



Protect seagrass through payments for ecosystem services

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1. IMPORTANCE AND THREATS TO SEAGRASS BEDS

Seagrasses are flowering plants or angiosperms that grow in intertidal and shallow intertidal zones in tropical to temperate oceans globally. They form “grasslands” that vary in size and density depending on species and geographical location. Seagrasses provide important ecosystem services to those who depend on them for food and income, and to all people around the world. Healthy seagrass beds support fisheries by is a nursery and safe haven for juvenile fish and shellfish, and also provides a food source for this group of organisms. By acting as a coastal buffer against waves, they protect shorelines from erosion and help maintain other coastal ecosystems such as mangroves. They also provide further benefits for climate regulation by sequestering large amounts of carbon in sediments, preventing its release into the atmosphere as carbon dioxide.

However, seagrass beds are at risk of damage or loss due to many direct and indirect pressures caused by human activities. Seagrass meadows can be eliminated to make way for infrastructure such as marinas. Vessel operations, including anchoring and some fishing methods such as purse seines and dredging, can damage or destroy seagrass beds. Due to pollution and sedimentation or due to land use practices including deforestation and upstream fertilizer runoff, the health of seagrass beds can be affected, in many ways, situations that can cause seagrass to die and disappear. Overall, these threats have resulted in the loss of 29% of global seagrass cover [1].

Therefore, community-based conservation offers an opportunity to fill this gap in protecting seagrass beds. Community groups conserve and manage natural resources through a comprehensive and structured approach, appropriate to the needs and resources of the community. The primary beneficiaries and community-based seagrass conservation project managers will be those communities that live adjacent to seagrass beds and depend on seagrass beds for food or livelihood. Through a community-based approach, communities are empowered to manage the natural resources they depend on, delivering positive outcomes for both ecosystems and people.

2. PROTECT SEAGRASS BEDS THROUGH PAYMENTS FOR ECOSYSTEM SERVICES

One mechanism that facilitates and finances community-based conservation is Payments for Ecosystem Services (PES). PES is an economic tool used for beneficiaries of ecosystem services to pay participants to maintain, protect and develop the functions of that ecosystem. In other words, PES is an environmental protection mechanism,

through which individuals and organizations pay communities to carry out conservation activities or enhance the provision of ecosystem services. Those who pay for PES are motivated by direct or indirect benefits. For example, coastal mangrove forests have the effect of blocking waves, resisting the impact of natural disasters, maintaining the region’s aquatic resources... Therefore, those who benefit through direct exploitation of the values that mangrove forests create must be responsible for paying a commensurate amount to those directly involved in maintaining and protecting the functions of mangrove forests. Or food and beverage manufacturers may benefit from improved water quality for their products and will therefore have to pay for environmental protection to improve water quality instead of paying for high - cost water treatment facilities. Other “beneficiaries” of payment for ecosystem services may be indirect. A common example is the purchase of carbon credits, in which individuals or organizations whose activities (such as flying by plane) emit carbon pay for activities such as planting or preserving trees that sequester that carbon. This allows individuals and organizations to reduce their environmental footprint.

In fact, payment for ecosystem services has been widely recognized as a successful policy tool for natural resource management in more than 60 countries. These programs have been applied to various ecosystem services internationally, including: biodiversity conservation, river basin services, carbon sequestration and landscape beauty. The total annual payout of PES programs worldwide is over 36 billion USD. Through PES, natural resource managers can receive environmental protection funds paid by individuals or organizations. PES deals are typically managed by third parties and are based on measurable outcomes such as biodiversity conservation or carbon sequestration. To date, no PES project has focused exclusively on seagrass conservation. However, the Mikoko Pamoja Blue Carbon Project, Kenya is a typical model of community groups using PES to support coastal conservation projects and demonstrates initial successes in mangrove and seagrass beds protection.



The Mikoko Pamoja blue carbon project has been running since 2013 on the southern coast of Kenya and is run by the Mikoko Pamoja Community Organization (MPCO) to restore mangroves and seagrass beds through the sale of carbon credits. The Mikoko Pamoja blue carbon project exploits the natural carbon capture ability of these ecosystems and uses it to sequester emissions instead of releasing them into the atmosphere to restore habitats, while also generating profits finance for sustaining communities. In addition, the Project will create positive economic and environmental impacts on coastal communities, while minimizing the impact of climate change.

The Mikoko Pamoja blue carbon project applied an integrated coastal ecosystem approach. Here, people have planted 117 hectares of mangrove forests with an average of 2,500 credits sold each year (one credit is equivalent to 1 ton of CO₂). On average, carbon sales generate about \$24,000 per year, 35% of which covers project costs, while 65% is reinvested in the community. The project operates as a carbon credit-funded mangrove conservation project for 6 years, then integrates seagrass as an added benefit. The Project design allows monitoring of seagrass beds in an effective yet simple and inexpensive way. Through the Mikoko Pamoja Project, the community gains skills, experience and services, as well as exposure on international platforms. Collaborating organizations have the opportunity to conduct research and support community in innovative climate mitigation activities.

The Project's successful network building is a result of clear roles and responsibilities, shared trust developed over many years, and shared benefits from participating in the partnership. Mikoko Pamoja's success is mainly due to community participation, support from scientific institutes, government support and international networks. The Mikoko Pamoja project is managed by the community restored 117 hectares of mangrove ecosystem in Gazi Bay, Kenya. This project is called "The world's first blue carbon project and has brought the community awards as well as a higher standard of living.



▲ *Kenyan coastal communities work to restore mangroves*

3. PAYMENT MECHANISM FOR MARINE AND WETLAND ECOSYSTEM SERVICES IN VIETNAM

Article 138 of the Law on Environmental Protection clearly stipulates payment for natural ecosystem services. Accordingly, payment for natural ecosystem services is when organizations and individuals using natural ecosystem services pay organizations and individuals providing environmental and landscape values created by natural ecosystems to protect, maintain and develop natural ecosystems. Natural ecosystem services covered include: Forest environmental services of forest ecosystems according to the provisions of forestry law; wetland ecosystem services serve the purposes of tourism, entertainment, and aquaculture; Marine ecosystem services serve the purposes of tourism, entertainment, and aquaculture; ecosystem services of rocky mountains, caves and geoparks for tourism and entertainment business purposes; natural ecosystem services serve the purpose of absorbing and storing carbon.

Regarding the principle of payment for natural ecosystem services, organizations and individuals using one or several natural ecosystem services must pay for natural ecosystem services; payment for natural ecosystem services is made in the form of direct payment or indirect payment through Trust fund; payment for natural ecosystem services is included in the cost of products and services of the users of natural ecosystem services, and must ensure compensation for costs of activities to protect, maintain and develop natural ecosystems; organizations and individuals providing natural ecosystem services must use the money collected from payments for natural ecosystem services to protect, maintain and develop natural ecosystems.

Organizations and individuals must pay for natural ecosystem services when engaging in the following activities: Exploiting and using the water and sea surface of the ecosystem for aquaculture and underwater entertainment services; Exploit and use the landscape of the ecosystem for tourism and entertainment services; Production and business



▲ *Seagrass conservation plays an important role in maintaining coastal ecosystems*

that emit greenhouse gases must use the ecosystem's carbon absorption and storage services to mitigate greenhouse gas emissions.

In Vietnam, payments for forest environmental services have been successfully implemented for more than a decade, contributing to increasing financial resources for forest protection and development. Lessons learned from payments for forest environmental services are the basis for replicating similar mechanisms for other ecosystems, including marine and wetland environments. Vietnam has implemented initiatives for marine and wetland ecosystems, however, there is currently no comprehensive form of payment for the services of these ecosystems. Some practical applications of payment for ecosystem services in Vietnam include: collecting service fees for visiting protected marine and wetland areas, co-management models of aquatic resources, or developing environmentally friendly aquaculture methods in some coastal areas with the support of international organizations and related industries... Many of these initiatives cannot be maintained for long term due to unclear legal basis.

The success of PES programs depends on many different factors. Watershed services, forest environmental services, biodiversity conservation, carbon sequestration and landscape beauty are the main objectives of PES programs globally. The best results are achieved when services are clearly defined, beneficiaries are well organized, and land and resource management communities have clear ownership rights and a strong legal framework.

Therefore, to implement PES programs for coastal areas in the near future in Vietnam, it is necessary to: Develop criteria and methods to evaluate national marine and wetland ecosystem services; support assessment and evaluation of ecosystem services at the grassroots level; mapping the current status of marine and wetland ecosystem services in Vietnam; Develop guidelines for provincial and grassroots level payment mechanism schemes; Pilot payment activities and complete policies and regulations on payments for natural ecosystem services, focusing on marine and wetland ecosystems.

4. CONCLUSION

Conservation is critical way to maintaining healthy coastal ecosystems, including maintaining productive fisheries. As a "Blue Carbon" habitat, seagrass beds are an important carbon store and maintaining healthy seagrass beds will help to increase carbon sequestration and prevent the release of carbon dioxide into the atmosphere.

As many local communities rely on seagrass beds for their livelihoods and as a food source, they are well suited to community-based conservation management, allowing local people to benefit from sustainable management. This conservation can be based on the PES model, enable results-based financial benefits to local communities for sustainable management of seagrass beds, which may be based on carbon sequestration or other ecosystem services including enhanced fisheries or coastal protection. PES provides a useful framework for seagrass conservation and benefits to communities ■

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