Valuing the Role of Aquatic Resources in Livelihoods:

Economic Aspects of Community Wetland Management in Stoeng Treng Ramsar Site, Cambodia

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EXECUTIVE SUMMARY

Wetlands are vital to the livelihoods of hundred of millions of people residing in the Lower Mekong region, and particularly to the food security of many of the rural poor. There are many stakeholders with interest in the management of these precious resources — including government agencies across different sectors and at different levels, private businesses, international and local non-governmental organisations, and local communities.

In Cambodia, however, there exist a number of barriers to effective wetland management. These barriers include: lack of co-ordination between different sectoral approaches; weak policy frameworks and unsupportive economic environments; inadequate information on which to base wetland planning and management decisions and policies; inadequate human and technical resources; and lack of options for resource use by local communities.

Economic assessments can help us manage wetland resources by improving our understanding of what drives resource-use decisions — and why, and to what extent, wetlands are valuable to local communities.

This document reports on a study which illustrated how economic assessments can improve wetland management. The aim of the study was to provide guidance on the use of environmental economic assessment methodologies to support wetlands management for poverty alleviation outcomes in Stoeng Treng Ramsar site. Village-level economic valuation techniques were employed to conduct livelihoods assessments in Veun Sean (one village within the Ramsar site) in order to draw more general conclusions about wetland resource use and management. The study extended beyond quantitative assessment to explore the context in which resource-use decisions are made — and the linkages between poverty and the importance of wetland resources.

The study found that wetlands resources are essential to the livelihoods of the villages from Veun Sean. Worth an average of $3,000 per household per year (or approximately $750 per capita per annum with the assumption of 4 persons in each household surveyed. Out of this total value, approximately 13% of which is accounted for by fisheries resources,and rest by other products and services that are mostly self consumed by the households but they very critical in terms of maintaining livelihoods of the rural community surveyed.

The absolute value of wetland resource use is high in a country with an estimated GDP of about US$300 per capita (or equivalent of about US$1200 per household per year). But, this difference on income of the wetland depended household is reasonable because of the facts that several non-traded goods and services derived from the wetlands are included in the value estimations derived in this study, but the standard GDP per capita measure includes only few of the wetland values that are traded in the national economy (mostly part of fish value that are traded in the national economy)

Quantitative estimates also reveal that in Veun Sean village, the fisheries resource is more valuable to poorer households than wealthier households — partly because larger household sizes of poor households mean that they consume more fish per household, and partly because a greater proportion of a poorer household's fish catch is sold for income.

Fisheries, wildlife and aquatic resources are critical both in terms of nutritive value and household income — particularly in the context of interrelated pressures of poor health, drought and rice shortages, In terms of meeting day-to-day needs, as well as coping with periods of external stresses and shocks, the conservation and maintenance of wetland resources is vital to all households of Veun Sean. However, it is equally critical to consider access to these fisheries and other wetland resources. The poorest households have limited access to land, labour, transport to markets, health care, or alternative sources to income. They are particularly dependent on fisheries resources on an "as-needs" basis to generate income to purchase rice.

The document concludes that there is great potential (and an emerging capacity) to use economic valuation for conservation and development policy, planning and management in Cambodia. However, it is critical that such studies are developed and conducted in collaboration with decision-makers and local communities — to ensure they reflect real-world management issues.

In Stoeng Treng a number of strategies and plans to conserve and protect wetland resources are underway. These include projects under the Lower Mekong Wetlands Biodiversity Programme, Communities Fisheries Management initiatives being implemented by national NGOs, Commune Council development planning and Ramsar Site planning. These processes must consider the biological and ecological importance of wetlands. However, it is also essential that this information be considered in the light of local community dependencies on and access to resources. In this context, participatory research methods for economic assessment should continue to be used as a key tool to inform in the planning process — to gain an understanding in the importance of wetlands resource to local communities.

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Thanks are due to many persons and agencies who supported this work. In particular the MWBP staff, government agencies and NGOs who actively supported this study in the field should be recognized, as should the villagers who participated in the study. Special acknowledgement is given to Mr Prom Nga and Mr Mao Kosal for their excellent logistical, technical and social support during the course of the study.

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LIST OF ACRONYMS

ASEAN	Association of Southeast Asian Nations
CAR	Council for Administrative Reform
CC	Commune Council
CDP	Commune Development Plan
CDRI	Cambodia Development Resource Institute
CEPA	Culture and Environment Preservation Association
CFDO	Community Fisheries Development Office
CFM	Community Fisheries Management
CIP	Commune Investment Plan
DFAT	Department of Foreign Affairs and Trade
DIW	District Integration Workshop
DSA	Daily Subsistence Allowance
EEPSEA	Environment and Economics Programme for Southeast Asia
EIA	Environmental Impact Assessment
GEF	Global Environment Facility
IMF	International Monetary Fund
I-PRSP	Interim Poverty Reduction Strategy Paper
ICEM	International Centre for Environmental Management
IUCN	The World Conservation Union
MAFF	Ministry of Agriculture, Forestry and Fisheries
MRC	Mekong River Commission
MWBP	Mekong Wetlands Biodiversity Programme
NCSC	National Committee for the Support to the Communes
NGO	Non-Governmental Organisation
NRM	Natural Resource Management
NTFP	Non-Timber Forest Product
ODA	Overseas Development Assistance
PA	Protected Areas
PFD	Partners for Development
PFO	Provincial Fisheries Officer
PRA	Participatory Rural Assessment
RGC	Royal Government of Cambodia
SEDP	Socio-Economic Development Plan
TBA	Traditional Birth Assistant
UNDP	United Nations Development Programme
UNICEF	United Nations Childrens Fund
UNTAC	United Nations Transitional Authority in Cambodia
WANI	IUCN Water and Nature Initiative
WTO	World Trade Organisation
WWF	World Wide Fund for Nature
YWAM	Youth With a Mission

At the time of the study US$1 = 4,300 Cambodia Riel

BACKGROUND

The project "Integrating Wetland Economic Values into River Basin Management" has the overall goal of more equitable, efficient and sustainable wetland and river basin management resulting from the practical application of environmental economics techniques and measures. To help to achieve this goal, its immediate objectives are:

- To increase awareness and capacity among planners, policy-makers and managers to identify and use economic measures for wetland conservation.
- To generate and disseminate practical and policy-relevant tools and examples of the use of economic measures for wetland conservation.
- To assess environmental economic aspects of wetland and river basin management at key sites, including the identification of wetland values, economic causes of wetland loss, incentives and financing mechanisms for wetland conservation.
- To work with local communities, government and non-government agencies and the private sector to integrate wetland economic values into development and conservation decision-making and to pilot concrete economic measures for wetland management.

National, regional and global case studies, policy briefs and technical working papers are being carried out as part of this project. These deal with the practical application of environmental economics techniques and measures to ecosystem and river basin management in different regions of the world, including Africa, Asia and Latin America.

This document reports on a study carried out between August 2004 and January 2005 as part of the Lower Mekong regional component of project. The activities conducted under the project concurrently contribute towards the economics component of the Mekong River Basin Wetland Biodiversity Conservation and Sustainable Use Programme (MWBP), a UNDP/GEF funded project which IUCN is implementing in conjunction with the Mekong River Commission.

The aims of this study were to provide guidance for the use of environmental economic assessment methodologies to support wetlands management for poverty alleviation outcomes in Stoeng Treng Ramsar site, Cambodia. This Ramsar Site represents a demonstration for both the MWBP (which is working with national and local stakeholders to develop wetland planning and management mechanisms), as well as for the project "Integrating Wetland Economic Values into River Basin Management".

Thanks are due to many persons and agencies who supported this work. In particular the MWBP staff, government agencies and NGOs who actively supported this study in the field should be recognized, as should the villagers who participated in the study. Special acknowledgement is given to Mr Prom Nga and Mr Sum Sochea for their excellent logistical and technical support to the study, and to the residents of Stoeng Treng (and especially Veun Sean Village) who so willingly shared information and hospitality during the course of fieldwork.

INTRODUCTION: Using economic assessment for wetland management

The study

This study employed village-level economic valuation techniques to conduct livelihoods assessment in Veun Sean, a case study village. In consultation with stakeholders, the constraints and opportunities for economic valuation in key planning processes were identified. Reflecting the particular importance of fisheries resources to livelihoods, Community Fisheries Management was identified as a key wetland management process. However, this study was not restricted to the fisheries resource — fisheries form an integrated component both of wetland resources, and of village and household livelihoods. The study therefore considered the spectrum of processes which affect wetlands (including fisheries) use and management.

Box 1: The role of economic assessment in the management of wetland resources

Over the past few decades, there has been a growing recognition that economic assessment tools can be applied to analyse the impacts of decisions which directly or indirectly affect wetland resources — and consequently, poverty alleviation. To assess these impacts, we need to understand the values associated with wetland resources: who values them, why they are valuable, and to what extent these values will be affected by management decisions.

A key component of the economic assessment toolkit are methodologies to value wetland resources, particularly those which are not associated with goods traded in the markets. Economic valuation can demonstrate to key decision-makers — such as Commune Councils — the importance of considering natural resource management as an objective, and to illustrate the linkages between effective wetland management and achieving other social or economic goals.

However, it is essential to note that the economic assessment framework provides more than just a method for calculating the total value of a resource. The framework is particularly useful as a tool for understanding the trade-offs of wetland management decisions, and describing underlying drivers of wetland dependency or loss. In assessing local-level values of wetland resource, quantitative assessment is seldom useful without addressing the following questions:

How do people's livelihoods depend on wetland values? What are the underlying drivers threatening these values? and, in particular, *What processes and institutions can we target and how can we influence wetlands management by answering these questions?*

Management Issues in Stoeng Treng Ramsar Site

In the Stoeng Treng Ramsar site, Cambodia, there are a number of constraints which, although not necessarily unique to the area, could in combination restrict the extent to which economic assessments can influence wetland management. In particular, power relations determine the way in which resources are used and managed. The Cambodian system is characterised by unofficial fee collection, a lack of trust in government agencies, and social displacement amongst its people. There is some evidence that planning processes are hampered by a lack of co-operation between government agencies, NGOs and communities. Furthermore, there is a lack of scientific information and human capacity to apply to the management of natural resources.

These legal, physical, institutional and social barriers might limit the short-term influence of economic valuation information. However, there exist urgent opportunities for environment economic assessments to contribute to the dialogue between stakeholders — and to have real, if longer-term, influence on wetland and fisheries management.

Purpose of the Study

Goal

The overall goal of this study is to provide guidance for the use of environmental economic assessment methodologies to support wetlands management for poverty alleviation outcomes in Stoeng Treng Ramsar site, Cambodia. The specific objectives are as follow:

Specific Objectives

1. To investigate village-level values of wetland resources, linkages between wetlands and poverty, key pressures on livelihoods, and the underlying social, economic and policy drivers of wetland loss in one village in the Stoeng Treng Ramsar Site.
2. To consult with local communities, government and non-government agencies from different sectors to identify key planning processes which affect, or have the potential to affect, fisheries and wetlands management in Stoeng Treng.
3. To increase capacity amongst agencies which influence wetlands management in applying village-level environmental economic assessment techniques.

Research methods

The study adopts applied "participatory" methods, as well as a structured household survey technique. The "participatory" methods formed the core of the research, where the issues where described and investigated, and key wetland values identified and ranked. The household survey was applied to cross-check the numerical information gained from group activities. These techniques are described in more detail in later sections of this report.

The preferred approach of many economists to collecting primary quantitative information is the structured questionnaire-based survey, moreover, there are several limitations and pitfalls associated with the structured questionnaire based household survey in the case of subsistence economy, as proposed for this study. For example, Lipton (1992) describes this convention of structured questionnaire based survey as an "historical accident". Likewise, IIED (1997) also summarizes a more recent trend on survey methods where economic assessments also pay attention to how economic information is elicited.

There are many potential disadvantages with applying conventional economic survey techniques, including:

- The concerns, concepts, questions and categories often reflect those of the researchers, rather than the reality of the "respondents".
- The process by which the questionnaire is administered also introduces inaccuracies, whether due to intimidation by interviewers, suspicion on the part of respondents on how their answers will be used, or translation misunderstandings.
- To investigate complex issues, surveys are often lengthy and complicated, causing interviewees to become fatigues and disinterested.

In many situations, the methods commonly described as "participatory" approaches (which vary in the extent to which they are truly participatory) have the potential to overcome some of the constraints posed by the questionnaire. In this study, there were a number of advantages to using more participatory information-gathering and learning techniques. These included the identification of resource uses by different people across different periods of time, and the beginning of a co-operative relationship between the Mekong Wetlands Biodiversity Programme and at least one village in the Ramsar site.

NATIONAL CONTEXT: Wetlands, the economy and development planning in Cambodia

Geographic setting

The Kingdom of Cambodia is located in the Indochina peninsula and has a total area of 18 035 square kilometres. It is bounded by Vietnam in the east and southeast, Laos in the north and Thailand in the west and northwest. It has a coastline stretching along the Gulf of Thailand for 435 km supporting an exclusive economic zone of 500 000 square kilometres. The country is generally flat with highlands and mountains along its borders. (Sour and Viseth 2003, ICEM 2004).

The Cambodian section of the Mekong River is 500km long and flows into four main branches: the Tonle Sap Great Lake, the Tonle Sap River, the Lower Mekong and the Bassac — meeting at the Chaktomuk area (Sour and Viseth 2003). 80 per cent of the annual rainfall occurs during the monsoon season from May to October. During the wet season, the lowlands become an extensive floodplain, and the rise in river water level causes the Mekong to push water back up the Tonle Sap River into the Great Lake. The surface area of the Great Lake expands four to seven times and reaches 900 000 to 1400 000 hectares. When the Mekong River water levels recede, the flow direction in the Tonle Sap system reverses and water flows out from the Great Lake.

Map 1: Location of Stoeng Treng in bodia

Source: UNDP (2004)

Inland wetlands and fisheries resources

Wetlands in Cambodia are essential to the livelihoods of millions of Cambodians and the food security of the most vulnerable members of society. Wetlands include mangrove forests of the coast, inland marshes and swamps, rivers, lakes and seasonally flooded forest and agricultural land (Torrell *et al* 2004).

Box 2: Freshwater wetland biodiversity, Cambodia

Freshwater wetlands in Cambodia represent one of the most diverse ecosystems in the Mekong River Basin. The degree of endemism in the Cambodian section of the Mekong River is high.

Nearly 500 of the 1200 fish species found in the Mekong River are in Cambodia. Endangered species include the Giant Catfish (*Pangasianodon gigas*) and Try Trasak (*Probarbus jullieni*). Of the 435 bird species in Cambodia, 105 are waterbirds, and the wetlands of the Lower Mekong Basin support 15 globally threatened species including the critically endangered Giant Ibis (*Pseudibis gigantean*). Other endangered species include the Irrawaddy Dolphin (*Orcaella brevirostris*) and the Siamese Crocodile (*Crocodilius siamensis*). Of the 20 species of turtles which exist in Cambodia, 10 are listed in the Red Data Book, including the critically endangered Chinese Three Striped Box Turtle (*Cuora trifasciata*).

Source: Mao (2004)

Inland fisheries resources are particularly important to the national economy and the food security and livelihoods of the Cambodian people. Over 75 per cent of protein in the Cambodian diet is obtained from fish — fresh fish, processed fish and fish sauce (Nao and Ly 1997).

Fisheries statistics are not very reliable because fish catch is often under-reported to avoid fee payment. However, according to MAFF (2000), in 1999 the total commercial fish production was 284 100 tonnes (including marine, aquaculture, freshwater and small-scale), 81 per cent of which was obtained from inland waterbodies. Subsistence fishing is also important, with estimates of total inland fishing (commercial and subsistence) varying from 300 000 to 400 000 tonnes per year (ICEM 2003a).

Inland capture fisheries in Cambodia are based on two systems: the Mekong River (which includes the Stoeng Treng Ramsar Site) and the Tonle Sap Great Lake. These systems are connected both hydrologically and ecologically. The whole of the Mekong mainstream from the Mekong Delta to the Khone Falls — including the Great Lake and the Stoeng Treng area — comprises a key migration route for many fish species. Furthermore, the annual floods that inundate large areas of the southern Cambodia (including the Tonle Sap system) and the Mekong Delta, and the annual reversal of the Tonle Sap River, are essential for fisheries productivity (Poulsen *et al*, 2002).

The Mekong system around the Stoeng Treng area is vital to supporting the fisheries resource. Two key elements are the spawning habitats in the rapids and deep pools in the Kratie to Khone Falls section, and the dry season refuge habitats in the deep pools in the Kratie to Stoeng Treng section .

There are a number of pressures, both internal and external to Cambodia, which threaten freshwater wetland and fisheries resources. Threats to freshwater wetlands include (Mao 2004):

- Loss of ecosystem integrity due to hydrological changes, agricultural runoff, pollution load, logging and sedimentation
- Reduction of species abundance and diversity due to exploitation of wildlife, destructive fish species, alien species and illegal shipments of timber and biomaterial

Threats and problems with fisheries management include (Kim and Hav 2004):

- Overfishing

- Lack of human resources
- Insufficient scientific data
- Lack of monitoring capabilities
- Poor law enforcement
- Inefficient administration
- Increasing conflicts between different types of users

Many threats to the fisheries resource also affect the extent to which the resource is effectively managed. Population pressures and poverty may lead to the overexploitation of resources — but also underlie the drive towards economic growth which may, in some situations, fail to consider the importance of the natural resources. The judicial system is weak, with government officials commonly receiving impunity, and there exists varying\ degrees of lawlessness amongst some communities. Amongst government agencies, there is overlap in some responsibilities and gaps in others, a lack of clear specification of the roles and relationships between and within ministries and departments, and a lack of resources and capacity. NGOs and donors have also been widely criticised for the lack of an integrated approach towards wetlands management.

People and economy

Many of Cambodia's 13.8 million population can be described as young, rural and poor.

Cambodia is one of the world's least developed countries, with an estimated GDP of only US$290 per capita for 2002 (NIS 2003). However, the economy has performed relatively well since 1999, with growth rates averaging approximately six per cent. Cambodia has a relatively open trading regime, and will reduce tariffs further in line with its ASEAN obligations. Cambodia is also currently negotiating to accede to the World Trade Organisation (DFAT 2003). Despite these achievements, poverty has not declined significantly and ICEM (2004) note that there is a high risk of increasing under-employment, particularly in rural areas.

Cambodia is largely a subsistence agriculture-based economy, with agriculture and related sub-sectors accounting for nearly half of GDP. International trade and investment comprise a very small portion of economic activity. Foreign Direct Investment is concentrated in the garment manufacturing, services, construction, tourism and, to a lesser extent, wood processing sectors. DFAT (2003) suggests that judicial reform and strengthening of corporate governance would help to increase these flows of foreign investment.

The tragic loss of one to two million people during the Khmer Rouge regime distorted the demographic distribution, and today sixty percent of the total population are women. Over one-third of the population lives in poverty, and the rate is higher amongst the 84 per cent of the population which live in rural areas. As a result of landlessness, rural to rural migration to areas which are richer in natural resources is common (ICEM 2004, UNDP 2004).

Human development indicators continue to illustrate the various dimensions of poverty in Cambodia. Under-five mortality rates have increased over the last decade, and there is a high maternal mortality ratio of 437 per 100 000 live births. Access to sanitation remains poor, particularly for rural people — for example, in 1998, over 70 per cent of the population did not have reliable access to safe drinking water. More than fifty per cent of urban and more than 90 per cent of rural people do not have access to sanitation facilities. (Ministry of Planning 2003).

Around 94 per cent of the population are ethnic Khmers. There are two main minority groups in Cambodia, the ethnic Chinese (about four per cent) and the ethnic Vietnamese (about one per cent). The Chinese are primarily engaged in commerce, while the Vietnamese are mainly farmers, fishermen and semi-skilled workers. There is also a significant Muslim Cham community spread across several provinces, and a number of indigenous hill tribes in the remote north-east of Cambodia (DFAT 2003).

Government and legal systems

In 1993, following three years of rule under UNTAC (United Nations Transitional Authority in Cambodia), the Kingdom of Cambodia adopted a Constitution which specifies that the King reigns, but does not govern. The Royal Government (executive branch) is defined as the Council of Ministers, led by the Prime Minister. There are 24 line ministries under the Council, with politically-appointed leaders. The National Assembly, consisting of at least 120 members, holds the primary legislative power, including the authority to approve all laws. Most legislation is instituted by line agencies. (ICEM 2004).

The territory of Cambodia is divided into 20 provinces and 4 municipalities, with provinces divided into 183 districts then 1621 communes. The Ministry of Interior administers provinces and municipalities, and provincial and municipal governors are appointed by the prime minister. Since February 2002, Commune Councils have been elected by the citizens of the commune.

The legal system in Cambodia exists within the overall governance structure created under the Constitution. The system of government is intended to have clear separation of powers between the legislative, executive and judicial branches. However, due to weaknesses and lack of capacity within both the legislative and judicial branches, the executive branch influences decisions made by the other two branches of government. (Oberdorf 2003).

Box 3: Overview of hierarchy of laws in Cambodia

The laws and regulations of Cambodia are hierarchical:

Constitution ➔ Laws (Chbab) ➔ Royal Decree (Reach-Kret) ➔Sub-Decree (Anu-Kret) ➔ Prakas ➔ Circulars (Sarachor) ➔ Deika

In general, the higher the level of legal instrument, the greater the length of time for actual enactment (due to various layers of review) and the greater the geographic and governmental scope. Laws have broad scope and apply to all government entities and geographic locations unless specifically limited within the text. Prakas are only binding within the Ministry in which they are promulgated, and Deika only apply to the geographical area of the province or commune in which they are enacted.

Source: Oberdorf (2003)

Development planning

There are two main planning processes in Cambodia which intend to provide over-arching guidance for economic development and poverty reduction. The Interim Poverty Reduction Strategy Paper (I-PRSP) is mandated by the IMF-World Bank, and the Five-Year Socio-Economic Development Plan II 2001-2004 (SEDP II) was developed in conjunction with the Asian Development Bank.

The Interim Poverty Reduction Strategy Paper (I-PRSP) outlines The Royal Government of Cambodia's poverty-responses measures which aim to “accelerate economic growth, improve the distribution of income and wealth and promote social development” (RGC 2000). The objectives of the I-PRSP are commonly known collectively as the “triangle strategy”:

- Long-term, sustainable economic growth at an annual rate of 6 to 7 percent
- Equitable distribution of the fruits of economic growth between the have and the have-not, between urban and rural areas and between the two opposite sexes
- Sustainable management and utilization of the environment and natural resources

Criticisms of the I-PRSP include (Guttal and Chavez 2001; IMF/IDA 2000):

- The I-PRSP is a requirement of the World Bank — IMF which is viewed as pre-condition to gain future donor support, is not constitutionally valid.

- There is a lack of harmonisation between how the objectives of economic growth and sustainable management of natural resources will be met.
- There is likely to be a lack of administrative capacity to implement the proposed measures.
- The external assistance required to implement the proposed measures may not be forthcoming.

The SEDP is a constitutional requirement in the Cambodian policy system. The four objectives of the SEDP II are the promotion of broad-based sustainable economic growth, promotion of social and cultural development; sustainable management and use of natural resources and the environment; and governance.

Like the I-PRSP, the SEDP has been similarly criticised for its lack of clarity, lack of harmonisation between sectoral strategies, and poor sequencing of reform (Guttal and Chavez 2001). In terms of wetlands managed, concerns have been expressed that the focus on growth-oriented development may under-emphasise the long-term importance of natural resources (such as forests and fisheries) for livelihoods (Thuon and Vannara, 2003).

Donor financing

> *"After a decade of pumping $500-600 million of foreign aid per year into Cambodia, little has been achieved in terms of poverty, public health, corruption, accountability, governance and jobs…"*
>
> *"We believe part of the problem is the ineffective way we donors are providing assistance. Because of our complicated procedures, the lack of co-ordination, gaps in important areas and duplications in others, and high volumes of aid coming in the form of technical assistance, it's not being well used. We need to harmonize what we do collectively and align our missions with the country's priorities."*
>
> Nisha Agrawal, World Bank country manager,
> quoted in *Phnom Penh Post,* 19 Nov – 2 Dec 2004.

Overseas development assistance (ODA) has long been the most important source of capital inflow in Cambodia. Donors are currently funding an estimated 90 per cent of all the public investment in Cambodia (around 40% of revenue) (DFAT 2003). From 1992 to 1998, the five main sector recipients of ODA were rural development (14 per cent), development administration (12 per cent), transport/infrastructure (12 per cent), economic management (11 per cent) and humanitarian relief (11 per cent). Agriculture, forestry and fisheries received seven per cent, and Protected Area management just a fraction of a percent. (ICEM 2003a).

Other sources of revenue include tax revenues, customs revenues, and non-tax revenues. However, Cambodia's tax structure remains weak, as does the enforcement of tax collection — payroll tax and taxes on unused land are virtually zero. Customs taxes are a potentially significant source of revenue, but collection is weak — customs administration fails to enforce anti-smuggling measures (ADB 2000).

Major obstacles to economic development and good environmental management have been recognised to include: the weak revenue base of the state, an overstaffed and underpaid public service, problems linked to demobilisation and reintegration of former soldiers, and limited technical capability. As a consequence of the weak state revenue base, natural resources are being targeted for revenue-raising. For example, following UNTAC, natural resource revenues have widely been used to finance political party war chess rather than the government budget. (Azimi 2001).

STOENG TRENG RAMSAR SITE: The current state of management planning

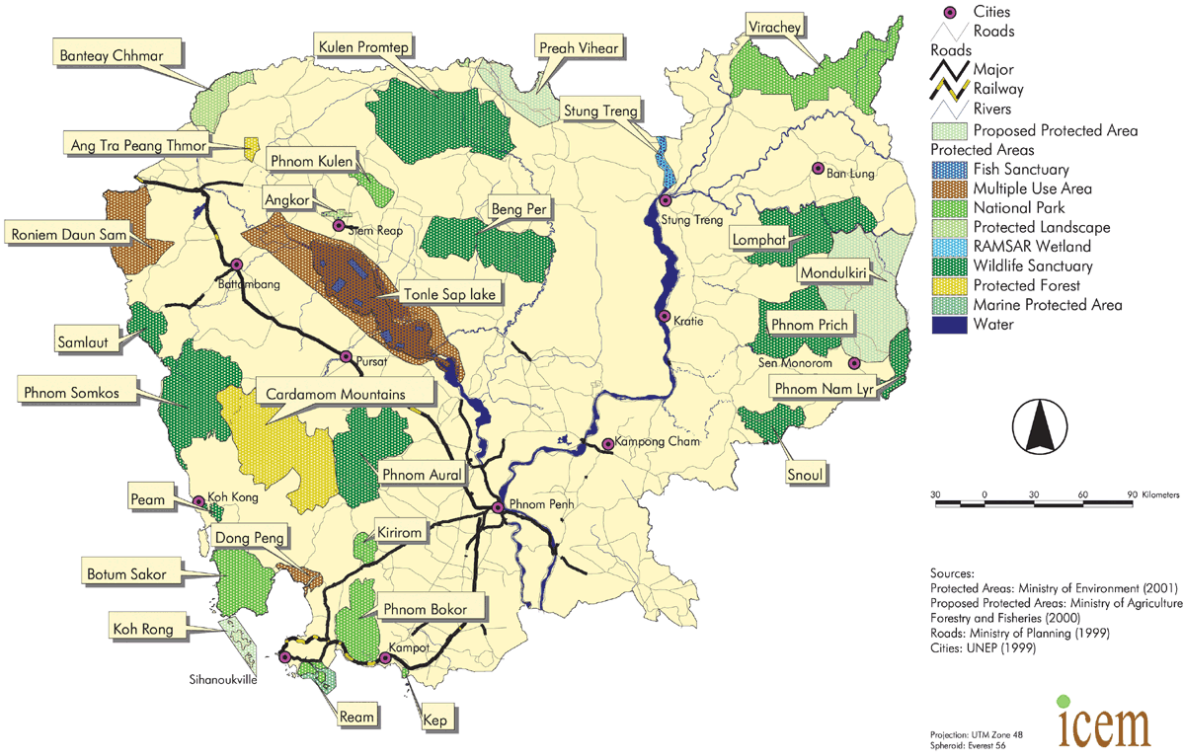
This chapter describes two main planning process which influence, or have the potential to influence, wetlands management in Stoeng Treng: Community Fisheries Management and Commune Council planning.

Background to Stoeng Treng Ramsar Site

The Stoeng Treng Ramsar site is one of three Ramsar sites in Cambodia designated by the RGC on 23 October 1999. Stoeng Treng Province is located on the Laos border, 481 kilometres from Phnom Penh. The Ramsar site is the area is 37 kilometres in length, extending from about 5km north of Stoeng Treng town to the Laos border, 500m along both sides of the bank of the Mekong River. The site boundary has not yet been clearly demarcated. (Prom 2004).

The Ramsar site of 14 600 hectares overlaps two districts, Thalaborivat and Stoeng Treng. Within the site lies 4 communes and 21 villages, with a total population of approximately 12 000 people. Although the population density of the province is low (about seven people per square kilometre), the population density inside the Ramsar site is considerably higher —(over 80 people per square kilometre). (Prom 2004).

Map 2: Location of Protected Areas, including Stoeng Treng Ramsar Site



The Ramsar site contains important habitats for many species of fish which migrate throughout the Lower Mekong system. A survey of fishermen identified 25 deep pools — vital dry-season habitats — in the Ramsar site (Sok 2004). Many species are believed to spawn within the Mekong mainstream of the Ramsar site at the beginning of the flood season in May/June. Eggs and larvae subsequently drift downstream with the current to reach the floodplain feeding habitats in southern Cambodia and Viet Nam. Typical fish species which undertake this migration belong to the genus *Henicorhunchus*, which, in terms of fisheries output, is regarded to be amongst the most important in the Lower Mekong. Many larger and valuable fish, including the giant catfish, also rely on the Stoeng Treng habitats on their migration route (Poulsen *et al* 2002). In a survey of fishermen in 2003, 21 of the 167 species occurring in the Ramsar site were identified as important in terms of market price (Sok 2004).

Sok (2004) identified the following threats to biodiversity in the Ramsar site:

- Hunting of wildbirds and crocodiles for wildlife trade, particularly to markets in Laos.
- Logging and clearing of forests for chamkar cultivation
- Shifting cultivation
- Forest fires

About 95 per cent of the provincial population are farmers and fishers (Thuon and Vannara 2003). The main activities are rice-growing, livestock-raising, vegetable and fruit cultivation, fishing and hunting (Thuon and Vannara 2003 and ICLARM 2004). Fishing, which mainly occurs in the dry season, is for consumption as well as sale. The area is also characterised by seasonal movement of fishers from both within and external to the province.

Table 1: Seasonal patterns of flow and fishing in Stoeng Treng Ramsar site

Nov Dec	Jan Feb Mar Apr May	Jun Jul	Aug Sep Oct
Sudden fall	***Water subsides gradually***	***Monsoon***	***Highest level***
Mekong falls below tributaries and flooded area drains. Fish migrate out of tributaries	During this period, the floodplain continues to drain. The lowest level of the Mekong occurs in April (about 2.3m)	The Mekong rises gradually and becomes muddy.	Water rises and spills onto floodplain. Fish enter flooded forests. The highest level of the Mekong occurs in September (12m)

DRY SEASON Reported fish catch 1.5 to 10 kg /household /day	WET SEASON Fish catch 0.5 to 5 kg/day

FISHERIES LAW: OPEN FISHING SEASON	FISHERIES LAW: SEASON CLOSED

Source: Thuon and Vannara (2004).

Community Fisheries Management

In Cambodia, partly in response to declining natural resources, various forms of community-based natural resource management have been established. By 2002, there were 162 community fisheries sites and 237 community forestry sites in Cambodia (McKenney and Prom 2002).

Community-based management approaches in Cambodia tend to have similar characteristics (Marshke 2003):

- Governments or NGOs provide support to communities to establish physically demarcated management areas and plans
- Rules and regulations are established which apply to members of the community management association

- Resource management committees are elected to guide community-based management initiatives
- Community-based natural resource management requires approval from some government level (for example, a provincial governor or national line agency)

Table 2: Community Fisheries Management: summary of key actors

Villagers	Depend on the fisheries resource for food and income. Fisheries provide food security when the staple crop, rice, is threatened. Some are reported to be involved with illegal fishing, or have been forced to sell to commercial fish-buyers at reduced prices.
Community Fisheries Committee	Receives training from Culture and Environment Preservation Association (CEPA) and is charged with communicating to and encouraging the villagers to maintain the fisheries resource. First in reporting line when a villager sites illegal fishing.
Culture and Environment Preservation Association (CEPA)	Cambodia-based NGO which supports Community Fisheries Management in villages which lie within the Ramsar site.
Provincial Fisheries Office (PFO)	Has the legal authority to detail fishermen accused of conducting illegal activities. Reported to be under-resourced. Some provincial fisheries officers reported to conduct unregulated fee extraction from fishers near Stoeng Treng, throughout the year.
Department of Environment (DOE)	Pending enabling legislation, the DOE(and not the PFO) has responsibility over the management of resources, including community fisheries, within the Ramsar site. In practice, the PFO has greater influence than the DOE.
Ramsar rangers	Within a Ramsar site, DOE Ramsar rangers have the authority to detain individuals accused of conducting illegal activities, including illegal fishing. In practice, the Ramsar rangers lack training and equipment, and their pay is often delayed.
Provincial governor	As the fisheries law and sub-decree are not yet passed, the support of a provincial governor can influence the extent to which community fisheries are supported by line agencies.
Commune Council	Can report to the police if illegal fishing is sited. Also involved with planning and prioritisation of village-level projects, and the negotiation with line departments and NGOs to support these projects.

Marshke (2003) also noted that "a policy environment, albeit disjointed, is being developed to support some forms of community involvement in resource management." The term "Community Fisheries Management" was officially introduced into fisheries policy dialogue in October 2000, when fisheries policy reforms commenced under Prime Minister Hun Sen (see Annex A for more information). One of the main stated objectives of government fisheries reform is to improve food security and reduce poverty of locally-dependent fishers (Oxfam 2002). The main elements of the reforms included:

- Release of 56% of fishing lots to "community fisheries"
- Elimination of tax on middle-scale fisheries
- Drafting of Community Fisheries Sub-Decree, which is intended to provide a framework within community fisheries can be established

Unlike the Great Lake fishing region, private fishing lots have never been officially established in Stoeng Treng province (although illegal licensing has occurred), reflecting the recognised importance of the region as a spawning ground for many fish species. Nevertheless, many of the broader issues and policy impacts which affect community fisheries throughout Cambodia are also relevant to areas in Stoeng Treng, including a lack of knowledge or clear specification of roles and responsibilities of government officials at various levels, and a lack of political or legal recognition of community fisheries.

Box 4 A brief history of fisheries: Stoeng Treng Province

Until the 1970s, fish were abundant in the province. Small-scale fishing gear was used by villagers who fished on a day-to-day subsistence basis (Oxfam CAA 2000).

During 1970s - 1980s Cambodia experienced frequent and drastic changes in its political and economic regimes (Khmer Republic, Khmer Rouge and Vietnamese communist rule), with severe impacts on people, society, economic infrastructure, social and cultural links and livelihoods. For example, the lack of social coherence in some villages and broader lack of human capital, social capital and trust can be linked to the mass genocide and displacement of people which occurred during the Khmer Rouge regime. During this period, the importance of power relationships in determining people's lives — and the management of natural resources — is evident in the emergence in the 1980s,after the Khmer Rouge, of widespread and destructive illegal fishing, often backed by powerful military and police.

During the 1980s - 1990s there were continued widespread reports of illegal fishing practices (explosives, electrocutions and poisons) and increasing population pressures. Middle-men, who conveyed fish from villagers to markets, loaned illegal fishing gear to villages, and purchased fish from village fishermen at low prices. Streams were blocked for large-scale fishing and commercial oligopoly/monopsony fish buying companies emerged — backed by provincial fisheries officers.

From the late 1990s, CEPA and Oxfam Community Aid Abroad have worked with villages in Stoeng Treng to establish community fisheries which aim to reduce illegal fishing and to increase local awareness of legal resource rights, responsibilities and resource management techniques.

Community fisheries: legal or political recognition?

The Community Fisheries sub-decree is the key legislation which would could potentially support community-based fisheries management through defining the role, responsibilities and relationships between villagers, NGOs and government agencies involved with the management of the resource.

However, the Community Fisheries sub-decree has been widely criticised on several grounds:

- The sub-decree is not enabling because it exists under a version of the Fisheries Law which is still draft. Cambodia has recently experienced political instability which has limited the effectiveness of the legislative system, and there may be delays before the Fisheries Law is enacted.
- The sub-decree does not empower villagers, Commune Councils or district officials with rights of enforcement (for example to arrest or detail those conducting illegal fishing)
- The sub-decree restricts villagers to family-scale fishing gear and prohibits sales. It is believed that the gear-size restriction limits the ability of households to meet their subsistence needs.
- Early drafts of the sub-decree were exposed to an extensive consultation process with NGOs and communities. However, more recent versions of the draft have been criticised for failing to incorporate suggestions arising from earlier consultations

The Community Fisheries Development Office (CFDO) was established under the Department of Fisheries to provide technical support and advice to community fisheries. However, it is thought that the CFDO lacks expertise, knowledge or jurisdiction to effectively support the development of community-based fisheries management (Levinson 2002). For example, the CFDO does not yet have any officers in Stoeng Treng. Despite over 300 community fisheries being established in Cambodia, several interviewees noted that many are not "functioning well".

The concept of enabling communities to manage fisheries resources lacks recognition or support from various levels. In 2000, the Prime Minister Hun Sen proclaimed in general terms his support for community-based fisheries management. In some provinces, the governors have consequently expressed support for CFM — however greater reluctance has been noted of

governors in other provinces. As the Fisheries Law and Sub-decree are still draft, provincial governers are not legally required to take any actions to support CFM.

At the provincial level, it is reported that Provincial Fisheries Officers claim that they are unclear about their roles under the fisheries law (including as applies to enforcement of community fisheries areas). At the Commune Council and village levels, many councils and villages have increasing awareness of the limitations of existing community fishery structures in terms of devolving power and responsibility to a local level. However, it has been reported that attempts to establish and enforce community rules and regulations have been disrupted by fisheries officials or parties external to the community area (correctly) claiming that these rights of enforcement are not part of "official" law.

Box 5 Underlying drivers of illegal fishing in Stoeng Treng province

"Illegal" fishing methods are widely referred to as a major cause of fisheries stock declines in Stoeng Treng. In common language, "Illegal" primarily refers to destructive methods (electro-shock and explosives).

Although the Fisheries Law prohibits destructive methods, commercial-scale fishing gear and export to Laos, there have been reports that many illegal activities are backed or conducted by military and the police. The NGOForum website reports that, despite the absence of an official lot operator system, stretches of rivers have previously been blocked off and "licensed" to commercial operators by fisheries officials, (who have been reported to face the dual perverse incentives of extremely low government salaries and pressure from the national level to raise revenue from the fisheries resource). Anecdotal evidence also suggests that, in the past, illegal fishing activity increased during election campaigns, where "fees" to provincial officials were directed to fund national campaign activities.

Some local fishers are also restricted in their access to markets. Previously, many fisherman have been forced to sell their catch to "moys" who run fish purchasing companies that receive exclusive rights from the provincial fisheries office and, in effect, from the national MAFF (Thuon 2004). During the mid-1990s, three of these "moys" operated in Stoeng Treng to purchase fish from villages to export at higher prices to Laos. However, informal local reports suggest that, following conflict between the wholesale buyers, one of the moys recently established as a monopsony buyer in the region — thus gaining an even larger margin on sales to Laos and further depressing the price paid for fish to villagers.

Community Fisheries Management: CEPA support in Stoeng Treng

The Culture and Environment Preservation Association (CEPA) is a Cambodia-based NGO which supports Community Fisheries Management in villages which lie within the Ramsar site. In May 2000, CEPA established community fisheries in nine villages in Stoeng Treng as part of a two-year pilot project. In June 2002, eight more community fisheries were established, including the CF in Veun Sean village.

CEPA employs a six-step approach to establishing a community fishery:

1. Identify and research study area
2. Conduct a Participatory Natural Resource Assessment
3. Disseminate information to the village about the importance of the fisheries resource
4. Establish the Community Fisheries Committee (CFC)
5. Capacity building of the CFC
6. Evaluation

The initial stages allow CEPA to gain an understanding of the natural resources in the village, opportunities for management, the likely challenges with working in the village, and to encourage local interest and participation. Through meetings, pictures and videos, CEPA then disseminates information to all villagers about the importance of the fisheries resource, the threats posed by illegal fishing, and the objectives of a Community Fishery Association.

Ten candidates then nominate themselves for membership on a Community Fisheries Committee. Five committee members, including at least one woman, are selected by all villagers using a secret ballot. The committee then decide amongst themselves the positions of chief, vice chief, ranger, secretary and casher.

CEPA then assists the committee to developing the rules and regulations of the community fishery. The role of the committee is to communicate the rules and regulations to the entire village. The rules and regulations specify the membership, roles and responsibilities of the Community Fisheries Committee; the procedures of committee selection, and specifies allowable fishing activities (for example, gear sizes and fishing location).

Box 6 Veun Sean Community Fishery Rules and Regulations

Chapter 1 – General Regulations. Describes the objectives and principles of the community fishery, including sustainable use of resources to improve livelihoods, participation by the community, a whole-of-community approach, and that the Village Community Fishery Committee shall not have any political affiliation.

Chapter 2 – Duty and Management. Lists the committee members by name and position, the conditions of membership, the rights and responsibilities of the committee members and general Community Fishery (CF) members.

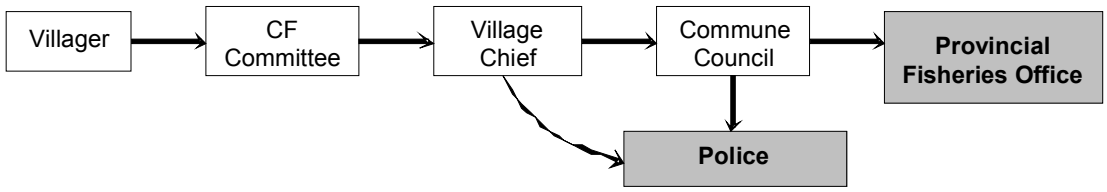
Chapter 3 – Other Conditions. Specifies the frequency of committee meetings and describes the conditions under which individual committee members or the entire committee can be removed from position.

Chapter 4 – Other Procedures. States that the committee has a role in conflict management, that the CF rules can be amended with approval from CF members and fisheries department, and describes the process of electing the CF committee.

Chapter 5 – Terms and Limitations. Describes the CF committee term as three years, describes the allowable and banned fishing gears, states that neighbouring committees must abide by the rules and regulations, and describes what kind of fishing activities are banned.

Source: Kingdom of Cambodia (2003), unofficial translation

CEPA also provides training to the Community Fishery Committee on methods to record and report illegal fishing. When a villager notices illegal fishing activities occurring, the recommended reporting line is as follows:



The Provincial Fisheries Office (PFO) and the police have the right to detain illegal fishers. CEPA notes that the effectiveness of this reporting line in reducing illegal fishing is hampered by a lack of radiocommunciations in some villages, the lack of PFO staff or resources, the distance from the PFO in Stoeng Treng to remote villages on the border, and poor co-operation between the PFO, Commune Council and police. In the future, CEPA hopes to seek funding to promote stronger links between Community Fisheries Committees (CFCs) and the Commune Council (which can report to the police), and between CFCs the PFO.

Commune Council Planning

The election of Commune/Sangkat Councils in February 2002 marked a key achievement in the process of decentralisation — the transfer of power and functions from central to local governments in Cambodia. With opportunities to obtain revenue, provide services and

contribute to the planning and management of resources for villages in the Commune, these newly-formed local governments are potentially key decision-makers with influence on the use and management of wetland resources. However, local-level governance in Cambodia faces a number of challenges.

Table 3: Community council planning : summary of key actors

Commune Councils	Elected in 2002, the Commune Councils are responsible for identifying and prioritising villages' needs, in order to design and implement development and investment plans for the Commune. In the future, Commune Councils may have greater responsibility in raising and investing their own revenue.
Villagers	The villages are represented by Commune Councils.
NGOs	At the District Integration Workshop, NGOs pledge preliminary support to projects identified by the Commune councils. There are a number of NGOs working within the Stoeng Treng Ramsar site on a variety of projects across different sectors.
Line agencies	One of the intended purposes of Commune Development Plans (CDP) is that line agencies can use them for their long-term planning. At the District Integration Workshop, line agencies can pledge preliminary support to projects identified by the Commune Councils.
Department of Planning	Charged with co-ordinating and providing technical training and support to Commune Councils in development planning.
Ministry of Interior	The key ministry responsible for the decentralisation process.
Ministry of Economics and Finance	Responsible for the allocation and delivery of national revenue to Commune Councils, through the Commune Fund.

Background to Decentralisation Processes in Cambodia

The current decentralisation process in Cambodia has evolved from the CARERE/SEILA initiatives, which commenced in 1992:

- The first phase (CARERE1) was backed by the United Nations Development Program (UNDP) from 1992 to 1996. CARERE 1 focused on disaster management and relief, the rapid implementation of infrastructure projects and schemes for the resettlement of refugees and internally displaced people.
- The second phase (CARERE2/Seila) took place from 1996 to 2001. The Seila programme, which was a collective undertaking by a national Seila Task Force comprising seven ministries, was developed in parallel with the UNDP-supported CARERE2 programme. This second phase focused on rural development and piloting decentralised planning and financing in five provinces.
- The aim of the current phase (Seila/PLG) is to contribute to poverty alleviation through local governance. The Partnership for Local Governance Project (PLG) is the donor support programme to Seila, established by a joint consortium comprising UNDP, DFID and SIDA. (Rusten *et al* 2004). This decentralisation process arises from two intentions of the Ministry of Interior — to extend and deepen democracy in Cambodia, and to ensure greater delivery of services to local people whilst promoting a culture of community initiative and participation in decision-making (CDRI 2003).

Although there is not yet a decentralisation policy document guiding the process, there are three main objectives of decentralisation:

- To promote pluralist participatory democracy at a local level
- To promote the culture and practice of participatory development
- To contribute to reduction of poverty in the country

In Cambodia, decentralisation is regarded to comprise two distinct, largely separate processes. "Decentralisation", usually called *political decentralisation* or *devolution*, refers to the transfer of power and functions from central to local government. The councillors are locally elected representatives of people who live in the area of territorial jurisdiction of the local government. The National Committee for the Support to the Communes (NCSC) is responsible for the decentralisation process. (CDRI 2003).

"Deconcentration", usually called *administrative decentralisation*, refers to the delegation of tasks and transfer of authority from central government agencies (such as national line agencies) to sub-national levels of government (such as provincial line agencies or Commune Councils). One example of an agency function which has been transferred to the Commune Councils is civil and election registration. This function is now\ performed by the Commune Clerk on behalf of the Ministry of Interior. The Council of Administrative Reform (CAR) is responsible for the deconcentration process (CDRI 2003).

The establishment of a legal framework through the *Law on Election of Commune/Sangkat Councils 2001* and *the Law on Administration and Management of Commune/Sangkat 2001* is recognised as one of the key achievements of the decentralisation process. However, Rusten (2004) notes that the *Election Law 2001* encourages upward accountability by councillors to their political party, rather than to the electorate.

There are many other challenges, including:

- The implementation of decentralisation and deconcentration as two separate rather than interlinked processes has led to a division of roles between separate interministerial committees — NCSC and CAR— and donors supporting one rather than both reforms (Rusten 2004).
- Many Commune Councillors lack the capacity to deal with the heavy workloads imposed on them (Rusten 2004, CDRI 2003). The Commune Chief of O'Svay commune, Stoeng Treng province, noted that the Commune Council requires training in the laws supporting decentralisation, because they are difficult to understand.
- A law on own-source revenue has not yet been passed, and there are limited opportunities for Commune Councils to obtain their own revenue (CDRI 2003).

Sources of Revenue for the Commune Council

There are three potential sources of revenue for the Commune Council. Firstly, according to the *Law on Administration and Management of the Commune*, the Commune has rights to receive grants from national revenue. The national government has created the Commune Fund, which includes both national transfers and donor funds earmarked for development and administration (Eng 2004). This Fund is held at the National Treasury, and is managed by the Commune Fund Board which is chaired by MEF. Two percent of national revenue has been allocated towards the Commune Fund. However, revenue shortfall often delays the release of grant assistance, constraining Commune Councils in project implementation (Kingdom of Cambodia 2004).

Box 7 O'Svay Commune, Stoeng Treng Ramsar site: sources of revenue and services provided.

O'Svay Commune Council does not obtain any revenue other than through the Commune Fund. The Commune Chief noted that these funds are earmarked for infrastructure-related projects only. In 2003, O'Svay Commune received 4.7million Riel, which they used to construct a road. In 2004 they expect to receive 16 million Riel, and will use the funds for repairing schools. Although the Commune Council identifies many priorities, the allocated funding is sufficient to meet only a few of these. A further problem is the lack of timely delivery of funds — by October 2004, O'Svay Commune Council had received only 40 per cent of the amount allocated for the whole of 2004.
Source: O'Svay Commune Chief (*pers. comm.*)

Secondly, Communes can collect fees from civil registration and other fees delegated from ministries. However, in practice only civil registration and election fees are collected, which create minimal revenue (Eng 2004).

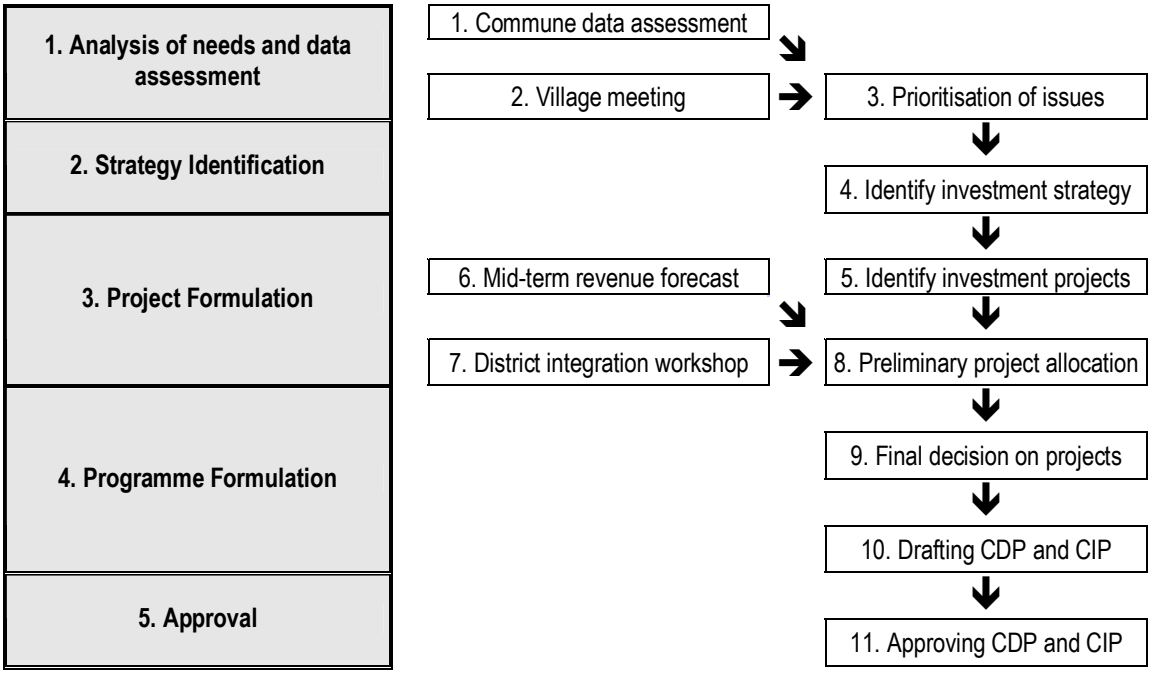
Thirdly, pending enabling legislation, Commune Councils could obtain their own-source revenue, through collection of taxes, non-taxes and service charges. (Eng 2004). CDRI is currently assisting the Ministry of Economy and Finance to pilot a number of Commune Council own-source revenues, and to develop tax-sharing arrangements between Commune Councils and Provinces. Four potential sources of revenue have been identified: taxes on transport and businesses (which are already informally shared with district tax offices), "pheasie" charges for operating a stall at a market (which is currently outsourced by provinces), and a general commune service levy (Eng 2004). In addition to identifying sources of revenue, other major challenges include:

- Informal fee collection and rent seeking practices
- Lack of administrative capacity of Commune Councils
- Political will of ministries at the national level

Commune Investment and Development Planning

Decentralisation reform in Cambodia has focused heavily on commune level planning. A mandatory responsibility of CCs during their first year in office was to prepare and adopt a five-year strategic Commune Development Plan (CDP) and three-year rolling Commune Investment Plan (CIP) (Kingdom of Cambodia 2004).

Table 4: Process for developing Commune Development Plan and Commune Investment Plan



The planning process comprises five stages, involving eleven steps. Each August, Commune Councils conduct a meeting with villages to identify and prioritise projects. These lists are then assembled in the CDP which in turn is distributed to the line departments. The line departments are supposed to use the CDP to inform their own planning processes. The CDP is also sent to the Governor, who in principle can accept or reject it. From the CDP, communes develop three-year rolling Commune Investment Plans which are updated each year. (Rusten *et al* 2004).

The District Integration Workshop (DIW) is held each year and is intended to promote collaboration between Commune Councils, NGOs, line departments and donors. At the DIW, Commune Councils present their prioritised lists of projects for the following year from the Commune Investment Plan, categorised under five thematic areas: economic sector, social affairs, administration and security, environment and gender. NGOs and line departments then make preliminary commitments to supporting individual projects.

In practice, there are a number of limitations of the Commune Council Planning process. These include (Kingdom of Cambodia 2004; Chief of O'Svay Commune Council, *pers. comm.*):

- Village consultations must be conducted in August. However, August coincides with the busiest time for villagers which limits the extent of village-level participation in identifying needs and priorities.
- Commune Councils have limited capacity to collect and assess village-level information. They report that the planning process is complex and time consuming.
- CDPs and CIPS tend to be wish-lists of projects, rather than strategic goal-setting documents.
- There is limited opportunity to discuss issues with other communes

Box 8 Observations from Thalaborivat District Integration Workshop, 29 October 2004

At the Thalaborivat District Integration Workshop (DIW), Commune Councils made a presentations to the audience which included the District Governor and representatives from the Partnership for Local Governance Project,\ the provincial Department of Planning, NGOs and some provincial line agencies. The Department of Environment and Provincial Fisheries Office were not represented at this workshop.

Each commune presented the projects which were undertaken in the previous year, and a list of projects drawn from the Commune Investment Plan (CIP) for the following year. In most cases, the Commune Council briefly listed the project name, location, outputs, estimated costs, number of beneficiaries and priority level. O'Svay Commune (which lies within the Ramsar site) identified 59 projects, of which seven related to environmental and natural resources. All seven environmental projects referred to training courses, although these were not described in detail.

From this DIW, it appeared that Commune Council planning processes are currently limited in their effectiveness. There was no analysis of the reasons why many projects earmarked for the previous year were not undertaken, nor evaluation of changing priorities from year to year. In this way, the CIPs are not really "rolling" but rather annual wish-lists of projects. The prioritised projects identified by Commune Councils were not described in any detail.

There are also limitations to the extent to which DIWs successfully integrate the planning processes of communes, NGOs and line agencies. NGOs and line department receive CIPs prior to the DIW, and the DIW presents an opportunity for Commune Councils to present their priorities. However, the strategies and plans of the NGOs or line agencies were not discussed at the DIW.

VEUN SEAN VILLAGE: A case study in wetland economic assessment

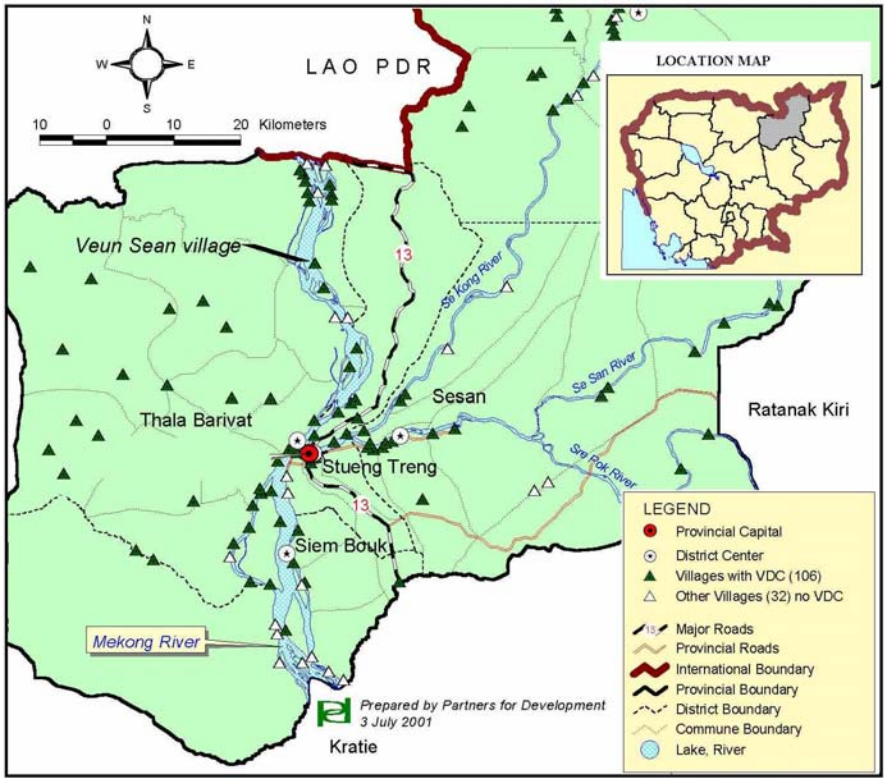
This case study demonstrates how village-level participatory valuation techniques can be used to explore wetland values — the types of benefits, the relative values, and the reasons *why* various aspects of the wetlands are important to villagers in Veun Sean.

Veun Sean village has previously been assessed using Participatory Rural Appraisal (*PRA)* or Participatory Natural Resource Assessment (*PNRA)* techniques by non-governmental organisations Partners for Development (PFD) and Culture and Environment Preservation Association (CEPA). This wetland valuation assessment did not seek to duplicate the past studies, but to build on the background information — with an additional focus on providing quantitative information on wetland values.

The following methodology was applied to analyse the value of wetland resources to Veun Sean village:

1. Identify different wetland resource values through PRA group activities (resource flow diagram and the relative rating of wetland values
2. Design and apply a household survey which includes collection of quantitative information about the fisheries resource (which had been identified throughout group activities as an important resource)
3. Calculate the monetary value of the fisheries resource
4. Compare the relative ratings of other components of the wetland resource to the fisheries resource, to calculate monetary value of other wetland resources

Villages in Stoeng Treng Ramsar Site



Veun Sean village background

Veun Sean village is located in the O'Svay commune, Thala Borivat district. The village households are situated on Khorn Hang island, although cultivation, non-timber forest product (NTFP) collection and wildlife hunting extends beyond the island to the mainland.

Box 9 A brief history of Veun Sean village

Veun Sean village was established in 1952 when five households moved from Koh Kralay and Koh Hib to settle on Khorn Hang island. From independence in 1954 until 1969, the population of the village remained low. During this period, Veun Sean villagers conducting rice growing, cash crop cultivation and timber extraction from the forests.

In 1970, Lon Nol came to power and the villagers fled to Koh Kra Lay. During the Khmer Rouge regime (1975 – 1978), the original inhabitants and many other people were relocated to Veun Sean, where they where forced to worked in collective agricultural production (Krom Samaki). The villagers suffered greatly during this period, from extremely harsh work conditions, insufficient food, and poor health.

In 1979 the population of Veun Sean increased as many original villagers returned and new households were established. During the 1980s, agricultural production increased and diversified to include both rice cultivation and livestock rearing. However, a severe flood in 1990 caused significant household damage and coincided with outbreaks of dysentery and measles which killed several children. Domestic buffalo also died from disease, resulting in a lack of dragpower and rice shortages.

During the 1990s, many villagers still faced lack of agricultural dragpower, but for some this was overcome by leasing buffalo from other households. The public rest house was also constructed and Youth With a Mission began its health care work in the village. Partners for Development and the Culture and Environment Preservation Association also began to work in the village.

Source: PNRA conducted by PFD and household discussions

With 36 households and a population of just over 150, Veun Sean is the smallest village in the Ramsar Site. Secondary information indicates that Veun Sean could be considered poor relative to other villages in Stoeng Treng province. For example, SEILA's online database indicates that the village is serviced by only one well; there are no latrines; and 71 per cent of adults above 15 years of age are illiterate, higher than the district and provincial rates of 43 per cent and 41 per cent respectively.

Assessments conducted by PFD and CEPA in 2000 and 2002 respectively explored the trends and causes of natural resource declines in Veun Sean village. The declines in fisheries, forest and wildlife resources since 1975 reflect the general pressures on such resources in the region. Fisheries declines have been attributed to illegal practices from outsiders, population increases, and the unofficial endorsement of illegal practices by powerful members from various authorities. Pressures on forest resources include increased demand from village and market, and from private concessionaires (which ended in 1999). It has also been noted that, due to hunting pressure, several species of wildlife have become locally extinct since 1970.

In 2003, CEPA established a Community Fishery Committee in Veun Sean village, and supported the identification of a community fisheries area and the development of rules and regulations.

Box 10 Village selection: A case study to add value

In consultation with CEPA, two villages in the Stoeng Treng Ramsar site were selected for potential case study. Koh Sneng, a relatively large village, had five years of experience with operating a Community Fishery. By contrast, in Veun Sean, the smallest village in the Ramsar Site with 36 households, the Community Fishery had been established only recently (in 2002).

Following visits to both villages, in which rapid rural assessments and household surveys were conducted, Veun Sean was selected based on criteria including: size, poverty levels, location to Veun Kham market, recent establishment of Community Fishery, and a relative lack of secondary information and studies – to maximise the potential to add value to the existing body of knowledge and analysis on community fisheries in the Ramsar site.

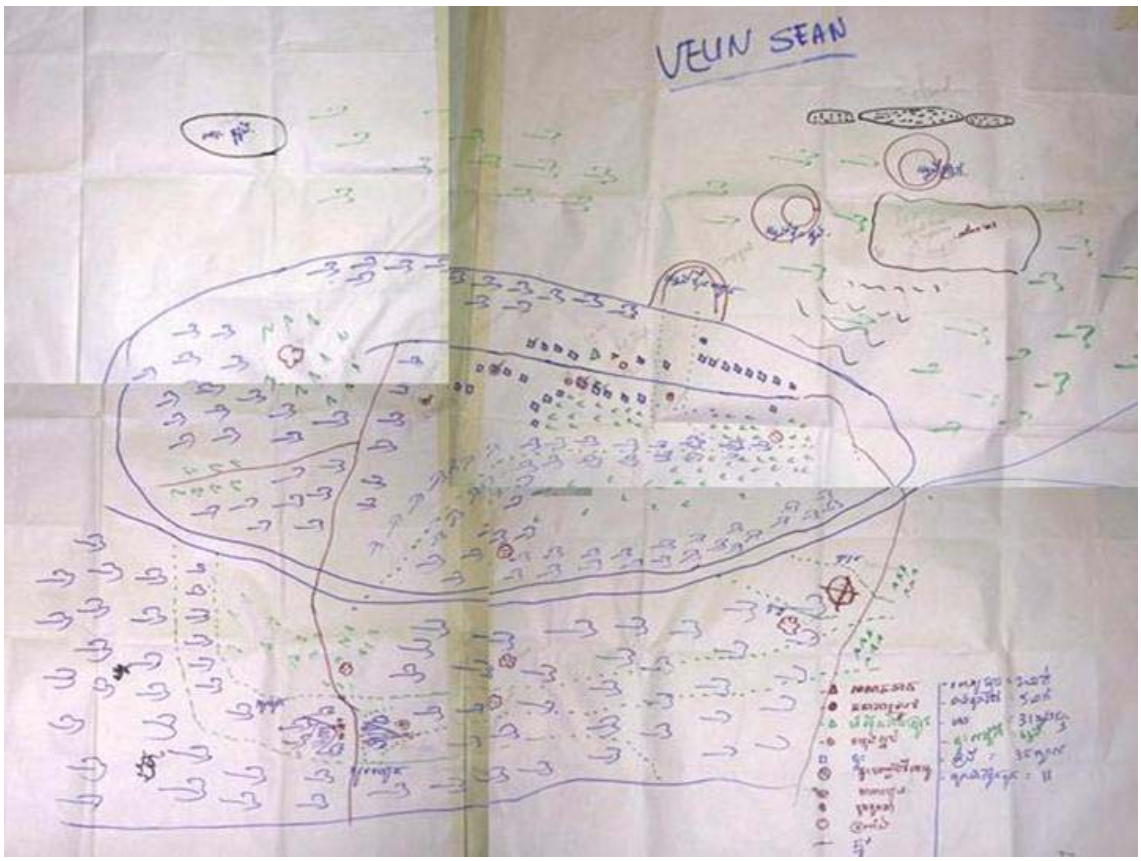
Economic assessment activities

The assessment team, which varied between three and five members, conducted the activities outlined below in Veun Sean village,

The outputs of many of the activities listed below do not necessarily relate directly to calculating the monetary value of the wetlands and fisheries resource. Understanding the linkages between households, stakeholders and the resources is vital to the evaluation of *why* the wetland resources are important to Veun Sean village — ultimately, to assess whether there is potential for economic assessment techniques to be used in planning processes affecting wetlands in the Stoeng Treng Ramsar site.

Activity	Groups	Outputs
Resource Mapping	mixed	• Households mapped • Resources and infrastructure mapped • Resource uses and key activities discussed
Flow Diagram — river and wetland uses and benefit flows	mixed	• Benefits from wetlands • Food resources • Market linkages • Sources of income and expenditure
Semi-structured Interviews		• Various
Wealth Ranking	mixed	• Villagers' perceptions of wealth • Households categorised
Web Diagram — social networks — stakeholders	gender	• External organisations identified • Social networks within village • Villagers' perceptions of the importance of agencies • Stakeholders in wetland resources
Seasonal Calendar — activities	gender	• Key labour activities identified • Relative labour efforts identified, across seasons and for different activities
Relative Ratings — wetland values — household problems	mixed	• Wetland values ranked • Household problems and underlying causes • Dependency on wetland resources
— food resources — income — expenditure	wealth	• Drivers of wetland resource use • Relative ranking of values
Household Surveys		• Fish catch, consumption, purchase and sale quantified • Fish prices and market linkages identified • Household problems and underlying causes identified • Perceptions and participation in Community Fisheries Management

Resource Mapping



The resource map shows the location of Veun Sean households on the island, but also extensive land use on the neighbouring mainland and upland rice on one small island to the north-west.

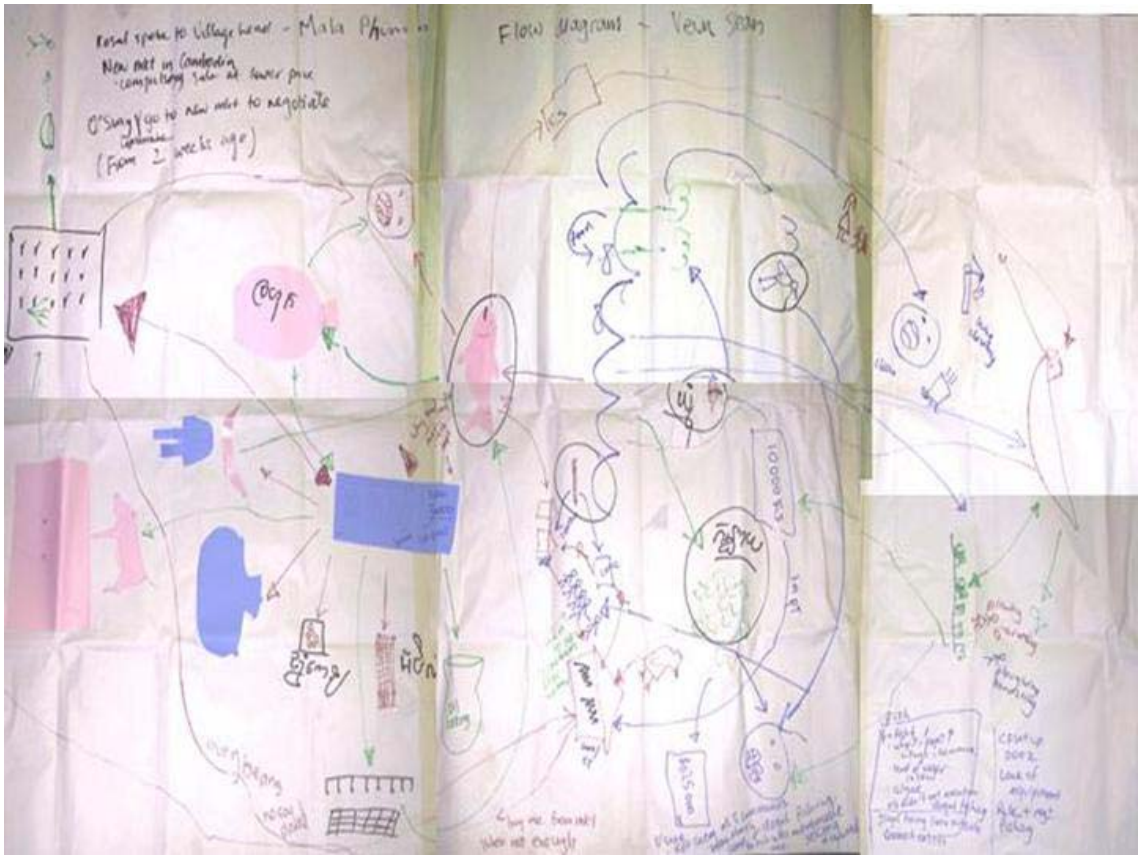
Key features include:

- There is one well, no latrines, one rice mill and one spirit house in Veun Sean village.
- There are four deep pools where some fishing activity occurs. Villagers do not generally travel great distances to conduct fishing activities. Fishing occurs mainly in the Mekong River near the island, and in streams, pool and rice fields on the island itself. Unlike other villages in the region, Veun Sean villagers do not generally migrate seasonally to fish in different areas.
- The small streams and lack of bridges on the island impede access within the island during the wet season, particularly for villagers who do not own boats.
- Rice cultivation occurs both in the lowland areas (near waterways) and further upland.
- Forests are particularly important for wildlife hunting and NTFP collection.

Flow Diagram of Wetland Values

The *flow diagram* activity invited participants to describe the values derived from the wetland resource, and to discuss *why* these aspects of wetlands are valuable.

The facilitator commenced the activity by drawing the Mekong River with flooded forest in the centre of the sheet, to represent the wetland. An arrow was drawn from the wetland to a fish, to illustrate a wetland use, and the question asked, "what can fish be used for and why is it an important wetland use?" Various benefit flows and market linkages were also identified.



Key wetland uses identified included fishing, spawning for fish, waterbird hunting, cooking and drinking, irrigating cash crops and transport.

The group agreed that fish was the "most important" wetland use because it can be eaten, made into prahoc and sold (at prices ranging up to 10 000 R/kg) for a significant income. As illustrated in the flow diagram, this income is necessary for purchasing various goods including clothes, fishing gear, rice, livestock and household goods.

Like fish, other resources derived indirectly or directly from the wetland were noted as important for both consumption as well as sources of income. The river was also noted as an important means of transport for the five to six middlemen from the village who sell fish, vegetables and cash crops at the Stoeng Treng market (in Stoeng Treng town) and the Veun Kham market (near the Laos border).

Web Diagrams of Social and Stakeholder Networks

The *web diagram* approach is a combination of the more commonly applied *Venn diagram* (which is used to identify institutions and their importance or influence on a community or group), and the *linkage diagram*, which can be used to describe flows, connections and causality. The web diagram was applied to identify the stakeholders in the wetland resource, and to explore social networks within the village, the relationships between villagers and external organisations, and the extent to and way in which different individuals, institutions and organisations have an influence on their lives.

In this activity, villagers were invited to identify institutions (individuals and organisations) which were important to or affected their lives. These were illustrated on paper circles. Institutions from within the village were placed inside a large circle, and external institutions were placed outside the circle.

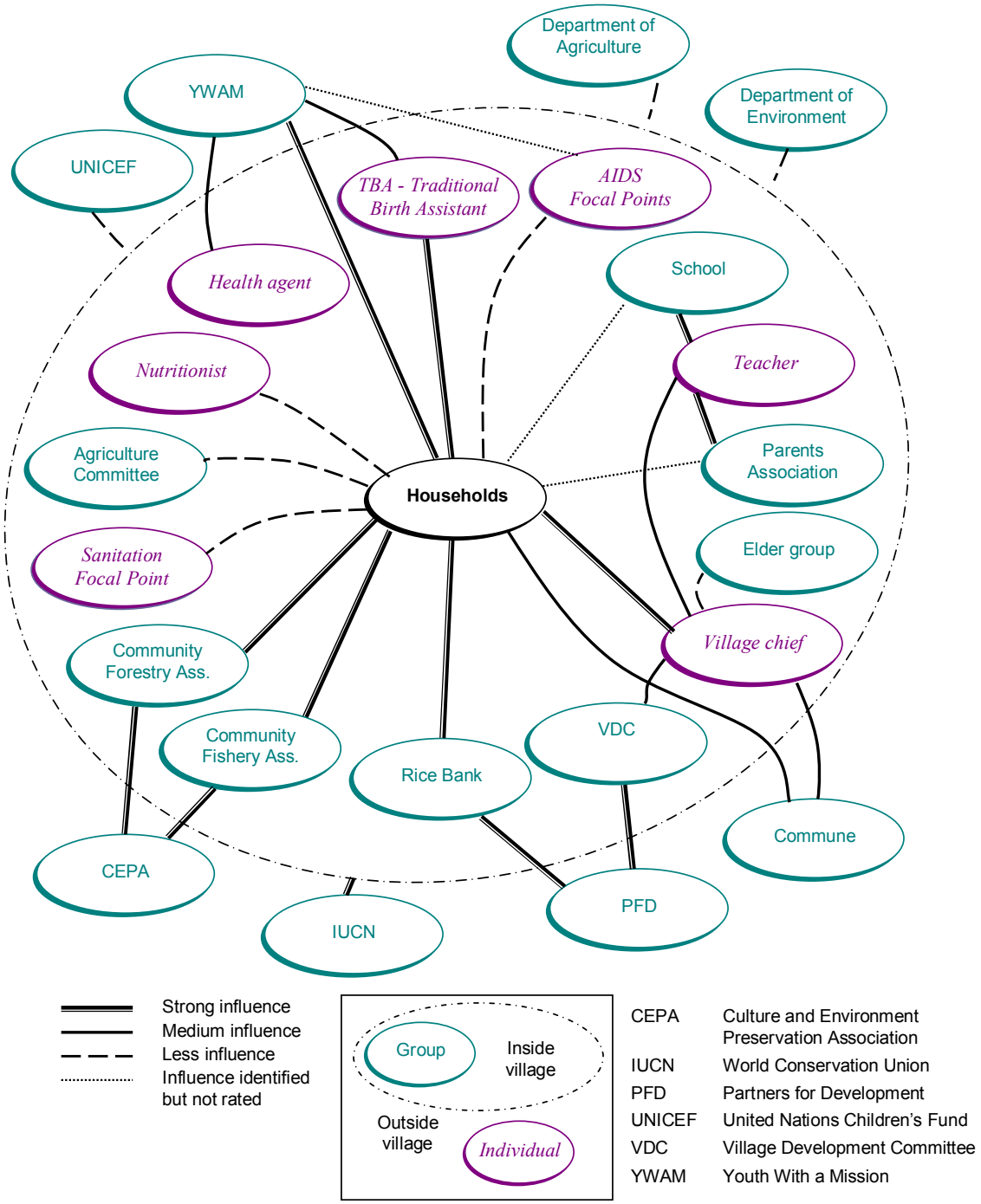
The group was then asked to identify and discuss relationships between different institutions, both internal and external to the village. The strength of these relationships (or "influence" of the institution) was then ranked as strong, medium or less. Key observations from both groups include:

- CEPA was readily identified as having "strong influence" through Community Fishery and Community Forestry associations.
- Both women and men identified Youth with a Mission (YWAM) as supporting health programmes in the village, through individuals such as the AIDS focal points and the TBA. However, individual consultation with YWAM revealed that UNICEF (not YWAM) currently supports health extension to Veun Sean village.
- Links were not identified between community fisheries and community forestry, and the Commune or Village heads. Very few government agencies were identified or discussed, and they were generally rated as "less influence".
- Most "focal points" and village committees are no longer active in the village, due to discontinued support from the NGOs which established them.

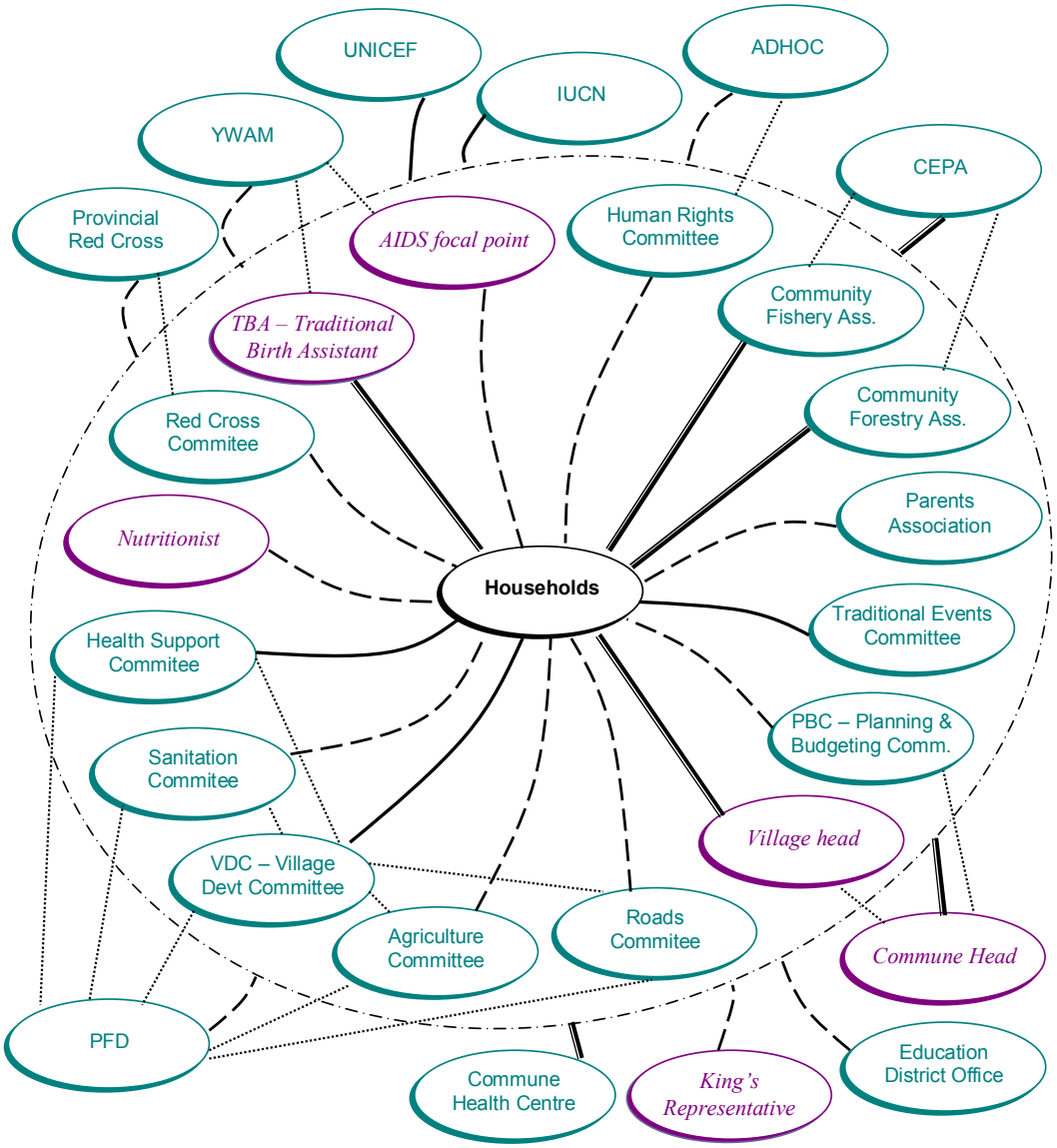
Key differences between women's and men's web diagrams include:

- Women tended to identify key individuals within the village, such as the Health Agent, the Nutritionist, and the Sanitation Focal Point. In comparison, men identified more committees previously established by PFD, which reflects their greater involvement in such committees.
- Although PFD no longer supports the various village committees, women still ranked PFD as a "strong influence" whereas men ranked PFD as a "medium influence"..

Women's Group



Men's Group



ADHOC Cambodian Human Rights and Development Association
CEPA Culture and Environment Preservation Association
IUCN World Conservation Union
PFD Partners for Development
UNICEF United Nations Children's Fund
YWAM Youth With a Mission

Seasonal Calendars of Activities

The purpose of this activity was to identify key activities conducted by men and women, and to broadly assess differences in time and effort spent between activities and across seasons. A combination of *seasonal calendar* and *rating* activities was applied.

Each group was first invited to identify the main activities which they conducted. These were then rated across seasons — wet, dry/cold, and dry/hot — using piles of between one and ten beans. The emphasis was placed on rating according to "effort" as defined by a combination of time and energy required. However, some ratings may have been biased towards either time spent or energy required, or may have reflected importance of the activity.

Men's Group	***Season***		
Activities	***Wet***	***Cold***	***Hot***
Rice growing	❍❍❍❍❍❍❍❍❍❍	❍❍❍❍❍❍❍❍❍❍	❍❍
Fishing	❍❍❍❍❍	❍❍❍❍❍❍❍	❍❍❍❍❍❍❍❍❍❍
Cropping - mung bean, corn, others	❍❍❍❍❍❍❍	❍❍❍❍❍❍❍❍❍❍	❍❍❍❍❍
Hunting wildlife from forest – snake, turtle, rabbit and deer	❍❍❍❍❍❍❍	❍❍❍	❍❍❍❍❍❍❍❍❍❍
Cogon grass harvest and weaving	❍	❍❍❍❍❍❍❍❍❍❍	❍❍❍❍❍
Collecting resin (NTFP)	❍	❍❍❍❍❍	❍❍❍❍❍❍❍
Collecting rattan, bamboo, vines for fishing gear	❍❍❍❍❍	❍❍❍	❍❍❍❍❍❍❍❍
Drinking wine –during ceremonies	❍❍❍	❍❍❍❍❍	❍❍❍❍❍❍❍❍❍❍
Collecting traditional medicines	❍❍❍❍❍	❍❍❍❍❍	❍❍❍❍❍
Collecting timber, bamboo and rattan for house construction	❍❍❍	❍❍❍❍❍	❍❍❍❍❍❍❍❍❍❍
Boat making and repair	❍❍❍❍❍	❍❍❍	❍❍❍❍❍❍❍❍❍❍
Caring for children	❍❍❍❍❍	❍❍❍❍❍	❍
Travelling to market	❍❍❍❍	❍❍❍❍❍	❍❍❍❍❍❍❍❍❍❍
Overall	❍❍❍❍❍❍❍❍❍❍	❍❍❍❍❍❍❍❍❍	❍❍❍❍❍

Household activities such as collecting water, collecting fuelwood, cooking, washing and caring for children are predominantly conducted by women. Both men and women are involved with vegetable cropping, but it appears that men are predominantly involved with fishing, hunting wildlife, and travelling to markets.

Women's Labour	***Season***		
Activities	***Wet***	***Cold***	***Hot***
Upland rice cultivation	❍❍❍❍❍❍❍		
Lowland (paddy) rice cultivation	❍❍❍❍❍❍❍❍❍		
Vegetable planting		❍❍❍❍❍	
Livestock raising	❍❍❍	❍❍❍❍❍	❍❍❍❍❍❍❍❍
Collecting water	❍❍	❍❍❍❍❍❍	❍❍❍❍❍❍❍❍❍❍
Collecting fuelwood	❍❍❍❍❍❍	❍❍❍	❍❍
Cooking and washing	❍❍❍❍❍❍	❍❍❍❍❍❍	❍❍❍❍❍❍
Caring for children	❍❍❍❍❍❍	❍❍❍❍❍❍	❍❍❍❍❍❍
Lowland rice harvest		❍❍❍❍❍❍❍❍	
Upland rice harvest	❍❍❍❍❍❍❍❍❍		
Cogon grass harvest and weaving		❍❍❍❍❍❍❍❍	
Harvesting vegetables			❍❍❍❍❍❍❍❍❍
Planting tobacco		❍❍❍❍❍	
Collecting tobacco			❍❍❍❍❍❍
Overall	❍❍❍❍❍❍❍❍❍❍	❍❍❍❍❍❍❍	❍❍❍❍❍

Two key factors influence the timing of activities across the seasons:

- Rice field preparation, rice planting and rice harvesting
- Seasonal differences in weather

From the ratings and group discussions with participants, it appears that many activities throughout the seasons are driven by the need to prepare rice fields and plant, cultivate and harvest rice. The *wet season* is the busiest time for both men and women, particularly due to rice cultivation and harvesting activities. At the end of the dry season, land is cleared from trees and prepared for upland rice growing. Both men and women cultivate upland rice throughout the wet season. Upland rice varieties have short growing spans (less than four months) and are harvested at the end of the wet season. Lowland rice varieties, which have longer growing spans (four to eight months), are harvested by men at the end of the cold season. Women identified that they conduct upland and lowland rice cultivation and rice harvest only during the wet season. For men, labour effort associated with rice growing occurs during both wet and cold seasons.

The men's group noted that as less time is required for rice growing activities during the dry (cold and hot) season (compared to the wet season), there is more time for other activities, including fishing, wildlife hunting and cropping. Some activities occur concurrently with rice growing activities — for example, fishing in the rice fields is conducted during rice planting, and wildlife is hunted when forests are cleared for upland rice planting. Other activities — such as cogon grass and resin collection — are conducted only during the dry season because they are too difficult to undertake in wet conditions. The women's group, however, noted that although fuelwood and water collection are more difficult during the dry season, these activities must be conducted throughout the year.

Wealth Ranking

Wealth ranking was conducted to gain an understanding of villagers' perceptions of wealth characteristics, and to provide information so that further activities could assess the differences in livelihoods of different wealth groups within the village.

A group of six individuals (three men, three women) were selected with assistance from the village chief. The group discussed the different characteristics of different "wealth groups", and then categorised individual households from a list provided by the Commune Council.

Rich	Medium	Poor	Very poor
Motorboat Rice mill Television Many buffalo Many paddy fields Large house with tin roof Always enough food Many pigs (5) Many ducks and chicken Enough rice to sell No debt Many chamkar fields Knowledge and skills	Motorboat Medium house with tin roof Buffalo (2-3) Less paddy fields than rich households Rice shortage for 6 months Pigs (1-2) Chicken and ducks (3-4) Chamkar fields (1-2) No debt Some skills	Rowboat Small house with grass roof Buffalo (1) Less paddy fields than medium households Rice shortage for 9 months Chicken and ducks (2-3) Small chamkar fields, some left fallow Borrow rice from relatives or rice bank, or buy rice from others No knowledge or skills	Small cottage Small or no paddy fields Small chamkar, some left fallow Sickness Many children Rice shortage for 10 months Work as labourer on others' land Fish and hunt to earn money to buy rice Chicken and ducks (2-3) No knowledge or skills Illiterate Widowed Disabled
4 households	***14 households***	***10 households***	***8 households***

One measure of wealth consistently identified was a household's ability to grow rice sufficient to meet the needs of the family throughout the year — a household which is unable to grow sufficient rice was said to face "rice shortage". Rich families were identified as growing sufficient or excess rice, medium families as facing rice shortage for six months, and poor and very poor families for nine or ten months. During the wealth ranking activity, the group noted that very poor households responded to rice shortages by fishing and hunting to earn money to purchase rice. The responses to rice shortage were explored further in subsequent activities. It was also evident that access to land, and the capacity to cultivate it, was a key factor in determining rice self-sufficiency.

Although the physical size of a house was identified as a criterion, observations from the village revealed that house size was not a strong determinant of wealth. Some families living in very small houses might have been classified "middle" or "rich", because they possessed wood for house construction, or had the potential to earn income to construct another house. It is possible, however, that the wealth ranking was biased by the group's response.

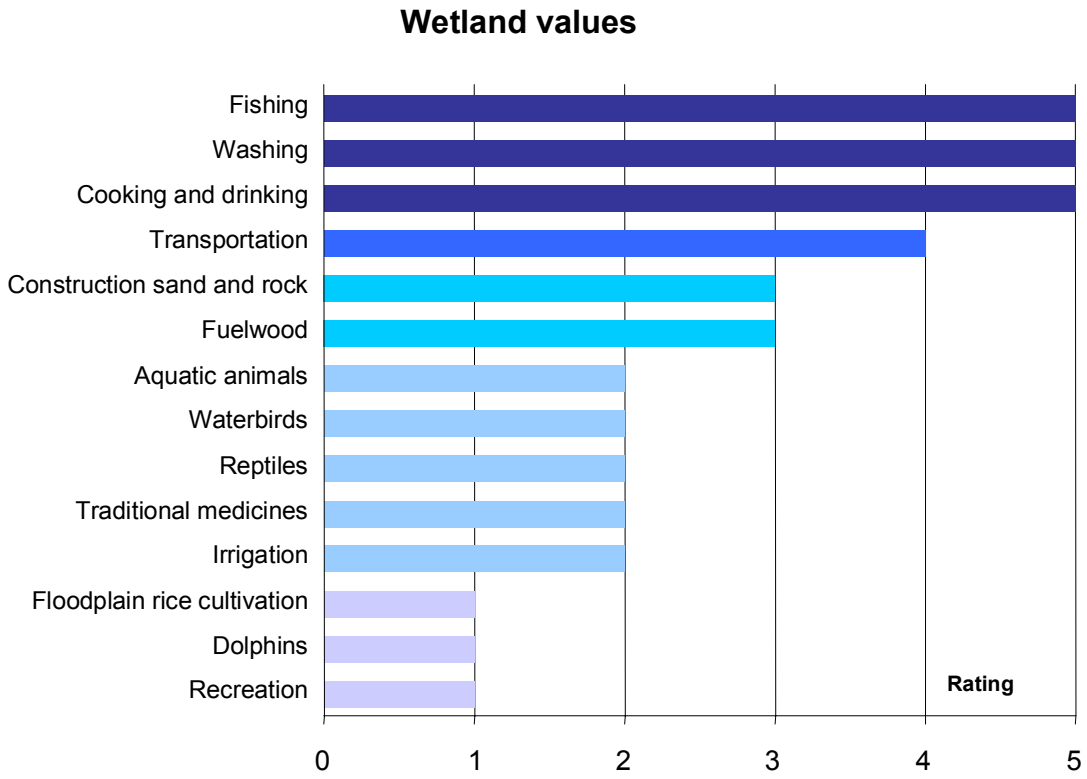
Relative Ratings

The rating exercises were directly linked to demonstrating relative values of the wetlands and fisheries resources. The design and conduct of these activities were informed by the issues raised in previous activities.

A total of five rating activities were conducted. Wetland values and household problems were identified, discussed and rated by a group representing households from across wealth categories in the village. Sources of food, income and expenditure were each rated by two groups: one group comprising poor and very poor households, and one comprising medium and rich households. Rating was conducted by using piles of one to five beans.

Wetland values

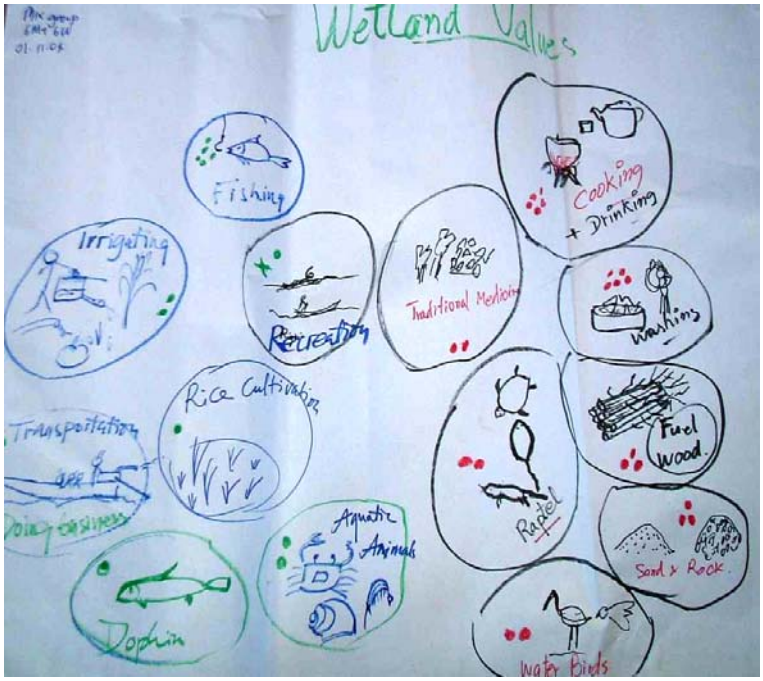
Wetland values were first identified in the wetland resource flows diagram. In the rating activity, wetland values were identified and rated according to their importance. The wetland was described as the river, flooded forests, and anywhere which was seasonally or occasionally flooded.



A variety of wetland values were identified, which corresponded broadly with values identified in the flow diagram.

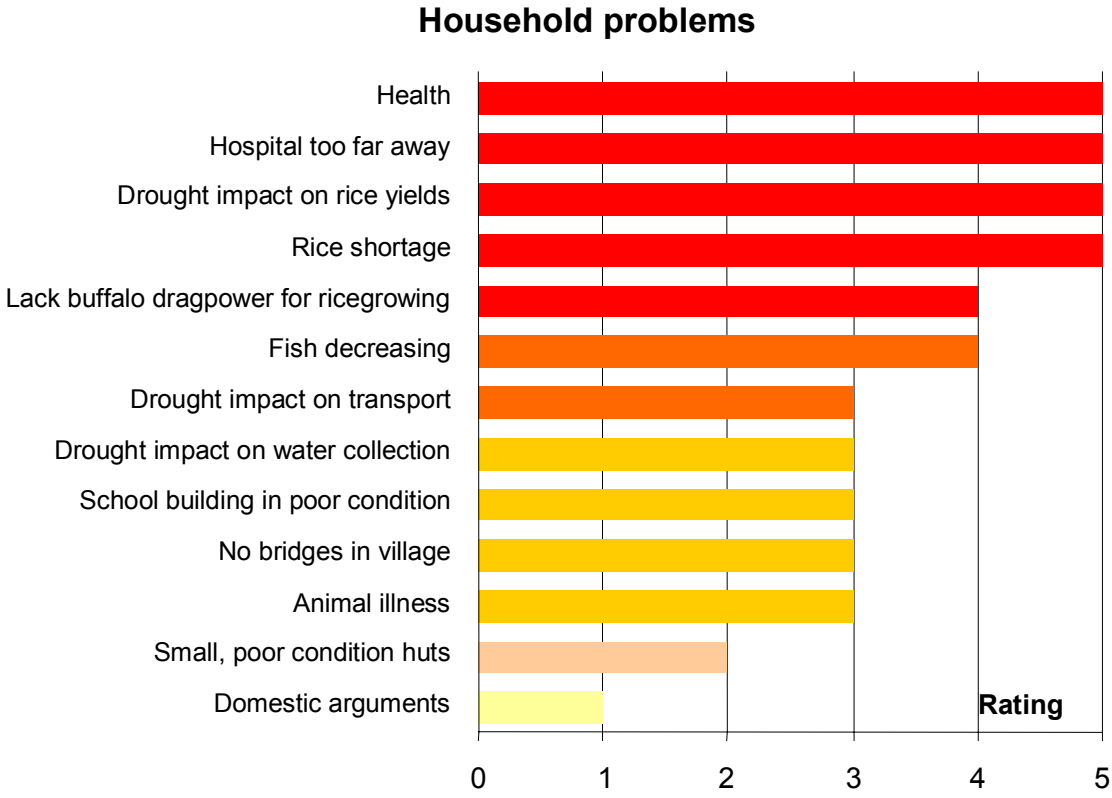
Many of these values represented consumptive uses of wetland resources — such as fishing, traditional medicines and wildlife. Other values related specifically to consumptive or non-consumptive uses of water — drinking, washing, irrigation and transportation. Two values identified — dolphins and recreation — relate to non-use values of the wetland.

The group unanimously rated fish with five beans, representing the highest level of relative importance. The women in the group suggested that cooking and drinking should also be rated with five beans, pointing out that fish are not valuable if they cannot be cooked. Two wetland values identified as important were construction sand and rock, and fuelwood collected from near the riverbank. Irrigation of vegetable crops was regarded as more important the floodplain ricegrowing, because nearly all rice is rainfed. There was limited discussion as to why dolphins were an important wetland value to the group.

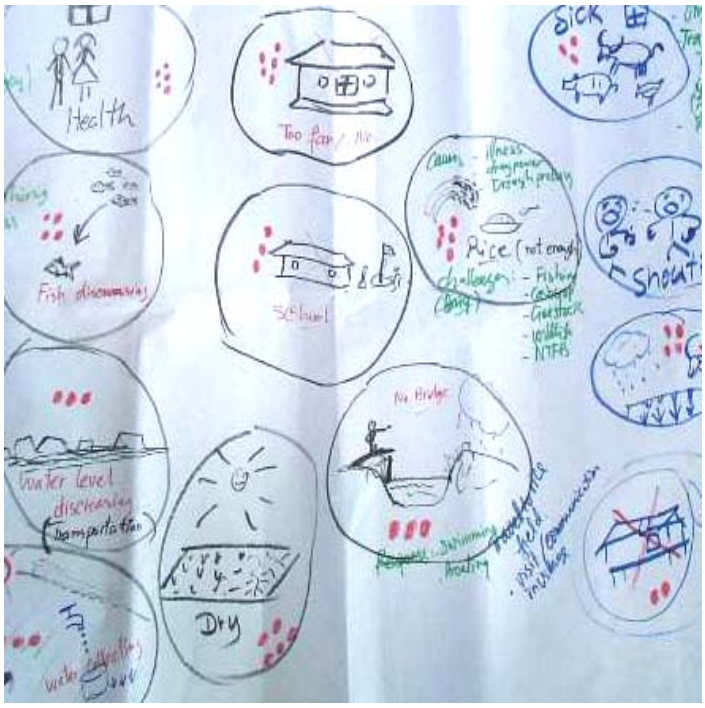


Problem Discussion

The *problem discussion* activity was a combination of *rating* and *linkage* exercises. The aim of the activity was to identify some of the key problems faced by households, the underlying causes of these problems, and the ways in which households respond.



The two main types of problems related to health and rice sufficiency. Lack of access to the hospital was described as a major factor contributing to health problems. The impact of the recent droughts and the lack of buffalo to prepare land were described as major underlying causes of rice shortage.



For many villagers in Veun Sean, the problems of poor health and rice shortages appear to reinforce each other. Poor health, leading to a lack of labour, was described as a reason why rice yields were insufficient and why it was particularly important to own buffalo to help prepare and harvest rice. However, rice shortages mean that income must be spent on rice, which makes it difficult for villagers to save enough income to purchase buffalo, or to purchase health services such as medicine or transport to hospital.

Declining fish stocks was also identified as a significant problem. As explored in further activities, fish is a key source of income, particularly for the poor and very poor.

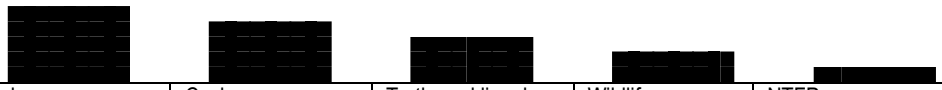
Food sources

Poor & Very Poor	Rice Fish Ingredients Prahok	Vegetables Fruit	Aquatic animals Wildlife	NTFP Turtle and lizards Domestic livestock	Waterbirds
Middle & Rich	Rice Fish Ingredients NTFP Fruit	Prahok	Vegetables Cash crops	Aquatic animals Turtle and lizards Waterbirds Domestic livestock	Wildlife

The results from this activity suggest that there is not a strong relationship between poverty levels and types of food consumed. Both wealth groups noted that rice was a staple, and that fish and ingredients were also very important. Prahoc is also a key food type, which is consumed year-round and not only when fresh fish is not available. NTFP and domestically grown fruits and vegetables are important sources of food for both groups. One key difference is that the poor and very poor group suggested that aquatic animals were important because they were readily available the entire year, whereas the middle and rich group noted that they if other food sources are available, they choose not to consume aquatic animals.

Similarities in *types* of food consumed does not suggest that there are not links between poverty levels and nutrition. One woman from the poor and very poor group noted that her family often ate only rice with salt, whereas discussions with the middle and rich group suggested a more consistently varied diet.

Sources of income



Poor & Very Poor	Fish	Cash crops – beans, tobacco and corn	Turtle and lizards Domestic livestock	Wildlife	NTFP Labour
Middle & Rich	Fish Livestock	Cash crops – beans Turtle and lizards	Cogon grass	Wildlife Vegetables Rice Small shop	Labour outside VS Rice mill Gifts from relatives Bamboo & rattan

This activity revealed that poorer households have fewer options for generating income — although it appears that they may be more dependent on income to purchase the staple food, rice. Although results may be biased, the middle and rich group identified twice as many sources of income as did the poor and very poor group.

Fish (mostly sold to middlemen) and cash crops are relatively important sources of income for all households. Turtles, lizards and other wildlife are also significant sources of income. However, a key difference between income groups was that the less poor identified livestock sale as more important. One woman in the wealthier group also generated income from rice milling fees, and rice sale. In discussions with the poorer group, some women indicated that they did not know about the relative values of different income sources, but suggested that we ask their husbands.

Expenditure

Poor & Very Poor	Rice		Medicine Clothes	Social contributions Hospital in ST Fishing gear Agricultural tools Cash crop seeds Petrol Household goods Ingredients	Fish Wildlife Livestock meat Wedding Boat purchase Transport
Middle & Rich	Medicine	Petrol Ingredients	Rice Hospital in S.T. Schooling children Rice mill maintenance Fishing gears Rice milling	Piglets Clothes Cash crop seeds Agricultural tools Household goods Wine and cigarettes	Social contributions Transport Weddings Employing labour

The overwhelming difference in expenditure between poorer and less poor households is the proportion of total income that poorer households spend on rice. This is consistent with the identification of rice shortage as a key characteristic of household wealth. For poor families, medicine is also a significant expense. However, wealthier families rated medicine as the highest expense, suggesting that they have greater capacity than poorer and very poor families to purchase health care. Wealthier families are also more likely to own motor boats and to purchase petrol.

Household Surveys

Eight of 36 Veun Sean households were surveyed individually. The survey was pre-tested twice and the final survey conducted with four households from poor or very poor wealth categories. and four households from medium or rich wealth categories (see Annex B for the survey instrument).

The purpose of the survey was to cross-check the information gained from group activities, to gain further quantitative information about the value of the wetland resource, and to investigate participation in and awareness of community fishing activities. Key types of information included:

- Household information — names, children, ages, school attendance, reasons for moving to Veun Sean, observations about household size, condition and building materials
- Fishing — activities, fish catch quantity and location, fish consumption
- Expenditure on rice and other main goods
- Income from fish selling and other activities
- Community fisheries participation and perceptions

There are many challenges associated with obtaining specific information from a household survey, due to varying interpretations of questions and biases in responses. These were overcome by applying a semi-structured approach to household surveys, and encouraging flexible questioning and discussions.

Box 11 How much fish do you catch in one year?

A longitudinal "follow the catch" survey would require significant investments in time and energy by both surveyor and households. In the absence of such a longitudinal survey, estimates of fish catch must be gauged from direct responses from groups or individuals.

In the household survey, some households seemed confident in estimating the volume of their total annual fish catch. However others were uncertain, and tended to respond with very low quantities (for example, a family of eight persons where two people fish every day, catching a total of 10 kilograms per year).

One way to check if a household's estimate of total weight of fish catch per year is of an accurate order-or magnitude is to consider the responses to the following questions:

- How often does your household eat fish? *Three days a week*
- How much do you eat each time? *Usually about one kilogram a day*
- This pile of beans represents fish caught in a whole year. Of your household catch, divide into two piles: consumed and sold. *Consume one-quarter of fish catch.*

This example household consumes about 150 kilograms of fish a year, which represents one quarter of annual fish catch – 600 kg. Although this estimate is approximate, for *selected* households it is likely to provide a more accurate order-of-magnitude measure of fish catch than their direct response to the question, "how much fish do you catch in one year?"

One challenge with applying the household survey instrument is how to obtain accurate information about aggregated quantities of weight, money or time. For example, some households were uncertain about income and expenditure totals, and their responses to questions about total yearly cash income did not match their total yearly cash expenditure — even though they could not recall borrowing from or lending goods, services or money to other households. Some households' fish consumption exceeded their fish catch, but they claimed that they never bought fish, only selling to others.

This challenge was overcome by also asking disaggregated questions. For example, the response to total income from fishing per year can be compared to that derived from the responses to:

- How often do you sell fish?
- During what time of year do you sell fish?
- How much do you sell each time?
- What is the price of fish?

Another factor which may bias results is the point-in-time nature of the survey. Households' responses may reflect the current point in time or just this season. Where possible, some clarifications were made about trends over time.

Finally, a factor which influences results is the group discussion nature of many household interviews, with neighbours and relatives also providing input.

WETLAND VALUES IN VEUN SEAN: What, why and how much?

This section draws on PRA and household surveys to value the wetland resource to Veun Sean village. The emphasis, however, of this valuation is not the quantitative numbers per se — rather, how these values can help explain *why* wetland resources are important to households.

Box 12 Stakeholders in the wetland resource

This economic assessment focuses on the value of the wetland resource to households in Veun Sean. However, there are many other stakeholders in the use and management of wetland resources in the area. These include:

- Households from other villages — The resource mapping activity revealed that the fishing grounds near Veun Sean have traditionally been used by fishermen from various other villages and communes. There are also extensive reports of illegal fishing near Veun Sean by "outsiders" from other villagers.
- The commercial fish-buying company — Does not appear to target fishermen in Veun Sean village.
- Upstream and downstream stakeholder — As the deep pools near Veun Sean are dry-season refuge habitats for migratory fish, upstream and downstream users are also stakeholders in the fisheries resources near Veun Sean.
- Government agencies —PFO and DOE have mandates to assist in the management of the fisheries resource. However, Veun Sean villagers noted little involvement from government agencies.
- Non-government organisations — played a role both directly in the management of the wetlands resource, and indirectly through working on other aspects of Veun Sean villagers' livelihoods.

Quantitative analysis of wetland values

As noted in the previous section, there are many challenges associated with applying household surveys at the village level to calculate quantitative values. Familiar statistical units of time and quantity — commonly applied in other situations — may not be perceived as relevant by households. This section illustrates how a range of values may be calculated, depending on the treatment of raw data from households.

The value of wetland resources was estimated by calculating the value of the fisheries resource, then applying households' relative ratings of different wetland benefits.

What is the value of the fisheries resource?

The value of the fisheries resource to households is derived from two direct uses: consumption, and as a source of income. The responses to several key household survey questions could be used to estimate the value of the fisheries resource. However, as noted in the table below, many of these responses could be biased and inaccurate due to households lacking familiarity with:

- Aggregating units
- Averaging quantities over periods of time (responses may be biased towards the most recent time period)

Variable		Bias		
		Type	***Level***	***Explanation***
1	Total income from fish sales per year	Aggregation	High	
2	Total fish catch per year (kg)	Aggregation	High	
3a 3b	Frequency of fishing activity Fish catch (kg) each time	Averaging	High	Varies across seasons
4	Total fish consumption per year	Aggregation	High	
5a 5b	Frequency of fish consumption Fish consumed (kg) each time	Averaging	Medium	Varies across seasons, but ranges provided
6	Proportions of fish catch which are consumed and sold over a whole year (using beans)	Averaging Aggregation	Medium	Excludes fish purchased for consumption
7	Price of fish	Averaging	Low	Consistent responses of 3000R/kg

One straightforward approach to valuing the fisheries resource would be to estimate total fish catch in the village, and multiply it by an average market price. However, as noted previously, there were difficulties in obtaining meaningful estimates of aggregate fish catch volumes (variable 2 in the table above) from households in Veun Sean village. In this situation, a longitudinal survey would be required to more accurately estimate total fish catch.

An alternative approach is to separately estimate the value of fish sales and fish consumption. As some (albeit limited) fish is traded directly between households, this would result in an overestimate of the fisheries value if aggregated to the village level. However, it enables an illustration of the value of the fisheries resource to individual households, and a comparison of the importance of the fisheries resource between households of different levels of wealth.

As household estimates of total annual fish consumption and income from fish sales are likely to be significantly biased, the following steps were followed to calculate the value of the fisheries resource to households.

1. Calculate annual household fish consumption (kg) from responses about frequency and quantity of fish consumption for each surveyed house.(These quantities were comparable to secondary information about fish consumption in Cambodian fishing households.)
2. Using individual household responses about proportions of fish catch which are sold and consumed, calculate annual household fish sales (kg).
3. Using the market price of 3000R/kg, calculate the values of fish consumption and fish sales for each household.

Household fish value	**Average household**	**Middle or rich**	**Poor or very poor**
Annual fish consumption (kg)	180 kg	150 kg	210 kg
Annual fish sale (kg)	420 kg	190 kg	690 kg
Value of fish consumed	500 000 R	500 000 R	600 000 R
Income from fish sale	1 200 000 R	600 000 R	2 000 000 R
Total value of fish	**1 700 000 R**	***1 100 000 R***	***2 600 000R***
Income as a percentage of total fish value	**70%**	**56%**	**77%**

Note:

The absolute values of these estimates should be viewed as approximate. However, these estimates reveal that in Veun Sean village, the fisheries resource is more valuable to poorer households than wealthier households — partly because the larger household size of poor

households means that they consume more fish per household, and partly because a greater proportion of poorer household's fish catch is sold for income.

What is the value of wetland resources?

Wetland values were rated by a group of households representing a mix of wealth groups. The monetary values of these values were calculated using the average household value of fish and the relative ratings. From other group activities, qualitative observations were made about why different wetland resources are valuable, and whether there are any linkages between poverty levels and wetland resources.

Average value of wetland resources, per household (annualised)

Ratings	Value (Riel)	Description of value
[redacted]		
Fishing	1 700 000	The fisheries resource is valuable a vital source of food and income. Particularly for poorer households, who do not grow sufficient rice and need to purchase rice each year, food security depends on income earned from the fisheries resource.
Washing	1 700 000	As Veun Sean has only one well, the majority of households draw water directly from the Mekong River for washing, cooking and drinking. Few households own water filters and others note that sometimes it is difficult to collect fuelwood to boil drinking water.
Cooking and drinking	1 700 000	
[redacted]		
Transportation	1 360 000	Veun Sean is not serviced by roads connecting to other villages or communes. As fish catch, cash crops, and wildlife are sold and medicines and rice purchased at Veun Kham and Stoeng Treng markets, Veun Sean villagers rely on the river as a transport route. Most goods are conveyed to and from markets by middlemen.
[redacted]		
Construction material	1 020 000	Rocks and sand for construction are extracted from the river bed.
Fuelwood	1 020 000	Fuelwood is collected from near the banks of the river.
[redacted]		
Aquatic animals	680 000	Wetland wildlife such as small aquatic animals, waterbirds and turtles are vital as a source of food and income. Some poorer families, particularly those who lack access to land, boats or fishing equipment, are particularly reliant on wetland wildlife for nutrition.
Waterbirds	680 000	
Reptiles	680 000	
Irrigation	680 000	Some vegetable crops are irrigated by fetching water from the river.
Traditional medicines	680 000	Traditional medicines are collected from the flooded forests. Most families resort to conventional medicine only when traditional treatments fail, but for many medicine is a significant expense. Conventional medicines are often ineffective because households lack access to medical care – they diagnose symptoms themselves, often resulting in inappropriate use of medicines.
[redacted]		
Floodplain rice	340 000	Most rice is not floodplain, but rainfed.
Dolphins	340 000	The group did not clearly describe why dolphins were important.
Recreation	340 000	Swimming.
TOTAL	**12 900 000**	Approximately US$ 3,000 per household per year.

.

The values of wetland products and services presented in the table earlier are again summarized below into two major categories; they are traded value and non-traded value. This is done based on nature of marketing opportunity availability for these products and services derived from the wetlands. Interestingly, the value of locally non traded products and services derived from the wetlands are almost 85 % of the total value of products and services traded in the local market. The most noticeable point of the valuation date derived here is that the total value of the wetland based products and services, as perceived by the local community, is much higher than the value of one or two directly marked products of wetland like fish and aquatic products that are usually reported in the past studies.

Table 5: Average value of the of the wetland resources by trade and market uses (in Riel per household and per year basis)

Value type	In Riel	In US $	Remarks
1, Direct Use value (or value of traded goods and services)	7,000,000	2,330	This includes sum of value of locally traded products and services as listed in the table above.
2. Indirect use value (non-traded goods and services)	5,900,000	1,970	This includes sum value of products and services listed in the above table that are not locally traded in the market and services.
Total	12,900,000	3,300	

Note 1. In case of irrigation benefits from vegetable crops, only 20 % of the total value of irrigation reported earlier is included in the direct use value of the wetland derived here, this is because of the fact that unlike fish and aquatic products, all the value of vegetables may not be attributed to the wetlands alone.

Even the value of traded goods and services (or direct use values of wetland) of US$ 2,300 per household derived here is much higher than the average per household GDP of the Cambodian, which is about US$1200 (@ $ 300 per capita per annum and with the assumption of 4 persons per household in the community surveyed). This nature of difference on the GDP per capita measure of income and the value of wetland based products and services derived here is possible because of the fact that the per capita GDP reported in the national account is value added component of the product and services that are traded in the national economy. The direct use values of the products and services of the wetland estimated here include several elements of the subsistence economy that are in fact not accounted in the national accounting systems from which the national level per capita GDP is measured. For example, goods like construction materials and fuel woods, and so the several other aquatic plants and animals derived from the wetlands are in fact potentially traded in the local markets but they are usually not accounted in the national accounting systems. Because of the same reason, the values of wetland products and services derived in this study are also not directly comparable with the GDP per capita estimated from the national account. Despite of this fact, the values estimated in this study clearly suggest that the wetlands are very critical to the livelihoods of the rural community, which needs to be recognized by any of development planning process implemented in the region.

Livelihoods and threats: Why is the wetland valuable? What drives dependency on fisheries resources?

The primary economic activities in Veun Sean village are rice-growing, fishing, cultivating vegetable and fruit crops, NTFP collection, and wildlife hunting and collection. For the majority of households income must be earned to purchase rice in addition to that grown.

For most households, nearly all income is obtained from selling domestic and wild produce. Fish and livestock are particularly important sources of income. Fish, which is caught near or on the island, is occasionally sold within the village. However, most households catch enough to eat and the bulk of fish is sold to middlemen from both within the village and from outside. Cash crops and livestock are generally sold to outside middlemen. Other products — such as wildlife, reptiles, and wildbirds — are sold within the village, or to middlemen who come to the village on a seasonal basis.

Box 13 Alternative income sources in Veun Sean village

The primary income source for households in Veun Sean village is the sale of produce – wild or domestic – to other households or to middlemen who convey the goods to market. The opportunities to gain alternative sources of income may be limited by the remoteness of Veun Sean village, and the high levels of illiteracy amongst adults.

However, some households engage in income-generating activities other than the sale of produce. For some wealthier households, this represents a greater diversity of income opportunities. For some poorer households, the ways in which they earn income reflect a lack of access to land or capital.

Ouch Chanhorn (age 57), from a "rich" household, said her family grows enough rice to eat and owns the only rice mill in Veun Sean. She noted that rice milling fees are a significant source of income, although maintenance of the rice mill is expensive. Her household owns several buffalo and other livestock, which she feeds with the husks leftover from the rice milling process.

Nyet Mao (34) and *Mao Nat* (33), from a "middle" household, recently moved from O'Run village. They have six children under twelve, a very small house and have not yet begun to cultivate rice or other crops in Veun Sean. However, their house also operates as a small grocery stall, selling clothes and cooking ingredients. Other villagers also report that Nyet Mao has recently established himself as a "doctor" in the village, and they approach him to obtain medicine.

Few households reported seeking income from employment outside the village. However one man, *Len Ta* (49) from a "middle" household, noted that during the dry season, he works as a driver in Stoeng Treng town. *Long Nut* (43), also from a "middle" household, recalled that in the past he was paid $3-$4 daily allowance by PFD to participate in training. Nhem Sean (38) reported that CEPA pays 50 000 Riel per day to participate in training in Stoeng Treng.

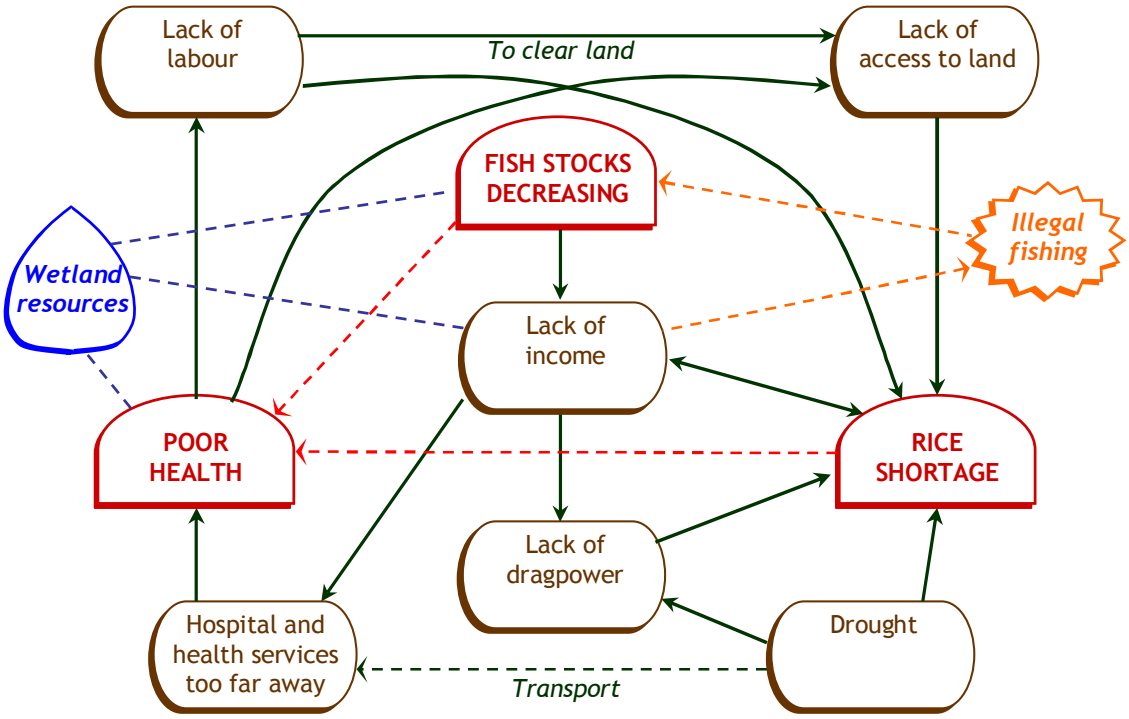
Several members — both men and women — of poorer households in the village described working as labourers on other households' land, earning one tin of rice or 3000 Riel per day.

The key economic activities and responses to rice shortages vary significantly amongst households at different levels of wealth:

- Some of the most wealthy households grow rice sufficient for their needs, and are much less likely to need to sell fish.
- Rice shortages drive dependence of poor household on "wild" resources (fisheries and wildlife) for income. The poorer households sell a greater proportion of their catch for income.
- However, some of the very poor who do not have access to fishing equipment or boats do not catch sufficient fish to sell. They are particularly dependent on "wild" food resources, including aquatic animals collected in rice fields.

In the face of interrelated pressures of poor health, drought and rice shortages, both fish and non-fish wetland resources are vital to villagers' livelihoods. Wetland resources including fish, aquatic animals, wildbirds and turtles provide necessary nutrition and income.

There were challenges associated with exploring the underlying drivers of illegal fishing activities (electroshock and explosives), because Veun Sean households were reluctant to discuss the issue with reference to households within the village. However, it is likely that other forms of "illegal fishing" – such as fishing in deep pools – may be widely practiced, because (prior to the establishment of Community Fisheries) deep pools were traditional locations of fishing during the dry season. The dependence on fishing from deep pools should be explored further.



NEXT STEPS: Using economic valuation for wetland management in Stoeng Treng

Reflections on using economic valuation for conservation and development planning in Cambodia

Although environmental economic valuation is in its infancy in Cambodia, several studies have been conducted over the last decade which attempted to assess the economic value of ecosystem goods and services and to draw conclusions relating to the management of environment and natural resources:

- As part of the ICEM Protected Areas and Development Review process in 2003, key economic values of Cambodia's Southwest Cluster Protected Areas were assessed by IUCN and the RGC, to justify on economic and development grounds why PAs should be conserved, and to point to the use of economic measures to strengthen PA conservation.
- The IDRC-funded Environment and Economic Programme for Southeast Asia has made a number of grants for environmental valuation research in Cambodia, including studies relating to mangrove management strategies (1997), Ratanakiri forest valuation (1997), and values of Ream National Park (2001).
- An *ex-ante* valuation of livelihood income losses and other tangible downstream impacts for the Yali Falls Dam to the Se San River Basin in Ratanakiri Province, Cambodia, was carried out by Oxfam Australia as a basis for advocacy talks and transboundary dialogue.
- An *ex-ante* identification of livelihood impacts and valuation of livestock and crop losses of the "Vietnam Dam" was carried out by Oxfam GB in 2003
- The World Wildlife Fund carried out an economic valuation of flooding in the Lower Mekong River Basin, as a baseline for assessing the impacts of infrastructure that would alter downstream hydrology.
- The WorldFish Centre has implemented two projects dealing with economic valuation, A Wetlands Approach (1999) and Aquatic Resources Valuation (2003 – 2005).

These studies have undoubtedly contributed to building capacity in environmental valuation in Cambodia. There is, however, less evidence that the findings of these studies have actually influenced on-the-ground conservation and development policy, planning and management.

Clearly there is great potential (and emerging capacity) to use economic valuation for conservation and development policy, planning and management, but further efforts need to be made to ensure that studies carried out are shared with decision-makers, and tied to real-world management issues.

Using economic assessment for Community wetland management planning in Stoeng Treng

- The activities being carried out under **MWBP** at the Stoeng Treng Ramsar Site provide an important opportunity to mainstream economic valuation into conservation planning processes, at both national and local levels.
- At the **Stoeng Treng Ramsar Site**, strategies to conserve and protect wetland resources must consider the wetland's biological and ecological importance. However, it is also critical that this "wetland importance" be considered in light of local-level dependencies on and access to the resources. In this context, participatory research methods for economic assessment should continue to be used as a key tool to inform in the planning process — to gain an understanding in the importance of wetlands resource to local communities.
- The **future sustainability** of attempts to conserve Stoeng Treng Ramsar site depend critically on sufficient financial resources and economic incentives being made available to support wetlands management. Economic assessment tools can help to indicate the economic impacts, costs and benefits, of conservation management regimes, point to opportunities and needs to capture and redistribute benefits to cover the costs of conservation, and present a strong case to outside agencies and central government of the need to fund wetland management initiatives.
- In the context of **Community Fisheries Management** activities being carried out by organisations such as CEPA, some of the assessment techniques could be applied when establishing or monitoring the progress of their community fisheries (for example to develop measurable indicators), and to provide local and national level advocacy and awareness materials which underline the of wetlands resources to villagers.
- In the context of **Commune Council Development Planning**, wetland economic assessment could provide valuable inputs into existing and future 5-year development and investment plans. In particular, economic assessment can highlight the contribution of wetland conservation to socio-economic development and poverty alleviation goals, and demonstrate the links between wetland status and improved outcomes for other sectors.
- In the context of **Ramsar planning and protected area management**, economic aspects form an important supplement to initial assessments of biodiversity status, threats and management needs. As a management plans are developed, economic assessment can help to identify a wide range of economic and financial tools with which to strengthen conservation implementation.

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ANNEX A: FISHERIES POLICY REFORMS IN CAMBODIA

The fishing lot system of fisheries resource management — in which fees are collected from users who have (partially) exclusive rights to fish in "lot" areas — was first introduced during French colonial rule to regulate the industry and raise revenue. This system was discontinued during the Khmer Rouge and subsequent Vietnamese control, but was re-established in 1987 under the Fiat Law (again with the aim of generate revenue). The Fiat Law divides fisheries into three scales: commercial, middle and family, each of which with specific regulations about the types, sizes, timing and use of fishing gears (Levinson 2002). However, it is widely noted that family-scale fishing gear regulations are too restrictive to provide subsistence levels of catch.

Under the Fiat Law, fishing grounds are auctioned as two-year tenure "fishing lots" to commercial operators. Although the Law requires lot-operators to permit access by family-scale fishers during the open season, this is often disregarded and conflicts have arisen between commercial lot operators and villages. Both commercial and family fishers are believed to use illegal fishing methods (such as electro-fishing and use of explosives) due to low enforcement capacity by fisheries officials, as well as pressures on family-scale fishers to access the resource (Levinson 2002). These destructive nature of these illegal methods is commonly believed to be damaging to resource stocks.

In October 2000, fisheries reforms commenced (under Prime Minister Hun Sen). One of the main objectives of government fisheries reform is to improve food security and reduce poverty of locally-dependent fishers (Oxfam 2002). The main elements of the reforms included:

- Release of 56% of fishing lots to "community fisheries"
- Elimination of tax on middle-scale fisheries
- Drafting of Community Fisheries Sub-Decree, which is intended to provide a framework within community fisheries can be established.

Levinson (2002) noted that the reforms encouraged the Department of Fisheries to assist communities in establishing and maintaining Community Fisheries. However, the reform process has been widely criticised for the rapid change in tenure without developing the supporting mechanisms to inform, empower, or enable communities to manage the fisheries resource. In particular, it has been noted that (Oxfam 2002):

- The reform process was marked by confusion with most villages unaware of the new fishing grounds and boundaries
- The withdrawal of provincial fisheries officials created a vacuum in enforcement
- The fishing lots released were those of poorer quality and lower fish stocks
- The reform process fails to meet its stated objectives of reducing poverty because it further restricts livelihoods of poor fishers, who cannot afford to purchase larger fishing gear, but benefits large-scale commercial operations

ANNEX B: Using economic assessment for wetland management

Economic valuation and wetland management

Economic valuation techniques have great potential to contribute to the effective management of wetland resources, and thus towards achieving poverty alleviation. Through identifying the underlying policy, market and social drivers of decisions made by stakeholders — including the pressures faced by local communities — economic assessments can be applied to gain an understanding of the importance of wetland values. In both developing and developed countries, this potential has been realised in a variety of wetland management situations:

- ***To justify conservation, in order to meet economic and development goals:*** By assessing the costs and benefits of alternative resource use options, economic assessments consider the impacts on local communities, industries and economy — including the non-marketed benefits of conserving wetland ecosystems, weighed up against the non-marketed costs of their degradation — and the distribution of these benefits and costs.
- ***To design incentives for conservation*****:** By understanding the underlying drivers of wetland loss, economic incentives such as pricing policies or fee systems can be designed to promote sustainable and equitable use of wetland resources.
- ***To develop sustainable financing mechanisms:*** For example, assessments of tourists' willingness to pay park entrance fees can be used to identify and design a sustainable source of revenue for protected area management.

However, calculating wetland values does not necessarily ensure that economic assessments influence wetland management — particularly, whether wetland values are factored into development and economic planning at various levels. To maximise the impact of an environmental economic assessment, strategies must be developed which use the information to target key individuals, agencies and planning processes which affect wetlands management.

ANNEX C: HOUSEHOLD SURVEY

HOUSEHOLD SURVEY - VEUN SEAN page 1

Interviewer: 1	Notetaker: 2	Date: 3

HOUSEHOLD INFORMATION

Household wealth ranking ☐ Rich ☐ Medium ☐ Poor ☐ Very Poor 4

HEADS OF HOUSEHOLD

Male Name 5 Age years 6 Here? Y / N 7

Female Name 8 Age years 9 Here? Y / N 10

CHILDREN

Number of children 11 Children's ages 12

Do children go to school? Y / N 13

If *"yes"*, how often do they attend? 14

OTHER HOUSEHOLD MEMBERS? *(eg. sister, brother, niece…)*

15

When did you **move** to VS? 16

Why did you move? 17

Is it better or worse in VS and why? 18

NOTETAKER'S OBSERVATIONS ABOUT HOUSE

19 Size of house
☐ small
☐ medium
☐ large

20 Condition of house
☐ Very damaged
☐ Slightly damaged
☐ Not damaged

Type of building materials
floor 21
walls 22
roof 23

Vegetable garden? Y / N 24

Household goods, fishing and agricultural gear 25

Other 26

FISHING ACTIVITIES AND EATING page 2

*How often does your household go to fish? *Twice a week during dry season. Once a month during wet* 27

*How much is caught each time? *Up to 5kg per time, usually 2-3 kg.* 28

These 10 beans represent fish CATCH for the whole year.
Divide into proportions consumed and sold by your household.

example - 7 eaten: 3 sold

***Eat/Sell ratio:** 29

*What main fishing techniques do you use? *Gillnet, castnet…* 30

*Where do you fish? *In dry season in deep pools. In wet season upstream.* 31

*Do you fish in Veun Pong deep pool? Y / N 32

If "yes" - how often do you fish there? *Once or twice a week during dry season* 33

*Do you fish the entire year? Y / N 34

If "no" - what times of year do you fish? *Only during dry season* 35

*How often does your household eat fish? *2 to 3 times per week* 36

*How much fish does your household eat each time? *0.5 - 1 kg per time* 37

EXPENDITURE page 3

Product	*Rice*	**Rice buying**	**One other _____** 44
Where? from whom?	*Ask middlemen from village to bring back rice from ST market*	Other households in village Village middlemen who go to ST / VK / other market Outside middlemen from ST / VK / other market Direct ST / VK / other market Other _____ 38	Other households in village Village middlemen who go to ST / VK / other market Outside middlemen from ST / VK / other market Direct ST / VK / other market Other _____ 45
How often?	*Once a week*	39	46
When?	*3 months a year when rice shortage*	40	47
Quantity bought each time?	*5 - 10kg*	41	48
Price	*1000R / kg*	42	49
Expenditure per year	*80 000 R*	43	50

Total household EXPENDITURE per year 51

SELLING AND OTHER SOURCES OF INCOME

Product	*Fish selling*	**Fish selling**	**One other** _____ 58
Where? to whom?	*Occasionally to other households in village. Mainly to middlemen from Veun Kham.*	Other households in village Village middlemen who go to ST / VK / other market Outside middlemen from ST / VK / other market Direct ST / VK / other market Other _____ 52	Other households in village Village middlemen who go to ST / VK / other market Outside middlemen from ST / VK / other market Direct ST / VK / other market Other _____ 59
How often?	*1 - 2 times per month*	53	60
When?	*During wet season when rice shortage*	54	61
Quantity sold each time?	*4-5 kg*	55	62
Price	*Depends on species 300 - 600 R/kg*	56	63
Income per year	*80 000 R*	57	64

*Do you earn income in other ways besides selling produce? Y / N 65 ***If "No", go to ****

If "yes" How do you earn this income and from where? 66

How frequently do you earn this income? 67

If away from VS - how often do you return home? 68

If away from VS Is it hard for your family and why? 69

*** Total household INCOME per year** 70

NON-COMMITTEE ***COMMUNITY FISHERIES PARTICIPATION AND PERCEPTIONS***

page 5

*Have you been involved with community fisheries? Y / N 71

If "no" Why not? *Too busy with rice farming. Not enough money for petrol.* 72

If "yes" How have you been involved and how often? *Attend meetings and patrol once a month* 73

What makes it worthwhile for you to be involved? *Illegal fishing bad for fish stocks and fish important source of income* 74

What restricts you from being more involved? *Not enough time or money for fuel to allow me to monitor more often.* 75

*What illegal fishing activities occur? *Electrocutting…* 76

*How often do you see illegal fishing occur? *At night once a week* 77
*When does it occur?

*Do you know who conducts illegal fishing? Y / N 78

If "yes" Who? 79 Anyone from Veun Sean? Y / N 80

*What happens when illegal fisher is seen? *Report to CC. Not sure if punished.* 81
*Are they punished? Why or why not?

*Do you know what the rules and regulations of CF are? Y / N 82

If "yes" please describe 83

FINISH. PLEASE FILL IN OBSERVATIONS ABOUT HOUSE, PAGE 1

COMMITTEE MEMBER | ***COMMUNITY FISHERIES PARTICIPATION AND PERCEPTIONS***

page 5

*What is your committee position? ☐ Chief ☐ Vice-chief ☐ Secretary 84
☐ Casher ☐ Ranger ☐ Other_____

*What do you do in this position? and what are your responsibilities? 85

*What do the other committee members do? 86

*How often does the committee meet? 87

*Does the committee have contact with

Village chief Y / N 88 how? 91
Commune Council Y / N 89 how? 92
PFO Y / N 90 how? 93

*What illegal fishing activities occur? *Electrocutting…* 94

*How often do you see illegal fishing occur? When does it occur? *At night once a week* 95

*Do you know who conducts illegal fishing? Y / N 96

If "yes" Who? 97 Anyone from Veun Sean? Y / N 98

*What happens when illegal fisher is seen? *Are they punished? Why or why not? *Report to CC. Not sure if punished.* 99

*Do you know what the rules and regulations of CF are? Y / N 100

If "yes" please describe 101

FINISH. PLEASE FILL IN OBSERVATIONS ABOUT HOUSE, PAGE 1

About IUCN

IUCN -The World Conservation Union brings together States, government agencies, and a diverse range of non-governmental organizations in a unique partnership. As a Union of members, IUCN seeks to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.

http: //www.iucn.org

About the IUCN Water & Nature Initiative

The IUCN Water and Nature Initiative is a 5-year action programme to demonstrate that ecosystem-based management and stakeholder participation will help to solve the water dilemma of today - bringing rivers back to life and maintaining the resource base for many.

http: //www.waterandnature.org

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This project aims to develop, apply and demonstrate environmental economics techniques and measures for wetland, water resources and river basin management which will contribute to a more equitable, efficient and sustainable distribution of their economic benefits at the global level and in Africa, Asia and Latin America, especially for poorer and more vulnerable groups.

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