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WISE USE APPROACH OF WETLANDS - CASE STUDY IN XUAN THUY RAMSSAR SITE

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ABSTRACT

Wetlands are formed from two important components: "soil" and "water", they are interactive and assisting each other in order to maintain a wetland area. Natural character of wetlands is different that they will create the different habitats and value of wetlands. In order to ensure the maintenance, sustainable development of wetland values, wise use solution is recognizing that is comprehensive method, which base on ecosystem approach to maintain ecological character of wetlands. This solution is encouraged to apply in conservation and management of wetlands by the Ramsar Convention. According to Ramsar Secretariat, Xuan Thuy Ramsar site is an international important wetland that must have activities of wise use in order to maintain the ecological character of Ramsar site, especially habitat of valuable and rare migrated birds. This research focuses on making clearly for scientific basic of wetland wise use and suggest the specific solution on wise use for Xuan Thuy Ramsar site that contribute to conservation and sustainable development of wetland resources for Ramsar site following to commitment of the Convention member. The result of this research is useful for Management Board of Xuan Thuy Ramsar site in order to complete the management task on wetland in Ramsar site.

Keywords: wetland, wise use, water and soil components, wetland function, Ramsar site, ecosystem, mangrove.

INTRODUCTION

Wise use concept of wetlands is concerned and mentioned in aspect of wetland management in the world and Vietnam. This is important content in the Strategy on Wetland of the Ramsar Convention with targets on conservation and sustainable development of wetlands in worldwide. However, there are many arguments on concept of wise use and applying wise use of wetland in practical of many countries. Vietnam is member of Ramsar Convention and we commit that has responsibility in conservation and wise use of wetlands, especially in Ramsar sites.

According to the Ramsar Convention, wise use of wetlands is the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development [3]. In order to the targets on wise use of wetlands, wetlands are need to use sustainable and ensure the maintenance of natural characters and preserve the value of ecosystem services of wetlands. That is a method on comprehensive management of soil, water and biological resources to promote conservation and sustainable use in way of justice.

So that, wise use of wetlands is implement on activities of conservation and using reasonable of wetland resources, which base on apply the science methodology, including that focus on species population on structure, ecological process, function and interaction between biology and its habitat, especially emphasis the role of human with cultural diversity and a main part of many ecosystems.

Xuan Thuy Ramsar site, in Nam Dinh province, is the first of Ramsar site in Vietnam and ASEAN region with global value of biodiversity and environment, especially mangrove ecosystem. The applying approach on wise use of wetlands in Xuan Thuy Ramsar site as a first step that is implementing on target of sustainable use of environmental elements (soil, water, biology) to maintain the sustain of their ecological process.

This research will provide the useful result for management of wetland in Xuan Thuy Ramsar site that will be sustainable in the future.

Scientific basis for wise use of wetlands

Under the text of the Ramsar Convention (Article 1.1), wetlands are defined as: areas of marsh, fen, peat soil 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 meters" [5]. Thus, soil and water are two main components to form the wetland, among them; water is basic component to maintain the wetland. Water regime is maintain and continuous in specific soil area that create the sustain wetland in this area.

Environmental condition of soil, water is different that will form the different wetland ecosystems by biology elements and their habitat. As principle "how is environment that will form species which suitable with its environment", that mean the environmental quality is key factor in order to ensure growth and development of species which live in this environment. In Xuan Thuy Ramsar site, soil and water quality is environment that suitable for many valuable and rare species, especially water birds and migrated species, such as: *Platalea minor, Larus saundersi, Pelecanus philippensis, Mycteria leucocephala*…. These elements have the close relationship and promote develop together, if an element change, it will influence the others (Figure-1).

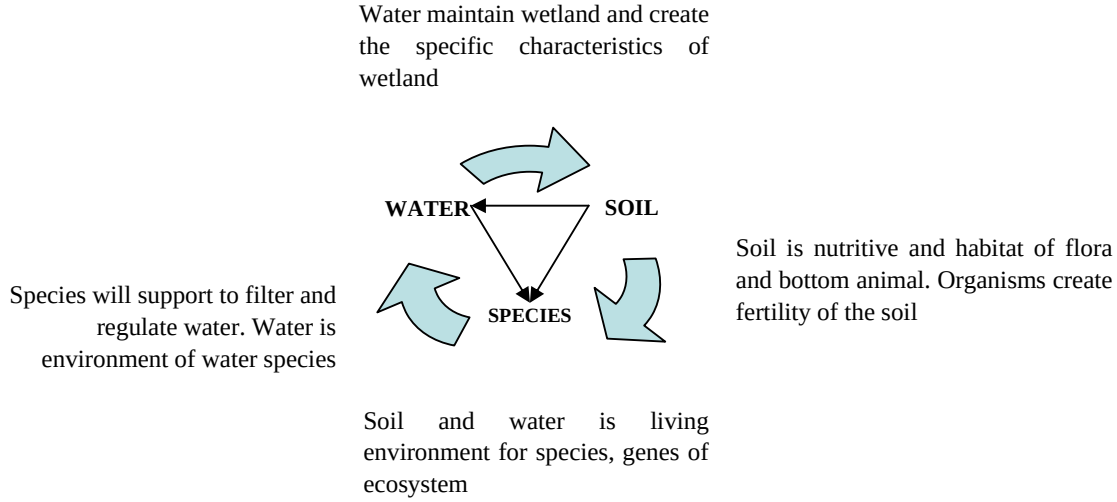

Figure-1. The interaction between elements in wetland ecosystem.

Wetland is complex with many elements as soil, water and species which coherence each other and form a unify system. These elements interact with each others, create the ecological process, and provide ecosystem services for human living. The compound of environmental and species elements, ecological process and services of wetland ecosystem that form the specific characters of each wetland, which call the ecological character of wetland. If there is any negative impact on soil, water or species, it will disorder the ecological process, loss the ecosystem services and influence to ecological character of wetland. Otherwise, the change of wetland ecological character will affect to wetland elements. So that, the ecological character of wetland will be maintain and sustain, if there is not any negative impact on wetlands.

Wetland has value if it has many important functions and provides ecosystem service that is essential for environment, economy, society and biodiversity of each area. However, due to developing demand, many wetlands are change the land use target or focus on exploitation follows to different objectives of each wetland element, such as: aquaculture, agriculture or forestry. When wetlands were overexploitation, the wetland quality is change and degrades

The objective of wise use is ensure the benefit and value of wetland through maintenance of its sustainable functions as control erosion and flood, maintain water quality and supplement of groundwater and surface water; support to development of aquaculture, agriculture and forestry, and ensure stable climate.... [4] That means, wise use of wetland is comprehensive approach in deal with wetland issues via ensure environmental components in order to maintain wetland ecosystems and contribute to conservation and sustainable development of wetland resources.

Case study on wise use of wetland in the Xuan Thuy Ramsar site

Vietnam is nation that belongs to the Ramsar Convention member, which has responsibility and obligation to implement the international commitment on conservation and sustainable development of wetlands as Convention regulations [1]. One of the Convention targets is promote the wise use of wetlands in member countries with objective to maintain its ecological characters, especially in Ramsar sites [6]. Xuan Thuy Ramsar site is in List of international important wetlands, so that Xuan Thuy needs to be wise use of wetland with aim at conservation and sustainable use of biodiversity, environment and economy in Ramsar site.

The quality of soil, water and biodiversity in Xuan Thuy Ramsar site is pressure by human and environmental risks or natural disasters. Management Board has many solutions to manage and developing plan for this Ramsar site. However, there is a decline sign of wetland resources in this Ramsar site. Aquaculture activities in Ramsar site is main reason that lead to polluted of water quality or overexploitation influence to biodiversity in there. Managing issues is big challenge due to activities on exploitation, use of wetland resources is approach separate follows to each element, which creates wetland, and is not sustainable.

Wise use of wetland is applied to Xuan Thuy Ramsar site through identify and guide to implement on activities: sustainable exploitation and use of wetland in order to ensure the maintenance of function, ecosystem service and available value of wetlands. That is solution, which has system with comprehensive method as complete the managing document of Ramsar, activities of sustainable use of wetland, awareness raising and role of community in Xuan Thuy Ramsar site. Some of methods for wise use of wetland in Xuan Thuy as follow:

Finalize documents on management and wise use of wetland in Xuan Thuy Ramsar site

Wise use of wetland is not attach special important to management in the Xuan Thuy Ramsar site and content of wise use is not represent in many managing document of this Ramsar site. This method creates the important legal basis for activities on use of wetland resources in there.

- Strength to power and responsibility of the Xuan Thuy Management Board in progress management, operation and tackle infringe to Ramsar site.
- Finalize the managing plan for Xuan Thuy Ramsar site that base on ecosystem approach to promote implementation on activities, projects of wetland wise use, which focus on managing planning, protection and sustainable development of specific ecosystem in Ramsar site in order to strength the function and ecosystem services of Xuan Thuy Ramsar site.
- Finalize the managing regulation for Xuan Thuy Ramsar site with main content are wise use of wetland by activities on exploitation of sustainability aquatic resources, biodiversity conservation and environmental protection and tackle infringe and reward the innovations of wetland sustainable use.

Promote the maintenance and sustainable use of wetland characters in Xuan Thuy Ramsar site

According to the result of survey, there are eight types of different wetland, which distribute in core zone and buffer zone in Xuan Thuy Ramsar site. They are included: tidal flat with mangrove ecosystem, tidal flat with no mangrove, shrimp or aquaculture ponds, coastal dunes, river and tidal runnels, estuary water zone, water rice zone and other types (wetlands for resident, agriculture in buffer zone). At present, the areas of these wetland types strongly vary since the Xuan Thuy wetland areas became to Ramsar site (Table-1).

Table-1. Area variation of wetland types by the time.

Wetland types of Ramsar site	**Area** (ha)				**Reason of variation**
	1986	**1995**	**2007**	**2013**	
Tidal flat with mangrove ecosystem	1459.0	1444.3	1711.5	1660.9	Exploit mangrove forest; develop shrimp ponds, rehabilitate, and regenerate mangrove.
Tidal flat with no mangrove	3175.6	2998.7	2396.6	2355.9	Change of coastal line and develop aquaculture in new tidal flat. It is difficult to growth mangrove trees.
Shrimp or aquaculture ponds	131.6	1099.8	1652.4	1698.7	High profit from aquaculture and the number of ponds is not control.
Coastal dunes	644.6	643.1	644.2	988.6	Variation of coastal line because of nature
River and tidal runnels	1932.0	1282.5	972.5	954.5	Develop the dike in Ramsar site and lead to prevent water flow.
Estuary water zone	3926.0	3825.8	3859.7	3557.4	Variation of mangrove; increase area of coastal dunes and cause to decrease estuary water zone.
Wet rice	2362.2	2332.6	2250.8	2235.0	Land use type (LUT) is changed
Other types	1093.3	1098.0	1236.3	1265.5	Land use type (LUT) is changed

Source: Report on status of biodiversity in Xuan Thuy National Park (Ho Thanh Hai and colleagues) [2] and Survey result at Xuan Thuy in 2013.

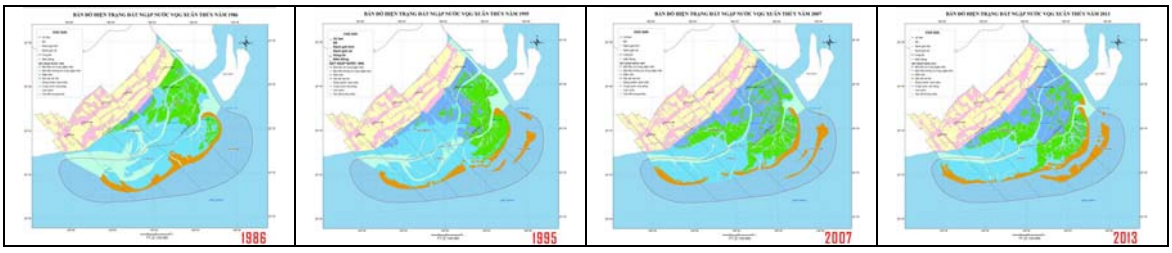

Figure-2. Varies progress of wetland types in Xuan Thuy Ramsar site in 1986, 1995, 2007 and 2013. Source: Report on status of biodiversity in Xuan Thuy National Park (Ho Thanh Hai and colleagues) [2].

In order to ensure ecological characters of Ramsar site, there is need to control or change activities that suitable with function and structure of each wetland type in Xuan Thuy Ramsar site.

Table-2. Activities on sustainable use of wetlands in Xuan Thuy Ramsar site.

Activities	Sustainable use of wetland types in Xuan Thuy Ramsar site							
	Tidal flat with mangrove ecosystem	**Tidal flat with no mangrove**	**Shrimp or aquaculture ponds**	**Coastal dunes**	**River and tidal runnels**	**Estuary water zone**	**Water rice zone**	**Other types**
Strictly protection of mangrove ecosystem and habitat of valuable and rare migrated bird and aquatic species	Yes	Protect a new tidal flat that has just formed	Protect ponds that is habitat of migrated bird	Zoning and protect	Protect aquatic species	Protect aquatic species	Protect wetland for rice cultivation	Environ-mental protection
Protect wildlife species and function, structure and services of wetland ecosystem in Ramsar site	Yes	Zoning and protect habitat of migrated bird	Yes for ponds where is habitat of wildlife species	Yes for ponds where is habitat of migrate bird	Yes for habitat of wildlife species	Yes for habitat of wildlife species	Yes for habitat of wildlife species. Protect wetland for rice cultivation	Yes for habitat of wildlife species.
Excusion and tourism	Prohibit at core zone	Limit	Yes for ecotourism	Yes for eco tourism	Limit	Yes for eco tourism	Yes for eco tourism	Develop eco tourism and culture
Collect samples of mine, wildlife species	Prohibit at core zone	Limit	Yes	Yes	Yes	Yes	Yes	Yes
Exploit tree for medicine, bee's honey and firewood	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Introduction of alien species which can cause harmful for environment and biodiversity	No	No	No	No	No	No	No	No
Hunting, trap of wildlife species (bird, animal, aquatic species…)	No	No	No	No	No	No	No	No
Overexploitation of aquatic species and use annihilate facilities	Prohibit	Prohibit	Prohibit	Prohibit	Prohibit	Prohibit	Prohibit	Limit and reduce
Exploit aquatic species	Prohibit	Limit and reduce	Limit and reduce	Limit and reduce	Limit and reduce	Limit and reduce	Limit and reduce	Limit and reduce
Grazing cattle and domestic fowls and industrial aquaculture	Prohibit	No	No	No	No	No	No	Yes but sustainabilit y planning
Build road, housing and public project	Prohibit	No	No	No	No	No	No	Yes for approved
Transgress land, land use change with illegal purpose	Prohibit	No	No	No	No	No	No	No
Make pollution and noise, idling vibration higher allowed standard	No	No	No	No	No	No	No	No
Plant forest and create landscape ecology	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Migration into Ramsar and settle in there	Prohibit	Prohibit	Prohibit	Prohibit	Prohibit	Prohibit	Prohibit	Limit
Negative impact on habitat of wildlife species	Prohibit	Prohibit	Prohibit	Prohibit	Prohibit	Prohibit	Prohibit	Prohibit
Make erosion or drainage water of rivers, canal, ditch, ponds and tidal runnes	No	No	No	No	No	No	No	No

Strength management and monitor ecological characters of wetland types in Xuan Thuy Ramsar site

The ecological process of Ramsar site is always developing, changing follow the law of nature if there is no intervention that cause harmful for Ramsar site by human. The objective of monitor on ecological characters in Xuan Thuy Ramsar site aims at identify the change of environmental components (soil, water, habitat, species, genes resources); ecological process and ecosystem services in there. From that result, we can limit or reduce negative impact that leads to decrease value of wetland resources and loss habitat of migrated bird and valuable and rare species of Xuan Thuy Ramsar site.

- Monitor the change of environmental components (soil and water quality and species) in wetland types in period to assess the variation in order to control and limit the negative affect to Ramsar site.
- Protect and monitor the variation of species in each ecosystem and habitat of Ramsar site, especially valuable and rare species and migrated bird, mangrove area and the growth of mangrove and species in there.
- Monitor the ecosystem service from each wetland type through value of aquatic amount, which exploit by community, protecting function, climate regulation, attractive tourists and the number of important habitat of valuable and rare species and migrated bird.

Raise awareness for communities on wise use of wetland in Xuan Thuy Ramsar site

Community who live in Xuan Thuy Ramsar site, understand the role and value of wetland. However, sustainable use is limit in there. Economic benefit and living demand cause to overexploit, loss aquatic species and their habitat and other valuable and rare migrated birds. In order to achieve the success of wise use of wetland in Ramsar siet, we need to implement activities on raising awareness for communities as follow:

- Organize the implementation on communicate programs on environmental education, natural conservation and wise use of wetland in Xuan Thuy Ramsar site for communities in buffer zones and Giao Thuy district.
- Strengthen the collaboration and participation of stakeholders (local and center government, enterprises, international and domestic organizations, communities and Management Board) in progress of implementation on wise use of wetland as manage strictly tidal flat, aquaculture ponds… in Ramsar site.
- Raise awareness and responsibility of communities on wise use of wetland through use sustainability of wetland resources and protect wildlife species.

CONCLUSIONS

The approach on wise use of wetland is new issue in wetland management in Vietnam. The research focuses on develop the activities of wise use for management on Xuan Thuy Ramsar site. This is right step, timely and suitable to ensure the ecological character of Ramsar site and reduce the negative impact on biotic resources in this area. Management Board of Xuan Thuy Ramsar site should mobilize participation of stakeholders, financial and human resource in order to promote wise use of wetland, control strictly wetland resources and strength capacity for managers of Ramsar site.

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