Benefits of Ecosystem Services provided by Thai Thuy Wetland in Vietnam

Ministry of the Environment, Japan

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Photos provided by BirdLife International and Viet Nature

Thai Thuy Wetland

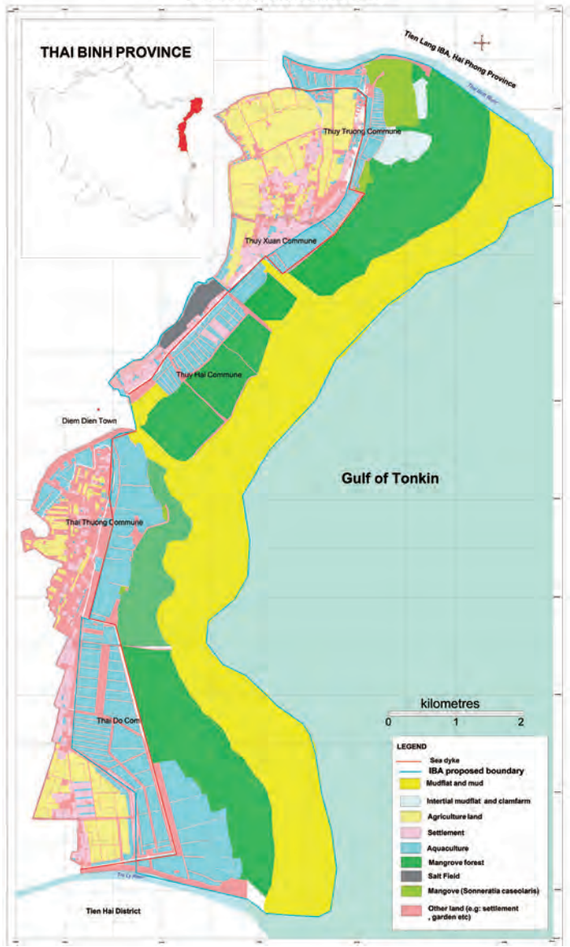
Basic Information

Thai Thuy wetland is one of the key wetland sites in the Red River Delta and it is identified as an Important Bird & Biodiversity Area (IBA)*. Thai Thuy district has 16 km of coastline and is bordered by the Tra Ly river to the south and Thai Binh river to the north. The IBA site covers 6,981 ha of the coastal area and is bisected by the Diem Ho river. To the south of the Thai Binh river mouth are located extensive areas of mudflats, farmed as a result of sediment deposition. To the west lies an area of salt pans and adjacent to the Tra Ly river is a region of aquaculture ponds. The wetland brings significant benefits to not only the wildlife but also local people.

Since the area is recognized as globally significant for biodiversity and ecosystem services, the Ministry of Natural Resource and Environment (MONRE) has a project aimed at establishing new wetland conservation reserves in Thai Binh and Thua Thien Hue to ensure the integration of wetland conservation into wider linked wetland landscapes.

*IBAs are identified using internationally agreed criteria applied locally by BirdLife Partners and other experts for globally and regionally threatened species, species with highly restricted ranges, bird communities restricted to biomes and internationally important congregations of birds.

Habitat and Land-use of Thai Thuy Wetland Area
Thai Binh province, Vietnam



Land use	Area (ha)
Intertidal mudflat	3,766
Mangrove forest	1,754
Aquaculture	1,411
Salt farm	50
Total	**6,981**

Map and land use of Thai Thuy Wetland

Importance of Biodiversity & Ecosystem services

Ecosystem services are the benefits that people receive from ecosystems and we depend on the services to produce our food, regulate our water supplies and climate, and protect us from extreme weather. A number of ecological and environmental processes and functions, such as soil formation and nutrient cycling, underpin the ability of an ecosystem to deliver services which result in 'goods' that are valued by people. We also value them in less obvious ways: contact with nature can contribute to spiritual experience, provide recreational enjoyment and is known to have a positive impact on long-term health and happiness. Thus, the economic, health, and social benefits that we derive from ecosystem services are vital for human well-being.

Thai Thuy wetland provides various benefits. Local communities living in five villages located near the IBA harvest food from the wetland. The mangroves provide a protection function from storms for local communities and the global benefit of climate regulation. The wetland also conducts water purification. There are wetland benefits to wildlife as well; it provides a home for migratory and residential birds, amphibians, fish, insects and aquatic plants etc. Among the waterbirds, the site supports threatened species including Spoon-billed Sandpiper (CR), Black-faced Spoonbill (EN) and Baer's Pochard (CR).

Major Ecosystem Services provided by Thai Thuy Wetland

Harvested Wild Goods

© One of the major industries in Thai Thuy is fishing and local people depend on fish from the wetland and the surrounding marine area. Shellfish are also harvested from the mudflat area of the wetland.

Cultivated Goods

© 20% of the IBA area is covered by aquaculture. Shrimps, fish and also seaweed are cultivated in ponds. Clams are cultivated and harvested in the mudflat area.
Salt is produced by using the sea water but recently the number of people engaged in this activity has reduced due to the difficulty to continue on a commercial basis.
A small amount of bee honey is also collected by breeding bees in the mangrove for family use.

Climate Regulation

© The wetland contributes to regulating the global climate through storage of carbon. Locally, water moderates the climate by absorbing heat by day and releasing heat at night.

Disaster Risk Reduction

© Mangroves in wetland areas can reduce the impact of coastal disasters such as flooding and storm damage. Previous research in Vietnam shows that the damage to the sea dyke and coastal communes by typhoons has been reduced by this function of mangroves.

Eco-tourism

© Eco-tourism such as bird watching and walking in the mudflat has not been developed at Thai Thuy but there is potential to attract tourists. Well managed eco-tourism can provide benefits not only for tourists, but also for local people as an income source.

Water Purification

© The mudflat conducts water purification through the activities of living organisms such as clams, microalgae and bacteria in the mud. Mangroves also have a waste treatment function and these functions are vital to maintain seawater quality.

Valuation of the Ecosystem Services

Thai Thuy wetland provides various ecosystem services. The economic value of a small subset of these services was estimated using a rapid methodological approach.

Exchange rate: 22,300VND/USD

Benefit

Harvested Wild Goods $2.2 million/year

Fish harvested in Thai Thuy district $1.37 million/year [1]
Shellfish collected in the mudflat $0.87 million/year

Cultivated Goods $ 11.7 million/year

Fish and Shrimp harvested from semi natural aquaculture $0.58 million/year ($2,524/ha/year) [2]
Fish harvested from intensive aquaculture $8.93 million/year ($7,558/ha/year) [2]
Clam harvested from clam culture in mudflat $ 1.93 m/year
Salt production in the salt farm $0.22 million/year [3]

Disaster Risk Reduction $ 1.1 million/year

Protective benefits of mangrove forest $1.05 million/year [4]

Climate Regulation $60.3 million

The benefit of global climate regulation from the carbon stored in the wetland is $ 60.26 million. This is an one-off stored value, i.e. not an annual value. [5]

Net Benefit : $ 15.0 million / year
Plus $ 60.3 million of carbon storage function

*1 Since there is no boundary in marine area, the contribution of mangroves to production function for wild fish was estimated as 25% according to previous research (Samonte-Tan, 2007).

*2 Since the sample size for aquaculture is limited, confidence in the results is low and should be improved by further survey with wider sample size.

*3 In other economic calculations, family labor cost is deducted in order to capture the net benefit from ecosystem services. However, family labor for salt farming was not deducted since most of them are elderly people or who are unable to engage in other jobs.

*4 The value was estimated by using previous research undertaken by the International Federation of Red Cross and Red Crescent Societies in a report entitled “Case study: Mangrove plantation in Viet Nam: measuring impact and cost benefit”

*5 There is no fixed price of carbon and the market price is highly variable. In this survey, the price of Plan Vivo certification ($31.69 MgC, in 2016) was used for the calculation. This is the price that a buyer would pay for carbon credits from the Plan Vivo certification scheme, if there was to be a carbon trade project established at Thai Thuy.

Interpretation of the Results

The value of ecosystem services at Thai Thuy were estimated based on existing data and simple interview surveys. Since only some of the major ecosystem services were selected for the survey, this is a minimum estimate. There is also need for caution in the interpretation.

- ✓ These economic values are estimates only and should be taken with caution due to limited sample size in the surveys
- ✓ Less important services such as bee honey and harvesting sea grasses were excluded
- ✓ Water purification function was excluded since it was difficult to estimate, although it is an important function
- ✓ The value of wider biodiversity is not covered in the valuation since it cannot be measured with monetary value in a straightforward way.
- ✓ The monetary value presented will vary year by year along with the market situation.
- ✓ It is uncertain that the estimated value would be maintained at the same level in future since the survey did not include the sustainability of resource use.

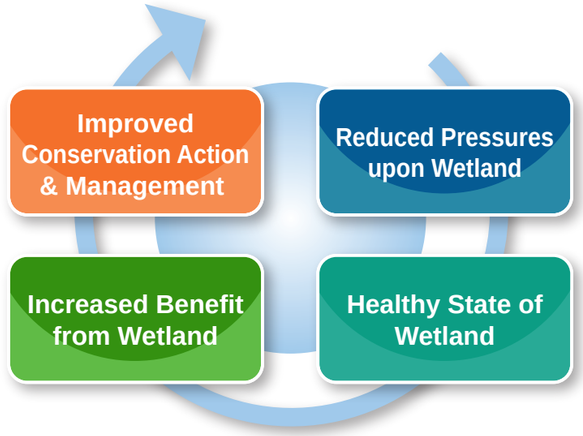
Despite the above caution, Thai Thuy wetland provides multiple benefits, some of which can be estimated using economic valuation.

Threats to the wetland

The following activities are major threats to wetland. In order to receive the benefit derived from the wetland, such activities need to be monitored and controlled in a sustainable way.
- Electric shock fishing : it causes overexploitation of fish resources
- Industrial and agricultural water pollution : contamination of the water affects human health and threatens the existing biologically diverse plant and animal species.

To receive this benefit sustainably…for future generations

Appropriate conservation action and management reduces pressures on the wetland and helps to maintain good ecosystem condition of the wetland. Healthy ecosystems deliver benefits sustainably to people.



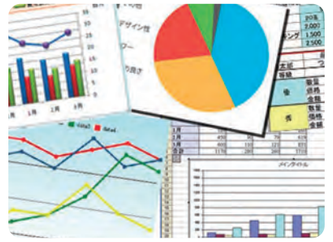
How to Measure Ecosystem Services?

This survey was conducted by using a rapid methodological approach, which is simplified and adjusted from a guidance toolkit called “TESSA” –Toolkit for Ecosystem Service Site-based Assessment. In “TESSA” , the step-by-step process for measurement is designed as a decision key and it leads the user through a series of steps or questions (For more information: http://tessa.tools/). In order to estimate the value of ecosystem services rapidly and simply, existing research was used as much as possible and simple interviews were conducted in order to complement the existing information.

Why value ecosystem services ?

Despite their importance, ecosystem services are consistently undervalued in conventional economic analyses and decisions. The valuation results help people to recognize ecosystem services better and the understanding can lead to wise use of the wetland such as sustainable agriculture and fisheries. It can also lead to better policy formulation, resulting in land-use and management options that deliver more effective conservation, resilient livelihoods and poverty alleviation.

The area of the IBA (Important Bird and Biodiversity Area) was selected as the site for this measurement. Background information and previous research was collected for scoping and identifying the beneficiaries.



All data collected during the survey were analyzed with the existing data and literature. For the climate regulation and disaster prevention, desk top analyses were conducted.

Preliminary work & Rapid appraisal

- Define site, based on biological importance and perceived threats
- Explore policy context
- Identify the stakeholders
- Identify habitat, services and beneficiaries

Methods selection

- Select relevant services to assess
- Select appropriate methods for each service

In this survey, four ecosystem services were identified and methods for each service were selected
- Harvested wild goods
- Cultivated goods
- Disaster risk reduction
- Global climate regulation

Data acquisition

- Collect/collate data for site

Data was collected from existing data and simple interviews. In order to identify missing services and collect information, a stakeholder meeting was conducted with the representatives of the area.

Analysis and communication

- Analyse data
- Communicate messages