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THE PRACTICE OF WETLAND ECOSYSTEM SERVICES' EXPLOITATION AND UTILIZATION IN DOWNSTREAM MEKONG REGION AND SHORTCOMINGS IN REGIONAL WETLAND EXPLOITATION AND MANAGEMENT POLICIES

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Wetlands in the Downstream Mekong Delta (also known as the Cuu Long River Delta), which is estimated to cover an area of 39,000 km^2, take a great part of the whole territorial nation. The wetlands are characterized by a large number of attributes, functions and values, which are essential for regional, and even national, socio-economic development. It is the Downstream Mekong Delta that is the nation's largest region of paddy production and aquaculture. The wetlands in the Delta once were areas of high biodiversity, plentiful genetic source, and numerous endemic and rare species.

Because of the lack of understanding of wetlands' characteristics and the interaction between wetland components, and the severe pressure of nation's and household's economic growth and overpopulation, along with the bad management performance and irrelevant policies, the regional wetlands have been messily exploited, which led to dozens of problems including ecological imbalance, exhausted resources, degraded environment, largely narrowed wetlands, fierce changes of habitats and highly-endangered state of rare species.

1. The wetlands in Downstream Mekong - areas of rich resources and high biodiversity

1.1. Natural resources

When conducting an assessment on development potential of a territory, apart from social conditions, such natural conditions as geographical location, climate, environment and natural resources including biological resources are key determinants. The development research in recent time is based on territory's basic studies, potential detection and recommendation of relevant development orientations.

The Downstream Mekong Delta covers an area of approximate 4 mil ha, of which the Dong Thap Muoi (The Plain of Reeds) that accounts for around 697,000 ha is the greatest wetland in area and typical for the whole wetland region of Lower Mekong. In the Delta, about 2.6 mil. ha (or 65% of entire region area) are arable lands.

The wetlands in the Delta are diverse including fresh-water bodies and coastal brackish-water bodies. The fresh water bodies are in forms of river, lakes, ponds, swamps, paddy fields. In coastal zone exist estuarine water bodies such as estuarine tidal flats, mangrove, aquacultural fields. The wetlands in the Downstream Mekong Delta present more favourable conditions for aqualife to develop in both species composition and quantity than those in other regions. The favourable conditions, in regard to plentiful wetland types, relief, landscapes and climate, of the region generate the diverse and typical aqualife system, including Macrophyta with mangrove species, the Plankton, the Benthos, the Necton, of which there are many rare species as well as many of high economic value.

It is noted that water bodies in coastal and estuarine areas in the Delta are rarely affected by typhoons, which is very good for aquaculture and sea-fish catching. Wetland ecosystems in the Downstream Mekong present the high productivity and their biomass is the essential input for higher natural aqualife and bred species.

With such the favorable conditions as mentioned above, the wetlands in the Downstream Mekong Delta are used for aquaculture at a huge intensity. The coastal water bodies are to breed shrimp, crab and seashell. The inland ones are used for fish, including breeding patterns as in pond, in fish cage along river and in paddy field. General speaking, the aquaculture sector has brought farmers much benefit and provided the regional economy with a great proportion. In Ca Mau province alone, the aquacultural products' export turnover in 2002 reached an amount of 350 mil. dollars.

1.2. Biodiversity

1.2.1. Diversity in species composition

Flora

The terrestrial flora in the Cuu Long Delta presents the not-very-large number of species. Current records show the identification of 640 species within 133 vascular plant families, which accounts for 6% of total number of vascular plant species in the entire nation. Such families with considerable quantity of species include: Poaceae: 75 species; Cyperceae: 56; Fabaceae: 36; Asteraceae: 25; Euphorbiaceae: 19; Rubiaceae: 19; Curcubitaceae: 13; Apocynaceae: 12; Rhizophoraceae: 12; Verberaceae: 11; Araceae: 11.

It is the plant composition that obviously shows the wetland characteristics of the study area represented by the large species amount of families Cyperaceae, Thyphaceae, Lemnaceae, Nymphaceae and hydrophyte species within families Poaceae (Echinochloa, Erianthus, Saciolepis, Oriza,..) Thyphaceae (Thypha,…). Such species typifying the saline habitat (Rhizophora, Sonneratia, Bruguier, etc.) or brackish habitat (Nypa, etc.) have confirmed to exist through surveys.

There are 9 rare species that are listed in Vietnam Redbook, including *Zygostelma benthami, Lumnitzera littorea, Dipterocarpus alatus, Hopea odorata, Aglaia cucullata, Ozyza rufipogon, Elaeocarpus hygrophylus, Sindora siamensis,* and *Hydnophytum formicarum*.

Fauna

It has been currently identified in the region:

- 219 bird species within 57 families (Roger Safford and Edward Maltby in their study (2002) confirmed the number of 889 bird species in the region);
- 75 insectan species;
- 39 mammal species;
- 32 reptilian species; and
- 42 amphibian species.

Among identified bird species, water-bird ones account for a greater number. The species number of other animal groups is not large, which truly reflects the nature of animal species composition in wetland ecosystems.

There are 14 rare species, including *Houbaropssis benganensis, Grus antigone, Anbinga melanogaster, Pseudibis davisoni, Threskiornis melanocephalus, Pelecanus philippinensis, Mycteria leucocephala, Anastomus oscitans, Leptoptilos javanicus,*

Ploceus hypoxanthus, Numenius madagascariensiss, Limnodromus semipalmatus, Vanellus cinerius, and *Egretta eulophotes.*

1.2.2. Diversity in habitat

Table 1: **Habitats in the Cuu Long River Delta**

Type	Habitat
Marine/coastal	coastal mudflat
	coastal aquaculture
	coastal mangrove plantation
	coastal wet rice
	coastal non-tidal grassland
Estuarine	estuarine mudflat
	estuarine salt works
	estuarine aquaculture
	estuarine mangrove plantation
Riverine	perennial rivers and canals
	floodplain grassland
	floodplain wet rice
	floodplain other crops
	seasonally flooded Melaleuca plantation
Lacustrine	permanent Melaleuca forest reservoir
Palustrine	seasonally flooded grassland
	seasonally flooded Melaleuca plantation
	seasonally flooded wet rice

Source: Birdlife International-Vietnam Program, Institute of Ecology and Biological Resources. Conservation report No. 13, 2000

2. The wetlands in Downstream Mekong - conflicts between ecosystem's exploitation and conservation

2.1. Wetland ecosystem services

2.1.1. Provisionning services

Provision of food

Provision of food is the most important services of ecosystems in the Cuu Long River Delta. Presently the region harvests totally 16.17 mil. tons (by rice). Unlike other regions in Vietnam, in the Cuu Long River Delta, the paddy (oriza sativa) absolutely dominates in the agricultural crops structure. Corn (Zea mays), millet (Setaria italica), cassava (Manihot esculenta*)* are not frequent in small areas.

For the past 30 years, the food provisioning services in the Cuu Long River Delta has intensively changed in both quality and quantity. Under pressure of social development demands, the political orientation of intensively and extensively exploiting the Delta was initiated, which corely aimed at making the Delta the greatest food-provisioning region of the nation. Then began the mightiest changing era of regional ecosystems, at which a large area of wild wetlands in the Delta has been converted to rice fields.

Provision of foodstuff (*exclusive aquacultural products*)

Main foodstuff provided by the ecosystems includes animal meats and various vegetables. Meats come from reptilians, mammals and birds. Animal species that are often used as a meat provisioner for human are recorded to encompass 10 reptile species (as snake, tortoise, varan), 2 amphibian species, 6 mammal species (mouse, pangolin, viverrine, weasal, bat, etc.).

Along with foodstuff coming from animals, vegetables and spiced plants, which are plentiful and diversified, are seen as a considerable foodstuff source. It has been listed till now 62 plant species that are used as vegetables and spiced plants in the region.

Fruit trees: include 46 species, of them many appear to have high economic values such as longan, mango, star apple, mangosteen, etc.

Provision of medicinal materials

In the region, 280 medical plant species have been identified, 150 of which are frequently extracted and come into use. Upon demand, many alien medical plant species have been grown here, which makes the regional medical plant composition more diversified.

Table 2: **The Cuu Long River Delta ecosystem provisioning services**

Item	Unit	1990	1995	2001
1. Food output by paddy	10^6 ton	7.547	13.986	16.172
- Paddy	10^6 ton	7.523	13.885	16.072
- Corn	10^6 ton	0.0232	0.100	0.0938
2. Buffalo	indvdl.	154,056	124,588	63,538
3. Cow	indvdl.	186,017	149,872	197,210
4. Pig	10^6 indvdl.	1.118	2.408	2.978
5. Poultry	10^6 indvdl.	18.174	34.052	44.212
6. Expltd. Timber output	m^3	49,652	315,631	459,262
7. Expltd. Fuelwood output	10^6 ster	0.512	2.163	3.696

Item	Unit	1990	1995	2001
8. Caught sea product output	Ton	126,398	421,286	648,121
9. Caught aqu. Product output	Ton	12,860	132,610	218,486
10. Brding aqu. product output	Ton	20,884	261,797	414,386
11. Export turnover	10^6 USD	338.396	730.485	1,468,946

Provision of construction and fuel materials

The ecosystem provision of construction materials roles an important position in the Cuu Long River Delta. About 85% of local population are using plant-originated materials for constructions (house, breeding facilities, …). Construction materials fall into two following groups:

- Timber trunk for house frame, usually of *Melaleuca cajeputi*
- Leaf stem as materials for roof and wattled wall, usually of *Cocos nucifera*, *Nypa fruticans*.

Fuel materials, which are quite plentiful, mainly come from mangrove (inclusive plantation), Melaleuca forests and estuarine forests. Total area of the region accounts for 280,480 ha (of which 58,136 ha are natural and 222,344 ha are planted). The mangrove has the high possibility of increasing stock and, hence, provides a great deal of timber and fuelwood.

Provision of bio-active substances

The regional ecosystems' provisioning potential of biochemical substances is great. It has been identified 16 plant species providing toxic products, 28 species providing color products and 21 species providing tannin. Besides, biosubstances could be extracted from venom of snakes, scorpions and honeybees.

Provision of fresh water

The fresh water in the Cuu Long River Delta comes from three sources: rain water (estimated 80 bil. m^3/year), river water (508 bil. m^3) and groundwater (the groundwater stock with salinity of less than 1 g/l can afford the extraction rate of 1.5 mil. m^3/day), which are sufficient to meet the expected demand to year 2010 and the rural drinking water needs for coming decades.

2.1.2. Regulating services

Alum soil regulation

The alum soil that is rich in pyrite (Fe2S) covers 40% of total regional area. Wetland ecosystems are the helpful factor preventing Pyrite from being oxidized to form Sulphate as well as dissolving and washing-away generated acid.

The seasonal inundation and flood acts as an effective alum-washing tool. In the past few years, the sense of initiative in irrigation and drainage has vanished the natural alum washing process, that leads to the heavier impacts on alum on agriculture.

Fresh water regulation

The Melaleuca forests in the Cuu Long River Delta are recognized to play an vital role in regional water regulation. In rainy season, a great amount of rainwater is absorbed and stored in peat layer and in artesian waters underneath the forest, which, in dry season, is gradually perspired to regulate the environmental water in the site and the surroundings. The stored water quantity in Melaleuca forest is great, indeed, the "water loading efficiency" of Melaleuca forested areas is highly evaluated. Besides, the Melaleuca forest is admired in term of water purification (input water to local human and agriculture is naturally purified by the ecosystem).

The web of rivers and canals in the region, along with a great number of ponds and lakes, also takes part in the regional water regulation.

2.1.3. Cultural services

The region with poetic landscapes is inspirational and, at the same time, is the birth place of many an art performance such as Ca nhac tai tu (amateur singing), Ca vong co, etc.

Sightseeing on rivers, in orchards and trade villages is a strong point of the regional tourism even though it is not well-organized.

Bird sanctuaries and special use forests (Melaleuca, mangrove) could be constituted to be eco-tourism sites.

Folk-tourism: with exploitation of historical vestiges, religious work (Khmer churches, Ba Chua Nui Sam temple, etc.), traditional festivals (Ngo junk competition, etc.).

2.2. Changes in land use - the gain, the loss, and arising conflicts

2.2.1. Conversion of wild wetlands into paddy fields

In the Downstream Mekong Delta, the conversion of wetlands into paddy fields has been taking place for generations. Being the greatest delta of the nation, the paddy production of the region is intensively developed. Rice has become the key product for not only the domestic food security but also the national export-led economy. Recently, the total area

of paddy cultivation in the region is estimated to be 700, 000 ha, 600, 000 ha of which locate in flood areas.

In order to develop agriculture, the irrigation systems have been intensively and extensively built. Within 20 years from 1976 to 1996, the region was invested, by both local and central government, with a total amount of VND 274.149 bil. to construct and improve 560 irrigation canals in Long An subregion. In addition, the investment for irrigation systems from local farmers accounted for VND 128.880 bil. Total length of irrigation canals that were newly constructed and improved in the period is 3,200 km.

The conversion of an area of barren lands plus alum-rich into a granary with annual output of 2.7 mil. tones was evaluated to be a landslide success, a breakthrough never seen before.

The rice-led economy of the Delta, however, encounters difficulties and risks, in particular,

- The regional economy will rapidly go down once the rice market gets into trouble;
- The mean income of rice farmers is low, which limits their investment to production;
- Extensive development of rice is facing difficulties with regard to limited cultivation area while the intensive development encounters technical and financial investment;
- The flooded areas, especially the Plain of Reeds, was alum swamps and naturally characterized by the biomes that were predominantly represented with Melaleuca, lotus, etc and a plenty of wildlife. The Plain of Reeds was acting as a water storage tank, a flood mitigation element and a place of high biodiversity, which is now a national granary with very low level of biodiversity. The increase of rice area and annual rice crop number (up to three) leads to dry state of many areas in both early and late flood season, which results in narrowed habitats of many natural aqualife, especially dark-skin indigenous fish such as those of Channidae, Anabantidae, Claridae, Sybranchydae and Notopteridae.

2.2.2. Ponding for aquaculture

In the coastal zone, there are two typical ecosystem types, they are mangrove and tidal flat. Increase of aquaculture area in tidalflats is one of key targets of coastal provinces nationwide in general and coastal provinces in Downstream Mekong Delta in particular.

Conversion of mangrove to aquaculture farms

The natural function of the mangrove is to protect the coastline from wave, erosion, etc. At the same time, the mangrove is the characterized by the high biodiversity and is the living place of many juvenile aquatic species.

Records show that in the past, the area of mangrove in the Downstream Mekong was around 250,000 ha. Because of war (around 120,000 ha of mangrove were destroyed by chemicals in US war), overexploitation and conversion to rice and shrimp, the remaining area of mangrove in 1998 was only 77,000 ha, which were in poor condition and concentrated in Ca Mau province.

In recent time, the rush conversion of rice fields to shrimp farms in coastal areas has made the saline intrusion more complicated. In many area, the conversion occurred out of control and are exposing immeasurable implicit risks (Le Van Sam, 2001). The development of coastal shrimp culture is bringing certain benefits to farmers in early years, such an assessment on its long-term ecological disadvantages/losses, however, has not been taken into comprehensive consideration. To converse the mangrove to shrimp farm is to narrow this type of natural ecosystem and to destroy the living place of juvenile individuals of valued species.

Conversion of rice fields to aquacultural ponds

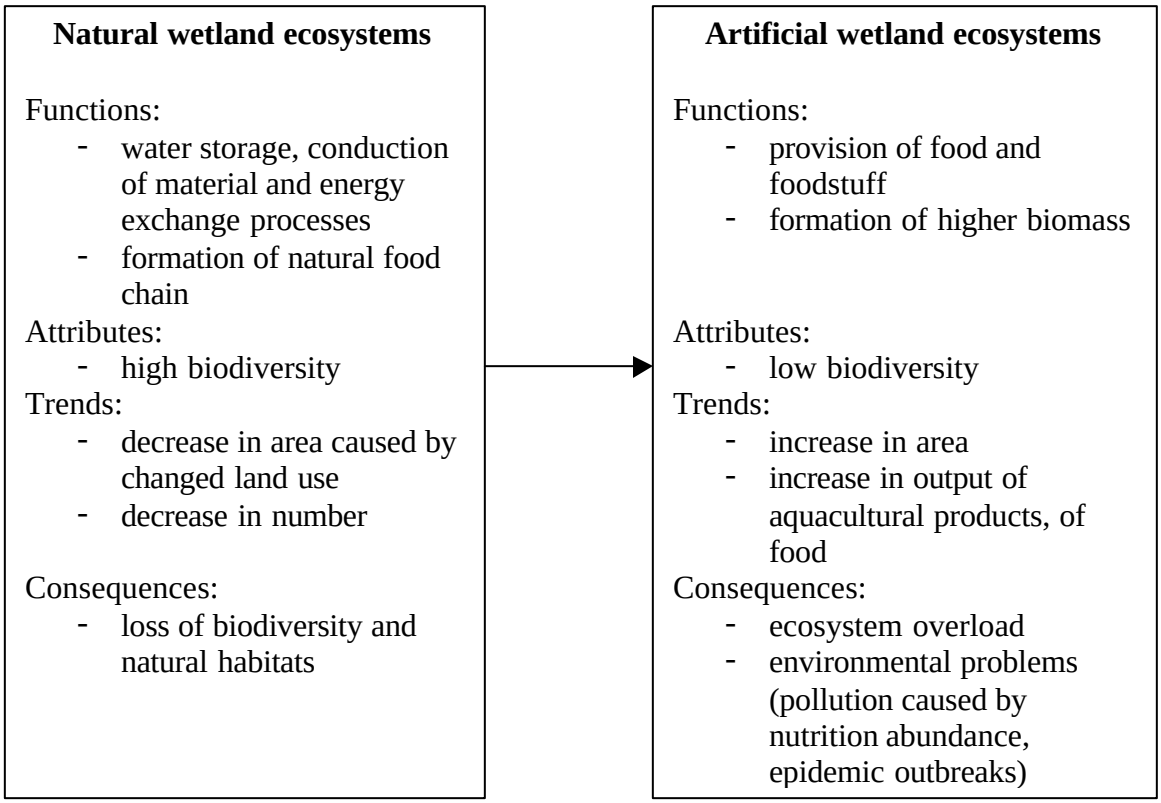
In the coastal Delta, many rice fields with low output have been changed to shrimp ponds. For the past two years, the conversion movement in Ca Mau has become out of control. It was reported by the Fishery Sector that in Kien Giang province to the year 2003, there were 23,325 ha to be shifted to shrimp, of which 13,000 ha had been wild lands and other 9,000 ha had been rice fields. In Soc Trang, the figure is 12,200 ha. The conversion area to shrimp up to now in Ca Mau exceeds the planning figure to the year 2010.

A trend is clearly seen in the Downstream Mekong Delta that the area of rice and forest is narrowing while of the aquaculture is increasing.

In first few years, the conversed shrimp farms give good outcome to farmers. Income from shrimp culture is ten times as much as that from rice production. This point of time is within the early stage of conversion and, indeed, the artificial change of a type of ecosystems to another must be considered in regard to long term consequences.

In short, the conversion of existing or ever existing natural ecosystems to artificial ones give out both benefits and losses.

Figure 1: **Conversion of natural wetland ecosystems to artificial ones**



2.2.3. Activities causing environmental pollution

The environmental pollution in wetland ecosystem is a hot issue recently. Waste disposals spreading out without proper treatment along with old-fashion production patterns are putting the ecological environment in threat.

Some problems have been taken place in shrimp farms such as waste water caused epidemic outbreaks in some places and killed a plenty of breeding shrimp. In coastal water there appeared the eutrophication that caused phenomena of red tide (filled with *Pyrrophyta sp.*) or green tide (filled with *Bacillariophyta sp.*), which impact in negative way on water environment and aquatic vegetation communities.

The pollution of water environment of shrimp ponds is accumulated during the breeding course (by high density, abundant food inputs), which consequently contaminates the water in coastal sea.

2.2.4. Environmental consequences and conflicts in targeted landuse of wetland ecosystems

Bad environmental and ecosystem impacts caused by changes of functions and features of wetland ecosystems are realistic in the Cuu Long River Delta.

- Wetland ecosystems, which had been the living places of a number of indigenous animals, were degraded (loss in quality and quantity of mangrove, of Melaleuca forests, of swamps) leading to the decrease of these animals' biodiversity.
- Studies in the Plain of Reeds clarify the fact that the irrigation improvement participated in increasing of active alum, which led to increasing of toxicants such as Sulphur-contained compounds and metallic ions. The canalization also promoted the saline intrusion. Many indigenous species have not seen in the Lang Sen (the typical wetland of the Plain of Reeds) caused by the change in natural functions of ecosystems.
- Agricultural intensification means increasing pesticides, fertilizers of which the remainings contaminate the environment.
- Waste water from intensive shrimp ponds, that is almost not treated before discharging out, pollutes the water systems and may then cause epidemic outbreaks.
- Conversion of natural tidalflats into high-density Meretrix sp. breeding grounds also causes environmental problems on one hand and places the owners against a risky business (high rate of premature death) on the other hand.

Change of wetland ecosystems varies from site to site, destruction of forest or conversion of rice to shrimp in the coastal zone vs. conversion of swamps to rice or rice to shrimp in the inland, for instance. By nature, any conversion/shift leads to conflicts in ecosystems' use targets of different sectors, Agriculture, Forestry and Aquaculture. These conflicts are briefly presented in table below.

***Table 3*: Conflicts in use targets when converting/shifting the functions of some wetland ecosystems**

Conversion of ecosystem functions	Forestry sector	Agriculture sector	Aquaculture sector	Environment
Mangrove-shrimp pond	Loss of protection forest, degradation of biodiversity		Increase in area and outputs of aquacultural products Degradation of aquatic biodiversity	Waste from cultivation, decrease of groundwater, desertification
Coastal rice field-shrimp pond		Loss of rice fields	Increase of aquacultural outputs	Contamination of environment Soil salinization

Conversion of ecosystem functions	Forestry sector	Agriculture sector	Aquaculture sector	Environment
Natural tidalflat-Mollusca sp. breeding ground			Increase of aquacultural outputs Degradation of natural tidalflat biodiversity	Contamination of environment
Natural Melaleuca forest, swamps-rice fields; changes of hydro-regime	Degradation of biodiversity	Increase of rice outputs	Loss of shelter for many indigenous aquatic species	Environmental problems (saline intrusion, alum increase, heavy metal increase)

3. Regional ecosystems' exploitation and management - shortcomings in policy perspective

3.1. Wetland management system - short of solidarity and relevance

The wetland management system in Vietnam appears to be vague and proves little efficiency. Many regional wetland management policies conflict with each other, particularly in regard to localities' interest, and many others are out-of-date or even go against the reality. Some features of national wetland management regime in Vietnam can be overviewed as follows:

- National wetland management regimes in Vietnam follow the decentralized administration system. There are two types of hierarchy, that is:
  - In the North of Vietnam: national wetland management regime was organized in 3 levels: ministerial level, provincial level and district level.
  - In the South of Vietnam: the government manages wetlands via aqua-silvicultural farms, which belong to Ministry of Agriculture and Rural Development, to local farmers. By allocated aqua-silvicultural farms to individual, wetlands and coastal forests are used and managed.
- The management system of Vietnam is characterized by the top-down approach. Almost decisions, policies, strategies and so on are imposed from the central government to local government.
- Community-based management has just established conceptually in the last few years and been proving its power in specifically the wetland management.

- Co-management is an urgent issue in wetland management of Vietnam. This management approach seem not exist in the country. The cooperation between central and local government or between local governments is generally poor and there is not a comprehensive policy on wetland management.

3.2. Policies on regional wetland exploitation and management - weak interrelation with little synchrony that leads to unsustainable development and ongoing degrading wetland ecosystems

From a general review, issues on using and management of wetlands had been addressed in Vietnam legal documents. Since 1982, the Council of Ministers had made a decision on aquaculture including regulations on aquaculture procution in wetland regions. This decision recommended management method as to educate and encourage organizations and local citizens to protect marine resources and living environment of water species.

Since 1985, a major shift has taken place in economic policy, from the centralized to oriented market economy. From early period of the innovation, the government had raised the issues on protecting the environment and conserving natural resources and biodiversity. Also in 1985, the Ministry of Labor issued a Circular No. 1-LD/TT that took in to consideration of encouragement of converting economic structure of areas of wild and unused wetland to aquaculture production.

In 1989, Vietnam government made policies to encourage people to develop their households' and collectives' economy. For examples, in March 1989, the Government had delivered the Decree No 30-HDBT to make encouragements on using wild land as well as on building new coastal dikes and forest plantation along the shoreline to create new wetlands for aquaculture. At the same time, a law on protecting fishery resources had been implemented. The articles No 2 and No 3 of this law state that the protection and development of fishery resources must be accompanied with protecting aquatic living environment which are water, wetland. The protections must be for keeping the natural rate of fishery development and for maintaining both the short -term and long- term profits of local people and of the society in general. In addition, the law also includes some articles (No 5, No 8) strictly forbidding actions of destroying fishery resources in term of using explosion in fishing or fishing in reproduction seasons. The law was then followed by a number of inter-ministerial circular letters as instructions for managing and using wetlands for aquaculture purposes.

There was no specific law relevant to forest protection until 1994. After the Forestry Protection Law in 1994, it has become a useful legal tool for managers to protect the wetlands and natural reserves.

A national plan for biodiversity conservation issued in 1995 strongly oriented for wetland management authorities. The short-term objectives of the plan were:

- Conserving the special characters of Vietnam ecosystems, protecting endanger or sensitive ecosystems and ecosystems in being threatened.
- Protecting parts of ecosystems that are being overexploited or abandoned.
- Assessing values of biodiversity for economic purpose on the basis of sustainable development.

Along with currently encouragement on expanding tourism and related services, Vietnam also takes action to address environmental concerns and creates strategies for such development activities. Those strategies are as follows:

Tourism planning must satisfy the requirement for protection of sustainable environments. A plan must include a suitable management for not only using but also maintaining the natural landscape and environment.

Dividing and classifying large tourist region into smaller zones suitable for specific management of each zone, e.g., zones of strict conservation, zones of land reservation, or zones to be recovered.

In general, a number of legislation concerning wetland has been issued in Vietnam in the last decade, which form basis framework legal tools for managing and protecting the wetlands. Recently, the Vietnam Law of Forestry has been amended with regulations relevant to national parks and natural conservation zones. Furthermore, a number of decrees of the Prime Minister were issued for establishing various wetland conservation zones such as Tram Chim, U Minh Thuong, Thanh Phu, Lung Ngoc Hoang in Downstream Mekong, which demonstrates that Vietnam government has paid attention to wetland conservation issues.

The national management system of Vietnam on natural resources such as land, water, and forest in coastal regions, in general has gained certain successes, which led to the rearrangement of land use systematically. However, because the function and value of wetlands have just been recognized for few years, the national management regime on wetland is far from effective. This is the consequence of a number of causes including those in the followings:

- Inadequate awareness of functions of wetlands and their ecological and economic importance among managers and stakeholders. This leads to unsuitable/unpracticed decisions on planning and using wetlands and may result in ineffective strategy. Besides, the importance of wetland management as well as dissemination of wetland information are still not adequately appreciated.

- Vietnam has not classified wetland as a special type of land, making the enforcing of current regulations difficult or impossible.
- Opaque decentralization of management functions. Decisions on interest and responsibility of managerial levels are opaque. For instance, major wetland regions are managed by the Ministry of Agriculture and Rural Development, some belongs to the Ministry of Fishery, whereas the other wetlands are either managed by local administrations or unregulated. Responsibility and right of different management levels are commonly overlapped and/or in conflict. Besides, managerial policies are not consistency and rapidly change from time to time lead to adverse effects such as puzzle, loss of natural resources.
- Lack of planning or inconsistent planning in wetland utilization. In many coastal regions, utilization and conservation of wetlands are planned inconsistently or even lack of planning. This causes conflicts between different utilization purposes and results in loss of natural resources.
- Ineffective planning may derive from lack of relevant regard and adjust to regional conditions, naturally, socially and economically.
- Ineffective cooperation among different sections (sectorial cooperation).
- Ineffective cooperation between different agencies in planning of wetland results in lack of information on decision-making processes, as well as overlap in wetland planning.
- Although the Ministry of Fishery and other related departments have implemented policies managing development actions in wetland areas and limiting deforestation and growing mangrove forests, these policies, however, these policies are shortcoming and do not meet the requirements for a comprehensive management strategy
- Top-down approach in wetland management does not meet communities' expectation. With traditional top-down approach in management of wetland, senior managerial levels tend to impose their decision on junior managerial levels without understand communities' expectation. However this method is something good thanks to short time advantage and unity, bottom- up approach or community- based management is preferred.
- Inadequate support for human life in wetland. In general, managerial levels have not paid attention to the material basis as well as the life of people who work with wetland and wetland conservation, due to not being encouraged and hard life, most wanted to change job.

The sum up, wetland and wetland-related policies act as the leading factor to the exploitation and management of wetland ecosystems. The practice of wetland exploitation and management, in turn, is the object of policies to regulate and the mirror to reflect the accuracy, the relevance and the efficiency of the issued policies. Such an analysis of the two-way relation between the policies on, and the exploitation and management of, wetlands requires a set of complex components, from a number of perspectives, and is time-comsuming. This analysis is planned to conduct in Phase 2 of our assessment and, as proposed, more systematic and comprehensive findings shall be figured out. ■