

## Lessons Learned from Mangrove Ecosystems

### Part 5: Efforts for conserving mangrove ecosystems in other areas

Previously, we introduced expert dispatch activities and a development study for mangrove ecosystem conservation in Oman. In addition, JICA has conducted similar studies in the same field in Myanmar and Senegal with the aim of conserving natural brackish water ecosystems.

	<b>The master plan study on restoration, conservation and management of mangroves in the Sultanate of Oman</b>	<b>The study on integrated mangrove management through community participation in the Ayerwarwady Delta in the Union of Myanmar</b>	<b>The study on sustainable management of the mangrove in the Petit-Côte and Saloum Delta in the Republic of Senegal</b>
Current situation and background	Cutting down of mangroves by local residents, overgrazing by livestock, decreasing mangrove habitat due to development activities, need for conservation as an integral part of the coastal area management plan.	Mangrove deforestation due to harvesting of firewood and charcoal materials and paddy field development, need to formulate of participatory management plan as an integral part of the forestry policy	Decreasing mangrove forests due to lower rainfall and felling, need for a sustainable management plan as an integral part of the Senegal's forest action plan.
Project objectives	Formulation of a master plan for reforestation, conservation and management of mangrove forests	Formulation of the comprehensive mangrove management plan, technology transfer for sustainable utilization of mangrove	Formulation of a sustainable management plan for sustainable use of mangrove
Project content	Formulation of mangrove reforestation, conservation and management plan, selection of appropriate areas for afforestation and transfer of afforestation techniques.	Formulation of the comprehensive mangrove management plan, transfer of participatory natural resource management methods and mangrove afforestation and nursery	Formulation of a sustainable mangrove management plan, implementation of experimental projects at village level, technology transfer regarding sustainable utilization methods
Project size	Existing forests cover 1,088 ha in over 24 locations. The study area is 600ha in 7 locations.	Study area covers approximately 224,000 ha in 5 conservation areas.	Study area includes approximately 50,000 ha of mangrove forest
Project period	June 2002 – August 2004	February 2002 – January 2005	December 2001 – March 2005
Implementing agency	Dep. of Environment, DG of Environmental Affairs, Ministry of Regional Municipalities, Environment and Water Resources	Forest Department, Ministry of Forest	Dep. of Water, Forest, Hunting and Soil Conservation, Ministry of Environment and Nature Protection

All these projects share similar backgrounds although the size of the target mangrove area varies greatly between the different locations. In all the three countries, mangrove forests are decreasing because of natural or man-made causes, and formulation of a management plan for sustainable use of the natural resources is ranked as a priority in the central government's planning. Moreover, all activities share a participatory approach involving local residents, place emphasis on technology transfer activities such as management capacity building and involve awareness raising programs.

In Myanmar, standards for selecting appropriate afforestation areas are not clear, and the growth rates of afforested mangroves vary greatly. Therefore, it is considered necessary to implement monitoring activities in order to clarify the correlation between the growth rates and various conditions of the afforestation areas. Moreover, use of GIS to consolidate information on natural conditions is also a basic approach of the study. In Senegal, there is a great expectation for planting *Avicennia marina* as this species can grow well in water with high salinity. However, in practice, nursery and afforestation techniques are not really advanced. In the master plan study in Oman, in order to establish a baseline for monitoring planted mangroves all the results obtained in the study were inputted in the GIS database. Nursery and planting techniques of *Avicennia marina* have already been established under the cooperation of JICA expert. In addition to the master plan study introduced here, since the 1980s, the UAE has been experimenting with mangrove afforestation as part of its aquaculture programs. Based on the achievement of successful direct sowing of *Avicennia marina*, UAE has been expanding such projects. Along the section of the Red Sea coast that lies in the territory of Sudan detailed researches exist on the intricate relationship between mangrove ecosystems and camel herders in the area. In Zanzibar, boardwalks for mangrove observation have been constructed with the participation of local residents and the development of participatory ecotourism ventures is foreseen.

Mangrove vegetation is established in the brackish water between seawater and the land, therefore generally this ecosystem is vulnerable to environmental changes and human activities. At the same time, mangroves offer important natural resources for local residents and also are recognized as having high potential as tourism resources. In the effort to conserve and utilize mangrove vegetation, it is an important task to promote information exchange and technology transfer. In Oman, an information center for coastal environmental conservation including mangrove vegetation is about to be established. I sincerely hope that mangrove ecosystems will be conserved by halting the decrease and degradation of mangrove forests in different parts of the world through appropriate information exchange and technology transfer at the center.