and there is still a continued reluctance from the central level to fully empower rural communities to manage natural resources. Despite these constraints, this project

has been exceptionally effective due to the fact that government staff, supported by a UN organization, has done implementation. Being part of the UN, FAO has been able to exert influence on policy and legislation and has also been able to help resolve difficult issues at the central level.

The process described in this case study, from initial site selection through the preparation and implementation of the community fisheries management plan, is based on 6 years of field experience. The strategy is continually refined and improved. The Government has recently made a commitment to implement an ADB community fisheries project based on the experiences in Siem Reap, that will work in all five Tonle Sap provinces, starting in the year 2004. A 4th phase of the current project has also recently been proposed to expand community forestry activities to the provinces of Banteay Meanchey and Oddar Meanchey. Beyond project support, the legislation is still lacking and the government requires human and financial resources to properly establish community-based natural resource management throughout the country. Community empowerment is essential to ensure that the remaining forest and fisheries resources are protected and managed for the future generations to come.

Conclusion

In many Cambodian communities, the upheavals of previous decades have undermined the social fabric and traditional knowledge making it more difficult for communities to pursue collective and meaningful resource management. Economic and cultural disparities in fishing communities also hinder community fisheries management. A village that appears to be overcoming these obstacles is Kompong Phluk, where management discussions over a six-year period are leading to a broad-based resource stewardship system that will rely on a detailed management plan. While Kompong Phluk is unusual in its homogeneity and traditions of forest protection, it provides an ideal context to explore effective systems of community-based resource management around the Tonle Sap.

Extension efforts by the Kompong Phluk community fisheries committee have helped reduce firewood consumption from 20 cm³ to 7 cm³ per family over the last few years.²⁰ Now, rather than cutting trees, people instead collect floating debris wood for fuel. Such local conservation efforts are helping reduce deforestation and are a direct result of the local community's decision

to ban the collection of green fuel wood from the protected forest area. As a consequence, people must travel considerable distances to collect wood. Most collection occurs during the flooded season from September to December and is transported by boat back to the community residence. While this strategy allows the protection and regeneration of Kompong Phluk's forests, it also transfers deforestation pressures to other flood forest areas, and therefore does not address more regional problems of deforestation. Moreover, as more communities become organized and look elsewhere for resources in order to protect their own immediate areas, conflicts may arise.

Kompong Phluk represents an unusual case of community forestry management, unusual because of the communities' past efforts to protect local forests without outside support, and because of the largely unanimous long-term goals of the population to allow the flood forest to regenerate and remain protected. The apparent lack of internal community conflict over forest and fisheries management objectives may be attributed to a number of factors, including the small size and ethnic homogeneity of the commune, and the fact that 95 per cent of the population are fishers and have a shared stake in seeing the flood forest regenerated and sustainable fishing practices enforced. The presence of a mature forest that inspires further protection, the recent support from the FAO and Fisheries Office, and the attention the management activities are drawing from outsiders, have also been motivating factors. These factors all reinforce the collectiveness of the community.

The reality facing other fishing communities around the Tonle Sap, which are also presented with the opportunities and challenges entailed in community management of flood forest and fisheries, is that they are often larger, ethnically heterogeneous communities with more diverse occupations, and so lack the cohesiveness to organize in order to develop and implement a community resource management plan. Most also lack a history of forest protection. Chong Kneas, the western neighbor of Kompong Phluk is a floating community with a large, marginalized Vietnamese population and a powerful group of port operators and entrepreneurs. These factors make it difficult for the current Community Fisheries Committee

to develop effective strategies to manage natural resources. To the east, Kompong Khleang is a larger, wealthier commune, many of whose members are farmers, and so do not have a vested interest in protecting the flood forest, but rather strong incentives to clear them for agriculture. They typically plant fast growing crops such as mung beans, cucumbers, and watermelons in the flood plains during the dry season. This introduces conflicts with neighboring communities who wish to protect the forest, including fishers who see the benefit the forest has on fish resources and therefore their own livelihood.



Leaders of the Kompong Phluk Fisheries Committee are responsible for supervising the management of 15,000 hectares of territory including 5,000 hectares of open lake. Routine patrolling responsibilities are divided among the villages three hamlets. The Committee also manages finances for administration and development projects and coordinates with local government and technical agencies.

It is the ability of these communities to develop sustainable, welfare-enhancing community resource management approaches that should be the gauge of success of CFM strategies and policy. In many Cambodian communities the political upheavals of the past forty years have undermined the fabric of the community and eroded the traditional knowledge base, making it difficult for communities to pursue collective and meaningful resource management. Economic and cultural disparities in fishing communities also hinder community fisheries management. Such social and economic challenges are the reality of community management and must be addressed in future discussions of resource management. Even in Kompong Phluk where cultural homogeneity and community consensus on

management issues are strong, management capacity is still developing. The fisheries management plan is ambitious and includes many novel institutional and financial arrangements that Kompong Phluk Fisheries Committee will be challenged to implement in the years ahead. Kompong Phluk will require the ongoing encouragement of local government and provincial technical agencies. While internal mechanisms are being developed to generate finances for management activities and expand livelihood opportunities, this is a long-term strategy that will likely continue to require external support for some time to come. Given that the flooded forests and diverse fish species protected by Kompong Phluk are an important component of the Tonle Sap ecology, and that sustaining that unique bio-region is a priority for Cambodia and of considerable interest to the global community, continuing technical guidance and financial support that allows Kompong Phluk to implement its management plan is well-justified.

Beyond Kompong Phluk, the rapid expansion of lakeside community fishery groups and upland community forestry organizations has been dramatic,

and indicative of a grassroots demand for assistance with, and recognition of community-level natural resource needs and management efforts. The FAO Project, through its close collaboration with the Provincial Fisheries and Cantonment Forestry Office have effectively extended their resources to respond to growing community demands for technical and organizational support. The demands are driven by increasing concerns over resource pressures from neighbors and from other actors. Illegal logging, illegal fishing, timber smuggling, and forest land encroachment are widespread and are often driven by wealthy and or powerful individuals. Communities see their local resources, critical for subsistence goods and cash, threatened. In growing numbers, they are seeking legal recognition of their rights and the authority to protect and utilize these resources. This demand, coupled with the effective and collaborative approach adopted by the FAO project and the provincial fisheries and forestry offices have allowed a joint CBNRM strategy to emerge in Siem Reap Province that was rapidly extended to over 200 villages, mostly over the past four years.



The lotus flower and stem (*Nelumbo nucifera*) are collected for food. The seeds are eaten as a snack and the stems and roots are made into soups and other dishes. The leaves are used to wrap food from the market, and other parts of the lotus are used as medicine.

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- ¹¹ Some deep water locations in permanent water bodies were set aside as "fish sanctuaries" to be fully protected for the protection of brood stock.
- ¹² FAO Siem Reap Report. 2002. P: 2.
- ¹³ For more information on livelihood issues in Kompong Phluk see Marschke, M. 2003. Sustainable Livelihoods in Context: Learning with Kompong Phluk Fishers. *Unpublished Workshop Proceedings*. Phnom Penh: Ministry of Environment, PMMR-IDRC.
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Annex

ANNEX I: Equivalent Terms for Units of Governance in Southeast Asia

	CAMBODIA	INDONESIA	PHILIPPINES	THAILAND	VIET NAM
Hamlet (no legal status)	Phum–Thmei (20-50 hh)	Dusun (50+ hh)	Purok (20-50 hh)	Klum Ban/Pok (20-30 hh)	Cum (20-30 hh)
Village	Phum (100+ hh)	Desa (5-10 dusun)	Barangay (7-10 purok)	Moo Ban (50+ hh)	Bàn/Lang (30-60 hh)
Commune (local government unit)	Khum (10-20 phum)			Tambon (8-15 moo ban)	Xa (8-15 bàn)
Sub-district		Kecamatan (10-15 desa)			
District	Srok (8+ khum)	Kapupaten or Kota (10+ kecamatan)	Munisipyo (10+ barangay)	Amphoe (8-10 tambon)	Huyện (12-18 xa)
Provincial	Khaet (5+ srok)	Propinsi (5-40 kabupaten)	Probinsiya (10+ munisipyo)	Chang Wat (8-20 amphoe)	Tỉnh (8-16 Huyện)
National Government	Kingdom of Cambodia (23 provinces)	Pemerintah Pusat Indonesia (32 provinces)	Republic of the Philippines (79 provinces)	Royal Thai Government (76 provinces)	Socialist Republic of Viet Nam (62 provinces)
Population	10 million	207 million	81 million	66 million	78 million



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