



Community-based Mangrove Reforestation and Management in Da Loc, Vietnam



The commune of Da Loc in Vietnam was badly hit by Typhoon Damrey in 2005, which destroyed protective sea dikes and caused major flooding to its coastal villages. These floods caused large areas of agricultural land to become saline, seriously reducing crop production for years to come, and forcing many local people to leave the community in search of paid work elsewhere. Climate change projections for Vietnam show that this type of extreme event is likely to increase in the future.

After the storm it became apparent that parts of the sea dike which had been protected by mangroves were still intact. As a result CARE, working with the local community, developed a project to restore the mangroves in order to save lives and protect livelihoods. The key adaptation strategies were to reduce vulnerability of the communities to risks from storms through sound management of mangroves and to increase adaptive capacity of the communities by providing alternative livelihoods. This project aimed to improve awareness and empower the local community to collectively manage the resource; to improve the quality and extent of the mangrove forests; to improve people's security as well as generate livelihoods from sustainable use of the mangroves; and to build awareness and acceptance by the local authorities for community forest management. The villagers were trained in collective management and decision-making as well as in how to create a nursery, plant mangroves and then take care of them to ensure their success. The project also supported livelihoods associated with mangroves, including activities such as sustainable oyster farming, shellfish collection and producing mangrove honey to sell on the local market.

Keywords: climate change adaptation, mangroves, disaster risk reduction, community-based ecosystem management, reforestation, mollusc collection, honey, Vietnam

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FOREWORD FOR THE ELAN CASE STUDIES

The Ecosystem and Livelihoods Adaptation Network (ELAN) is a global network working to enhance poor and marginalized people's resilience to the impacts of climate change. To do so, ELAN promotes an integrated approach to adaptation, defined as *adaptation planning and action that adheres both to human rights-based principles and principles of ecosystem sustainability, recognizing their co-dependent roles in successfully managing climate variability and long-term change*.

ELAN has developed a series of case studies on adaptation practices whose design and implementation approximate aspects of this integrated approach. The ELAN case studies showcase how nature-based adaptation can offer benefits to communities. They also demonstrate the complexity of pursuing a truly integrated approach to climate change adaptation and highlight elements of adaptation projects that lend themselves to an integrated approach. It is our aim that this enhanced understanding of an integrated approach may contribute to learning, knowledge exchange and capacity building, and in particular help practitioners to design and implement future adaptation projects that enhance poor and marginalized populations' capacity to adapt.

The research process consisted of examination of hundreds of projects and consultation with a diverse range of project managers. The selected ELAN case studies constitute the best available practices and approaches of projects that combine nature-based solutions with community benefits. Case studies represent a broad geographic scope and ecosystems. They are drawn from Africa, Latin America and Asia.

Ecosystem and rights-based integrated adaptation

Adaptation projects based on an integrated approach should meet the following criteria in the project design and implementation:

- ❖ Promotion of livelihoods resilience;
- ❖ Disaster risk reduction to minimize the impacts of hazards, particularly on the most vulnerable households and individuals;
- ❖ Capacity strengthening of local civil society and government institutions so that they can more effectively support community, household and individual adaptation efforts;
- ❖ Advocacy and social mobilisation to address the underlying causes of vulnerability including poor governance, degraded ecosystems, inequitable control and access to resources, limited access to basic services, discrimination and other social injustices;
- ❖ Sustainable management, conservation, protection and restoration of ecosystems and biodiversity in order to maintain the multiple benefits provided by the ecosystems' goods and services.

What can we learn from the ELAN case studies?

An important lesson learned from the research process is that projects that fully embody an integrated approach to adaptation are few and far between. Indeed, despite extensive research, case studies that met *all* the above-mentioned criteria for an integrated approach and adhered to both human rights-based principles and principles of ecosystem sustainability could not be found. Why not?

First, the complexity of ecosystem goods and services and their links to climate change were often ill-considered during project design and implementation. Often a community-based adaptation project may simply entail community-based natural resource management – which is not the same as adopting a truly ecosystem management approach. In other cases the proposed measures had no real foundation in climate change. Finally, most projects focused on restoring or conserving ecosystems under a *static* climate, rather than on finding ways of preserving ecosystems to help people adapt in the context of a *changing* climate, posing the project's long-term sustainability at risk.

Second, ensuring that adaptation policy and practice promote human rights-based principles was often not straightforward. Although most projects were designed to increase community resilience to climate risks and deliver additional benefits to local livelihoods through nature-based solutions, only a few addressed the underlying causes of vulnerability and pursued true empowerment of vulnerable groups. In other cases, projects intending to promote a rights-based approach supported the rights of some community members but not others. For example, while the

importance of involving women in adaptation initiatives was often underscored, efforts to address the special needs of other vulnerable groups (such as the elderly, the disabled, or children) were not always prominent components of the projects, particularly during the implementation phase.

Third, the ELAN case studies demonstrate the complexity of pursuing a truly integrated approach to climate change adaptation. While there are many projects that prioritized the promotion of human rights through community-based adaptation practices, environmental sustainability was not always equally guaranteed. At the same time, an ecosystem-based adaptation project may not always seek to ensure that the rights of the poorest and most vulnerable members of society are protected.

These and other lessons learned make an important contribution to generating and exchanging knowledge on integrated adaptation approaches. In addition, the case studies help to underscore the challenge and importance of integrating the full range of rights-based and ecosystem-based responses to climate change. An enhanced understanding of the complex interplay between these principles – informed in part by these case studies – can help move us towards the goal of protecting the ecosystems that play a vital role in ensuring that poor and marginalized populations can manage and adapt to climate variability and change.

INTRODUCTION

In Vietnam and elsewhere mangrove forests have been destroyed and degraded by unsustainable harvesting as well as by a myriad of coastal development projects including tourism and aquaculture. However, in light of recent extreme natural events and the risk of rising sea levels due to climate change (IPCC, 2007), there is increased interest and motivation in restoring mangrove forests for both livelihoods as well as for the disaster risk reduction benefits they provide.

Mangroves can reduce the impacts of storms, sea-level rise and big waves such as tsunamis. Their roots stabilise the soil, thereby decreasing erosion by wind and waves, and provides a physical barrier that slows down storm surges and tidal waves, thereby reducing their height and destructive power (Chopra *et al.*, 2005; WWF, 2005).

Livelihood benefits from mangroves are numerous. The forest provides a nursery for young fish and crustaceans including shrimp and crabs, and a rich habitat for a variety of molluscs including oysters and mussels. These species play important roles within the ecosystem by decomposing organic matter or by supporting animals higher up in the food chain, including fish. Seafood is of great economic importance and can significantly improve household income when sold on the market or for self-consumption. Honey produced from mangrove flowers is another value that illustrates the broad and multiple benefits of mangroves. The trees themselves have tremendous value, both as firewood and construction if sustainably harvested, and as critical carbon dioxide sinks. In addition mangroves are important as habitat for a wide variety of wildlife.

Project context

Da Loc is a coastal commune where mean temperatures vary from 20-28°C throughout the year. The average annual rainfall is about 1,800mm, and extreme events like flooding and drought are becoming increasingly common. With a distinct dry and rainy season, the commune is usually hit by five to six storms each year. In 2005 Typhoon Damrey however was exceptional, destroying the coastal dike that had been built to protect the villages and agricultural land from flooding with sea water. This caused serious salinisation of the soil that will last for years, destroyed crops and forced many local people to leave the community in search of paid work elsewhere. Fisheries declined, as local people explained that in the past most people could earn enough per day by fishing up to 1km from the coastline. Nowadays they need to invest in larger boats and travel over 100 km to get a reasonable catch. Local officials noted that unemployment has risen, and since 2005 some 1,000 to 2,000 people—mainly young—leave the area every year due to limited livelihood opportunities.

After the storm local people, government officials and aid agencies observed first-hand the functions and values of mangroves in risk management. In areas that had either been deforested or where replanting efforts had failed, the coastal dike proved too weak in the face of the storm. However, where there were mangroves, the dike held.

The project developed by CARE² had two overarching aims: mangrove restoration and the protection of lives and livelihoods. Its four main objectives were to improve awareness and capacity to collectively manage the mangrove forest; to improve both the quality as well as the extent of the mangrove forest; to improve people's security as well as to develop diverse livelihoods from sustainable use of the resource; and to improve understanding and acceptance by local authorities of community mangrove forest management. Community-based natural resource management is increasingly viewed as the most appropriate arrangement for promoting sustainable development of common-pool resources (Le Hue, 1994) in this case as a communal risk management strategy.

Stakeholder involvement

The community (in this case the six target villages) is deeply involved with the management and protection of its mangrove. The Community-based Mangrove Management Board (CMMB) has day-to-day responsibility for organising local people into various groups (e.g. for nursery work and replanting). The local people, not only the CMMB, seem to have a genuine interest and enthusiasm for the protection of the mangrove and the project. The CMMB has been given District level approval to manage and benefit from the project. The decision was made with the support of Thanh Hoa Provincial People's Committee. The mangroves are classified as "protection forest" and are State-owned resources.

ADAPTATION STRATEGIES

Strategy 1: Sound mangrove management to reduce risks and impacts of storms

a. Improved awareness and capacity

The first project objective was to improve awareness and capacity of four villages to collectively manage 250 ha of mangrove forest by developing community participation in mangrove management, by:

❖ Creation of “Green Teams”

To improve awareness, and following up on a request by the Youth Union which had growing concerns about climate change impacts, the project started by working with young people to help develop “Green Teams”. This started as a result of 23 high school students setting up a Green Team to support mangrove conservation and environmental protection. This grew into a network of 10 Green Teams in 10 villages, and included 164 members belonging to the Youth Union and students in secondary and high schools. The Green Teams then elected an executive committee of 12 members which included the leaders of the Youth Union and Green Teams. This executive committee has the responsibility to lead and monitor the activities of all 10 Green Teams in the commune of Da Loc.

The Green Teams clean the beach and maintain the mangroves and also help farmers reduce rubbish by encouraging recycling and composting to produce organic fertilizers. They also support a number of environmental education activities by organising events and distributing pamphlets. Over 5,000 people (including people from neighbouring communes) have obtained information from the Green Teams who have also organised fun events aimed at younger people. These involve contests including planting exercises, drawing pictures and singing songs that are linked to environmental and mangrove protection. This awareness building has also contributed to the fourth objective of the project, which was to change attitudes of local leaders about community forest management.

❖ Community participation in mangrove conservation

The local community developed a “Community-based Mangrove Management Board” (CMMB) with a clear and democratic institutional structure. The CMMB is a freely-elected board made up of farmers as well as representatives of different organisations and the village authorities. This board oversees the nursery, planting and mangrove maintenance operations, as well as activities aimed at improving livelihoods. They collectively decide on what groups are needed to undertake what work, whether it be groups working in the nursery (the “nursery group”), planting the seedlings (“the planting group”), or taking care of the plantations by cleaning and protection activities (“the protection group”).

b. Improved quality and quantity of the mangroves

The second project objective aimed to improve both the quality as well as the quantity of the mangrove forest by building capacity in the local community to manage the resource. Mangrove reforestation is not new and a number of resources aimed at managing resources are available (e.g. Melana *et al.*, 2000). Two hundred hectares were planted with a good survival rate (70-90% in 2009, depending on the location). Three areas of focus are required to ensure mangrove success:

❖ Replanting

Choosing the right mangrove species is crucial for a successful replanting programme. The villagers first planted the native species *Kandelia candel*, which grows well on water-logged soil. It is essential to plant native rather than introduced species both for resilience as well as for biodiversity conservation. Once the *Kandelia candel* had stabilised the soil after a year, it was then intercropped with another native species of mangrove (*Sonneratia caseolaris* or “mangrove apple”). *Sonneratia* was introduced in a second phase because its seedlings require a more solid substrate than *Kandelia*, but this species grows faster and has the

potential to provide a wider canopy. Local people knew that *Kandelia candel* used to grow in Daloc prior to 1970, when farmers cut down the trees in order to encourage seagrasses used for handicrafts, and after that shrimp ponds replaced the mangroves. Since 1987, both seedlings and seeds of *Kandelia candel* and *Sonneratia* spp. were brought from the north of Vietnam (Thai Binh Province) for replanting. The mix of mangrove species is vital in creating a robust and more natural self-regenerating mangrove forest in the future.

❖ **Nursery**

The CMMB decided to establish a nursery to propagate these two species of mangrove, as they can grow both in the sea as well as along river banks which need to be protected from erosion. The nursery teams are composed of women as the CMMB considers that women have better growing skills (even though the women then chose a man to be leader of the nursery due to his experience and the fact that he had visited another Province on a mangrove study tour). These teams collect propagules from older mangroves and prepare seed beds with the best quality soil. Pesticides are not used and the plants are fertilised by using river water. The teams have a meeting each month to decide who takes care of the nursery and what needs to be done.

❖ **Mangrove care**

Follow-up care is essential for mangrove plantation success. In addition to the volunteers from the Green Teams, all members of the local community who wish to do so periodically remove plastic and other rubbish from the developing plants. They also remove barnacles which are a significant cause of mortality to seedlings. Although chemical removal has been tried in other projects, it is much more environmentally sound to remove the barnacles by hand, and this method was suggested by the community itself. Community members who engage in mangrove care and protection receive a small allowance for their work from CARE.

Strategy 2: Improve livelihoods to increase the adaptive capacity of communities to extreme events

a. Livelihood benefits

The third project objective was to ensure livelihood benefits from the mangroves, with the challenge being to ensure that all use remains sustainable. Benefits from the forest (composed of the newly planted 250 ha and 200 ha of older mangrove) include:

❖ **Limited firewood collection**

Collecting firewood from the mangrove forest was previously illegal. However the CMMB voted to allow 100 poor households to collect dead wood from the mangrove forest to use for cooking, which appears to be sustainable.

❖ **Honey production**

Honey is collected during the summer season and is sold on the market.

❖ **Fish, crab and mollusc harvesting**

Currently 1,000 households collect fish, crabs and molluscs in the mangrove areas planted in 2007, as well as in older mangrove forests, for sale on the local market. The planting activities increased the amount of mud and silt in the tidal area, increasing access to and the amount of harvestable seafood. Poor people, mainly women, are once again able to collect molluscs and fish at low tide for seven to ten days per month. The project also reported that in just one day, 400 poor farmers were able to earn 1,000 USD by collecting molluscs in the new mangrove plantations, an area which prior to 2007 was barren. They were able to do this for four to five days between the months of April and September.

❖ **Improving oyster yields**

The CARE project also improved on small-scale oyster farming to generate either additional or principal income for families, by training families in how to construct bamboo scaffolding for oyster farming. To these they attach larger shells (which at first they could obtain free of charge from restaurants until the restaurants realised there was value in the shells and started charging). Wild oysters then naturally accrete to these

structures. Training on improving traditional methods was provided by visiting a DANIDA project in Quynh Luu District – Nghe An Province. CARE is now helping these 34 families form a cooperative to be able to commercialise their oysters at fairer prices. Although no technical survey has been undertaken, the project reports that through this method oyster yields have increased.

❖ **Project allowance**

Most local people in the project area have benefited from allowances provided for various support activities. While these allowances are only a small percentage of their total income, they are welcomed by the local community as a very useful supplemental income. This raises the question of the long-term sustainability of the project once the allowance scheme stops. Other potential livelihood sources that may be developed in the future include ecotourism and bird-watching. The mangrove forest will also protect livelihoods by flood protection, although currently the forest is still too young to fully protect the surroundings from a typhoon.

In addition to the services listed above, and while not directly connected to mangrove restoration and ecosystem adaptation, the project also provided some pigs to the local communities to supplement their livelihoods, and organised technical training courses on pig farming in six villages, encouraging them to learn from each other. Training on improving traditional pig farming methods was provided by visiting a DANIDA project in Thach Thanh District.

The project also focussed on restoring salt-affected agricultural land following Typhoon Damrey. Given the number of households suffering from food insecurity, the Community-based Mangrove Management Board asked CARE for assistance. They developed a project to construct a series of canals to improve rice production by flushing the salt-contaminated land with river water. The canals can now supply fresh water for 200 ha of fields. Biannual rice crops have increased yields from 50-200 kg of rice/500 m² to 300 kg of rice/500 m² with the canal. This canal project as well as the pigs helped improve local livelihoods, thereby reducing pressure on the mangroves.

b. Institutional change

The fourth project objective was to develop institutional change and acceptance by the local authorities of the importance of community-based forest management to improve livelihoods, which was achieved through following activities:

❖ **Enhanced understanding of community-based mangrove management by authorities and local communities**

The project provided training to 20 CMMB members (which included local authorities) to develop a “Participatory Forest Land Use Plan” (PFLUP). This process helps decision-making on policies for the sustainable use and management of the mangroves. Legal studies on legitimate rights and responsibilities, as well as a practical participatory inventory of the extent of mangroves resources and values (using GPS) were conducted with the CMMB and three villages. The inventory calculated the speed of tree growth, timber and non-timber forest product volumes to date and estimated future resources for the next five and ten years. The inventory also helped evaluate the potential for damage to the mangroves by disease and wave action.

Through this process the community identified priority resources and estimated sustainable harvests. A map outlining mangrove forest land use, including sustainable harvesting quotas, was then developed for these three villages. These activities provided information for the PFLUP which was then developed by representatives of the Hau Loc District People’s Committee, the Provincial Department of Agricultural and Rural Development, the Communal People’s Committee, the CMMB, and village leaders. This process helped ensure stakeholder understanding about their roles and rights. It also led to an agreement on the division of the community mangrove area between three coastal villages for management, protection (when the mangrove will be big and strong enough, in around five to seven years) and development.

❖ **Increased communication between authorities and local communities**

Village rules and regulations for harvesting, management and protection were agreed based on findings of the legal and inventory studies of the PFLUP. The Hau Loc District People’s Committee has approved the village-level regulations for community-based mangrove management and made three formal decisions which assigned rights for mangrove management, protection and development for the next five years. These community regulations were then disseminated by radio to all villages to ensure that local people knew when

they were allowed to exploit resources from the mangroves, and the regulations enforced by the “protection groups” composed of members of the local community.

❖ **Increased communication between authorities and women**

Training courses were organised by the Women’s Union on mangroves, environment and gender issues, broadening project awareness-raising, and ensuring that women gain access to benefits. These courses were attended by 369 participants from the commune of Da Loc and two neighbouring communes (Hung Loc and Minh). After the training the participants had a better understanding of gender concepts, roles of mangroves in disaster risk reduction and local environmental improvement, as well as their rights and responsibilities regarding those issues. Women became more confident thanks to their active involvement in project planning and implementation.

❖ **Establishment and implementation of group benefit-sharing systems**

The CMMB voted to set up and implement a plan on mangrove forest and aquatic resource use based on results from the inventory. This covers the exploitation of forest resources such as firewood; seeds; bee keeping; seafood harvesting including fish, crabs, shrimp and molluscs; and the harvesting of mangrove seedlings for use in the nursery and replanting. People who exploit the mangrove forest and its natural resources must contribute financially to the protection and management of the mangrove areas. The rules and regulations were communicated to all households. The CMMB also assigned community members to volunteer “protection groups” who patrol the mangrove areas, particularly at times when other members of the community are most likely to collect shells or wood, informing them of sustainable practices such as how to dig at a correct distance from the plantlets so as not to cause disturbance. They also report people to the competent authorities after repeated disregard of the community-based rules.

RESULTS

In November 2009 the impacts of Phase I and II of the project were evaluated against the stated objectives. The evaluation took eight days with multiple stakeholders, and four different methods were used: a self-assessment form (for CARE staff and CMMB members); a community questionnaire (given to 100 people in the six project villages); community interviews (24 lasting between 30 to 60 minutes); and a participatory rural appraisal on the livelihood benefits of the project (six to ten participants in each village). Although this project is now complete, the donor and CARE Australia still visit the project sites to review project progress.

The results of the evaluation shows that the mangrove has greatly improved both in quality and quantity, with 200 ha of new mangrove forest established. Although still young, the mangroves have already changed the coastal environment from barren mudflats to a regenerating multi-use forest with stabilized soils and increasing marine life. Another positive sign is that 50 ha of mangroves have been planted up to 700 m out to sea which will provide strong coastal protection once they are mature. This forest will significantly increase security from storms and floods during the next decade.

Livelihoods have been improved, even though sustainable use of the forest is limited to the people living closest to the mangrove who have greater opportunity to use the forest resources. Examples of direct livelihood benefits include:

- ❖ 695 households (2,993 people) in Dong Hai, Dong Tan, and Ninh Phu villages have new opportunities concerning the right to sustainably exploit forest following the decision taken by the Hau Loc District People’s Committee.
- ❖ 1,000 households can now exploit fish, crabs, and molluscs in the mangrove forests planted in 2007 and before. These people come from all 10 villages of the commune of Da Loc and neighbouring communes. It is reported that some 400 households were able to earn more than 1,000 USD (on average 2 USD per household) per day of mollusc collection.
- ❖ 100 poor households are allowed to collect dead wood in the mangrove forest for use in cooking.

There is also clear evidence of increased awareness of and better behaviour towards mangrove values and conservation, as well as to environmental protection in general. Behavioural change in regard to cleanliness, litter and pollution is already having a positive impact on the mangrove. Over 5,000 people (including neighbouring communes) have obtained information from various project meetings as well as from contests on environmental education and

mangrove protection, planting exercises, and livelihood improvement issues. Villagers testified in the project evaluation that dropping litter in the village eventually reaches river, then the sea and can kill the young mangrove trees. Other people said that the environmental standards in the community had improved especially due to the creation of Green Teams.

Local authorities demonstrate a clear understanding of the project's approach and are fully supportive, having worked closely with the CMMB and issuing a decision in November 2009 which allows community management of the mangrove.

CONCLUSION AND LESSONS LEARNED

Mangrove management

The CMMB system has been consolidated thanks to decisions made by the District People's Committee which represents an important milestone for community management and decision-making in Vietnam. This process requires a Participatory Forest Land Use Plan (PFLUP) involving a number of preparatory steps including an inventory of the resources; agreeing who has access to what quantity of resources; and the development of rules and regulations for management, protection, monitoring and sanctioning. The CMMB model established in Da Loc is not only a first for the district of Hau Loc and the province of Thanh Hoa, but also pioneering for coastal Vietnam and as such has attracted much interest and may be replicated in other communes.

Participatory planning and implementation

Considering the extremely harsh project conditions including high waves and deep mud, it was essential that planning and decision-making be made in a participatory manner to maintain high morale and overcome the physically demanding work far out at sea. The logistics of planting mangroves far from the coast in deep mud and with large waves presented a challenge, and innovative solutions as well as boats had to be found. The project team and the CMMB organised participatory meetings and technical training courses, working closely with farmers in the field. The Participatory Forest Land Use Plan (PFLUP) process is new and requires a number of steps and decisions. These include formal negotiations for land allocation and contracts with the District People's Committee, the preparation of legal documents for the three villages, and agreement on the benefits and responsibilities for each community. Local people with no previous experience need to be encouraged to contribute their ideas and adopt new responsibilities with confidence.

The cost of planting mangroves per hectare has decreased since 2009 due to the improved capacity of the CMMB, who are now able to lead the process. Local people are well organised and motivated to plant mangroves, with an increasing rate of success. In 2010 farmers continued to remove barnacles and plastic waste in the plantations by hand as they understand that if they do not do this, the young trees will die. Raising awareness by having fun motivates people, and entertainment including planting contests, painting pictures, and singing songs based on environmental and mangrove protection issues attracted people not only from the commune of Da Loc but also from neighbouring coastal communes. Some events were organised on the beach next to the mangroves to encourage people, especially youth, to attend. Children who get their hands dirty and have fun will probably retain environmental messages better than they would in a more formal educational setting.

A few equity issues need to be raised. First, the more marginalised community members are probably the least involved, as benefits stem from active physical participation. Second, the people benefiting directly from livelihood improvement are in general the ones living closest to the mangroves.

Sustainability

Given Vietnam's changing policy environment with regard to benefit-sharing and community management of natural resources, and based on international good practice, the project was designed to not only be participatory, but to effectively become part of the community itself to ensure its sustainability. However, the true test will come in forthcoming years when the project no longer provides allowances or supports management boards at the village

level. It remains to be seen whether the village boards will be able to implement their management plans and receive technical support from the district, or whether exploitation will increase to replace the lost benefits provided by the allowances. An indicator of sustainability will be whether the CMMB and the nurseries continue to function once the project ends and whether these monetary benefits outweigh the costs and act as an incentive.

Replicability

Some positive signs have occurred at the institutional level, as Thanh Hoa Province and Hau Loc District People's Committees have recently given their verbal support to an expansion of the current project using the same approach. Currently 695 households (2,993 people) in Dong Hai, Dong Tan, and Ninh Phu villages have been given new rights - especially new decision making rights - concerning mangrove management, protection and development by decisions from the Hau Loc District People's Committee.

At a broader level, the project team was invited by the Vietnamese Ministry of Agriculture and Rural Development (MARD) to present the project results at an annual meeting which included 420 participants, mainly provincial staff from Da Nang City. The MARD Forest Institute is developing plans for a 100,000 ha government mangrove planting and management program and have decided to establish an experimental plot in Da Loc in order to learn from the CARE model. A report from the district engineer (Son, 2010) illustrates the interest the project has generated as a model to be replicated. The "Co-operation Development Group", which includes both Vietnamese and international NGOs, visited the project to discuss potential replicability and the project's impact on disaster risk reduction. Government representatives from three provinces (Nghe An, Ha Tin and Quang Binh), Thanh Hoa Farmers Union members, 19 representatives from the regional centre on flood and disaster control agency, Thanh Hoa leaders, and a high level advisor for national government also made field visits to the project to see how the mangrove management scheme was implemented.

Critical Success and Risk Factors

The limited success of previous mangrove restoration projects in the area show that an innovative approach is required to mangrove planting, care and overall management.

In three years the project has succeeded in establishing a formally recognised community-based mangrove management system with clear community rights, rules and regulations and organisational structures at the local level. The community has been empowered to manage their environment but they also benefit from new rights to manage their surroundings. Other direct benefits include livelihoods activities such as oyster production or honey collection. Indirectly their security against disastrous effects of storm surges have been improved even though it is necessary for the mangrove to grow in order to provide effective protection.

The process has followed internationally accepted standards for co-management of natural resources, and represents a milestone for community rights in Vietnam. This has set the scene for each village to implement the system and manage their mangroves. In order to do so, they need to develop detailed management and monitoring plans based on the inventories to be made in the coming years. The CMMB will need further capacity strengthening to create the management plan, implement the system and develop the relationships it requires. Access to local government support will ensure the sustainability of local structures as well as the planning, implementation and monitoring of the protection and sustainable use of the mangrove areas.

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Recommended reading

The CARE project brief: www.careclimatechange.org/files/adaptation/Vietnam_Mangroves_Thanh_Hoa.pdf

'Mangroves for the Future' website: <http://www.mangrovesforthefuture.org>

Ecosystem & Livelihoods Adaptation Networks

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