

**Katoomba XVII Workshop**  
**COASTAL MANAGEMENT, MANGROVES, AND CARBON SEQUESTRATION**  
**June 25-27, 2010, Xuan Thuy, Nam Dinh Province**  
**Socialist Republic of Viet Nam**

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Photos: sign board in Xuan Thuy National Park; dyke separating mangroves cleared for fish farming (right) and core zone (left).

## Summary Report

### Background

The Katoomba workshop on June 25-27, 2010 on coastal management, mangroves, and carbon sequestration brought together more than 70 carbon market specialists and mangrove experts from 14 countries to discuss the opportunities and issues related to mangrove carbon financing in Viet Nam. Participants included Vietnamese government officials and researchers from Hanoi and Nam Dinh Province, field practitioners, resource managers, donor representatives, and the media. In addition to Viet Nam, the following Asian countries were represented: India, Myanmar, Philippines, Sri Lanka, and Thailand.

The workshop was a joint initiative of Mangroves for the Future (MFF), Forest Trends (FT), Ministry of Agriculture and Rural Development (MARD), and Ministry of Natural Resources and Environment (MONRE) as a contribution to the XVII Katoomba Meeting held in Hanoi on June 23-24, 2010, which addressed the broader issues of payments for environmental services.

The workshop comprised presentations, plenary discussions, and working groups covering a range of topics including mangrove ecology, carbon monitoring, financing issues, and local livelihoods. There were sessions on how to measure carbon stocks and sequestration rates, case studies of mangrove conservation in Vietnam, the policy framework for mangrove management, and opportunities for carbon financing under the regulated (i.e., CDM, REDD) and voluntary markets.

The workshop was preceded by a field visit to Xuan Thuy National Park, Viet Nam's first Ramsar site. Established in 1989, the park covers 5,000 hectares (of which 1,300 hectares are mangroves) and is very important for both biodiversity conservation (especially for migratory birds) and income generation (mainly coastal aquaculture and fisheries activities).

*This summary presents the major issues concerning mangroves in Viet Nam that were highlighted in the workshop presentations, and the main conclusions and recommendations that emerged from the discussions.*

## **Findings**

As a result of chemical defoliation in the south during the 1970s and large-scale clearing for shrimp and fish farming in the 1980s and 1990s, Viet Nam lost about two-thirds of its mangroves by 2000, and what remains is highly fragmented. GIS databases from MARD's Forest Inventory and Planning Institute (FIPI) and MONRE show that the total area of mangroves in Viet Nam in 2005 was no more than 150,000 hectares (other government reports indicate 250,000 hectares), with an average patch size of about 100 hectares. (By comparison, the area of mangroves in Indonesia was about 2.5 million hectares in 2005.) According to the Forest Science Institute of Vietnam (FSIV), the average mangrove carbon stock is also low at less than 40 tons/hectare.

The small patch size is important because the fixed costs of a carbon project must be shared over a small area of forest and correspondingly small amount of carbon. This increases the risk of project failure, which is mainly due to the inability to generate enough carbon credits during the early phase of a project when the start-up costs are high. Because many mangrove forests were cleared after December 31, 1989, they would not be eligible for CDM funding. But they could still be eligible for the voluntary carbon market, which requires that the land be non-forest 10 years before (i.e., 2000). The voluntary market also allows more land use options (e.g., REDD) and simpler methodology requirements than CDM. While the voluntary market probably holds greater potential than the regulated market for mangrove carbon projects, there are currently no voluntary projects in Viet Nam.

Although the area of mangroves has increased since 2000 as a result of replanting, the scope for large-scale recovery is limited by several factors. The first is the lack of available land. Viet Nam's coastline is densely populated and intensively used. Aquaculture is highly profitable at least in the short term and even when ponds are abandoned, land leveling, hydrological restoration, and other human interventions are usually required to make the site suitable for mangrove recolonisation.

An indicator of the competition over coastal resources is the high opportunity cost for mangrove conservation. In Xuan Thuy, clam collection on the mud flats where mangroves could be planted is highly profitable and limits the extent to which external financing could make mangroves a viable land use option. In Can Gio Biosphere Reserve, which contains 33,000 hectares of mangroves (the largest contiguous block in Vietnam) and is just 60 km from HCMC, the city government pays local households \$35/hectare/annum to protect the mangroves. HCMC can afford to pay this price, but most authorities elsewhere in Viet Nam could not.

Linked to the high opportunity costs of mangrove conservation is weak management. Most of Viet Nam's national parks and nature reserves are under the control of the provincial authorities that prioritize development over conservation. Surrounded by 46,000 people, half of whom depend on the park for their livelihoods, Xuan Thuy National Park is a case in point. Analysis of satellite images shows that the area of mangroves shrunk rapidly as shrimp ponds were established throughout the buffer zone and even in the core zone (see photo). The area of mangroves recovered after 2000 as a result of a replanting campaign supported by the Danish Red Cross from 1997 to 2002 (about 2,400 hectares of mangroves were planted), but land encroachment and over-exploitation of coastal resources continue. Similarly, Mui Ca Mau

National Park, which contains Viet Nam's second largest area of mangroves, has 10,000 people living inside it and has experienced rapid deforestation.

Another constraint is the highly dynamic coastline of the Mekong Delta where 70% of Viet Nam's mangroves are found. Heavy sediment flow from the Mekong River and powerful along-shore currents result in distinct patterns of coastal erosion and accretion from sedimentation. While mangrove replanting is possible on accreting shores, these are very dynamic as new land is created and land is lost in close proximity. Thus, the persistence of mangrove conservation projects may be an issue. The experience from Kien Giang Province, where the construction of canals to the sea in the late 1990s triggered intense coastal scouring and mangrove loss, highlights the unintended consequences of infrastructure development in such environmentally sensitive areas. This raises the question of whether or not REDD funds should be used to compensate for the effect of badly designed infrastructure.

Another limitation on mangrove recovery is linked to the low survival rates of government supported projects. The traditional approach has been to use Programme 661 funds to pay local people as day laborers to plant and protect mangroves. But young mangroves require care to protect them from natural hazards as well as human interference, and without the whole-hearted participation of local communities, mortality rates are usually high. Conversely, CARE and GTZ supported projects in Thanh Hoa and Soc Trang Provinces have shown how the use of co-management arrangements, which give local people a long-term interest in mangroves, can greatly increase their survival rate.

However, it may be difficult to scale up promising co-management arrangements because 70% of mangroves are classified as protection or special use forest (i.e., protected areas) and consequently fall under the control of government management boards and cannot be allocated to households. This also has implications in terms of the distribution of revenues derived from the mangroves, particularly as they relate to local communities.

An issue highlighted by the Can Gio case study is the risk of planting mangroves in high densities (10,000 seedlings/hectare is the government standard). The mangroves that were planted from 1978 are starting to die off, perhaps due to competition for light, or because of being crowded together so closely they are particularly susceptible to insect attack. Because of their designation as protection forest, thinning of these mangroves is banned. The GTZ project in Soc Trang is supporting selective mangrove clearing to test the impact of diversifying the forest system.

### **Conclusions and Recommendations**

There is potential to develop carbon marketing and PES projects in Viet Nam, especially in some of the mangrove areas in the Red and Mekong River Deltas. However, several challenges lie ahead. These include defining exactly what mangroves are in Viet Nam's forest classification system and the eligibility of mangroves in global carbon market mechanisms. Nonetheless, there are grounds for optimism.

Because of their important storm and flood protection functions, the government is convinced of the economic case of protecting mangroves, particularly now with the additional threat of sea level rise. They are no longer considered "mosquito ridden, foul smelling places" as one participant put it. The case studies also documented the importance of mangroves for fish breeding grounds and in the case of Can Gio for filtering dirty water discharged from HCMC and

nearby industrial zones. In other words, carbon is likely to be only one of several environmental services that could be marketed.

MARD's mangrove recovery plan, which aims to replant or restore 300,000 hectares of mangroves by 2013, provides a supportive national policy framework, even if the implementation modalities have still to be defined. (Since the workshop, MARD has expressed interest in preparing a decree to support community-based payments for ecosystem service for mangroves. This would build on the payments for forest environmental services decree that MARD has drafted following two years of pilots and would be an opportunity to address management authority, community participation, benefit sharing, etc.)

There are also technical difficulties regarding carbon measurements in mangrove ecosystems, especially the below-ground carbon accumulation, the dynamic nature of mangrove forests, and the need to better understand and quantify the other economic values of mangroves, especially for aquaculture and coastal infrastructure development. However, the session on mangrove carbon measurement showed that Viet Nam's universities and research centers have adequate capacity to monitor carbon stocks and to value the other goods and services that mangrove forests provide.

The ability of mangroves to adapt to sea level rise hinges on the response of different species (hence the importance of species selection) and allowing space for mangroves and other coastal vegetation to migrate inland. In other words, it may be possible over time to assemble a patchwork of natural and semi-natural habitats, including but not restricted to mangroves, that could increase adaptive capacity and economies of scale for carbon marketing.

In the short term, MFF will support the preparation of a National Strategy Action Plan (NSAP) for Viet Nam that will identify potential field level projects to help implement the strategy. There may be a need to create a regional working group (which MFF could facilitate) as a mechanism to continue the carbon related discussions that includes the neighboring countries of India, Indonesia, Myanmar, Philippines, Sri Lanka, and Thailand. This will ensure that international expertise and experiences are shared on an on-going basis.