

Mangrove and their Environment: the role of FREDA with particular reference to Myanmar

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Abstract: The mangrove environment in general and with particular reference to Myanmar has been reviewed. The rehabilitation and conservation activities of Forest Resource Environment Development and Conservation (FREDA) in the wake of natural disaster like cyclone Nargis of 2008 have been stated elaborately. The future strategies in mitigating the adverse effects of global warming and climate change have been highlighted.

Key words: Mangrove environment, FREDA, Myanmar.

Mangrove forests are one of the important Ecosystems of Wetlands. Mangroves are important to people living near tropical and sub-tropical coastal regions as wood and food resources and also for coastal protection. They are also important from the global view point of the earth's natural environment. Mangrove environments are formed through strong feedback relations between biota, landform, water flow and the atmosphere. In fact, water flows play a very important role in mangrove ecosystems, differentiating from freshwater wetlands and terrestrial ecosystems. Mangrove areas are periodically inundated by brackish water, with salinity ranging from that of seawater to that of freshwater, usually twice a day by astronomical tides. The hydrodynamics caused by the tide and sea waves are the dominant physical factors affecting the mangrove ecosystems.

In Asian countries, where mangrove forests have been extensively degraded and even completely destroyed, mangroves and their ecosystem conservation is very essential not only for the natural disaster protection but also for the production for wood as well as marine products for food.

Southeast Asia's 563 million people are concentrated along coastlines measuring 173,251 kilometers long, leaving them exposed to rising sea levels. Where Myanmar has also a long coastline of 2,832 kilometers with a continental shelf area of 228,781 sq.kilometers. At the same time, the region's heavy reliance on agriculture for livelihoods – the sector accounted for 43% of total employment in 2004 and continued about 11% of gross domestic product (GDP) in 2006 – make it vulnerable to droughts, floods and tropical cyclones associated with global warming and climate change. Its high economic dependence on natural resources and forestry as one of the world's biggest providers of forest products – also put it at risk. And increase in extreme weather events, deforestation, forest degradation and forest fires arising from climate change jeopardizes vital export industries.

Rapid economic growth and structural transformation in Southeast Asia helped lift millions out of extreme poverty in recent decades. But poverty incidence remains high as of 2005, about 93 million (18.8%). Southeast Asia still lived below the \$ 1.25 a day poverty line and the poor are the most vulnerable to climate change. Mean temperature in this region increased 0.1-0.3°C per decade between 1951 and 2000; rainfall trended downward during 1960-2000; and sea levels have risen 1-3 millimeters per year. Heat waves, droughts, floods, and tropical cyclones have become more intense and frequent, causing extensive damage to property, assets, and human life. The number of recorded floods/ storms/ cyclones has risen dramatically

recently. Cyclone Nargis of 2008, Giri of 2010, heavy rains and floods all over Myanmar and neighbouring countries are the current examples (Lateef. 2009).

The best and effective way to counter these natural disasters and to help and improve the livelihoods of coastal population is to preserve or protect the existing coastal mangroves and to restore or re-establish the degraded or depleted mangroves. The remaining mangroves of the world in terms of area and percentages can be stated as follows:

Sl.	Country	Area(km ²)	% of world total
1	Indonesia	31,894	20.9
2	Brazil	13,000	8.5
3	Australia	9,910	6.5
4	Mexico	7,701	5.0
5	Nigeria	7,356	4.8
6	Malaysia	7,097	4.7
7	Myanmar	5,029	3.3
8	Bangladesh	4,951	3.2
9	Cuba	4,944	3.2
10	India	4,325	2.8
11	Papua New Guinea	4,265	2.8
12	Colombia	4,079	2.7

Distribution of mangroves in Myanmar may be stated as follows:

Name of Division/State	Area in ha	% of total
1. Ayeyarwady Division	87,963	19.06
2. Mon State	21,265	4.61
3. Rakhine State	141,883	30.73
4. Tanintharyi Division	200,034	43.33
5. Yangon Division	10,479	2.27

FREDA has been establishing community forestry plantations with mangrove species in Pyindaye and Kadonkani Reserve Forests, Ayeyarwady Delta where natural mangrove forests were depleted due to encroachment for rice cultivation and land use change. Since the farmers have to abandon their rice fields after some years due to extrusion of salt water and acid sulphate from below, the only approach to address this issue is to restore the mangrove forests by the communities under the Community Forestry Instructions (CFI) of the Forest Department.

Extension activities for increased awareness, technology transfer and material support were undertaken by FREDA with the cooperation and support of international NGOs such as ACTMANG of Japan, DKH and EED of Germany. So far over 5,000 acres (> 2000 ha) of mangrove plantations are already established. FREDA has

established several nurseries to produce millions of mangrove seedlings for planting by the local communities. Now FREDa is conducting 3 kinds of mangrove plantations such as CFI for fulfilling the basic needs of communities, village wood-lots for the protection of village communities and their assets as disaster prevention and the wind-break or shelter belt plantations along the sea-shores and stream banks to protect wind and wave erosions.

Soon after Nargis Cyclone in 2008, FREDa had distributed emergency relief assistance to 26 villages of the project area with 14,508 rice bags, 22,000 viss of cooking oil, 20,700 viss of salt, 200 rolls of tarpaulin (91 metre rolls), 4,000 bottles of drinking water, 200 T-shirts and some medicine during May to December 2008.

Under the “Food security-related relief and rehabilitation project after Cyclone Nargis, Myanmar”, a total of 5,350 baskets of paddy seeds, 25 power tillers and 5,902 gallons of diesel were distributed during the period from June to November 2008 in 6 villages, in Bogale Township, Phaypon district, Ayeyarwady Delta.

Under the project of “Rehabilitation and disaster preparedness in Nargis affected area of Myanmar through sustainable landuse and renewable energy”, about 42,000 grafted fruit trees seedlings were distributed to assist the livelihood security of the Nargis-hit communities and about 16 ha (40 acres) of wind-break forest were established in some villages close to the seashore. In addition, renewable energy like, solar energy, wind energy and wood/rice husk gasification were introduced in some villages as the pilot feasibility studies.

After Cyclone Nargis, the majority of the people in the cyclone-affected areas have to stay in the temporary bamboo huts and tents. Hence there was the need of permanent wooden houses and cyclone shelters in case of occurrence of natural disaster in future. Based on the population density and vulnerability of natural disaster, 4 school-cum-cyclone shelters (SCCS) were constructed in Tebinseik, OkphoKwinchaung, Kuntheechaung and Kontanpauk villages. Similarly about 500 houses were also constructed in Kontanpauk, Padekaw and HtawPaing (ShwePyi Aye) villages in 2009-10 under the “Rehabilitation of Houses and construction of Cyclone Shelter in Ayeyarwady Delta” project.

In cooperation with the Diakoniekatastrophenhilfe (DKH) of Germany, FREDa has planned to implement the project

“Disaster Risk Reduction and Sustainable Landuse in the Ayeyarwady Delta after the Cyclone Nargis” for 3 years starting from 1st January 2010 up to the end of December 2012. The project activities mainly include construction of smaller school-cum-cyclone shelters, formation of high ground-cum-pond, provision of school furnitures, water harvesting scheme, training courses etc.

In partnership with NEF(Nagao Natural Environment Foundation), Japan, FREDa has been supporting the outstanding scholars of local universities leading to M.Sc and Ph.D degrees in various fields related to Botany, Biology, Ecology, Environmental Science, Forestry and Zoology. Since 1998, a total of 25 M.Sc students and 40 Ph.D candidates have been awarded with NEF Scholarship support. FREDa has also awarded scholarships to outstanding undergraduate forestry students studying at the Forestry University at Yezin and also stipends to promising high school graduates who are financially handicapped to study forestry at the University. So far a total of 61 undergraduates in forestry have been awarded scholarships and stipends since 1999 academic year. Support is also given to the outstanding students of the Myanmar Forest School at PyinOoLwin every year. Support to students in the academic field of environmental science is one of the avenues that FREDa is promoting jointly with NEF of Japan for increased awareness, motivation and experience of the younger generation, contributing towards effective conservation of the natural environment in Myanmar.

FREDa is also conducting applied research on aqua-forestry to fulfill the livelihood of Community Forestry Users Groups with funding from Wetlands Alliance.

18. FREDa is also launching on the fuel wood plantations in the Yangon division with appropriate first-growing fuelwood (*Acacia* spp.) with funding from Total Oil and Gas Company Ltd., Myanmar.

The present trend, now-a-days is “Green Economy and Green Growth” in mitigating global warming and climate change especially for developing countries. We, therefore, have to go ahead with Development on socio-economic and environmentally friendly guidelines in the near future.

References

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