

Rehabilitation of Habitats and Sustainable Use of Fisheries Resources in the Con Chim Area, Thi Nai Lagoon

Project Summary

Thi Nai Lagoon covers an area of 5,060 ha and represents a major wetland ecosystem in Binh Dinh Province. The significant areas of mangrove and seagrass are essential to the viability of local fisheries in the lagoon but past levels of unregulated resource exploitation have led to the ecosystem functions being lost. Natural fisheries production is around 36 tonnes of fin-fish, 75 tonnes of crustacean and 600 tonnes of molluscs annually, whilst the forest supports 10 resident bird species and some 37 species of migratory water-birds use the habitats of the lagoon.

Con Chim Marine Sanctuary, with an area of 480 ha, has been developed by the Binh Dinh Fisheries Department in collaboration with the local coastal communes whose livelihoods rely heavily on marine resources. The long-term objective is to stabilize the ecosystem of Thi Nai Lagoon and the immediate aim was to establish a zone of ecological rehabilitation and natural resource conservation in Con Chim and the neighbouring areas, where the ecosystems of the mangrove forest and sea-grass beds could be rehabilitated and protected. The conservation of these natural resources and their sustainable use support the sustainable development of the area.

Issues and Challenges

Thi Nai Lagoon once supported a mangrove forest of 1,000 ha with associated seagrass beds over an area of 200 ha. These ecosystems resulted in high biodiversity and provided favourable conditions for an abundance of aquatic species which supported the livelihoods of human communities adjacent to the lagoon, especially the population of Quy Nhon City.

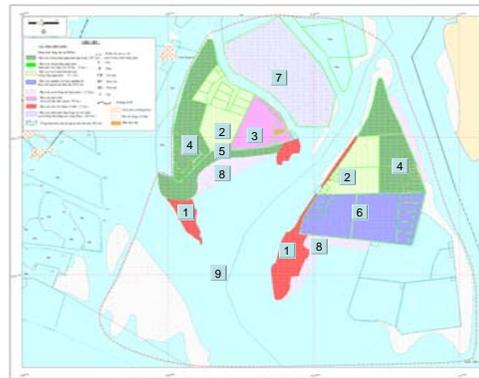
Unfortunately, the area and condition of the mangrove forest has degraded drastically, with as much as one-third of the lagoon area being converted into aquaculture. In addition the increasing discharge of wastes from the city and port of Quy Nhon and neighbouring areas has accelerated the pace of environmental degradation. The consequence of these adverse changes has been marked economic losses caused by: the lagoon bottom and navigable channels

becoming shallower; the aquaculture industry facing more frequent disease outbreaks; the lagoon landscape having been adversely affected; and bird "sanctuaries" having become abandoned. These changes have resulted in lost potential to develop ecotourism which is viewed as a major source of income for most of the central provinces of Viet Nam.

The ecological and economic problems resulted in the provincial authorities attempting to develop feasible solutions to partially rehabilitate depleted natural resources, enhance the economic benefits, and conserve the natural resource base. This project on rehabilitation and sustainable use of the aquatic resources of Thi Nai lagoon is expected to provide solutions to the problems of resource management.

Practices Implemented by the Demonstration Site Project

Attempts to solve the environmental problems of Con Chim lagoon requires determination and a recognition of the scale and extent of the challenges associated with designing a management plan that is both acceptable to all stakeholders and will at the same time take into consideration the environmental and socio-economic complexities of the lagoon system and its multiple uses.



Zones of Con Chim Marine Sanctuary: 1 seagrass and resource protection (15 ha); 2 environmental friendly aquaculture plus re-planted mangroves (25.1 ha); 3 bird protection and office site (9.4 ha); 4 concentrated mangroves (38.7 ha); 5 integrated mangroves and aquaculture (10 ha); 6 research and fisheries resource recovery (26.2 ha); 7 sustainable aquaculture extension (in Con Gia – 33.4 ha); 8 mollusc farming (11.6 ha); 9 for capture fisheries (310 ha).

It is also necessary for the plan to be agreed at all levels from provincial government down to the grass-root levels; for the communities to achieve a high degree of understanding of the reasons behind the designs chosen; to establish links and mechanisms for co-cooperation among all sectors, especially between the fisheries and forestry sectors; to involve and have support from scientists, institutes and relevant organizations that can provide expertise and advice; and to diversify involvement from central to grass-root levels, and from international and private organizations.

To address the problems associated with the conflicting uses of the lagoon a zoning map for future resource uses in Con Chim has been developed, that clearly demarcates zones for conservation of mangroves and seagrass, environmentally friendly aquaculture, as bird sanctuaries, and for fishing using appropriate gear.

Establishing Sustainable Aquaculture Practices and Local Livelihood Assistance

Activities have included the identification of environmentally and economically sound aquaculture techniques for appropriate species that can be employed by the local communities. This is based on trials to assess various models for multi-species culture and development and implementation of best practices amongst the local aquaculture practitioners in the area. In addition, through development of a co-management system involving the local communes in planning and implementing activities fishers previously involved in destructive practices have been encouraged to move into areas of sustainable aquaculture production, through provision of funds for the purchase of seed and grow-out facilities, as well as technical assistance.



Local oyster species using rack or ground culture methods

Rehabilitation of Mangrove and Seagrass

To address the problems of habitat degradation community based re-planting schemes for both the intensive and integrated use zones of mangroves have been developed and the local community has been directly involved not merely in re-planting but also in protection and management of the newly established young mangrove forests. Species diversity within the mangrove has been enhanced through the establishment of multi-species mangrove seedling nurseries. The degradation of seagrass habitats has been addressed through increasing the awareness of the local communities to the vulnerability of seagrass beds to destructive fishing gear and the identification and protection of core areas of seagrass in the lagoon.



Community based mangrove re-planting and protection programmes

Community Education and Awareness

One of the underlying causes of the environmental degradation in the area was the lack of community awareness of the significance and role of the natural habitats in sustaining fisheries production in the lagoon. As a consequence a programme of community awareness was developed to foster an understanding of conservation issues and sustainable practices amongst the local communities. This programme included education of children at local schools, the development of educational posters, pamphlets and displays on the environment, particular species of importance, and conservation activities and their use in the Con Chim information centre. Through involvement of the local community in the planning of small scale

tourism trips to the Con Chim Marine Sanctuary, awareness and understanding of the involved individuals has been enhanced.



Raising awareness of conservation and fisheries issues through education programmes, pamphlets and posters

Rationale for Approach Taken

The ecological complexity of the lagoon system with its mosaic of mangroves, seagrass and soft sediment benthic communities reflects the natural variation in topography and sediment characteristics of the lagoon floor, which has been greatly altered by past aquaculture activities. The seagrass and mangroves are critical nursery habitats for the larvae of aquatic species such as crustaceans and molluscs, which have been adversely impacted by changes in water quality and sediment characteristics. Past overfishing and the use of destructive fishing gear have altered the structure of the animal and plant communities whilst removal of mangroves and changes in sediment characteristics have necessitated trials to ascertain whether particular areas are suitable for replanting mangrove and whether changes in practices will result in natural recovery of some communities.

The project has benefited from favourable policies and finance from the Provincial People's Committee, domestic as well as overseas organizations, and from international expertise in mangrove recovery and coastal fisheries conservation. The co-management approach which has directly involved local fishing communities has worked well. Initial outcomes in terms of mangrove restoration and adoption of new models of shrimp farming and oyster rearing plus mangrove re-

planting, shrimp and tilapia farming, and oyster culture have proved successful. It is hoped that developing tourism while recovering significant habitats of mangroves and seagrass will help to improve local livelihoods.

The present efforts however, represent only the first stage in the rehabilitation of significant habitats and protection of fisheries resources in the Con Chim Marine Sanctuary and Thi Nai lagoon. Education to raise local awareness of the problems and potential solutions has only just begun. Outbreaks of shrimp disease are still occurring at a high frequency, and economic development of the local people is still at a low level. A major constraint has been the lack of adequate and sustainable financing.

Potential for Replication

Experiences in developing the Thi Nai Sanctuary provide examples of co-management approaches to a complex environment and ecosystem facing threats from multiple uses. As such they serve as a model for potential replication in other threatened coastal lagoons both in Viet Nam and elsewhere in the region.

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The Thi Nai Sanctuary is included within the South China Sea network of demonstration sites as a "self-funded" project

