SUSTAINABLE UTILIZATION AND MANAGEMENT
OF CAMBODIA WETLAND
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This paper gives the participants during the workshop on national wetland action, will be organized, in cooperation between the department of fisheries, the Ministry of Agriculture Forestry and Fisheries and international center for living aquatic resource management (ICLARM), held on 11-12 September 2000 in Siem Reap Province.

I. Overview of Wetlands context in Cambodia

1.1 Introduction to the wetlands of Cambodia

The Kingdom of Cambodia an area of 181,035 km2 in the South-western corner of the Indochina peninsula. It is bordered by Thailand to the west. Loa PDR to the north and Vietnam to the east and the Gulf of Thailand to the South. In terms of wetlands, Cambodia is one of the most important countries in the Asian region. Over 20% the country in natural wetlands and over 10% is rice field. Lake Tonle Sap of Cambodia is the largest floodplain lake in Asia, and one of the largest and most productive in the world.

1.2 Wetlands and the Cambodia people

The Kingdom of Cambodia is culturally and economically closely linked to wetlands. The ancient Kingdom of Cambodia, including the magnificent Angkor Wat, Were built upon the plentiful bounties of wetlands areas. Approximately 80% of the population now lives in the central floodplain areas of Cambodia especially relying upon the same wetland resources that have been exploited by Cambodia for centuries. Wetland products harvested by local communities include food (fish, water birds, edible plants, animals), medicine water and fuel wood.

II. Threats to wetlands in Cambodia

Cambodia is facing with the of environmental problems. All wetland natural resources are damaged, diminished, and changed yearly by human activities.

Summary of the problems encountered in the selected target wetland in Kampong Champ, Stung Treng and Kratie Provinces.

Drainage of Wetlands for:
Intensive cultivation/agriculture

- Urbanization
- Tourism development
Infilling for land reclamation
Infrastructure development

- Embankments
- Port facilities

Dam construction for

- Water supply
- Hydroelectrical

Hydrological management

- Flood control
- Irrigation
- Drainage

Upstream/Upland development

- Watershed damage
- Erosion

Pollution and nutrient inputs

- Urban
- Agricultural/pesticides
- Industrial and mining
- Salinity changes

Damage to fisheries

- Over fishing
- Dynamic fishing
- Conflict between artisanal and commercial fishermen

Damage to forest resources

- Over exploitation of the available resources
- Wastage due to inefficient extraction
- Illegal activities
- Illegal harvesting

Damage to biodiversity
- Introduced species
- Hunting pressure
- Livestock pressure

**Social factors**

- Poverty of wetland users
- Users not aware of sustainable alternatives
- Malnutrition
- Outside vested interests

**Institutional and legal factors**

- Lack of legislation
- Destructive policies (e.g. wetland drainage)
- Land ownership (e.g. privatization of communal marshes)
- Official attitudes towards wetlands
- Lack of train personnel at provincial and district level
- Lack of planning and uncoordinated development

**III. The reasons of wetland degraded**

The government also provides budget for the management of wetlands. However, the government and foreign aid budgets are still not adequate. The available fund is primarily focused on the capacity building at the national and provincial levels for multi-discipinaries such as: hydrology, forestry, fishery, agronomy, environment and Socio-economic development (PRA). In simultaneous period, the wetland resources has been degraded, because the project is considering as inventory only. It means that is not identified as the management of wetlands areas by specific identifying demarcation boundaries. Some reasons for this include:

- Insufficient allocation of funds,
- Low capacity on wetland management and assessment at national, provincial and district levels
- Lack of information on wetland policy in Cambodia;
- Only a few sources of foreign funding interested in wetland conservation;
- Lack of understanding and appreciation of the need for wetland conservation;
- Only few government regulations enforcement;
- Lack of an information network on wetland management, both regionally and internationally,
- Wetland management is still not a high priority in the annual budget of the government and foreign aids;
- Lack of local expertise involved in promoting wetland management and conservation;
- Provincial authorities neglect conservation on the wetland management and conservation;
- Community participation in wetlands conservation is under-developed.

Environmental Impact Assessment legislation is in force in Cambodia by the Ministry of Environment.
EIA is mainly related to pollution discharge from factories.

What is really needed in Cambodia are guidelines on how to manage wetlands sustainably so as to accommodate the needs of different users in the long term. Indeed, we should realize that more community participation is necessary: this can be accomplished through improvement of people's understanding of wetlands.

Pilot projects are needed to provide examples of sustainable management possibilities and potential.

IV. Summary of the function and value of wetlands

Hydrological

Flood mitigation
Storm and flood storage
Base flow and estuarine flow modification (eg prevention of intrusion of saline waters)
Recharging aquifers and groundwater storage and discharge

Geomorphological

Erosion protection
Sediment trapping
Pollution trapping
Remove of toxic substances (eg heavy metals, radioactive isotopes, pesticides, herbicide)
Nutrient removal
Waste processing
Net oxygen production
Geochemical storage (eg high storage of organic matter and CO2 sink)
Biogeochemical cycling (many biogeochemical cycles are closed by reducing N,C,S, Fe etc in anaerobic muds.

Habitats and nursery grounds for wildlife including commercial and recreational fisheries, bird rookeries and refuges for terrestrial animals; pest predator production such as Ibis,
Gene banks for plants and animal species
Reference of biodiversity
wildlife corridors
Primary productivity and biomes production
Secondary productivity and biomass production -export to adjacent ecosystems of organic food (eg commercial and sport fisheries)

Social/economic

Commercial values (flooded forest, gracing, apiary, agriculture, fishing, peat extraction, aquaculture, solid waste disposal).
Recreation value
Open space and aesthetics or landscape value
Cultural values including archeological, natural heritage
Aboriginal cultural significance
Scientific and educational

V. Institutional management of wetland
A such larges in Cambodian wetlands, an organization/government agency could not protect and manage alone. The wetland resources protection management need to be integrated in good manner with different line-agencies and departments concerned as well as the regional cooperation. The main institutions dealing with wetlands are the Ministry of Environment, Ministry of Rural Development, Ministry of Water Resources and Meteorology and the Ministry of Agricultural Forestry, Fisheries (Department of Forestry, Fisheries and Agronomy) and The Ministry of Women Affairs.

This is an example of project implementation by IMCWP conducting in Boeung Thom, Kampong Cham Province.

Institutional Arrangement Management Structure of Boeung Thom
VI. The most urgent priority actions

Within a huge wetlands resources in Cambodia, agency could not do alone in wetland management and protection. Therefore, the integrated management approach should be carried out by the departments and ministries concerned in order to address the wetlands issues. There are the most urgent priority actions:

- A Wetland National Action Plan should be adopted by the government and. Furthermore, the National Wetland Committee should establish and have responsibility the all wetland projects in Cambodia. The committee should comprises of all relevant government agencies in co-operation with relevant international organizations and Non-government Organizations (NGOs) and should operate into levels:

National level     Relevant ministries
Provincial level   Provincial technical government offices and provincial authorities

At the national level the committee should be chaired by the Ministry of Environment and at the provincial level by the Governor Provincial Department of Environment.

- Should have the appropriate means to fulfils its duties, including fair salaries
- Afford protection to important and threatened wetland areas in the country;
- Review existing legislation pertaining to wetlands in the country;
- Develop and protect Ramsar sites in sustainable and wise use by defying demarcation boudaries;
- Create more wetland protected areas by defying demarcation boundaries
- Protect wetlands areas by classifying the conserve zone, buffer zones, mixed urban zone and Residential zones
- Review and resolve conflicting roles and objectives pertaining to management of wetland resources among government agencies
- Specify the activities that individual ministries and various agencies must undertake to individually, and in common, insure regional use of wetland resources;
- Increase awareness programs for the different groups of people in the country, especially the decision-makers;
- Encourage more research in wetland areas by allocating additional funding to conservation agencies and institutions in the country;
- Encourage public participation/stakeholders/VDC in the planning and management of wetland areas in the country;
- Develop wetland classification
- The National Wetlands Working Groups comprising the senior technical departments and
ministries should be appointed to oversee wetland related matters in the country and
- Encourage the sustainable use of wetland resources by decentralization system.
- Support community-based and community-implemented projects by donors agencies;

**How could we plan it better? It could have to:**

- Complete inventory, habitat, species migratory passages, in wetland and watershed.
- Make information exchange network
- Identify sensitive resources and critical areas and economics
- Study environmental impact analysis
- Set-aside references sites (habitats, function)
- Maintain down-stream hydrology (flood pulse, fluctuating system maintains species diversity such as conflict with decrease in dry-season flows)
- Maintain delta sediment balance
- Adaptive resources management
- Establish the environmental and hydrological modeling

Process should lead to improve knowledge, dialogue and adaptiveness, considering fish, wildlife, habitats, biodiversity and system functioning can be helpful in making most appropriate long-term decisions. The following suggestions would be:

- Rehabilitation and improve management of wetland areas
- Rehabilitation and preventing further deterioration of aquatic ecosystem
- Minimizing changes in hydrological regimes from planned hydropower and water diversion schemes
- Minimizing erosion, reduce sediment load, deterioration of ground water quality and soil quality.

**Sustainable development process/implementation**

i. There has been a big focus on dams and hydropower
ii. Current Mekong agreement is broad. The thinking and strategies of the committee needs to reflect this breadth.
iii. People must be the focus of development
iv. In international cooperation there is a need to check that all people are benefiting equitably
v. Information gathering and disseminating. Research on people, biophysical and biological elements.

Need for good governance and transparency of the sustainable development process by the users as well as all developers.

**VII. Management of wetlands**

Sound management of wetland environment requires appropriate government policies and mechanism. Management of wetland should be on the concept of total catchments management,
recognizing that all the activities in a catchments area may impinge on wetland benefits that wetland provide.

**Population**

The population in Cambodia is growing rapidly. The pressure of high number of people exploiting natural resources is one of the major factors involved in the degradation of wetland. These become landless and try to migrate to the wetland in the hope of obtaining food by catching fish and harvesting other wetland resources or by reclamation-flooded forest for farm.

**Recommendation**

- Effective family planning should be given immediate priority. incentive could be given to low-income groups to have smaller families.
- Settlement and resettlement plans should be reviewed, and due consideration given to wetland conservation issues.
- Awareness/education programmer should be undertakings to educate the people living in, and around, wetland areas on the various and function of the wetland.
- Regional/site specific planning for population distribution is needed.

**Inventory and monitoring**

**Inventory**

Long-term planning and wise of resources relies on knowing the extent and statue of the resources available. For wetland management, the first step is to compel a national wetland inventory. This should include the biological, hydrological and social/cultural value of wetland. In addition, socio-economic data are particularly required in order to ensure that the needs of local communities are considered. This inventory will act as a basis for setting management priorities.

Computerized databases are very useful tool to store and update large amounts of information on wetland. However, it is important that data are disseminated effectively in order for them to be useful.

Today, the project has completed GIS on wetland sites surveys, fish spawning and migration sites, wildlife sites, catchments.

**Recommendation**

- The collection of socio-economic and hydrological data should be given proper attention.
- A review should be made of the amount and type of information available for management planning and implementation. By identifying gaps and deficiencies, research priorities can be established.
- In country where a national inventory of wetland does exist, periodic updating is required to
identify major threats and recommend remedial measures.
- Remote sensing techniques should be used to map and monitor wetland. This information should be made easily accessible to user agencies.

A national wetland committee should provide direction or research on wetland ensure that relevant information is gathered for the management and conservation of wetland.

**Monitoring**

Monitoring is the process of measuring change in ecological character in any wetland over a period of time:

The following points should be observed in any monitoring effort:

- The need to produce objective information
- The need to follow up activity taking place in a wetland
- The knowledge gained from a specific project or activities

**Fishery and fisheries**

Unsustainable logging techniques have contributed to widespread destruction of wetland habitats and consequently have affected the different plants and animals, and destroyed the resources used by local communities.

The increasing use of modern fishing practices threatens the sustainability of fish population. Pollution and salutation from erosion by wetland and watershed deforestation reduce water quality, threaten aquatic life and destroy fish breeding sites. Dams built across major rivers have resulted in increased siltation and obstruction of fish migration routes, changes in flow characteristic and nutrient flows.

**On site management issues**

The important issue amongst these factors is a lack of coordination between the agencies that have the capacity to influence wetland environments and to develop effective management plans and the means to implement them.

There is an urgent need to develop and implement integrated management models involving local communities. An important aspect of these models and plans is the development of schemes that can generate income on site, and like the value of the wetland to the well-being of the local community.

**Recommendations**

- Models of planning and implementation processes need be developed in the region. These models need to be evaluated within each county.
- Develop and implement integrated management plans, and coordinate these at each specific wetland site and within the catchments.

Where required, governments, NGOs and international agencies should provide assistance to local communities to improve their standard of living through the sustainable utilization of wetland, and through developing alternative income generating activities.
- Review the effectiveness of legislation pertaining to forestry and fisheries practices.
- Prevention further biodiversity degradation and project area and endangered species of fish

**Land ownership and rights over resource use**

Stewardship, over land and resource, means that local people are given responsibility for long-term sustainable management of resources. This ensures that those involved in decision-making affecting the environment must accept the long-term consequences of their decision.

Thus, stewardship where local people gave an understanding that long term, sustainable management in their best interests is a model to adopt in all wetland areas.

**Recommendation**

- Land reform must be carries out to ensure that those who use resources have a long-term incentive to do so in a sustainable manner.
- There should be more effort directed to setting up areas in which the land/wetland and/or its resources are owned be the local community (common property), thus providing an incentive to manage resources wisely.
- Where governments own land, there should be some form of long-term stewardship system, where by local communities are given right over resources for periods of 25 years or more, for example, local communities may be given the right to harvest timber as long as it is done on a sustainable basis and reforestation is carried out.
- Methods in which commercial companies can be provide with long-term stewardship of resources should be identified as a model to encourage sustainable utilization.

**Strategy zoning**

In order to manage and protect wetland natural resources, we need to define zoning. The four zones can be classified as follows:

**Conservation zone:** The most significant function of this zone was expected to be preservation of the structure and functioning ecosystem to enable sustainable management of biodiversity to ensure protection of river fisher job as well as support multiple uses that would not duplicate biodiversity.

**Buffer zone:** The significant function of this zone was expected to be flooded buffer, and prevention of expansion of residential and industrial activity into the conservation zone. Generally state land, which unused attracts encroachment. Buffer zone management would
therefore include cost effective activities that are economically strong enough to prevent further urbanization such as recreation development, and which could enhance biodiversity.

**Mixed urban zone**: The significant function of this zone would be facilitation of integrated economic growth and employment generation.

Residential zone: Low to high density. Settlement planning and residential development were expected to occur for this zone in a manner that would provide for relocation of the encroacher population in the marsh to locations with healthier living conditions and better access to infrastructure.

**Local community participation**

Community participation in the management of wetland and their resources is an essential ingredient for successful management.

Consultation with, and involvement of, local communities in all stages of management planning through survey, project design, implementation and evaluation, is absolutely vital.

Community-based resources management offers one of the best solutions for more effective and long-term conservation and management of wetlands.

**Recommendations**

- Establish mechanisms to involve local communities in the management of the wetland resources upon which they depend, and to involve them in all stages of the planning, implementation and review of project in their local area. Decentralization policy a real local management of wetland natural resources.
- Evaluate development projects against national imperatives and the development needs of the local people.
- Direct greater attention to wards methods to involve local communities in the decision-making process by:
  - Encouraging partnership with local people through providing leadership and guideline for management policies and legislation
  - Exploring and developing alternative sources of income, either within or from outside the wetland, to supplement or compensate for the loss of income formerly derived from unsustainable practices in the use of the wetland.
- Utilize the valuable knowledge of communities that have traditionally exploited the resources of wetland to produce viable models for sustainable and multiple use wetland resources.
- Evaluate projects based on community use and/or ownership of resources. Successful modes should be applied to other situations.
- NGOs as well as the MoE and the MRD should play a role in strengthening and setting up people's organisations in areas where they are weak or do not exist. This would facilitate participation by local communities.

**Decentralization policy**: Towards a real local management of natural resources
The community forestry and decentralization try to reach the same objective. If the community forestry is seen not only as a 'technology' but also as an approach that replaces social well being and socio-economical relations at the heart of the system, decentralization tends to offer the context and the minimal conditions for greatest responsibility of local populations in natural resources decision-making.

It seems to me useful to answer some basic questions such as: what is decentralization? Why decentralization? How? Under what conditions? What potential impact can it have on resource?

Decentralization is defined as the transfer of regulatory and executive competence to local authorities, without central governments retaining a supervisory role. Let us distinguish between two complementary tracks of decentralization:

- The creation of conditions that enable local communities to manage their own resources; and
- Administrative reforms whereby central powers are transferred to local governments.

The proposals for decentralization in the Cambodia have been mainly raised, until recently, to administrative reforms. Moreover, decentralization is often confused with devolution, the transfer of limited power to local or regional bodies (mainly government agencies), power that may only be exercised under the supervision of the central authority. But now the need for real decentralization and even for self-governance, which will go a step, will be recognized everywhere. Self-governance is a policy where the people are able to seek and develop partnerships with each other in development processes: where they can fulfil their potential for self-organization at multiple levels on which they hold the legal rights and diverse resources to engage in collection action. The state's primary role is to act as a framework of rules. Applied to the management of natural resources, decentralization implied that certain guidelines are formulated at national levels, e.g. in a legislative framework, and that a national policy plan is then set out and implemented at regional and local level, which can be specially adapted and fleshed out according to local circumstances.

**Role of the government agencies**

- Need for political will at all levels of government
- No one agency is solely responsible for wetlands
- Need for coordinating agency for wetlands
- Intersect oral approach
- Federal role is to encourage cooperation with agencies and interest groups
- Respect for jurisdiction of different agencies and ownership rights
- Need for legislation to control policy and to protect interests of wise users
- Management agencies must accept the reality of multiple use of wetlands
- Substantial technical assistance may be required
- Wise use projects are an excellent mechanism for institution building

**VIII. Trans border wetland conservation**

To fulfil its obligations in this area, Cambodia:
- Gathers information on wetlands and water systems that are shared between two or more Contracting Parties where such wetlands or water systems contain at least one wetland included in the List of Wetlands of International importance

- Promotes, in consultation with contracting parties, bilateral or multilateral arrangements in respect of wetlands situated along migratory of fish and flyways which across the territories of two or more contracting parties;
- Reports on the results of these activities to each meeting of the Conference of the Contracting Parties.

IX. International laws, treaties, convention and agreement

On behalf of signatories to be a member for the conventions, Cambodia country should work to quickly fulfil the obligations under the convention, especially International Laws, Treaties, Conventions and Agreements. There are:

- The International convention on the Prevention of Marine Pollution from Ships (MARPOL CONVENTION), In 1994
- The Convention on Biodiversity, in 1995;
- The climate Change Convention, in 1995;
- The Convention on the Wetlands of international Importance (RAMSAR Convention, on 23 October 1999);
- The United Nations Convention on the Law of the Sea (UNCLOS) and the Exclusive Economic Zones;
- The Seas of East Asia (COBSEA) as the Co-coordinating Body
- ASEAN agreement;
- Biosphere Reserve
- Mekong River Commission Agreement on sustainable Development on the Lower Mekong Basin in 1995 and
- BASEL Convention (will be a member in the near future)

X. Conclusion and recommendation

The conservation of wetlands and their sustainable use in a vast areas such as Tonle Sap Lake and River, Mekong, Bassac River and Wetlands resources is a greatest task; it can be only be achieved through the concerted and coordinated efforts of all concerned: government and non-government, organizations and inviduals (including decision makers, administrators, scientists, technicians) and finally the local people. It is a common responsibility, it requires joint efforts. Cambodia is taking steps to manage its wetland along environment sound lines. Therefore, the government should increase budget. Allocation for the conservation and sustainable management of important wetland areas.