

Management of Wetland Resources in the Lower Mekong Basin: Issues and Future Directions

M. Torell, A.M. Salamanca and M. Ahmed

Abstract

The Lower Mekong Basin has extensive wetlands and these are being threatened by numerous problems. Most of these problems are interdependent and interact with one another. The lack of an appropriate definition of wetlands applicable to the region, pervasive inefficiencies and chronic lack of funds among riparian governments, and the poor appreciation of the true economic importance of wetlands and its resources are among the most prominent. The current definition, based on the Convention on Wetlands (Ramsar, Iran, 1971), is too broad when compared to the “common” understanding of wetlands as being swamps, marshes and the like, and was developed specifically for wetlands with international importance as waterfowl habitats. Furthermore, wetlands are composed of different types of resources, which require different modes of management. Often, institutional competition, overlapping mandates and sometimes jealousies occur between government departments when they try to assert their authority on a particular wetland resource and use, and put forward their development plans without considering how these may conflict with other wetlands uses. Finally, effective wetland management requires reliable statistics or information on rate of harvest of natural resources such as fish and others, fishing/harvesting methods over time in order to determine the level of exploitation, and the status of the natural resources. This information is needed to identify opportunities for expansion, to establish historical trends, and to determine when management interventions are necessary to protect the resources from being overused by other developments. In order to address these issues, ICLARM – The World Fish Center has launched a project, the aim of objectives of which are described in this paper.

Over the last decade, alarm bells have been sounded in many fora on the consequences of wetlands deterioration, and actions needed to address these have been outlined (Dugan 1990; Dugan 1991; Maltby et al. 1992; Dugan 1993; Dugan 1994a; Dugan 1994b; Maltby 1997). It was reported that by 1989 nearly half of protected wetlands in Asia were under moderate to severe threat (Scott and Poole 1989). Yet wetland loss is unabated. Direct human uses of wetlands are among the major culprits. These include use of natural wetlands for rice cultivation, deforestation, human settlements, construction of dams and navigation channels, flood protection schemes, and pesticide and insecticide discharges from agricultural lands.

Several diagnostic studies carried

out by the Mekong River Commission (MRC) and other organizations in the Lower Mekong River Basin (LMB) (Hirsch and Cheong 1996; Mekong River Commission 1997a, b; Ojendal 2000) also issued similar warnings. Ensuring sustainable and wise use of public and private wetlands and related resources in the LMB is one of the major challenges to riparian states (i.e., Cambodia, Lao PDR, Vietnam and Thailand). Among other actions, it will require an enormous amount of political will, regional cooperation, donor assistance, participation of communities, and properly crafted and functioning institutions. Institutions are crucial to any regime that will manage wetlands in the region for they influence how users

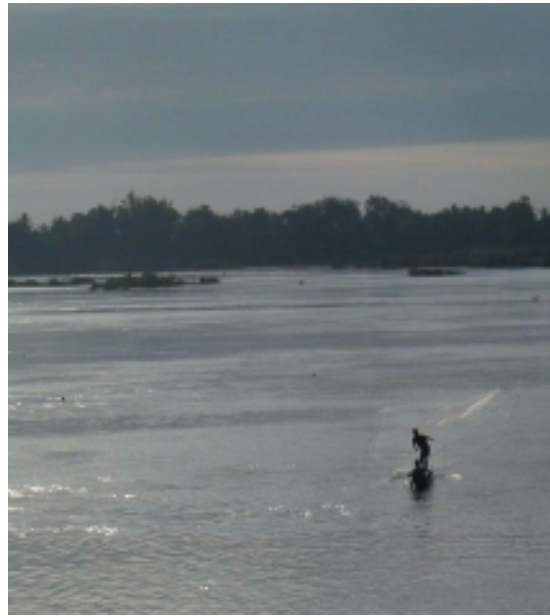
and governments interact in using and managing resources. Solutions to wetlands resources management problems are therefore rooted in changes and strengthening of institutions that deal with wetland resource use, development and conservation. This paper provides a review of the institutional issues affecting wetlands management in the Lower Mekong Basin and describes the new initiative ICLARM-The World Fish Center is implementing in the region. Three major problems are addressed in this paper. The definitional context of the term “wetlands” as understood or used in the region is a necessary starting point of discussion in order to highlight some of the seminal problems of management. Defining wetlands and classifying them into

readily identifiable units and sub-units are prerequisites to efficient planning, management and monitoring. This is particularly important in the LMB when dealing with fish habitats and their dramatic seasonal changes with which management of the resource shifts depending on the season and water level. Then institutional problems and poor appreciation of the true economic importance of wetlands and its resources are discussed before describing the new initiative of ICLARM-The World Fish Center in the region.

Definition

Based on the Convention on Wetlands (Ramsar, Iran, 1971) definition, wetlands are “areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres” (UNESCO 1994). They may therefore range from permanent or seasonal lakes, seasonally waterlogged soils, fluvial systems, estuarine systems to marine systems.

The problem with the current definition is that it is too broad when compared to a “common” understanding of wetlands as being swamps, marshes and the like, and was developed specifically for wetlands with international importance as waterfowl habitats. This definition basically covers “natural”, “artificial” and “marine” wetlands as long as the depth does not exceed 6 m at low tide. Artificial lakes and certain coral reef areas are therefore covered. The focus on waterfowl leaves out ecologically important freshwater wetlands (Erftemeijer 1999) and adoption of this definition by countries in the



E. Baran

Fishing is an important livelihood for communities in the Lower Mekong Basin.

region without any regard to the specific local contexts of wetlands glosses over the management needs of other important types of wetlands such as floodplains and seasonally flooded forests. The understanding of wetlands differs among riparian countries depending on the extent and nature of their wetlands, as well as on their association with these resources, such that there is no direct equivalent of the generic term “wetlands” in Lao, Khmer, Thai or Vietnamese.

Role of institutions in wetland management

Identifying and strengthening appropriate institutions to manage wetlands in countries in the LMB is a big challenge. Pervasive inefficiencies and a chronic lack of funds have hindered attempts to improve their management. Dugan (1990) identified five different sources of institutional inefficiency: sectoral organization of wetlands management, limited availability of management techniques for protected wetlands, shortage of qualified staff, inadequate

legislation, and limited resources.

Wetlands are dynamic and, being the transition zone between land and water, management of resources cannot be the sole responsibility of one department, as is the case in most countries. This in itself is a major source of institutional problems. Wetlands are composed of different types of resources, which require different modes of management. Often, institutional competition, overlapping mandates and sometimes jealousies occur between government departments when they try to assert their authority on a particular wetland resource and use, and put forward their development plans without considering how these may conflict with other wetland uses. But a single government authority with a broad mandate that will encompass the diversity of wetland resources is not a viable alternative either, as this may just create a large and inefficient bureaucracy. This will also duplicate or encroach into the domain of other government agencies that are responsible for a specific resource such as fisheries, land, agriculture, and forests, which



Transportation as a major form of use of the Mekong River and its wetlands.

by themselves require a separate institutional setup due to the nature of the issues they address.

In considering the institutions involved in wetlands management and conservation, it is important to understand the capability of governments for proactive management in the light of their political and economic concerns. Aside from an adequate institutional framework, financial resources and manpower are requisites to effective environmental and natural resource management.

Effective wetland management and conservation in the basin and sharing of management responsibilities among riparian countries is hampered by the absence of a coherent and strategic policy framework to guide their actions including the many joint aspects of wetlands use (e.g. fisheries and navigation). Existing wetlands policies in the riparian countries tend to rely on countless, but unrelated, legislation and mandates of various government agencies. As a result these policies are often confusing, overlapping or conflicting. Thailand is the only riparian country so far to have developed and implemented a wetlands policy, but whether it is successful remains to be seen.

Similar discussions have been carried out in Vietnam, Lao PDR and Cambodia. Cambodia and Vietnam have already drafted a National Wetlands Action Plan and these documents are being finalized.

Poor appreciation of the true economic importance of wetlands and their resources

Effective wetlands management requires reliable statistics or information on rate of harvest of natural resources such as fish and others, fishing/harvesting methods over time in order to determine the level of exploitation, and the overall status of natural resources. This information is needed to identify opportunities for expansion, to establish historical trends, and to determine when management interventions are necessary to protect the resources from being overused by other developments. Being a major wetland resource in the LMB, the fisheries sector mirrors how this lack of information is pervasive, not just in this sector but for natural resource management in general.

Based on a Mekong Committee

(1992) study, fisheries production in the four countries in the LMB is estimated at 624 301 to 887 000 t with Vietnam contributing the largest at 438 000 t. The study however reported that the production data is “generally unreliable” as it only takes into account some of the production from commercial fisheries and under represents or underestimates the subsistence or household fisheries. There are doubts also on the reliability of the information from the commercial sector. The study notes that “Subsistence and small-scale fishing, ranging from part-time fishermen operating in rivers and reservoirs to rice farmers fishing in their fields and small canals, provide the backbone of the supply of animal protein to large populations in the Basin” (Mekong Committee 1992). Thus, the total estimates of fish catch would be higher if proper statistics and resource accounting is undertaken. Current estimates by the MRC reported that the total fish catch in the basin is about 2 million t per annum (MRC 2001).

Another important aspect of fisheries in the Basin’s wetland ecosystems, aside from the harvest of freshwater fish fauna which has often been neglected, is the collection of other aquatic resources such as frogs, snakes, shells, crabs, shrimps, insects, and aquatic plants. In southern Cambodia for example, non-fish aquatic resources contribute significantly between 1/5 to 1/3 of the total household catch (Gregory et al. 1996). In Huai Nam Un in upper northeastern Thailand, wetland wildlife provides supplementary protein to the diet of rural households (Choowaew 1995) while in Nong Chan marsh in Lao PDR aquatic plants such as *Ipomoea* (water spinach), *Lemna* (duckweeds), and *Eichornia crassipes* (water hyacinth) are important sources of animal feed

and extra cash income (Choowaew 1993). Therefore, information on their level of exploitation, catch, trends, status and economic values is also necessary so that appropriate measures are undertaken to manage and conserve, as needed, these resources in a sustainable way.

Furthermore, the economic values of wetland goods and services are essential in measuring cost and benefits of large-scale developments, which are potentially environmentally unsustainable, so that responsible decisions or options are made. These values are also important in order to determine how much these resources contribute to the country's gross domestic product (GDP). Policy-makers need this kind of information so that the policies that they develop reflect the value of the resources and the issues surrounding their management and

conservation. Wild living wetland resources, particularly non-fish aquatic resources, and services are among, if not the most, undervalued resources in the LMB. The absence of this information grossly undervalues wild wetland products and services when compared with other proposed developments such as dams or wetlands reclamation for industrial purposes and intensive production of irrigated rice. In view of this, wetland goods and services therefore may appear to be easily replaceable and of no value.

Moving forward

The MRC and concerned departments in Lower Mekong riparian countries are already making good progress in addressing these issues. However, significant advances are required in clarifying

the definition of wetlands as applied in the region, the economic valuation of wetland resources and improvement in the legal and institutional operational framework for management. These are important concerns in order to produce better policy on the management of wetlands and their resources including schemes for the protection of important areas for fisheries production.

When the economic benefits derived from the goods and services provided by various types of wetlands are not clearly demonstrated, conventional development ideas such as large-scale infrastructures become more appealing because of the "more obvious" economic contribution they will make to a country's GDP. However, natural wetlands too contribute to GDP through the habitat they provide, as means of transpiration, and the resources which rural communities utilize for food especially for countries in the region where wetlands are extensive (Table 1). In addition, through the complicated biophysical properties of wetlands which regulate flooding, groundwater recharge and nutrient retention, riparian communities are able to grow important commodities, such as rice and capture fish, which are the two major staple foods in the diet of rural households. Without these basic commodities, food security among these households will be seriously threatened.

Deriving the appropriate economic value of wild wetlands resources is only one step; using it to make responsible policies and decisions is another. The second aspect to consider is strengthening legal and institutional frameworks for the management and conservation of wetlands keeping in mind the broad and multisectoral

Table 1. Wetland types in the LMB and coverage (Dubois 2000)*.

Wetland Type	Lao PDR	Thailand	Vietnam	Total Area (ha)
Pool in perennial river	2,886	-	-	2,886
Floodplain grassland	7,254	-	-	7,254
Floodplain wet rice	770,051	770,593	2,123,330	3,663,974
Floodplain trees and shrubs	59,358	55,774	-	115,132
Permanent freshwater lake	12,934	18,522	-	31,456
Permanent reservoir	83,376	32,026	-	115,402
Permanent flooded grassland	541	-	-	541
Permanent freshwater swamp trees & shrubs	27,209	-	-	27,209
Seasonally flooded grassland	1,404	-	400,260	401,664
Seasonal freshwater swamp trees	20	-	122,790	122,810
Perennial river rapid	-	81,794	-	81,794
Riverine banks beaches bars	-	1,909	-	1,909
Seasonal marsh/backswamp	-	14,892	-	14,892
Seasonal lake	-	9,651	-	9,651
Marine sub-tidal	-	-	1,040,660	1,040,660
Intertidal estuarine cliff	-	-	18,530	18,530
Intertidal estuarine saltworks	-	-	3,290	3,290
Intertidal estuarine aquaculture	-	-	126,220	126,220
Estuarine mangrove swamp	-	-	123,670	123,670
Perennial river	-	-	134,420	134,420
Total	965,133	985,153	4,093,170	6,043,456

*No data is available for Cambodia yet. The author of this compilation warned that this information should not be considered definitive due to a lack of verification from site visits.

Table 2. Relevant institutions in wetland use and management in LMB riparian countries

Type of activity	Cambodia	Lao PDR	Thailand	Vietnam
Agriculture	Ministry of Agriculture, Forestry and Fisheries	Ministry of Agriculture and Forestry,	Ministry of Agriculture and Cooperatives - Department of Agriculture	Ministry of Agriculture and Rural Development
Forestry	Ministry of Agriculture, Forestry and Fisheries – Department of Forestry	Ministry of Agriculture and Forestry	Ministry of Agriculture and Cooperatives – Royal Forestry Department;	Ministry of Agriculture and Rural Development – Forest Protection Department
Fisheries	Ministry of Agriculture, Forestry and Fisheries – Department of Fisheries	Ministry of Agriculture and Forestry - Department of Livestock and Fisheries, Living Aquatic Resources Research Center	Ministry of Agriculture and Cooperatives – Department of Fisheries	Ministry of Fisheries
Tourism	Ministry of Tourism	National Tourism Authority of Lao PDR	Tourism Authority of Thailand	Ministry of Commerce and Tourism, Vietnam National Administration of Tourism
Transport systems	Ministry of Public Works and Transport; Ministry of Industry, Energy and Mines	Ministry of Communications, Transport, Posts and Construction	Ministry of Transport and Communications	Ministry of Transport and Communication
Energy production	Ministry of Industry, Energy and Mines	Ministry of Industry and Handicrafts – Office of Hydropower	Office of the Prime Minister - National Energy Policy Office Ministry of Science, Technology and Environment - Department of Energy Development and Promotion	Ministry of Planning and Investment
Water resources, irrigation and dams	Ministry of Water Resources and Meteorology; Ministry of Industry, Energy and Mines	Ministry of Agriculture and Forestry – Department of Irrigation, Department of Hydrometeorology, Department of Promotion and Management of Industry	Ministry of Interior – Metropolitan Waterworks Authority	Ministry of Agriculture and Rural Development General Department of Hydrometeorology
Human settlements	Ministry of Rural Development Ministry of Land Management, Urbanisation and Construction	Committee on Rural Development and Management – Office of the Prime Minister	Ministry of Interior – Department of Local Administration	Ministry of Population and Family Planning
Protected wetland areas	Ministry of Agriculture, Forestry and Fisheries; Ministry of Environment	Ministry of Agriculture and Forestry – Department of Forestry, Science, Technology and Environment	Ministry of Agriculture and Cooperatives – Royal Forestry Department; Ministry of Science, Technology and Environment – Office of Environmental Policy and Planning	Ministry of Science, Technology and Environment – National Environment Agency
Enforcement	Ministry of Interior	Ministry of Interior	Ministry of Interior – Department of Local Administration	Ministry of Interior

context in which they exist. In view of this, ICLARM-The World Fish Center with assistance from Swedish International Development Cooperation Agency (Sida) has embarked on a collaborative project involving riparian national institutions as well as concerned regional and international agencies such as the Wetlands International, Asian Institute of Technology, MRC and The World Conservation Union (IUCN).

This project will analyse the present situation in the Lower Mekong riparian countries and search for possible routes towards a more coherent legal and institutional structure to manage their wetlands in a way that harmonizes with local and national customs and traditions. The development objective of the project is to enhance the quality of life of the people in the Mekong River Region by supporting environmentally sound development, and sustaining and improving the values and functions of wetlands in the Mekong River Region. It will also look at the developments in the region and their relationships to law, policy and institutions. It will identify mechanisms where community participation in wetlands management and conservation can be encouraged and institutionalized. What is needed is a mechanism of coordination that will minimize overlaps and ensure efficiency in decision-making and program/project implementation. Table 2 shows the number and extent of institutions involved in wetland use and management in the Lower Mekong River Basin. Finally, the project will analyse international and regional agreements on resource utilization and economic cooperation and their implications for the sustainable development of the wetlands and related resources in the LMB.

In summary, the research and studies component of this project will focus on: (i) review and analysis of existing laws, including customary rules, and institutions concerning wetlands use and management; (ii) identification and analysis of economic, social and cultural importance of various properties, goods and services of wetlands; and, (iii) development of approaches for building/strengthening nationally suited frameworks for a multisectoral management of wetlands based on a harmonized institutional and legal regime, and optimal economic, social and environmental benefits. The research, and associated training, will be carried out through partnerships with national aquatic research system (NARS) partners in each of the riparian countries in order to build capacities among these entities and to ensure that research funds are efficiently used. Networking will be essential to allow for sharing of information and publications.

References

- Choowaew, S. 1993. Inventory and management of wetlands in the Lower Mekong Basin. *Asian Journal of Environmental Management* 1(2): 1-10.
- Choowaew, S. 1995. Sustainable agricultural development in Thailand's wetlands. *TEI Quarterly Environment Journal* 3(2): 2-13.
- Dubois, M. 2000. Study on the MRC Wetlands Classification System Including Recommendations for its Further Development. Mekong River Commission, Vientiane.
- Dugan, P.J. 1993. *Wetlands in danger: a world conservation atlas*. Oxford University Press, New York.
- Dugan, P.J. 1991. The World's Wetland Resources - Status and Trends, p. 5-10. *In* J. Untermaier (ed.) *Legal Aspects of the Conservation of Wetlands*. IUCN, Gland, Switzerland and Cambridge, UK.
- Dugan, P.J. 1994a. Wetlands in the 21st century: the challenge to conservation science. Keynote address to the IVth International Wetlands Conference, Columbus, Ohio, USA, 14-17 September, 1992, p. 75-87. *In* W. J. Mitsch (ed.) *Global Wetlands: Old World and New*. Elsevier, New York.
- Dugan, P.J. 1994b. Constraints and opportunities for training in wetland management. *Mitt. Internat. Verein. Limnol.* 24: 365-368.
- Dugan, P.J. (ed.) 1990. *Wetlands Conservation: A Review of Current Issues and Required Action*. IUCN-The World Conservation Union, Gland.
- Erfteemeijer, P.L.A. 1999. Wetland management in South-East Asia, p. 10-16. *In* OEPP (ed.) *Proceedings of the Meeting on Wetland Situation in Thailand*, held in Bangkok during 2-3 February 1998. Office of Environmental Promotion and Policy, Bangkok.
- Gregory, R.A., H. Guttman and T. Kekputhearith. 1996. Poor in all but fish: a study of the collection of ricefield foods from three villages in Svay Theap District, Svay Rieng, pp. 29 Working Paper C-5. AIT Aqua Outreach (Cambodia), Asia Institute of Technology, Bangkok.
- Hirsch, P. and G. Cheong. 1996. *Natural Resource Management in the Mekong River Basin: Perspectives for Australian Development Cooperation, A Final Report to AusAID*, University of Sydney, Sydney. [Online]. Available: <http://www.usyd.edu.au/su/geography/hirsch/index.html> [1999, January 11].
- Jensen, J.G. 1996. 1,000,000 tonnes of fish from the Mekong? *Mekong Fish and Culture* 2(1): 1-12.
- Maltby, E., P.J. Dugan and J.C. Lefevre. 1992. Conservation and Development: The Sustainable Use of Wetland Resources. *Proceedings of the Third International Wetlands Conference*. Rennes, France, 19-23 September, 1988.
- Maltby, E. 1997. Why manage wetlands as 'natural' systems?, p. 3-7. *In* R. J. Safford, D. V. Ni, E. Maltby and V. T.

- Xuan (eds.) Towards Sustainable Management of Tram Chim National Reserve, Vietnam. Proceedings of a Workshop on Balancing Economic Development with Environmental Conservation. Royal Holloway Institute for Environmental Research, London.
- Mekong Committee. 1992. Fisheries in the Lower Mekong Basin. Main Report. Interim Committee for Coordination of Investigations of the Lower Mekong Basin, Bangkok.
- Mekong River Commission. 1997a. Inventory and Management of Wetlands in the Lower Mekong Basin Phase II. Mekong River Secretariat, Bangkok.
- Mekong River Commission. 1997b. Mekong River Basin Diagnostic Study: Final Report. Mekong River Commission, Bangkok.
- Mekong River Commission. 2001. The MRC Programme for Fisheries Management and Development Cooperation. Annual Report 2000/2001. Mekong River Commission, Phnom Penh, 10p.
- Ojendal, J. 2000. Sharing the Good: Modes of Managing Water Resources in the Lower Mekong River Basin. PhD Dissertation, Goteborg University, Goteborg, Sweden.
- Scott, D.A. and C.A. Poole. 1989. A Status Overview of Asian Wetlands. Asian Wetland Bureau, Kuala Lumpur, Malaysia.
- UNESCO. 1994. Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar, Iran 2.2.1971), as amended by the Protocol of 3 December 1982 and the Amendments of 28 May 1987, as of July 1994. Office of International Standards and Legal Affairs, UNESCO. [Online]. Available: http://www.iucn.org/themes/ramsar/key_conv_e.html [2001, July 19].

M. Torell, A.M. Salamanca and M. Ahmed
*are from ICLARM-The World Fish Center,
 Penang, Malaysia.*

