Analyse Wetland Economic Value: Case Study in Xuan Thuy National Park, Viet Nam

Nguyen Thanh Nga, Yoshiro Higano, Helmut Yabar
University of Tsukuba
Graduate School of Life and Environmental Sciences
nganguyen66@gmail.com

Abstract
Wetland in Xuan Thuy National Park, the first Ramsar site in Viet Nam directly or indirectly provides livelihoods for more than 48,000 local people living in the buffer zone as well as people in neighbour areas. However, Xuan Thuy is now facing with negative changes and degradation of natural resources because of unsustainable livelihood practices of local communities, limited capacity of human resource and global climate change. This study provide information on current situation of wetland using and management in Xuan Thuy National Park. Direct economic value of wetland in Xuan Thuy National will be estimated by using market price approach and travel cost method. The results of this study can be used for making trade-offs among alternative management options for wetland in this area.

Keywords: Xuan Thuy National Park, wetland, economic value, market price, travel cost method

1. Introduction
Wetlands, as defined by the Ramsar Convention, cover a wide range of habitat types such as rivers, lakes, coastal lagoons, mangroves, peatlands and coral reefs and are considered as a homeland of a variety of flora and fauna and provide tremendous economic benefits. There is a great diversity of wetlands in Viet Nam that provide a large range of resources, biodiversity, functions and important social, economics and cultural values. These wetlands play a vital role in the lives of millions of Vietnamese local people and social-economic development of the country.

Located at the estuary of the Red River in in Nam Dinh Province, about 150 km from Ha Noi, Viet Nam, Xuan Thuy National Park is the first Ramsar site in Viet Nam with more than 15,000 hectares in total area and viewed as a typical wetland ecosystem of national and international importance and the basis of livelihood of more than 48,000 local people. However, Xuan Thuy National Park is now under a number of threats and problems including resource overuse and mismanagement. Large areas of the wetland have been reclaimed for the aquaculture and agriculture activities, fishery resources have decreased due to over-exploitation and a large number of mangrove areas have been destroyed because of aquaculture, especially intensive shrimp farming. Moreover, the ecosystem is being polluted due to chemical waste from agriculture cultivation and the increasing population in the buffer zone with heavy population density exerts additional pressure to the wetland conservation and management in the region. Therefore, one of the most serious challenges of the local authority is to conserve the natural value of wetlands while enhancing the livelihoods of local people.
Economic valuation can provide useful information to wetland management. Information on the rate of harvest of natural resources, harvesting methods in order to determine the level of exploitation, and the overall status of natural resources are needed to effective wetland management. Moreover, the economic values of wetland goods and services are important in cost benefit analysis of development and help decision makers to make the best choice.

By using market price approach and travel cost method, this study estimates direct value of the wetlands in this area. The information on direct economic value provides evidence of monetary benefits of wetlands to community and managers and gain their support for conservation of wetlands. The results of this study is proposed recommendation for making trade-offs among management options for the wetlands in Xuan Thuy National Park.

In this paper, Section 2 presents background to wetland in Xuan Thuy National Park, socio-economic feature, challenges in wetland resource use and management. Section 3 describes methods applied in the paper and data collection. Because the study is now in the process of implementing, expected results are presented in Section 4.

2. Background to Xuan Thuy National Park

Xuan Thuy is the 50th Ramsar site worldwide (1989) and the first Ramsar site in the Southeast Asia. In 2003, the Vietnamese government officially designated Xuan Thuy as a National Park in recognition of its high biodiversity and productivity resulting from the density of flora and fauna species located in this region. Xuan Thuy National Park is a vast wetland, which covers more than 15,000 hectares in total area, with 7,100 hectares comprising the core zone and 8,000 hectares comprising the buffer zone (Nhuan et al. 2009). All of the land in Xuan Thuy National Park is very low lying, ranging in altitude between 0.5 and 0.9 meters above sea level.

Fig.1. Map of Xuan Thuy National Park.

Source: (2)
Endowed with rich alluviums, Xuan Thuy National Park boasts a unique wetland habitat with diversified species of flora and fauna, especially migratory birds. Until now, it has 150 species of vascular plants, 120 of which thrive particularly well in the wetland habitat. 111 aquatic plant species have been recorded. Certain species of seaweed in particular are of high economic value. Over 500 species of benthos and zooplankton (shrimp, fish, crab, oysters, etc.) have also been identified. Xuan Thuy is also home to 219 species of birds from 41 families and 13 orders. Specially, nine species of birds designated as endangered by the International Red Book have been sighted in Xuan Thuy: Western Curlew, Black-faced Spoonbill, Sauber's Gull, Painted Stork, Asian Dowitcher, Spoon-billed Sandpiper, Spot-billed Pelican, Nordmann's Greenshank, and Chinese Egret (11).

The aquatic biodiversity of this wetland ecosystem provides food and wetland-dependent livelihood for local people in five communes in buffer zone namely Giao Thien, Giao An, Giao Lac, Giao Xuan, and Giao Hai with population above 48,160 people, 12,080 households in 2009 and area about 38.66 km$^2$ (2009) and other communes in neighbouring areas (2). Their livelihood is primarily relying on wetland resources through main economic activities such as aquaculture activities, especially shrimp and clam farming and eco-tourism.

However, there is a number of critical problems in wetland resources using and management in Xuan Thuy National Park. These include over fishing, overexpansion of aquaculture, water pollution, degradation of biodiversity and conflicts between different interested groups. Specially, among 48 thousands of local people living in the buffer zone, nearly 50% of them have livelihoods and incomes dependent on wetland resources (3). At the management level, there is a number of governmental institutions that have responsibilities for Xuan Thuy Ramsar site, but lack of effective coordination and cooperation mechanisms.

Major threats and challenges to Xuan Thuy National Park are a high growth rate of population (1.7% per year) with high population density (1,246 person per km$^2$), a lack of appropriate of human capacity, weak community awareness and impacts of global climate change. 90 percent people were interviewed in one research conducted in 2009 answered that it is possible to use modern tools to collect aquaculture products in wetland area (3). While social factors such as number of fishermen, aquaculture farming area do not decrease, pressure of economic activities on wetland resources is becoming much bigger.

Consequently, Xuan Thuy is now facing with various environmental and social issues. Beside challenges such as climate change, pollutants from upstream of Red River, three main groups of issues in Xuan Thuy National Park keep remaining as identified in the strategic plan (2008) are (i) negative changes and degradation of natural resources, (ii) unsustainable livelihood practices of local communities, and (iii) limited capacity of human resource

3. Methodology

3.1. Total Economic Value

Total Economic Value of wetlands includes both use and non-use value. Use value can be derives from people direct or indirect uses of wetlands through wetland goods and services. Direct uses of wetlands could involved both commercial and non-commercial activities such as
harvesting of fish, collection of fuel wood and use of wetland for recreation. Indirect use values refer to values provided by wetlands that maintain and protect nature and human systems through services such as maintenance of water quality and flow, food control and storm protection, and the production and consumption activities they support (5). A classification of Total Economic Value for wetland is presented in the Table 1. Because of time and resource limitation, we focus on estimating direct value of wetland in Xuan Thuy National Park.

**Table 1:** Classification of total economic value for wetlands

<table>
<thead>
<tr>
<th>Direct Use Value</th>
<th>Indirect Use Value</th>
<th>Option Value</th>
<th>Non-use Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish harvest</td>
<td>Nutrient retention</td>
<td>Potential future uses (as per direct and indirect uses)</td>
<td>Biodiversity</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Flood control</td>
<td>Future value of information</td>
<td>Culture heritage</td>
</tr>
<tr>
<td>Fuelwood collection</td>
<td>Storm protection</td>
<td></td>
<td>Bequest values</td>
</tr>
<tr>
<td>Recreation</td>
<td>Ground water recharge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>External ecosystem support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wildlife harvesting</td>
<td>Micro-climatic stabilization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peat/Energy</td>
<td>Shoreline stabilization, etc.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Barbier et al (1)

3.2. Market Price Method (MPM)

Market price is a straightforward method to estimate the value of wetland goods. Market prices reflect what people are willing to pay for wetland products, the value they place on them. In this study, we apply a MPM to estimate direct use values of wetland in Xuan Thuy National Park. The direct values can be calculated from main resource-based economic activities in this area included shrimp, clam, scab farming and honey collection. When these products are sold in the market, market prices are used to calculate the generated gross income. We also calculate the opportunity cost of time and labour spent in collecting and producing these wetland products. (5)

3.3. Travel Cost Method (TCM)

The travel cost method is used to estimate economic use values associated with ecosystems or sites that are used for recreation. The basic premise of the travel cost method is that the time and travel cost expenses that people incur to visit a site represent the “price” of access to the site. Thus, peoples’ willingness to pay to visit the site can be estimated based on the number of trips that they make at different travel costs. This is analogous to estimating peoples’ willingness to pay for a marketed good based on the quantity demanded at different (13). In this study, TCM is applied to estimate the wetland economic values of eco-tourism in Xuan Thuy National Park.

3.4. Data collection
To implement this study, we use the secondary data from previous research and carry out the survey in five communes located in the buffer zone. Household questionnaire surveys were conducted in July and August, 2010 to gain primary data on quantities and cost in collecting and producing wetland aquaculture products. Corresponding household number of each economic activities are 30 households for shrimp farming and 41 households for clam farming. Two different questionnaire surveys are going to conducted in November and September, 2010 for domestic and foreign tourism to calculate economic value of eco-tourism activities.

4. Expected Results

Based on collected data, we are in the process of calculating the net benefit of each wetland resources-based economic activities that includes shrimp, scab, clam farming, honey collection and eco-tourism in Xuan Thuy National Park. The direct value of wetland in Xuan Thuy will be analysed and compared with other previous research at the same place and other wetland areas in Viet Nam. We also analyse the cost-benefit of each economic activities with the harmful impact on environment and wetland natural resources of Xuan Thuy. The expected outputs may be useful for policies and decision making trade-offs among alternative management and use options of wetland in this area.

The study will be completed in April, 2012.
References


(2) CORiN-ASIA Viet Nam. Report for monitoring the social impact and evaluate potential vulnerability of wetland resource-based livelihood activities in Xuan Thuy National Park, Nam Dinh; 2009

(3) CORiN-ASIA Viet Nam. Wetland management: Capacity Building at the local level towards poverty reduction in Xuan Thuy National Park, Nam Dinh, Viet Nam, 2010


(7) Xuan Thuy National Park Management Board. Report of tourism in Xuan Thuy National Park, 2008


(10) Vietnam Environmental Protection Agency. Overview of wetland status in Viet Nam following 15 years of Ramsar Convention Implementation, 2005

(11) http://www.vuongquocgiaxuantuy.org.vn

(12) http://www.vea.gov.vn

(13) http://www.ecosystemvaluation.org/travel_costs.htm