



## That Luang Marsh-An urban wetland in Vientiane, Laos PDR

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**Short title:** Wetlands reduce damages to infrastructure, Lao PDR

**Key Message:** Urban wetland provides almost 5 Million USD worth of local and regional benefits annually.

**Suggested citation:** TEEBcase by P. Gerrard (2010) Wetlands reduce damages to infrastructure, Lao PDR, available at: [TEEBweb.org](http://TEEBweb.org).

### What was the problem?

Measuring around 20 km<sup>2</sup>, That Luang Marsh is the largest urban wetlands situated on the outskirts of Vientiane City in Laos PDR. The marsh provides a range of direct and indirect critical ecosystem services to the city such as flood control, wastewater treatment and sanitation. There are 17 villages of over 7000 households ranging from rural to urban located around the marsh and dependent on it. Flooding occurs at least 6 times a year which causes damage to building, roads and transportation in the city. Agricultural expansion and urbanisation are reclaiming the marsh (1.6 per cent converted into residential settlements), consequently affecting the local livelihoods and subsistence, and the vital services of water treatment and flood management that is being provided for. It is important to note that the services they provide are directly in league with urban needs such as poverty reduction, income and employment generation and basic quality of life.

In addition, the abundant aquatic wetland resources of That Luang Marsh have declined sharply in recent decades, due in part to government development projects. Many species are virtually extinct in this area such as crocodiles (including the Siamese crocodile), herons, otters, white belly rats, and big snakes. However, That Luang Marsh still contains exotic fish species, frogs, toads, snails, June beetles, freshwater shrimps, crabs and other crustaceans. There are about 41 types of vegetation in this region that are very important for its residents as sources of food and income<sup>1</sup>. It was therefore necessary to integrate the sustainable management of wetlands into the larger urban planning and decision making process of the city.

### What was done to solve it? How were ecosystem services considered?

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<sup>1</sup> (Kyophilavong 2008)

A study<sup>2</sup> was conducted in 2004 to examine the economic value of the wetland through direct and indirect use of urban wetland. The direct use values (see table below) were estimated to be just over US\$ 2 million per year making up 40% of the total economic value of the wetland. While the indirect use values were estimated to be under US\$ 3 million and although this only represents two of the services it corresponds to 60% of the total value of the marsh.

<b>Wetland Goods - Direct Use Values</b>	<b>(US \$)</b>
Rice Cultivation	349,681
Garden Cultivation	55,017
Aquaculture Production	179,671
Capture Fisheries (fish, frogs, snails and aquatic invertebrates)	1,092,095
Other Wetland Products (wild plants etc)	354,106
<i>Sub-Total</i>	2,030,570
<b>Wetland Services - Indirect Use Values</b>	<b>(US \$)</b>
Flood protection	2,842,000
Wastewater Purification	70,088
<i>Sub-Total</i>	2,871,000
<b>Total</b>	<b>4,901,570</b>

*Summary of the Annual Value of Wetland Economic Benefits from That Luang Marsh  
(Gerrard 2004)*

#### **What was needed to solve the problem in terms of data, resources and capacity?**

The price based approach was used to frame an economic assessment of the ecosystem values of the marsh. Direct values were measured by applying market prices to wetland goods collected from the marsh. This information was collected based on interviews conducted with village authorities from all of the 17 villages located around the marsh as well as through target interviews with villagers from six of the villages. Target group interviews were conducted in 2 urban villages, 2 semi-urban villagers, and two rural villages.

To value the indirect benefits, drainage as an ecosystem service was measured by the annual value of flood damages avoided in these areas. This was calculated to be US\$ 2,842,000 by the year 2020. With regards to sanitation and waste water purification, the value of replacement costs by improving household sanitation and upgrading facilities to replace the marsh services for the next 25 years was calculated.

#### **What resulted from taking an ecosystem service perspective? Did the approach influence public management or result in policy uptake?**

The results of the study attributed the value of the marsh to be under US\$ 5 million annually. The immediate effect of such quantification was a renewed interest in protection and management of the wetland in government policy makers. During the first year after the valuation, a variety of development proposals were reviewed and rejected by the Municipal Environment Agency because of their potential to impact the ecosystem and its benefits.

<sup>2</sup> The study was conducted jointly by IUCN, WWF, the Lao National Mekong Committee, and the Science Technology Environmental Office (STEO) of Vientiane Municipality.

However in 2007 the Government of Laos announced the allocation of a large part of That Luang Marsh for urban development and housing by a group of one Laos and three Chinese Companies. The New Town project is supposedly still in the plans but was scaled back significantly in early 2008. As of mid 2010 no ground activity regarding the New Town project is evident.

Yet at the same time, building on the initial valuation study, WWF, STEO and the Wildfowl Wetland Trust (WWT) secured a grant from the European Commission to examine the feasibility of creating a constructed wetland treatment system to treat domestic and industrial wastewater while maintaining the important functions of flood detention and food web support. The project - Wastewater Treatment through Effective Wetland Restoration (WATER) - contributed to the capacity and understanding of the need to integrate wetlands into urban development plans by decision makers in Vientiane Capital. The project activities included training over 20 technical staff in participatory processes in wetland planning, management and monitoring, constructed wetland design and operation; and promoting the scope and value of wetlands to urban environments to over 15 high level policymakers through stakeholder consultation, involvement in the project steering committee and study tours in the region.

The City of Vientiane Capital is now reviewing the constructed wetland designs and looking for donor support. In conjunction with this, the Food and Agriculture Organization (FAO) has proposed a That Luang Marsh Master Plan - a document written in collaboration with local residents and government ministries which will determine the future of the That Luang Marsh ensuring that all development is in concert with the unique cultural, historical, socio-economic and ecological assets of the area. The BTL (Beung That Luang) Master Plan Project is currently being reviewed by the Ministry of Information and Culture and will hopefully start later this year.

In addition, Vientiane Capital with support from the Japanese Development Agency (JICA), is currently developing the Vientiane Master Plan for Water and the Environment. This draft highlights the value of That Luang Marsh, referring heavily to the initial ecosystem valuation study, and the importance of all urban wetlands and their role in city development and design.

#### **References:**

Gerrard, P., 2004, Integrating Wetland Ecosystem Values into Urban Planning: The Case of That Luang Marsh, Vientiane, Lao PDR, IUCN – The World Conservation Union Asia Regional Environmental Economics Programme and WWF Lao Country Office, Vientiane

Kyophilavong, P. 2008, 'The impact of irrigation on aquatic wetland resources: a case study of That Luang Marsh', Lao PDR, Economy and Environment Program for Southeast Asia (EEPSA).

**Acknowledgement:** Dr. Phouphet Kyophilavong ([phouphet20007@hotmail.com](mailto:phouphet20007@hotmail.com)) for reviewing the case