



## **Building Coastal Resilience in Vietnam**

An integrated, community-based approach to mangrove management, disaster risk reduction, and climate change adaptation.

Experiences from CARE in Da Loc and Nga Thuy Communes, Thanh Hoa Province, 2006-2014





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## Acknowledgements

This report was prepared by Sarah Orleans Reed, consultant to CARE, in collaboration with Nguyen Viet Nghi, Nguyen Anh Minh, Ha Thi Kim Lien, Tran Manh Hung, Ngo Van Thien, and Nguyen Kim Anh of CARE Vietnam. The authors would like to acknowledge in particular the insights and support of Ms. Bui Thi Din, a member of the Community Based Mangrove Management Board for Da Loc Commune, who supported the team throughout the documentation process. Nguyen Thi Yen, Nguyen Van Hue, Aurélie Ceinos, Edward Boydell and Nguyen Chau Thanh also provided valuable analysis, review, and feedback. We are extremely grateful to all of the individuals from Da Loc and Nga Thuy communes who shared their time, experience, and knowledge about community-based disaster risk reduction, ecosystem management, and climate change adaptation.

## Executive Summary

A high level of exposure and a host of underlying social and environmental challenges render Vietnam's coastal communities highly vulnerable to climate change. The case of Da Loc and Nga Thuy communes in Thanh Hoa Province demonstrates how these complex factors interact to drive a downward spiral of vulnerability. Over the last half-century, degradation of coastal ecosystems like mangrove forests has exposed local residents, their homes, and productive assets to more serious storms and tidal floods. Poverty creates additional pressures on natural resources, as households exploit mangrove forests for timber and seafood or are forced to apply chemical fertilizers to crops. Coupled with external stressors like upstream river pollution, these factors further degrade the quality of local soil and water resources.

In these fragile systems, a flood or storm can have catastrophic results. This was the case for Da Loc and Nga Thuy in 2005. Tidal waves and upstream floods from Typhoon Damrey overwhelmed the surrounding coastal dike, resulting in inundation of homes and agricultural fields. In Da Loc alone, the floods destroyed shrimp farms and 500 hectares of crops, demolished or severely damaged 100 houses, and contaminated soils with salt water. The devastation was dramatic and long-term. For many households, losses from the storm and poor harvests associated with saline contamination led to hardship and debt for years to come.

Climate change is exacerbating these challenges in numerous ways. Projections indicate that extreme events, changing temperature and precipitation patterns, and sea level rise will continue to impact coastal communities in the coming decades. The report *Climate Change, Sea Level Rise Scenarios for Vietnam* produced by the Ministry of Natural Resources and Environment (IMHEN 2009), projects that under high emissions scenario A2, temperature would rise by 1.5°C by 2050 relative to the average of 1980–1999. These projections are conservative compared to modeling conducted using new Representative Concentration Pathways under *Vietnam Climate Futures* (CSIRO 2013). Sea level projections suggest a rise of 33 cm by 2050, threatening coastal communities and agriculture long before that time through saline intrusion and coastal erosion.

The challenges confronting these areas are increasingly severe and complex. While the government of Vietnam has been proactive in addressing disaster risk reduction and climate change adaptation, existing efforts are often hindered by a lack of coordination and meaningful community participation. These shortcomings reduce efficiency and effectiveness of interventions and raise costs.

Interlinked challenges require an interlinked set of responses. From 2007-2014, CARE worked with local communities to apply an integrated, community-based approach to building coastal resilience. CARE supported local partners to:

- Restore and establish new institutions for community-based management of mangrove forests. Community-Based Mangrove Management Boards (CMMB) was formed, composed of representatives elected from Commune People's Committees and mass organizations. The CMMBs steered a process of planning and decision-making, planting and maintenance, and protection of the young mangrove forests. CARE supported the Da Loc CMMB to implement Participatory Land Use Planning (PLUP) with local villages in Da Loc. This process informed establishment of mutually agreeable regulations and benefit sharing mechanisms, by supporting community members to inventory existing resources and project future growth. As a result of achievements from this approach, officials in Hau Loc District contracted three villages in Da Loc to manage the mangrove system for a period of five years from 2009-2014.
- Build capacities for disaster risk reduction. Village level facilitators were trained to support vulnerabilities assessments and to develop disaster preparedness plans. This involved close coordination local officials from both DARD and DoNRE, such that insights from local engagements were integrated into Socioeconomic Development Plans (SEDPs).
- Promote resilient livelihood strategies: With support from external experts, local households identified, piloted, and replicated new livelihood models that are more sustainable and resilient in the face of climate change. These strategies ranged from the application of bio-fertilizer to replace chemical inputs, to innovative approaches for growing rice and maize, to a new relationship between the commune cooperative and a chili import-export company.
- Enhance understanding and local support for the integrated approach: "Green Teams" composed of local youth were formed to promote new coastal resilience strategies. Working closely with mass organizations, Green Teams developed creative awareness campaigns on mangrove forest-use regulations, disaster risk preparedness measures, and climate resilient livelihood models.

Experience from CARE's work in Da Loc and Nga Thuy communes provide a number of important insights for how coastal communities can more sustainably manage natural

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*1. Depending on proximity to the coastline. Mangroves exposed the open sea have a lower survival rate than those next to the beach.*

resources and respond to climate change. These will be relevant for national and local policy-makers, staff and leaders of mass organizations, international and Vietnamese non-governmental organizations (NGOs), or other organizations seeking to reduce risks from natural disasters and climate change in rural coastal communities.

## Lessons and Challenges:

***Challenges wrought by disasters, climate change, depletion of natural resources, and underlying marginalization are interrelated – and should be addressed together rather than separately at the local level.*** CARE's approach to community-based adaptation shows how mangrove management, livelihood support, and disaster preparedness planning can be more than the sum of their parts. Integrating these diverse components helps drive a virtuous cycle, making communities more resilient in the face of shocks and stresses. Restored mangrove forests along the coastline are helping to mitigate future impacts from storms and floods. They also provide a source of income for local people. New agricultural and livestock models have helped households diversify their livelihoods, stabilize or increase incomes, and improve water and soil quality. Villagers have institutionalized disaster preparedness planning processes, with enhanced capacity to respond when storms and flood do strike. The integrated approach also saved time and budget, by coming assessments and trainings for a range of related topics.

***The community-based approach already demonstrates strong short-term achievements.*** Successes of the community-based approach are clear. Since 2007, community members have planted 277 hectares of mangrove forest in Da Loc and 181 hectares in Nga Thuy. Local people engaged in planting, maintaining, and protecting the young forests. In just one day, 700 people contributed their labor to mangrove planting. At a survival rate of 70% - 90%,<sup>1</sup> the mangrove forests have flourished compared to earlier projects in the same area. The use of local labor and local expertise also led to cost savings, efficiency gains, and strong community buy-in for forest protection.

Strong mobilization of the local community reinforced all of these objectives, as people came to see them as interrelated – if they protected the mangroves, they would be protecting their future livelihoods. Local officials and community members are highly confident that as a result, mangrove forests will not be overexploited or depleted by illegal activities in the near future.



*With government support, CMMBs played a crucial role in these achievements.* Strong support from local government was critical to the success of community-based activities. Approval from the commune level provided the license to operate, mobilized mass organizations, and furnished the effort with powerful, influential spokespersons. It also allowed the formation of CMMBs. These institutions were highly effective in mobilizing community members to contribute time, knowledge, and labor to the process of mangrove restoration, disaster preparedness planning, and climate resilient livelihood models. Eventually, the success of planting activities from 2007-2009 in Da Loc persuaded district-level officials to delegate management authority to the lower level.

*In the longer-term, new institutions such as the CMMB can provide effective platforms for meeting ongoing management challenges.* Beyond organizing and facilitating activities, community-based systems are required for negotiating between different stakeholders' needs. CARE supported the CMMB to apply PLUP for this purpose. Developing regulations through PLUP helped distribute ecosystem benefits fairly and transparently and build capacity for inclusive management. Because of experience with Typhoon Damrey, the shared understanding that mangroves would benefit everyone by reducing disaster risk made this relatively easy in Da Loc. The high level of consensus was a key success factor. Such consensus has remained high in the community, which escaped any serious damage to housing, crops, or other assets following storms in 2013.

This situation is relatively unusual for coastal communities, and it is already beginning to change in Da Loc and Nga Thuy. In 2011, clam farmers seized an opportunity to benefit from the mangroves, threatening overexploitation. However, CMMB proved effective in finding a mutually agreeable response to the conflict. This highlights the need to sustain transparent, accountable decision-making platforms like CMMBs to mediate stakeholder interests in the longer-term.

*The absence of appropriate mechanisms for delegating authority and budget from the district level, and assuring accountability at the commune level, threatens these systems.* Despite these successes, current community-based mangrove management institutions are at risk in Da Loc and Nga Thuy. Both CMMBs may not have the authority and funding to support ongoing activities after 2014. In their current form, CMMBs also lack mechanisms to ensure they remain representative and accountable as community-based organizations in the longer-term. These same issues may hamper efforts to develop community-based management in other districts and provinces.

Currently, prevailing systems for household and community management of mangrove forests do not provide sufficient local incentives. Sustainable management of mangrove forests depends on all community members having an assured, long-term stake in the resource and/or adequate remuneration. Because of the high level of consensus around mangroves for their protective function, community members were willing to accept short-term management arrangements and low levels of compensation for their services. In the longer-term, this may change. Currently legal frameworks do not permit long-term tenure arrangements for mangrove forests, which are designated as Special Use or Protection forests. Short-term contracts provide far less incentive for communities to protect and manage resources for long-term sustainability.

## Recommendations:

***Through national policy, the Ministry of Natural Resources and Environment (MoNRE) and Ministry of Agriculture and Rural Development (MARD) can enable an integrated approach at the local level:*** Current programs under MoNRE and MARD provide excellent platforms for bridging the policy divide between climate change adaptation, coastal forestry, and disaster risk reduction. For instance, the National Program on Community-Based Disaster Risk Management (CBDRM) can enhance assessment and planning under the National Target Program in Respond to Climate Change (NTP-RCC). MoNRE can require local teams or consultants charged with climate change planning to join and support CBDRM programming, integrating local priorities into climate change action plans and providing additional insights for communities to assess longer-term climate impacts and responses. Ultimately, MoNRE and MARD should work towards a unified approach to assessment, planning, and investment.

***New policies on Forestry, currently under development, must support community-based management of mangroves.*** New Prime Ministerial Decisions on Forest Co-Management and Coastal Forest Management, Protection, and Development can support community-based resource management through:

- Provision of long-term tenure arrangements for the community, such that all community members have a clear stake in benefits and thus a long-term incentive to protect the forests. In contractual arrangements, community members should also receive adequate compensation for protecting mangrove forests
- Support for establishment of local management and decision-making institutions, such as a Community-based Mangrove Management Board, voted by members of the community.

- Application of participatory processes such as PLUP to develop regulations and benefit sharing mechanisms for both direct benefits (ie. collection of fish, mollusks, firewood, honey, etc.) and indirect benefits (ie. tourism, payment for environmental services)

***National programs and policy on climate change should support the role of communities, particularly in managing coastal resources as an adaption strategy:*** MoNRE can promote community-based adaptation and resource management through its climate change programs. Funding from the Support Plan on Responding to Climate Change (SPRCC) for instance can be directed to support community-based adaptation. Community-based adaptation should include support for mangrove reforestation and management, in coordination with existing policies and programs under MARD.

***At provincial and district levels, officials can promote sustainability of community-based management systems by decentralizing decision-making authority and resources.*** District authorities must be willing to provide extended term rights for collectivities to manage and share benefits from the mangroves. This arrangement must also include a budget for management activities under the CMMB. In Thanh Hoa, Hau Loc district officials should extend the rights of Da Loc villages to manage and share benefits from mangrove forests. Nga Son district can grant similar management rights to villages in Nga Thuy commune. Both districts should allocate budget for ongoing management activities under CMMBs and compensation for local people for protection.

***DARD and DoNRE can be more effective in promoting climate change adaptation and disaster risk reduction:*** Across Vietnamese province, climate change adaptation planners have the opportunity to work closely with CBDRM programming. This approach helps to share insights and budgets, and reduces confusion among local people.

***At the commune levels, officials and communities can adopt the CMMB and PLUP approaches, in a manner that promotes meaningful participation and accountability.*** CMMBs must include representation from all resource users, particularly women and marginalized groups, as well as mechanisms for regular reelection. PLUP is a critical tool for assuring equitable benefit sharing and buy-in from stakeholders. Local authorities can seek guidance from expert facilitators on applying it, and learn from experience of communities such as Da Loc. PLUPs should be conducted and revised every several years, as local ecology and economies evolve.

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*In Da Loc and Nga Thuy communes, CMMBs should regularly hold elections for their members, conduct PLUPs, and review and revise existing forest-use regulations.*

*Civil society can contribute as facilitators and technical experts, while promoting transparency and accountability among management institutions.* NGOs and mass organizations are often able to access and gain trust among governments and community members, acting as a bridge and broker. Likewise, NGOs can provide technical capacities not available within local government – for instance, in facilitating PLUPs or assessing climate risk to livelihoods. Mass organizations can act as trainers of trainers for assessing risks, planning, and implementation of integrated activities. It is also the role of civil society to monitor institutions intended to represent the community, such as the CMMB. This is critical for assuring that decision-makers remain accountable and do not disproportionately represent the interests of certain groups.

# Introduction: An Integrated, Community-Based Approach to Coastal Resilience

## The challenge for Vietnam's coastal communities

"Storms are like war," explains Ms. Din. Her neighbours in Da Loc commune nod gravely in agreement. They speak from experience: in 2005, a severe typhoon destroyed the commune's coastal dike and inundated homes, businesses, public facilities, and agricultural fields. As in a war, the consequences of this destruction lasted far beyond the storm itself. In the short-term, local households lost their crops and livestock, and suffered major destruction to their houses. After several years, community members continued to suffer from salinized soils and water sources, burdensome debts, and the constant threat that another major typhoon was just around the corner.

Da Loc's experience is not unique among Vietnam's northern and central coastal communities. Along Vietnam's coast, degradation of mangrove ecosystems over the last half-century have exposed these areas to more serious tidal floods. Agricultural pollution and saline intrusion are further degrading natural resources, moreover, threatening water and soil resources used for farming. Resulting poor harvests and losses from storms and floods lead to financial hardship and debt for many farming families. In turn, poverty brings additional pressures to exploit ecosystems for timber and seafood, or to apply chemical fertilizers to failing crops.

Each of these environmental and social factors interacts, creating a downward spiral of vulnerability. As systems supporting coastal communities become increasingly fragile, a storm or flood can have catastrophic results. It is a range of longer-term factors that turn these events into "disasters." Climate change represents an additional stressor with unpredictable impacts such as changing rainfall patterns, extreme temperatures and events, and sea level rise. Indeed, Vietnam's coasts are recognized to be among the world's most threatened by climate change (Dasgupta et al 2007). These issues are accelerating the downward spiral.

### **Climate change impacts for Vietnam**

Recent projections undertaken by the Ministry of Natural Resources and the Environment and the Commonwealth Scientific and Industrial Research Organization (CSIRO) underline a range of threats that Vietnam faces due to climate change:

- **Temperature:** Average annual temperature is projected to increase by a range of 0.8 – 3.4 °C by 2050, with increases greatest in the north. Days with temperature over 35 °C and

heat waves (i.e. over five days of extreme temperature) are projected to increase as well. Temperature changes of this nature will may have serious consequences for human health and agriculture, in particular.

- **Change in rainfall:** Changes in rainfall patterns are highly uncertain due to limitations in modelling, with projections in change in annual rainfall varying from -16% and +36% by 2050. They suggest decreased summer rainfall, increased rainfall for other seasons in central Vietnam, and increased droughts and amount of extreme rainfall throughout most of the country.

- **Storms:** Like rainfall, extreme events are difficult to project into the future with high confidence. Preliminary studies suggest that typhoons may become less common but more intense.

- **Sea level rise:** Sea level is projected to rise by between 150 and 300 mm by 2050 through Vietnam's coastline, with a greater increase in the south than in the north. Sea level rise will bring greater frequency of and risk associated with storm surges.

Reference: IMHEN and CSIRO 2013

Recognizing these challenges, local governments, NGOs, and communities throughout Vietnam are seeking robust strategies to build resilience of their coastal systems. Under the Ministry of Natural Resources and Environment (MoNRE) and the Ministry of Agriculture and Rural Development (MARD), numerous national programs seek to reduce vulnerability from climate change impacts and natural disasters. These include initiatives to rehabilitate coastal ecosystems such as mangrove forests, prepare communities for disasters through Community-based Disaster Risk Management (CBDRM), and plan for short and long-term climatic changes under the National Target Program to Respond to Climate Change (NTP-RCC). The national policy environment provides an immense opportunity for coastal communities in Vietnam to build resilience.

Prevailing mechanisms for climate adaptation hold a number of limitations, however. These problems—lack of effective coordination, a focus on standalone solutions, and top-down planning and management – are not unique to Vietnam. Poor coordination between different departments and programs means that responses are often planned and implemented in a piece-meal fashion. This practice reduces efficiency of the measures and increases costs – for instance, by obligating separate planning processes for disaster risk management and climate change adaptation.

The piece-meal approach often leads to technical standalone solutions that address only one part of a complex problem, furthermore. This is seen for instance in the common



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2. See Annex 1 for CARE's Community-Based Adaptation Framework

emphasis on flood protection infrastructure. In the absence of other adaptive strategies, the erection of dikes frequently leads to unforeseen ecological and livelihood consequences, and heightens the risk of catastrophic failure during unpredictable, extreme weather events like Typhoon Damrey (Lebel and Sinh 2009).

Current approaches to both adaptation planning and coastal forest management also lack meaningful mechanisms for participation. This is particularly the case in northern Vietnam, where coastal forest management systems are aimed narrowly at protecting forests, in a way that often excludes local people from decision-making processes and benefits (Powell et al 2011 - see Box 2). The absence of effective participatory management mechanisms in NTP-RCC processes likewise reduces their effectiveness in identifying appropriate adaptive strategies. It also means that poor and vulnerable populations may not be effectively included in decision-making processes that directly affect their adaptive capacity.

## A community-based, integrated approach

An interlinked set of challenges requires an integrated response. CARE argues that effective community-based adaptation must include:

- Promotion of climate-resilient livelihoods strategies in combination with income diversification and capacity building for planning and improved risk management
- Disaster risk reduction strategies to reduce the impact of hazards, particularly on vulnerable households and individuals;
- Capacity development for local civil society and governmental institutions so that they can provide better support to communities, households and individuals in their adaptation efforts; and
- Advocacy and social mobilization to address the underlying causes of vulnerability, such as poor governance, lack of control over resources, or limited access to basic services.<sup>2</sup>

CARE's approach acknowledges the multiple scales that can enable or prevent effective local adaptation. It also draws critical linkages between complex, interacting social and environmental pressures. In local communities, awareness and capacity building allows local government to support more resilient livelihood strategies, sustainable resource management, and disaster preparedness planning. These strengthen community resilience to disasters, which also relies on healthy eco-systems and effective early-warning systems. CARE's model of CBA acknowledges that underlying issues of poverty and marginalization drive vulnerability, and thus require concerted, long-term attention.

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Community members planting young mangroves

## Community-based adaptation in Thanh Hoa Province

CARE applied this framework in practice in Da Loc and Nga Thuy communes of Thanh Hoa province in Northern-Central Vietnam. From 2007-2014, CARE programs supported local government and community members to restore mangrove forests, establish new institutions for community-based mangrove management, build capacities and plans for disaster preparedness, and identify and pilot new livelihood models that are more sustainable and resilient to climate change impacts.

Short-term achievements of this approach are already evident. Since 2007, community members have planted 277 hectares of mangrove forest in Da Loc and 181 hectares in Nga Thuy. Local people engaged in planting, maintaining, and protecting the young forests. At a survival rate of 70% - 90%, the mangrove forests have flourished compared to earlier projects in the same area. The use of local labor and local expertise also led to numerous cost savings and efficiency gains since earlier approaches. 28 villages now have disaster preparedness plans developed by trained local facilitators, who work with community members in their villages every year to review and revise their plans. Households have diversified their livelihoods, applying a range of profitable new models that have numerous environmental benefits.

Each of these individual strategies reinforces the others through a virtuous cycle. Thanks to protection from the forests, local authorities expect that the dike system will be able to withstand more powerful waves than those that destroyed it in 2005. Nevertheless,



disaster preparedness capacity helps assure that communities are mobilized to protect their assets, support elderly or disabled members, and evacuate in the event of a major storm. New farming techniques such as the use of bio-fertilizer have increased income of local households and reduced their dependence on chemical fertilizers that degrade soil quality. The development of a mature mangrove ecosystem likewise allows community members to harvest sustainably timber and aquatic species from the forests.

Creative campaigns have helped raise awareness about how each of these individual activities contributes to resilience. As a result, community members have become attentive guardians of the mangrove forests. The approach ensures harmonization of efforts that might otherwise be fragmented, and reduces the resource burden of addressing them one-by-one.

Lessons from Da Loc and Nga Thuy's experience can be replicated in other coastal areas in Vietnam. This document is intended for national and local government officials, community leaders, or civil society organizations working to build resilience in disaster vulnerable coastal areas, particularly those that are seeking to benefit from restoring or protecting



Photo 1: Farmers growing rice and chili in using bio-fertilizer

mangroves forests. It outlines CARE's integrated approach to community-based adaptation in Da Loc and Nga Thuy. Key success factors and challenges are considered, with particular attention to sustainability of the approach in the Vietnamese policy context.

Finally, recommendations for national policy makers, local officials, NGOs and mass organizations are presented. A companion publication entitled Integrated Models for Climate Adaptive Livelihoods and Community Based Mangroves Management provides specific technical guidance to communities for mangrove planting, maintenance, and climate resilient livelihood models.

## The Integrated Approach in Thanh Hoa Province, 2007-2014

CARE Vietnam has been working in Thanh Hoa province since 2006, one year after Typhoon Damrey caused an unprecedented level of destruction in several coastal communes. CARE Denmark and CARE Australia supported a mangrove reforestation project in Da Loc, Hau Loc District commune from 2006-2009. In 2011, CARE with support from AXA initiated a new project to promote an integrated approach to coastal resilience. The project sought to scale-out the experience of mangrove reforestation and management in Da Loc to the nearby commune of Nga Thuy in Nga Son District. In addition, it expanded its scope beyond

Young mangroves in Da Loc



mangrove management, towards building the capacity of communities to plan and prepare for disasters and develop more sustainable, climate resilient livelihoods.

Below, we consider how CARE Vietnam (hereafter referred to as CARE) and local partners supported each component of the integrated approach – community-based mangrove management, climate resilient livelihoods, and disaster risk preparedness. These were highly interlinked, with complementary benefits and activities across each component.

***Timeline of CARE's Integrated Community-Based Adaptation Programs in Thanh Hoa province***

<b>2005</b>	Typhoon Damrey destroys sea dike and inundates coastal villages.
<b>2006</b>	Da Loc Community-Based Mangrove Management Board (CMMB) established
<b>2007</b>	Da Loc Community begins planting Kandelia candel species
<b>2009</b>	Decision by the Hau Loc district PPC to grant three “core villages” formal responsibility and management rights over the mangrove forests. Community begins intercropping Kandelia candel with Sonneratia species in Da Loc
<b>2010</b>	With support from Metro Company through CARE Denmark, CARE expands its scope to include support for community-based mangrove management in Nga Thuy commune
<b>2011</b>	CARE deepens engagement in Nga Thuy commune and Da Loc commune with support from AXA and CARE France. This project introduces an integrated approach to community-based adaptation through support for mangrove management, disaster preparedness planning, awareness raising, and piloting of climate resilient livelihood models. Nga Thuy CMMB is established.
<b>2013</b>	With support from the Australian Aid Program, CARE replicates mangrove management systems, disaster preparedness planning, and bio-fertilizer livelihood model in Nga Tan commune, Nga Son District

**Box 1 Profile of Da Loc and Nga Thuy Communes**

“Về quê hương Đa lộc nơi đây vùng biển bạc, ngàn con sóng mênh mông, ta về với sóng biển khơi, đó là sức trẻ đó em ơi, ta chung tay xây đắp cho cuộc đời, trong gian lao mà lòng vẫn vui cười. Em ơi hãy hát khúc tình ca, hát về đồng Cói quê ta, hát về đồng lúa bao la, hát về quê mẹ thiết tha ân tình, hát về quê mẹ thiết tha tình người.”

“Coming to Da Loc homeland with silver sea and thousands of great waves; I am coming to the sea, that is the youth my dear, hand in hand to build life, we still smile despite our struggles. My dear, let us sing the love song, let us sing for the sea grass, let us sing for the vast rice field, let us sing for our motherland with love, let us sing for our motherland with humanity.”



Da Loc commune

**+ Traditional folksong from Da Loc Commune**

Da Loc and Nga Thuy are located between Len River and the coast, at a low elevation of 0.8-2 meters above sea level. Da Loc's primary economic activity is agriculture, with a variety of produce including rice, vegetables, peanuts, as well as chicken and cattle livestock rearing. A scarcity of land means that farmers are limited to 400 m<sup>2</sup> per capita. In Nga Thuy, sea grass is the primary agricultural crop, furnishing a small cottage industry of weaving. This traditional craft is an increasingly unstable source of income, because of unpredictable international demand. Though households grow their own rice and vegetables, salinization of water sources and soil in Nga Thuy has prevented this at a larger commercial scale. In the last ten years, policies favoring aquaculture have led to development of coastal shrimp ponds in both communes. Clam farming is also becoming an increasingly common activity in the area. Yet aquaculture remains at a relatively small scale.

Both communes are considered to be among Thanh Hoa's most vulnerable. The official poverty rate in Da Loc for 2011 was 25%, and in Nga Thuy 33%. Local people estimate that approximately 40% of men leave the community to work as migrant laborers. This brings needed remittances to the community. Through their work cultivating rice and vegetables and raising livestock, women are still the main providers for their households.

Frequent natural hazards – storms, floods, saline intrusion, unusual cold spells, and changing

precipitation patterns — exacerbate economic hardship. In the area, an average of three to four serious storms make landfall every year. During typhoon Damrey in 2005, peak tide and river storm surge occurred simultaneously. Surge destroyed 3.7 km of coastal dike system protecting Da Loc. Floodwaters inundated seven out of ten villages, lasting for several hours. More than 100 houses were heavily damaged or destroyed, with all shrimp farms and 500 hectares of crops lost. As community members later discovered, the only section of dike spared by the storm was the 4.7 km protected by mangroves.

After the storm, Da Loc households suffered consecutive years of rice and other crop failures as a result of saline contamination and drought. Rice yield was reduced by 70% from 2006-2010 in saline contaminated areas as compared to 2005. Cold spells likewise contributed both to low crop and livestock yields. Combined with outbreaks in pests and disease, these unfavourable conditions made farmers increasingly dependent on fertilizers and pesticides. Use of chemical input not only raised the cost of production for farmers, but also further degraded soils, polluted water resources, and adversely impacted poultry rearing and grazing.

Taken together, these multiple hazards created conditions that prevented people from accumulating assets necessary for sustainable livelihoods. A diverse variety of hazards occurred with such frequency that there was little chance for households to fully recover at any point.

References: The Center for People and Forests 2010, Sen 2011

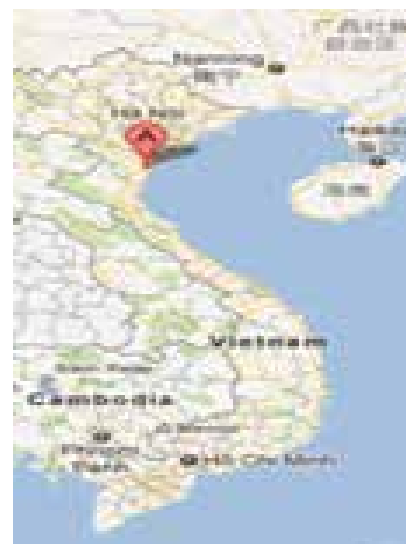
***Project Profile: Disaster Resilient Coastal Communities in Hau Loc and Nga Son District, supported by AXA (2011-2014)***

Location: Nga Thuy Commune, Nga Son District, and Da Loc, Hau Loc District, Thanh Hoa Province in North-Central Vietnam

Direct beneficiaries: 4,551 people (3,650 households):

- of which 11,389 people (2805 households) or are directly engaged in disaster risk reduction activities and mangrove reforestation
- of which 3162 people (845 households) are engaged in disaster risk reduction activities

Indirect beneficiaries: Approximately 90,000 individuals from neighboring communes who have been invited to participate in awareness raising and training activities, and who benefit from improved protection of the coastline from mangrove reforestation



## Community-Based Mangrove Management

Worldwide, international agencies, governments, and local communities have recognized the value of mangrove ecosystems, which provide a multitude of benefits in reducing disaster risk, providing sources of livelihood, and sequestering carbon dioxide. In the face of land conversion pressures, Vietnam has seen the loss of healthy mangroves forests over the last several decades. Numerous national and local level efforts to rehabilitate mangrove forests have been initiated and have made progress in restoring coverage. Many mangrove forestations efforts have failed to accomplish their objectives, however, because of a focus on planting and protection alone (Box 2).

In contrast, CARE has aimed to create robust, multi-stakeholder management systems that share benefits among multiple users. The case of Da Loc and Nga Thuy communes indicate that successful mangrove forestry is supported by:

- Consensus among key stakeholders on the need to restore and protect mangrove forests
- Local officials willing to take a participatory approach that relies on local people as equal partners in planning, implementing, decision-making, and monitoring
- Management institutions involving all stakeholders, including government, farmers, and other community members, so that all people can share in both direct and indirect benefits of mangrove forests.
- Processes that combine both local and external expertise, including assessment and negotiation platforms like Participatory Land Use Planning (PLUP)
- Ongoing monitoring, learning, and adaption, so that management systems can be constantly improved and adapted to new challenges

### **Box 2 Management of mangrove forests in Vietnam**

Mangroves perform a number of critical ecological functions. They provide nutrients for oysters, shrimps and fish, functioning as a nursery for many species and a habitat for bird life. For local communities, forests can provide livelihood options through honey, firewood, and cultivated seafood such as clams. Mangrove forests also contribute to climate change mitigation by accumulating and storing carbon. By slowing the speed of water flows, healthy mangrove forests also limit the height and strength of waves reaching the coast.

Internationally, there is a growing awareness of the services provided by mangroves. This is true especially in the context of climate change adaptation and Reduced Emissions from Deforestation and Degradation (REDD/REDD+), which is bringing attention, funding, and

technical assistance to preserving forests to mitigate climate change. Mangrove restoration in particular has emerged as an important national-level priority in Vietnam over the last several decades. Since the early 1990s, international bi-laterals and government programs have initiated a number of efforts to rehabilitate mangroves forests. 2008 marked the first time that the trend of nationwide mangrove forest decline was finally reversed (Osbeck 2011). Vietnam's Master Plan for Mangrove Forests for 2008 – 2015 administered under MARD aims to extend existing mangrove forest areas from 200,000 to 323,000 hectares, and to plant an additional 30,000 hectares by 2020.

Despite this recognition, efforts to restore and protect mangroves have been hindered by top-down management systems. Many efforts focus on mangroves as a biophysical barrier against floods and storm, at the expense of considering their multiple ecological and livelihood benefits (Powell et al 2011). This approach places a high emphasis on the process of planting and protecting mangroves. In contrast, successful case studies from Vietnam and around the world show that forests require management through long-term, multi-stakeholder processes. Successful management systems represent the interests of all resource users, mediate between them, and allocate resources according to these needs and priorities.

International experience provides a number of frameworks for sustainable management of natural, common pool resources such as mangrove forests. Co-management is a process through which “two or more social actors negotiate, define and guarantee amongst themselves a fair sharing of management functions, benefits, mandates, and responsibilities for a certain area or a set of natural resources.” In Community-based management, legal rights and economic incentives are transferred from the state to the local community (Swan 2010).

These approaches meet a number of challenges in the context of top-down mangrove management systems. Whereas community members and households in terrestrial forests can receive long-term (50-year) land-use rights, most mangrove forests are designated as Protection or Special-use Forests. In these cases, management boards are permitted to contract local households to protect sections of these forests, a practice applied in a number of Mekong Delta provinces. More common in the coastal north is establishment of short-term contracts for mangrove forest protection by collectivities of households or communities. In principle, contracted communities or individual households receive rights to share in resource benefits, or direct payment for these services (Hawkins et al 2010). However, allocation of management authority to communities has in many cases failed to provide sufficient incentives for community members to protect rather than exploit forests (Powell et al 2011).



## Mangroves forests in Da Loc and Nga Thuy communes - a history

“Most of the success of this project is due to participation of the community in each step: planning, implementing, monitoring” – Do Ngoc Thu, member of Dong Hai Village Management board.

As described in Box 1, both Da Loc and Nga Thuy are highly vulnerable to disasters and climate change, particularly from storms, floods, and saline intrusion. Since 1986, a number of programs led by international NGOs and the government had helped restore 200 hectares of mangrove forest. The immense value of these interventions became clear to the local people in 2005; of Da Loc’s 8 km of coastal dyke system, only the 4.7 km stretch flanked by mangrove forests remained intact after Typhoon Damrey.

However, the prevailing system for mangrove planting and protection had little role for local people. At the planting stage, district authorities engaged private contractors, with limited labor contribution from local residents. Planning meetings and trainings were offered only to local authorities, meaning that most community members had little awareness of these activities, their purpose, or plans and budgets. Managed from the district level, this system was slow and unresponsive. In one instance, contractors did not receive funds in time to collect mangrove seeds before rain and wind swept them away. Budgets were designed to support planting, but not maintenance or protection. Combined with inappropriate planting techniques, this led to a low survival rate.

Finally, without any power sharing mechanism, local people had no opportunity to influence regulations for harvesting timber and aquatic species from the forests. Only the Border Army and guards contracted by the district were aware of the regulations. They were responsible for guiding others on a case-by-case basis.

At a stakeholder meeting in 2007, community members shared their views that this system suffered from several problems: inappropriate land use planning; a top-down land allocation process; an absence of appropriate environmental and technical management; and insufficient opportunities for local people to earn livelihood from the mangrove resource (Swan 2009). Authorities admitted that they were struggling to protect the forests, due to dwindling funds for the Border Army.

A process of organizing, negotiating, and experimenting with new management systems helped break through these impasses.



## New institutions for mangrove management

International experiences provide conceptual models for “governing the commons” – that is, sharing power for resource management between a variety of stakeholders with different needs and interests (Box 3). In Da Loc and Nga Thuy, CARE and local partners pursued a community-based management approach. This relies heavily on mobilizing knowledge, labor, and ongoing monitoring support from the community. Importantly, it requires that decisions surrounding regulations and benefit sharing are made collectively, not by the government alone.

This approach also depended heavily on support from government authorities at the commune and district level. Balancing the power of the community and the power of the government is thus a critical challenge for community-based approaches in Vietnam, as discussed further below.

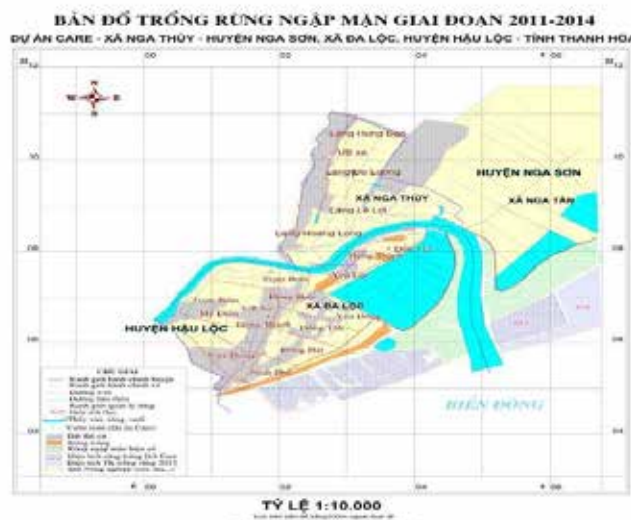


Photo 2: Map of mangrove plantation areas in Da Loc and Nga Thuy

## Community-based Mangrove Management

CARE supported the establishment of Community-Based Mangrove Management Boards (CMMB) in Da Loc and Nga Thuy. Members of the Commune People’s Committees and mass organizations (Women’s Union, Fatherland Front) were invited to run for election. Local people selected from among these candidates to represent the community on the CMMBs.

### **The role of the CMMB is to:**

- Organize planning processes for mangrove resource allocation and mobilize technical groups for planting, maintenance, and protection of the mangroves forest
- Establish, manage, and inform the community of the budget for mangroves forest protection
- Manage sustainable harvesting, including developing regulations and benefit sharing mechanisms through consultations with community

### *3. Depending on proximity to the coastline*

- Notify and raise awareness of community members on regulations, informing the community how and when mangrove resources can be sustainably harvested

CMMBs must be composed of individuals who fairly represent the full range of community stakeholders and interests and will be accountable to the community for their decisions. In principle, this means including representation from each stakeholder group, as well as representation from women and poor people. Because of the need for respect and trust from the community, women are often well positioned to take leadership roles in the CMMB (on the Da Loc CMMB, 2 out of 5 members are women). Finally, there is a need to ensure that powerful, vested interest do not dominate or take control (Swan 2009).

The Da Loc CMMB was established 2006, with planting activities starting in April 2007. By 2009, the high survival rate of new forests helped (70% - 90%,<sup>3</sup> dwarfing previous projects as described above) CARE and CMMB members to persuade district authorities that the community-based approach was working. The Hau Loc People's Committee assigned responsibility to three villages in Da Loc to manage the mangrove forests for a period of 5 years (2009-2014).

## Management Groups

Among the CMMB's primary roles is to organize groups for mangrove management functions: the mangrove nursery, forest planting, maintenance and protection. All members received technical training to perform these activities.

Members of village management boards from Da Loc



Photo 3: Mangrove planting in Nga Thuy

The nursery group is responsible for raising young mangroves in a protected environment before they are large enough to be planted on the coast. The use of seedlings rather than seeds was one of the factors helping to assure the high survival rate. As described in Box 5, the mangrove nursery group was almost entirely women-led.

A planting group is responsible for organizing community members to transfer the young



seedlings from the nursery to the forest area. Mangroves were planted in the spring during low tide, when the water is low enough for wading onto the shore. Once planted, mangroves are threatened by barnacles that attach to their exteriors. A maintenance group works on removing each of these barnacles by hand.

In Da Loc, participants received low remuneration, of only 20,000 VND (USD 1) per day. Nevertheless, the rate of participation was high. According to community members, the mangroves were important, and people enjoyed the social opportunities afforded by planting and cleaning them together. CMMB leadership describe that on one day, 700 community members came out to support planting.

An elected protection group was established to patrol the forests, once planted. The group's main function was not to arrest violators, but to build capacity of the community to exploit the mangroves sustainably. Protection team members acted as a resource for people harvesting timber and seafood from the forests. They informed people of local regulations, and demonstrated proper techniques – for instance, by digging for crabs at an appropriate distance from mangrove roots.

## Regulations and Benefits Sharing

“Mangroves don't provide a benefit to just one person. They benefit the whole community: everyone.” – Nguyen Thi Thao, Nga Thuy commune

Community meeting to establish regulations on mangroves management and benefit sharing



Sustainability of the community-based approach hinged on establishing clear resource access rights and sharing of responsibilities between local government (mangrove forest owners) and local communities (mangrove forest users). CARE supported the Da Loc CMMB to develop land use plans and regulations through a rigorous PLUP over the course of several months. PLUP processes

require mapping existing mangrove resources and developing an estimate of current and future yields from timber and non-timber products. PLUP allowed discussion, negotiation, and development of shared expectations and regulations in villages, later combined to produce commune-level regulations. A full list of regulations for Dong Hai village are included in Annex 2, as an example.

In all villages, regulations originally included provisions for community members to contribute financially. This specified graduated requirements for households, depending on their level of use. However, in practice the CMMB has not collected fees, in part because costs for protection were lower than expected. Additional considerations and challenges for future financial sustainability are discussed further below. Regulations have been promoted through radio and communications activities organized by the Green Team (introduced below) and mass organizations.

## Achievements to date

Since 2007, community members have planted 277 hectares of mangroves in Da Loc commune and 181 hectares in Nga Thuy. The trees survived at a rate of 70%-90%, with trees sheltered near the beach having a higher rate of survival than those next to the open sea. According to local authorities, this dwarfs survival rates from earlier projects, which ranged from 10%-50%. The mangrove ecosystem has flourished, allowing community members to harvest timber and aquatic species sustainably from the forests. Local authorities expect that the dike will now be able to withstand more powerful waves than those that destroyed it in



Mature mangrove forest in Da Loc, planted in 2007

2005, as a result of the forests' role in reducing wave strength. (As described further below, however, the community is nevertheless preparing for the worst-case scenario, by strengthening disaster preparedness and evacuation procedures).

The average cost of mangrove planting at \$1000 USD per hectare – including costs of training, seeds, labor, transportation, protection, and equipment - compares favorably to other approaches. The use of local labor and knowledge (Page X) greatly reduced costs and increased transparency. Community members are now able to access the resource for firewood collection, honey production, and collection of aquatic species. By 2014, fishermen were able to catch the fish cá còi, providing additional income of 70,000 – 160,000 VND (\$3.5 – 8) per day. Other households can collect molluscs during peak season in April, when permitted by authorities. Several households living close to the sea estimate that the molluscs earn them an additional 150,000 – 200,000 (USD \$7-10) in one month.

Most importantly, mobilizing the community helps assure sustainability. The protection group in Da Loc has disbanded, in recognition that the forests are now older and less vulnerable to human threat. As articulated by many individuals in Da Loc, “now, the community is the protector.” For community members, the experience of raising and planting mangroves themselves means that the forests are not just another feature of the landscape: they are an indispensable part of the community. This sense of responsibility was already demonstrated in 2011 when clam farmers encroached upon the mangrove forests, a violation immediately reported to local authorities by community members.



## In the future

CARE projects in Thanh Hoa will end 2014. As explained further below, there is uncertainty with regard to the ongoing rights of communities and CMMBs to manage mangrove forests after 2014, and a lack of budget to support ongoing activities.

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Mangrove nursery

This does not pose major threats to the forests in the short-term. In Da Loc, the youngest mangrove forests are over three years old. This means that they no longer require the same level of protection or maintenance. In Nga Thuy, young forests will still need maintenance to assure a high survival rate; authorities will need to provide support for maintenance to continue. On the other hand, the long distance in Nga Thuy between the coast and mangrove forests means that the forests are relatively inaccessible to unauthorized exploitation.

Maintenance and protection are just one aspect of management, however. As described further below, the overwhelming support for mangrove reforestation as a form of coastal protection greatly simplified the process, since mangroves are seen as a common good rather than a resource to be apportioned among competing users. This is unusual in coastal communities and it may change in Da Loc and Nga Thuy as well. Economic pressures, environmental conditions, and the mangrove ecology itself will evolve significantly over the coming decades. In such a dynamic social-ecological system, there will always be a need for inclusive management systems that mediate between stakeholder interests and make transparent decisions regarding the uses of a common natural resource.

Da Loc stakeholders in particular have achieved some success in developing this type of management system in the short-term. Yet as noted above, sustainability of the new system is threatened by several factors. These include the withdrawal of CARE technical and financial support in 2014, a lack of clarity regarding allocation of management authority between the district and commune after the initial contract ends, and the absence of accountability mechanisms to assure equal balance of power between government and community members. These challenges to maintaining a community-based management system are discussed further below.

## Climate Resilient Livelihoods

As described in Box 1, existing farming practices in Da Loc and Nga Thuy had suffered due to extreme weather, increased salinity levels and pests. Farmers turned to chemical fertilizers for a short-term solution to this problem, but in several years this contributed to degradation of soils and water pollution. Many activities no longer generated the incomes necessary for families to make further investments to secure their lives and livelihoods.

Experience in Da Loc showed how benefit-sharing arrangements through community-based mangrove management could supplement local livelihoods. Having supported the community to restore these ecosystem services, CARE and the CMMB turned their attention to the challenge of securing more sustainable livelihoods practices on land.

In order to build robust strategies for community-based adaptation, this project used CARE's Climate Vulnerability and Capacity Analysis (CVCA) methodology to facilitate initial

discussions on livelihoods adaptation to climate change. CVCA is founded on livelihood analysis, assessing local peoples' assets, their use of resources, and how these resources will be affected by climate change. This approach uses both community knowledge and scientific data to identify vulnerabilities and gain a greater understanding of local impacts of climate change. It also considers the role of institutions and policies at different scales (ie. household, local, national levels) in constraining or facilitating adaptation. Critically, the CVCA process is not geared towards merely the collection of data. By engaging community members in assessing their vulnerabilities, the process builds awareness and capacity to identify responses, plan and prioritize.

The project engaged researchers from the University of Hue to provide guidance on



At first, Ms. Vu Thi My was too embarrassed to tell her neighbors that she was raising worms in her yard. Now, many people in the community come to her for instruction worm raising

alternative livelihood models. Researchers facilitated community discussions on current livelihood strategies and how climate change hazards and other factors were impacting them. This process aimed to elicit local input on potential improvements, alternatives, and diversification strategies. Drawing on successful experiences in other Vietnamese provinces, researchers proposed a set of integrated models that they argued could provide both economic and ecological benefits and build resilience to drought and changing rainfall patterns.

Research was presented in discussion groups with community members, who evaluated the merits of each proposed models using SWOT analysis (Strength, Weakness, Opportunity, Threats). They scored models based on a set of criteria including suitability for most vulnerable groups, feasibility, accessibility of resources and equipment, relevance to climate change and disaster risk reduction, economic efficiency, sustainability, and replicability. Discussion groups also nominated and elected households to pilot the new models, prioritizing poor or vulnerable households facing exposure to hazards. Community members also agreed on measures to monitor and evaluate models in order to make improvements. Through piloting and experimenting, households have innovated and further improved the models, which include:

**Bio-fertilizer:** Previously, overuse of chemical fertilizers degraded soils, contaminated local water resources, and reduced the income of farmers who had to purchase the expensive inputs. The bio-fertilizer technique adopted by local households requires only leaves and other bio-waste, an enzyme provided by the project, fresh dung, and water – about two-thirds of the cost of the chemical fertilizers used previously. Applying bio-fertilizer also improves soil by maintaining moisture and reducing acidity from salinization, and increases resistance to plant root diseases and pests. Farmers found that both crop productivity and net-income were significantly higher as a result. From the 14 households originally piloting the model, CARE estimates that 3000 households in Da Loc, Nga Thuy, and several neighbouring communes have now adopted it.

**Earth worm raising:** Many households have adopted earth worm raising, which is among the most simple and accessible livelihood models introduced by the project. Worms are raised in bio-fertilizer and fed with manure. They provide a nutritious feed for poultry, reducing the amount of time needed to raise chickens and ducks.

**Rice** – CARE piloted a set of new practices for rice cultivation Da Loc Commune. Nicknamed the “3 decreases, 3 increases” model, the model reduces labor needs, input costs, and growing time – and increases output, quality of rice, and quality of soil. The new technique requires farmers to add elevated dirt paths their rice fields, in order to apply bio-fertilizer.



Agricultural limestone is spread to the field to reduce acidity in the soil, improve the uptake of nutrients, and improve water penetration. According people who have applied the model such as Ms. Vu Thi Hue (Box 3), the model has improved quality and raised output levels by as much as 30%.

## Chili

CARE and the Da Loc Commune cooperative were able to establish an innovative public-private partnership with a buyer in Hai Duong province. As a result of this relationship, the community secured a stable market for chilli outputs. The contract stipulates guaranteed purchase at a guaranteed minimum price. This partnership has led many families to grow more chilli, which can bring approximately 5 times the profit of rice.

**Peanuts** – Da Loc farmers have grown peanuts for many years. After receiving support from CARE, they switched to preparing their fields with bio-fertilizer and limestone. One farmer, Mr. Pham Van Kieng, experimented to see the difference between the two approaches. He found that the peanuts in the new model grew faster, and had a marginally higher output. Because of the reduced input cost, his profit from the new model was 582,000 VND (nearly USD 30) higher than the old model.



Mr. Pham Van Tuy began raising ducks after 2011, using these profits to buy and rear pigs. Livestock raising dramatically improved Mr. Tuy's income. It allowed him to pay off debts and support his son's education

**Ducks** – Ducklings can be purchased for 7-8,000 each and sold in the market after 2 -3 months. Among pilot households who raised 60 ducks each, each earned an average profit of 1.4 million VND (USD 70). Though many have continued this model, others have abandoned it because of problems with avian flu and price instability.

**Maize** - New species of maize used by farmers are yielding several benefits. The new plants produce two corncocks rather than one, doubling output. Higher stalks are better protected from disease and pests, as well.

Along with bio-fertilizer, worm raising, rice, peanuts, chilli, and ducks, the program also supported onion farming and pig and chicken rearing in Da Loc commune. Vegetables cultivated using bio-fertilizer are considered “rau sạch” (clean vegetables), which can fetch a higher price in some urban markets. In Nga Thuy commune, the project also supported farmers to cultivate sea grass using bio-fertilizer.

Participants in a focus group discussion shared that bio-fertilizer, rice, chilli, and peanuts were among the most successful livelihood models introduced through the program, because of their improved yield, reduced input costs, and overall higher profit. Chilli in particular provided a high economic return, relatively low investment, and low labor requirements. Pig rearing was likewise highly profitable, but the initial investment was high and therefore not accessible to many households. Bio-fertilizer was highly beneficial for its low investment, but had large labor demands. In contrast, worm raising was accessible to poor households and households with disabled members.

Technical guidance on alternative livelihood models is available in a companion publication entitled Integrated Models for Climate Adaptive Livelihoods and Community Based Mangroves Management.

### **Box 3: Climate Resilient Livelihood Case Study: Ms. Vu Thi Hue**

The garden of Ms. Vu Thi Hue home is teeming with life. Vegetable gardens, rice fields, and fish ponds surround her family’s small house in Da Loc. Green coconuts hang from trees, and the family offers a drink of fresh coconut to visitors.

In spite of this abundance and the family’s warm hospitality, Hue has always struggled to support herself and her family. Her household includes eight people: Hue (48), her husband (49), four of their five children, and their 80-year old grandmother. Hue has four daughters and one son, the youngest child.



Photo 4: Ms. Vu Thi Hue with her daughter

As with many households in Vietnam, cultural and social pressures led their family to have a large family, creating burdens for school fees, medical needs, and other expenses. Hue's husband's job as an electrician pays just over 1 million VND (USD 50) per month, so the bulk of the burden falls to Hue for cultivating rice, vegetables, fish, and livestock on the family's 1,500 m<sup>2</sup> land. For the last ten years, they have had at least one daughter enrolled in university at all times, at a cost of 18 million VND (USD 900) per year. Designation as a "poor" household has given them access to low interest loans, but nevertheless the family depended heavily on support from relatives.

Hue's family was fortunate in 2005 to escape the worst of Typhoon Damrey. Their home suffered only minor damages, and salinization was less serious on their

land than in other parts of the commune. The storm nevertheless made an impression on Hue. She has since participated actively in mangrove planting and trainings on disaster risk reduction. These activities complement her efforts to improve the family's livelihood strategies and income, by building resilience to floods and storms.

After agreeing to pilot the new livelihood models, Hue soon had a pile of bio-fertilizer in the garden. She has tested a variety of the models, including onions, duck raising, and chili. Particularly beneficial has been a new rice model of "3 increases, 3 decrease," for which she participated in trainings from the project – the first time that Hue has received formal training in rice cultivation. As a result, her family's overall profit from growing rice has doubled. Hue also experimented with growing onions and chili using bio-fertilizer.

Though it is difficult for the family to estimate changes in income as a result of the project, Hue notes that the increased profit gained from these activities means that they are less dependent on loans from relatives for financing their daughters' education. Now, they borrow for only one daughter, rather than two.

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Ms. Ngoc Thi Trong with her granddaughter

**Box 4: Climate Resilient Livelihood Case Study - Mrs. Ngoc Thi Trong**

Cradling her 2 year-old granddaughter on a crisp February morning, Ms. Ngoc Thi Trong points to a large pile of soil next to her chili plant field. This bio-fertilizer is easy to make, she explains: it requires just a packet of enzyme, water, and agricultural waste like rice stalks that she can collect from her field. Yet this pile of dirt is the secret behind higher yields, higher quality, and improved quality of her land.

Since the project began in 2011, she has piloted the use of bio-fertilizer for all of their agricultural production. Trong has two adult children, including a daughter who lives in Hanoi. Her husband Mr. Vu Xuan Ngoc is the Vice Chairman of the Da Loc People's Committee and the head of the CMMB. Of their combined income of roughly 9 million per month, 6 million of this comes from Ms. Trong's work cultivating vegetables and rice and raising livestock on her family's 2000 m<sup>2</sup> of land.

Trong and Ngoc had very personal motivations for engaging with CARE's integrated set of activities. In 2005, Ngoc led the flood rescue team during Typhoon Damrey to evacuate community members remaining in their homes as the dyke collapsed. Though his efforts prevented any deaths in the commune, the typhoon did not spare Ngoc and Trong's home. The house suffered severe damage and lost its entire roof to the thunderous wind. Flood destroyed their entire crop for that season. Overall, the typhoon imposed upon the family a significant financial hardship.

Trong and Ngoc recognized the relationship between this disaster, the mangrove ecosystem, and community response capacities. As leaders in the community, they felt it was their responsibility to show support for the integrated approach. Ngoc played a leadership on the CMMB, working to mobilize community members for mangrove planting, maintenance, and protection. Trong meanwhile adopted a number of the new livelihood techniques, to provide a model for her neighbors.

Indeed, the results caught the attention of many others. Since she no longer uses chemical fertilizer inputs or pesticides for her crops, Trong estimates that she saves between 400,000-500,000 VND (USD 20-55) per 1000 m<sup>2</sup> of crop. Her vegetables like cabbage and maize are higher quality, a difference that Trong can both see and taste. Applying bio-fertilizer has helped to increase overall yield, moreover. The chili model is particularly successful, since due to the commune cooperative's arrangement with a chili import-export company in Hai Duong, she is guaranteed a high price. Whereas before her family earned roughly 10 million VND (USD 500) per year by selling chili, they now earn 15-17 million VND (USD 750-850).

Adopting new practices means that Trong can save as much as 3 million VND each month, roughly twice as much as she could before. For Trong however, the real success has been in witnessing the emergence of more resilient livelihood practices within her community. Over 3000 households across several communes have adopted the bio-fertilizer model since she started using it. Both Ngoc and Trong express renewed confidence that Da Loc will be able to withstand future shocks and stresses, as a result of the integrated approach.



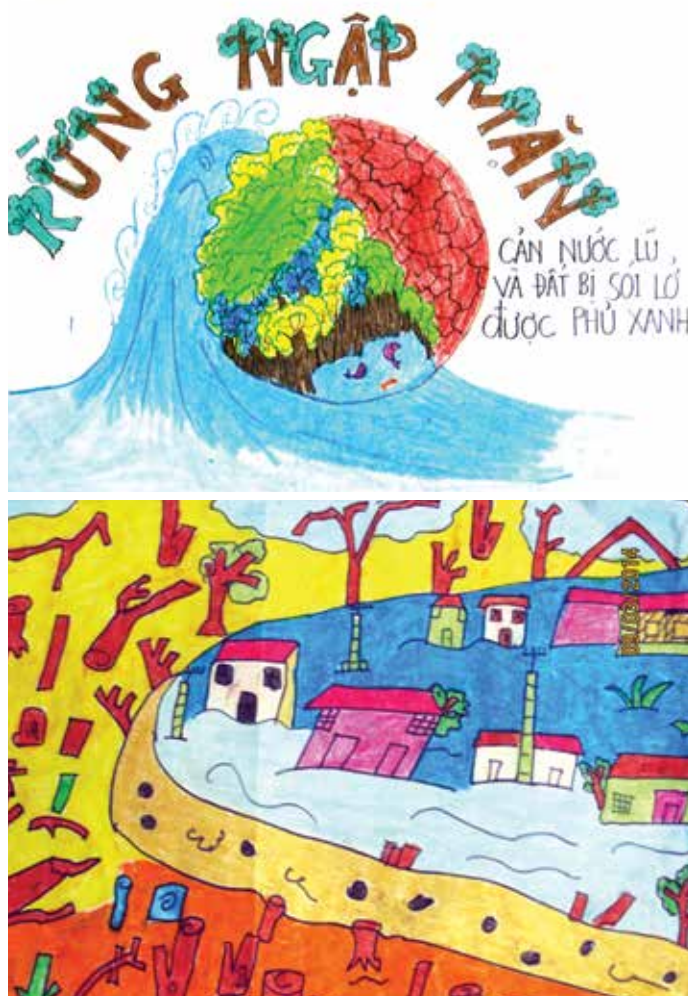
# Capacity building for coastal resilience

## Disaster risk preparedness planning

Consistent with Vietnam's Grassroots Democracy Degree, effective disaster risk reduction and climate change adaptation needs to engage local people through a bottom-up approach. This has been recognized by the government and is being put into practice through Vietnam's National CBDRM Program.

Previously in Da Loc and Nga Thuy however, disaster risk management trainings and planning initiatives were accessible only to local officials and staff of mass organizations. CARE therefore supported a core group of local facilitators to receive trainings on disaster risk reduction. Participants learned to undertake vulnerability and capacity assessments, develop seasonal hazard calendars, identify vulnerable groups and households, and map safety areas. These new skills were applied in practice, as the trained facilitators worked with members of their local villages to prepare disaster risk reduction plans. Plans outlined actions to take before, during, and after a disaster. 28 villages in Da Loc, Nga Thuy, and neighboring Nga Tan commune have collectively prepared disaster risk reduction plans, which have since been aggregated and integrated into plans at the commune and district levels. At the end of each year, the village reviews and revises their plan.

In Dong Hai village for example, the plan stipulates that after receiving a storm warning, community member's work together to tie sandbags to the



Drawings from awareness raising competition on mangroves

roofs of their homes to prevent dislodgement from wind, and move livestock to higher elevation areas. Households should then prepare themselves for evacuation. In 2013, Typhoon Haiyan tested implementation of this plan, with all village members successfully following preparation protocols. Fortunately, evacuations were unnecessary.

## Awareness Raising

In a classroom in Da Loc secondary school, walls are covered with drawings of green mangroves. Students and members of the local youth union are sharing their recent artistic endeavors, one of many creative projects undertaken as part of the local “Green Team.” CARE and Live and Learn supported the formation of such groups as an integral component of mangrove management, climate resilient livelihoods, and disaster risk preparedness planning. As young leaders with access to many people in their community, the Green Team plays a vital role in educating and mobilizing residents. Their work spanned all components of the integrated approach, illustrating to community members how each of these activities contributed to enhanced resilience.

Green Teams work closely with mangrove protection groups. In this capacity, team members educated community members about the value of mangrove forests, CMMB regulations, and approved harvesting techniques and calendar.

Green Team members on a Beach Cleaning Day



Members have worked to communicate disaster risk reduction and climate change adaptation concepts through theatre productions, awareness competitions, drawing, film-making, and fashion designing, poetry writing. One dramatic performance told the story of an apathetic community member who litters and does not support the community in their efforts to maintain the mangroves. She eventually changes her behavior after learning the value of the ecosystem.

Green Teams also support local households to apply new livelihood techniques, organizing demonstrations and providing technical support for those testing them for the first time. A number of bio-fertilizer workshops helped spread this technique far beyond the original number of households engaged with the project.

Secondary school students engaged nursery and primary school students and community members to support and participate in these activities. Green Team membership fluctuates from around 60 to 100 members, since members often leave the commune for university or work elsewhere – although many of these members return in their free time to participate in activities. Between 2006 and 2014, Green Teams held 22 events and competitions, with an audience over 10,000 community members attending different events.

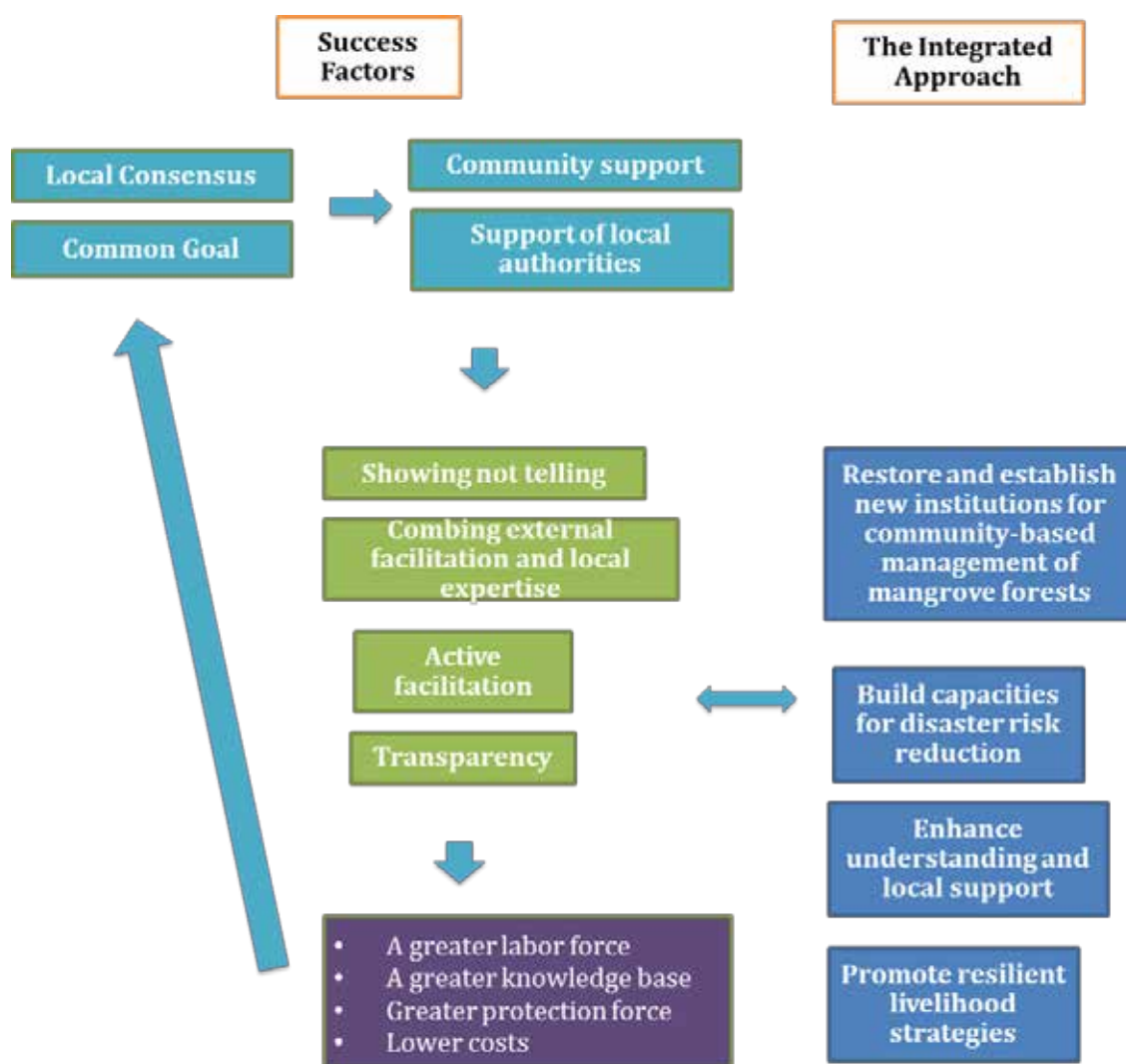
## Success factors, challenges and risks

The community-based approach in Da Loc and Nga Thuy has numerous achievements that distinguish it from more conventional approaches to mangrove rehabilitation. High survival rate at low cost, active participation and vigilant monitoring from community members, and mutually agreed benefit sharing were successful features of the project. These were possible thanks to a combination of good practices and favorable conditions.

Yet under any conditions, communities developing a robust, integrated approach to coastal resilience confront many challenges. Integrating disaster risk reduction, climate change adaptation, and resource management is complicated by a lack of coordination between government departments. Moreover, the absence of an enabling policy framework for community-based management is an obstacle for developing sustainable, long-term management systems. Equitable power sharing between the government and community—and among members of the community itself—is easily threatened.

Below, we discuss some of the key success factors, challenges, and risks identified through discussions with local authorities, community members, and CARE staff.





## A common enemy and common goal

“Storms are like war. People realized that the storm isn’t afraid of anyone – no matter who they are, even if they are a big, important person.” – Ms. Bui Thi Din, Da Loc CMMB

Typhoon Damrey may have taken away homes, crops, and livestock – but it left a powerful legacy. The storm is etched into the collective memory of people from Da Loc and Nga Thuy communes. The devastation it caused created an overwhelming motivation to act.

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Da Loc family in front of home, after Typhoon Damrey in 2005

Mangrove provided an outlet for this energy. Because they had succeeded in protecting a section of Da Loc's dike, the mangroves represented a visible, common source of activity around which the community could mobilize. A teacher from Da Loc secondary school noted that this common goal was a critical factor in activating the Green Team. The pride with which community members describe to outsiders their green, beautiful, and protective mangrove illustrates how the forests captured their hearts and imaginations.

In many ways, the mangroves were most powerful not in protecting people from the storm or providing ecological benefits, but in bringing them together. As Ms. Nguyen Thi Thao from Nga Thuy shared, "people here are closer to each now. The project gave us common activities to gather together and share between different villages." Others describe the seriousness with which everyone worked, mirroring each other in keeping all appointments, arriving promptly, and reliably fulfilling all agreed responsibilities. Villagers have an increased sense of self-assurance in their individual and collective capacities. Such cohesiveness and confidence made possible other objectives requiring collective action, such as disaster risk management planning.

## Local Consensus

An earlier experience in Da Loc showed that local communities are highly protective of their rights and interests in ecosystems. In 2005, a private company received approval to establish aquaculture farms in Da Loc. Concerned that the initiative could threaten access to the coastline, local people obstructed the company from developing their activities.

After intervention by authorities, clam farms were permitted 500m from the coastline, beyond the mangrove forests

Local police became involved, removing local people from protests. However, the company's activities were sufficiently disrupted that it faced bankruptcy and was forced to withdraw.

CARE recognized the potential for resistance to restoring mangroves. It therefore approached the community through iterative trust-building engagements. Early on, some fishermen were reluctant to support the mangrove plantation for fear this would threaten their source of income.



Overall however, mangrove reforestation had overwhelming support. In contrast to many cases of coastal resource management in Southeast Asia (Arthur et al 2008), Da Loc and Nga Thuy's economic structure meant a relative absence of conflicting interests among local stakeholders. In 2005, most people were dependent on agriculture. Fisheries and aquaculture activity remained at a small scale, and many shrimp farmers had lost their entire stock as a result of Typhoon Damrey. The typhoon and other disasters in the region (such as the 2005 tsunami) reminded community members of the need for mangrove forests for protecting their shoreline.

In this way, the potential to accrue direct livelihood benefits was a secondary priority. Since all people benefit equally from mangroves as a source of protection, the need for negotiation among different stakeholders was relatively small compared to other Vietnamese and international experiences with co-management.

Consensus in dynamic ecological and social contexts is never permanent. This became clear in 2011, when clam farmers encroached on mangrove area, threatening the young forests. The community management system was agile and effective in responding to this problem. Residents informed local CMMB members, who responded by dividing the first 1000m of coastal areas into separate mangrove and clam farming areas.

This conflict demonstrates that there will always be a need for transparent management systems to mediate between different stakeholders' interests. Requirements and risks for ongoing management are discussed further below.

## Community support

Collective experience from the 2005 storm was the most important factor in gaining community support for mangroves. Creative awareness campaigns helped to reinforce this. Green Team activities like calendars, theatrical performances, and competitions popularized the idea that each community member had a personal responsibility for protecting the community's natural resources, from the youth upwards.

### *In practical terms, having community support translated into:*

- A greater labor force: Whereas previous projects relied on contracted laborers, planting efforts in Da Loc and Nga Thuy easily drew hundreds of people each day. This labor force was also more agile and responsive. Unlike in previous projects, community members always managed to collect seeds from the forests before a storm could sweep them away. The large labor force also made it possible to remove all barnacles threatening young trees.
- A greater knowledge base: Knowledge of the local environment from local people led to a number of innovations, as described further below.



Local trained facilitators lead disaster risk preparedness planning facilitators and other community members.

- Greater protection force: Rather than relying solely on commune police or the Border Army, mangrove forests are protected by the entire community.
- Lower costs: Socializing these processes means less reliance on contractors and consulting for planting, monitoring, training, and planning. Rather, these capacities are now available among local

### **Transparency:**

"In planning, implementing, and budgeting, CARE and the CMMB always clarified what they would do and talked with community about this." – Ms. Vu Thi Diu, Dong Hai Village Women's Union

Essential for gaining community support was a spirit of transparency promoted by CARE and CMMB. In earlier projects, people complained that the government and contractors shared little information about their objectives, costs, and activities. In contrast, planning was conducted as a participatory exercise through the PLUP. Technical designs and maps were designed through this process, allowing local people to monitor their implementation. CARE and the CMMB shared and distributed budgets (including cost norms) for mangrove planting, transportation, and labor. They also reported results of all activities, even when these were not positive. Trainings and activities were open to everyone, not limited to government staff.

### **Support of Local Authorities**

Particularly in Northern Vietnam, authorities commonly manage mangroves with the primary goal of providing coastal protection (Box 2). This often leads to policies aimed at keeping local people out of the forests, rather than supporting multiple benefits among different stakeholders.

CARE helped to raise support for a different approach among local authorities in Da Loc and Nga Thuy. A prevailing conception among authorities was that mangroves reforestation required only planting and protection, which could be more effectively outsourced to technical contractors. Iterative engagements and field visits helped persuade them of the need for inclusive decision-making processes around regulations and protection. In piloting the model, they quickly recognized the value gained from local expertise and mobilization of community members for planting and maintenance.

Achievements from this approach were eventually recognized at the district level. District officials also realized that current management systems were ineffective and provided insufficient budgets for protection. This led to a contractual arrangement between district and three villages in Da Loc to protect and exploit the mangrove forests for a period of five years.

In Vietnam, it would not be possible for any natural resource management interventions to operate without this level of government support. Recognition provides the license to mobilize people for all types of activities, from planting and planning, to awareness raising activities with the Green Team. In the future, government support may also bring financial resources to continue activities at the local level.

### **Showing not telling**

“If you just talk, people won’t understand. You have to demonstrate the model in order to promote behavior change” – Mr. Vu Xuan Ngoc, Chairman of Da Loc CMMB, Vice Chairman



of Da Loc People's Committee

Over a period of time, CARE demonstrated to local authorities that mangrove forests would be bigger, healthier, and better protected if the community participated in managing them. Local government believed them only once they saw it for their own eyes.

CARE staff initiated this process by inviting officials and community members to Thai Binh province, where mangrove forests have been successfully restored. In Thai Binh, Da Loc commune members learned planting and maintenance techniques from local people. This gave them a clearer vision, and a boost of confidence to pursue the approach themselves. "Showing rather than telling" was important in other aspects of the project as well. Mr. Ngoc and his wife, Ms. Trong (Box 4) piloted each of the livelihood models at their home to build support for the new techniques. Green team members described themselves as "creating a mirror" for others for good environmental behavior and participation in community mangrove and cleaning activities. Farmers hosted "field schools" to disseminate new livelihood models such as worm raising, bio-fertilizer, "3 increases, 3 decreases" rice farming.

### ***Combining external facilitation and local expertise***

Community forestry in Da Loc and Nga Thuy benefited from external as well as local expertise. CARE facilitators, national and international experts brought new concepts, processes, and techniques related to climate change, natural resource management, and rural livelihoods. An expert consultant, drawing on nationally recognized best practice for co-management, facilitated PLUP. From Thai Binh, community members learned about choosing appropriate species, planting areas, and types of soil.

Yet many of the most important technical and management insights came from community members. Several people recognized for instance that barnacles could be removed by hand rather than by chemical pesticide, eliminating risks from pollution. Local community showed CARE staff how to take advantage of the tide for transporting mangroves to the sea. These insights were not



Planting seeds in mangrove nursery



only related to technical issues. At an early meeting at the village level, women community members were able to convince men of the need to train all people to monitor the mangrove resource. As noted above, this collective monitoring approach has been one of the project's key successes.

Experimenting with new approaches also led to some local innovations. The nursery team tested a variety of approaches for growing young *Sonneratia*, experimenting with different water temperature and techniques to cover the seedlings with nylon. Households also made improvements to livelihood models introduced by experts. For instance, several farmers discovered that bio-fertilizer was equally effective without the input of corn and sugar. This change in technique reduced costs by about 80%.

## Role of facilitator

CARE played an important role as facilitator, relationship broker, and capacity builder. Staff was based in Da Loc, organizing and facilitating trainings, meetings, and workshops. One staff member became so heavily and engaged in the community that local people now refer to him warmly as "Mr. Mangrove." These close relationships helped to build trust and

CARE Senior Project Manager, Nguyen Viet Nghi, developed such strong ties Da Loc and Nga Thuy that residents called him "Mr. Mangrove."



understanding of local officials, who were new to the community-based approach. CARE also brought in new knowledge and expertise, such as PLUP-CFM and climate resilient livelihood assessments. Although the experience in Da Loc shows that CARE's approach is less costly and more effective than many other mangrove reforestation efforts, it does require expertise that is rarely accessible locally.

## Institutional limitations to community-based management

Despite the achievements in Da Loc and Nga Thuy to date, the absence of specific policy frameworks for mangrove management creates a number of constraints for local authorities and communities in managing this resource. As noted above, in other co-management or community-based management contexts, balanced power sharing is secured through the allocation of land rights to different stakeholders or to the community itself. Mangrove forests in Vietnam are categorized as Protection or Special-use Forests, meaning communities and households can be contracted and compensated to protect mangrove forests. There are no mechanisms for allocating long-term land tenure. In principle, this reduces their incentive to maintain and protect mangrove forests.

This did not cause major obstacles in Da Loc or Nga Thuy, over the course CARE's programs. As described above, the community's main priority was gaining a protective barrier from flood and storms, not reaping economic benefits from the forests. This could change in the future. Challenges to sustainability in this context are considered below.

## Sustaining Operations

CMMBs have played a critical role in supporting planning, implementation, and monitoring of the new mangrove systems, as well enabling other project activities. In Da Loc, the management board was granted this responsibility officially from the district level from 2009-2014.

It remains uncertain whether the CMMB will maintain district-level approval for managing the mangrove system after 2014, however. Even if this delegation of authority remains, it would not necessarily come with a budget to sustain any of the CMMB's operations. Regulations developed at the village level anticipated this challenge and stipulated user fees to be paid by households that harvest seafood or timber from the forests. However, these have not been collected in practice. Financing options from payment for environmental services and

REDD+ have potential in the long-term, but are complex and unlikely to materialize in the next several years.

This raises both immediate and long-term concerns. Reduced resources for maintenance and protection can threaten the forests' integrity and survival. In Nga Thuy, some of the new forests are less than one year old, and still require manual labor to remove barnacles. Currently there is no budget to support transportation to the site or labor for this work.

In Da Loc's more mature forests, maintenance of this nature is no longer necessary. CMMB members express confidence that the community's watchful eyes will protect the forests from over-exploitation. Yet there are lingering concerns that community vigilance and the Border Army will be less effective than the now-defunct protection group.

On a longer scale, there is need for ongoing mechanisms for collective decision-making about managing mangrove resources. Achievements in Da Loc have thus far hinged primarily on mutual consensus around the need for protection. As the forests grow and economy changes, additional pressures and interests will inevitably emerge. Minor conflicts such as those between clam farming and mangrove protection could become larger and more problematic in the future. Certainly, there will be new proposals for using the resource, for instance for eco-tourism or to collect payment for environmental services. These would present great opportunities for local development—but they also have many potential pitfalls related to environmental sustainability and equitable benefit sharing. All of these issues indicate the need for a robust, accountable CMMB able to foster negotiation, mediate disputes, and make decisions transparently on behalf of the community.

CARE and Da Loc are appealing to Hau Loc district to extend village contracts and delegate budget to the CMMB, so that the Da Loc management system can continue to operate. It is not clear that this will be successful. In the absence of clearer authority for local governments, this will be a challenge for replication in other communities as well.

## Sustaining the community-based management approach

A second risk relates to the sustainability of meaningful community engagement. Without secure land tenure or rights over the resource, communities rely on assignment of management responsibilities from the government to assure that their involvement can continue.

Reconciling this issue in practice is a major challenge. CARE promoted greater community representation by supporting an election to choose members of the CMMB. Regulations

state that community members have the power to hold CMMB members accountable should they make inappropriate decisions. CARE also attempted to instill the community-based approach in individual authorities. As described earlier, “showing not tell” was an effective strategy for this. Several authorities have become active spokespersons for the community-based approach, hosting site visits and traveling to present their experience in national workshops.

Nevertheless, candidates for election to the CMMB were limited to a pool of local officials and mass organization leaders. This means that CMMB members are all affiliated with the government. There are no clear mechanisms for holding reelections of these individuals, moreover. This highlights the risk that over time, the management system will shift back towards a top-down structure dominated by government.

## Gender equity

Community-based approaches seek to equalize power relations between the people and government, to share authority and benefits. Yet often they perpetuate other inequalities imposed by society. Expectations around gender roles present one such challenge.

Women in Da Loc have made progress in recent years but still face discrimination that is deeply embedded in culture (Box 5). A heavier burden falls on them to provide for their families and care for their communities. This means they are also more vulnerable to climate change and disasters.

CARE recognized that gender would strongly impact the way that people engaged with (and benefited from) mangrove management, climate resilient livelihoods models, and disaster risk reduction activities. Overall, women felt that although they contributed more in terms of time and labor, men played a larger role in decision-making. Such inequity is like to persist into the future.

### **Box 5: Gender equity in the community-based approach**

Meeting powerful women leaders like Ms. Bui Thi Din, one might assume that gender expectations no longer play a determining role in Da Loc society and politics. Ms. Din (60) is a member of the Da Loc CMMB. She is a powerful speaker and relationship broker, responsible for mobilizing a tremendous number of people to participate in mangrove management, livelihood, awareness raising, and disaster risk reduction planning activities. International

experience suggests that female leaders such as Ms. Din are often the most appropriate candidates to serve on community-based resource management boards (Swan 2009).

CARE recognizes that gender-defined roles and expectations render women highly vulnerable to climate change and natural disasters. Globally, discriminatory legal frameworks, unequal access to key institutions such as credit and education, and a gap in wage earnings constrain women's opportunities, creating a spiral of vulnerability in the face of emerging hazards. Women face hurdles in reaching policy and decision-making processes and in acquiring information and skills required to escape hazards or cope with changing climate. Data discrimination can additionally underestimate the role and needs of women, such that climate change programming may actually exacerbate vulnerabilities (UNDP 2013). These issues are present as well in community-based natural resource management worldwide. Women frequently face barriers in achieving meaningful participation in decision-making processes around resource-use rights and regulations (Beck and Fajber 2006).

In Da Loc and Nga Thuy, women have made progress in recent years in accessing education, inheritances, and raising awareness about gender equality. Yet major challenges remain. Men still hold a greater degree of decision-making authority within the household and the local government. Culturally defined gender discrimination continues to impact the society from birth onwards, because of the pressure on family's to produce a male heir. In 2013, 170 boys and only 114 girls were born in Da Loc commune. Other families continue to have baby girls until finally producing a boy, forcing them to spread resources thinly between members. In some cases, families may thus prioritize educational and material needs of sons over those of daughters.

Women suffer the most when soils are contaminated by salinity, for instance, since they are responsible for producing food and income for their families. They are more likely than men to be burdened with additional responsibilities when disasters strike. Underlying this is unequal access to decision-making authority that could help them better manage resources or plan for the future.

To combat these issues in Da Loc and Nga Thuy, CARE prioritized participation of women. Staff provided dedicated trainings on communications to encourage active contribution of ideas from women community members in all stages of the mangrove management process. For the community at large, CARE trained both men and women on gender issues related to voice, access, and rights. Discussion with women community members and representatives from the Women's Union confirmed that these efforts were in many ways successful. Women participated more than men in program activities, by a rate of about 60% to 40%. Women dominated activities such as nursery management, mangrove maintenance,

awareness raising and promotion activities, and trainings. They generally took the lead role in piloting and applying livelihood models, consistent with their normal responsibilities. Women participated equally as voters in the CMMB election, as well.

Community members had varying perceptions of women's leadership and authority in the project. Some women in the community – especially older, established women like Ms. Din—argued that they played an equal role in influencing decision-making. Several younger women disagreed. They felt that they were less vocal during meetings on disaster risk management planning and developing mangrove management regulations, for instance. Young women active in the Green Team agreed that although women members outnumbered men, men were viewed as having greater “leadership skills,” and thus often took on leadership roles.

“Women allow men to make decisions more, because they respect them more than men respect women” – Vu Thi Hang, Nga Thuy Women's Union

All agreed that overall, project benefits were shared equally between men and women. These benefits included protection from the mangrove forest during floods and storms, which provided a renewed sense of relief and security. Income generated by new livelihood activities is shared among the family. Some women noted that they in particular had gained greater confidence in raising their voices and sharing ideas, a benefit that would remain long after the project ended.

The above project achievement in increased women participation in community-based adaptation is encouraging to other projects aiming to promote gender equality. However, it also emphasizes that genuine participation of women either in their households or in community affairs goes far beyond how many women are present in an event or activity. Women's capacity and confidence to powerfully voice their concerns and the respect granted to women by men are proven factors that determine the true depth of their participation. On this aspect, local authorities should take the lead in building on recent achievements and strive to transform existing unequal gender relationships.



## Conclusions and Recommendations

As residents of Da Loc and Nga Thuy recognize, the challenges confronting their communities are serious. They include degradation of natural resources, threats to traditional livelihoods, unpredictable rainfall patterns, more extreme temperatures and storms, and underlying forms of social exclusion.

These issues are by no means unique to Da Loc and Nga Thuy. Coastal communities particularly in Vietnam's northern and central coasts are facing increasing threats due to natural disaster and climate change. Drivers of vulnerability interact and reinforce each other in a negative, dangerous spiral. While a number of national policies and programs are designed to tackle these issues, policy makers and practitioners are still learning how to effectively coordinate and engage local people.

Experience from Da Loc and Nga Thuy demonstrate that indeed, communities can build resilience to natural disasters and climate change. This is evident from a wide set of achievements. Lessons from Da Loc and Nga Thuy thus provide a set of insights that are highly relevant for national policy, local planning efforts, and other initiatives working to address natural resource management, climate change, or disaster risk reduction.

***Challenges wrought by disasters, climate change, depletion of natural resources, and underlying marginalization are interrelated – and should be addressed together rather than separately at the local level.*** CARE's approach to community-based adaptation shows how mangrove management, livelihood support, and disaster preparedness planning can be more than the sum of their parts. Integrating these diverse components helps drive a virtuous cycle, making communities more resilient in the face of shocks and stresses. Restored mangrove forests along the coastline are helping to mitigate future impacts from storms and floods. They also provide a source of income for local people. New agricultural and livestock models have helped households diversify their livelihoods, stabilize or increase incomes, and improve water and soil quality. Villagers have institutionalized disaster preparedness planning processes, with enhanced capacity to respond when storms and flood do strike. The integrated approach also saved time and budget. Assessments and trainings combined a number of topics, ranging from mangrove management, to disaster preparedness, to climate change. This prevented local departments from each sponsoring separate activities from separate budgets. It also optimized another scarce resource: community members' time. Through this approach, participants came to understand more clearly how each of these topics related to each other.

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4. Depending on proximity to the coastline. Mangroves exposed the open sea have a lower survival rate than those next to the beach.

***The community-based approach already demonstrates strong short-term achievements.***

Communities in Da Loc and Nga Thuy have mobilized to plan, plant, maintain, and protect the mangrove forests. This aligns strongly with Vietnam's Grassroots Democracy Degree. Successes of the community-based approach are clear. Since 2007, community members have planted 277 hectares of mangrove forest in Da Loc and 181 hectares in Nga Thuy. Local people engaged in planting, maintaining, and protecting the young forests, with as many as 700 people contributing their labor in just one day. At a survival rate of 70% - 90%,<sup>4</sup> the mangrove forests have flourished compared to earlier projects in the same area. The use of local labor and local expertise also led to cost savings, efficiency gains, and strong community buy-in for forest protection.

Strong mobilization of the local community reinforced all of these objectives, as people came to see them as interrelated – if they protected the mangroves, they would be protecting their future livelihoods. Local officials and community members are highly confident that as a result, mangrove forests will not be overexploited or depleted by illegal activities in the near future.

Moreover, the training of local facilitators means there is local capacity for planning and assessment to continue into the future.

***With government support, CMMBs played a crucial role in these achievements.*** Strong support from local government was critical to the success of community-based activities. CARE's role as external facilitator helped to broker the relationship between government and community. Its strategy of "showing-not-telling" through field visits and demonstration projects illustrated the case for involving the community in every step of the process.

This approach was ultimately effective. Approval from the commune level provided the license to operate, mobilized mass organizations, and furnished the effort with powerful, influential spokespersons. It also allowed the formation of CMMBs. These institutions were highly effective in mobilizing community members to contribute time, knowledge, and labor to the process of mangrove restoration, disaster preparedness planning, and climate resilient livelihood models. Eventually, the success of planting activities from 2007-2009 in Da Loc persuaded district-level officials to assign management authority to three villages for a period of five years. This temporary solidified the rights of communities to manage the mangrove resources.

*In the longer-term, new institutions such as the CMMB can provide effective platforms for meeting ongoing management challenges.* Beyond organizing and facilitating activities, community-based systems are required for negotiating between different stakeholders' needs. CARE supported the CMMB to apply PLUP for this purpose. Developing regulations through PLUP helped distribute ecosystem benefits fairly and transparently and build capacity for inclusive management.

Having a "common enemy" a "common goal" made this relatively simple for Da Loc and Nga Thuy. Community members shared the understanding that mangroves would benefit everyone equally, by reducing risks from floods and storms. Such consensus had emerged from the shared experience of Typhoon Damrey in 2005. Highly effective awareness campaigns reinforced this message. Few stakeholders had strong interests that competed with this goal, moreover.

The high level of consensus in Da Loc and Nga Thuy is notable. In most contexts, stakeholders bring divergent priorities and interests around forest use, such that questions of resource sharing become contested. For Da Loc and Nga Thuy, the situation may still change. In the future mangroves will provide additional opportunities for harvesting valuable aquatic species. Tourism or urban development could likewise spark new pressures, opportunities, and conflict.

When clam farmers seized an opportunities to exploit the mangroves in Da Loc, the CMMB proved effective in finding a mutually-agreeable response to the conflict. This highlights the need to sustain transparent, accountable decision-making platforms like CMMBs to mediate stakeholder interests in the longer-term.

*The absence of appropriate mechanisms for delegating authority and budget from the district level, and assuring accountability at the commune level, threatens these systems.*

Despite early successes, current community-based mangrove management institutions are at risk in Da Loc and Nga Thuy. Management contracts for Da Loc villages will expire in 2014, and Nga Thuy villages have yet to receive any official forest management authority from the district-level. Both CMMBs will lack funding to support ongoing activities, following the conclusion of CARE projects. Uncertainty around authority and budget are institutional problems throughout Vietnam. These same issues may hamper efforts to develop community-based management in other districts and provinces.

Aside from authority and budget, CMMBs currently lack adequate systems for accountability. Facilitation from CARE helped to maximize community participation in decision-making

over the short-term through supporting an election, PLUPs, and participation of vulnerable groups. CMMBs need mechanisms to ensure they remain representative and accountable as community-level organizations, in the longer-term.

Currently, prevailing systems for household and community management of mangrove forests do not provide sufficient local incentives. Community-based management requires that stakeholders receive sufficient benefits for participating in management systems. In general, stakeholders will weigh the benefits they receive against opportunity costs – for example, the cost of not harvesting the mangroves for their own financial gain.

As noted above, community members in Da Loc and Nga Thuy shared a clear vision that mangroves would protect them during floods and storms. The potential to accrue direct livelihood benefits from the mangroves was a secondary priority. Because of the high level of consensus around mangroves for their protective function, community members were willing to accept short-term management arrangements and low levels of compensation for their services. In the longer-term, this calculation may also change. Sustainable management of mangrove forests depends on all community members having an assured, long-term stake in the resource and/or adequate remuneration.

Currently, legal frameworks do not permit long-term tenure arrangements for mangrove forests, which are designated as Special Use or Protection forests. Although official “forest owners” are able to contract with individual households and/or collectivities of households (as was applied for three villages in Da Loc), short-term contracts provide far less incentive for communities to protect and manage resources for long-term sustainability.

## Recommendations:

Based on lessons from Da Loc and Nga Thuy, it is clear that adaptation in Vietnam’s coastal communities will require action from the national to local level. This is consistent with CARE’s Framework for Community-Based Adaptation, which highlights how institutions and actors at various scales can enable local level adaptation.

Recommendations for national level policy makers, local authorities, practitioners and NGOs are outlined below. A companion publication, *Integrated Models for Climate Adaptive Livelihoods and Community Based Mangroves Management*, provides technical guidelines to local practitioners and households for planting and maintaining mangrove forests and for applying climate resilient livelihood models.

### **National level:**

***Policies should enable an integrated approach to climate change adaptation and disaster risk reduction:*** National policy makers have a critical role to play in enabling an integrated, community-based approach to coastal adaptation at the local level. Currently, the artificial distinction made between climate change adaptation under MoNRE and disaster risk reduction under MARD reduces efficiency and effectiveness of programs. In contrast, the cooperation between DARD and DoNRE in Hau Loc and Nga Son districts provides a model how these two agendas can work together to save time and budget.

Good practices of this nature can be scaled and replicated elsewhere in Vietnam. National policy can create mechanisms for disaster risk reduction activities under MARD to work directly with climate change planning initiatives under MoNRE. In particular, the National Program on CBDRM provides an opportunity to enhance assessment and planning under the NTP-RCC. MoNRE can require local teams or consultants charged with climate change planning to join and support CBDRM programming, integrating community priorities into action plans and providing additional insights for communities to assess longer-term climate impacts. Ultimately, MoNRE and MARD should work towards a unified approach to assessments, planning, and investment decisions.

***New policies on Coastal Forestry, currently under development, must support community-based management of mangroves.*** The role of healthy ecosystems in reducing disaster and climate risks is already recognized and promoted through numerous policies and programs. Many local initiatives in terrestrial and mangrove forests, including CARE's work in Da Loc and Nga Thuy, have demonstrated that involving local communities and households is the most effective approach to restoring and preserving these critical systems.

National policies could do much more to support community-based management of coastal forests. New laws under development related to Coastal Forestry (including the Prime Minister's Decision on the Forest Co-Management Mechanism) must include provisions that allow community-based mangrove management, such as:

- Provision of long-term tenure arrangements for the community, such that all members have a clear stake in benefits and thus a long-term incentive to protect the forests. In contractual arrangements, community members must receive adequate compensation for protecting mangrove forests
- Support for formation of management and decision making mechanisms, such as CMMBs, elected by members of the community.
- Application of participatory processes such as PLUP to develop regulations and sharing

mechanisms for both direct benefits of mangroves (ie. collection of fish, mollusks, firewood, honey etc.) and indirect benefits (ie. tourism, payment for environmental services)

***National programs and policy on climate change should support the role of communities, particularly in managing coastal resources as an adaption strategy.*** MoNRE can promote community-based adaptation and resource management as a climate change adaptation strategy. Funding from the Support Program in Respond to Climate Change (SPRCC) can be directed to support community-based adaptation. This may require exploration of decentralized financial management mechanisms, so that CMMBs could manage funds directly. Community-based adaptation should include support for mangroves, in coordination with existing laws and programs under MARD.

### **Local Level**

Decision-makers at the provincial, district, and commune level have a range of options at their disposal for promoting an integrated, community-based approach to coastal resilience. Importantly, authorities need to recognize that planting and protection are just components of management, which also includes planning, decision-making, and budgeting over the long-term.

***Local governments operating in coastal communities can work with external experts and learn innovative management approaches from other provinces.*** Community-based and co-management programs in Da Loc, Ca Mau, Soc Trang, and Kien Giang, among others, offer different models for involving local households and communities in mangrove forestry. Experimentation with different arrangements can lead to learning and improvements. In many contexts, management systems will require a greater degree of negotiation between different user groups than was the case in Da Loc, especially if aquaculture is an important industry or if the coastal area faces pressure from tourism or urban development.

***At provincial and district levels, officials can promote sustainability of community-based management systems by decentralizing decision-making authority and resources.*** Sustainability of community-based mangrove management systems requires extended contractual arrangements and allocation of budget to lower levels. District authorities must be willing to provide rights for collectivities to manage and share benefits from the mangroves. This arrangement must also include a budget for management activities under the CMMB. Such short-term contractual relationships do not replace longer-term land-use tenure arrangements, which require support under national policy frameworks described above.



*At the commune levels, officials and communities can apply the CMMB, CVCA, and PLUP models to facilitate effective management and benefit sharing.* Elected CMMBs can provide a platform to represent different needs and interests of community members. Ensuring credibility of these institutions is critical, since they are vulnerable to domination by government or other powerful interest groups. For this reason, CMMBs should include representation from all resource users, particularly women and marginalized groups. They also require mechanisms for regular reelection.

PLUP is a critical tool for assuring equitable benefit sharing and buy-in from stakeholders. Local authorities can seek guidance on applying it from expert facilitators. They should also learn from experience of communities such as Da Loc, by inviting community members to coach them through the process. PLUPs should be conducted and revised every several years, as local ecology and economies evolve.

*By working together, DARD and DoNRE can be more effective in promoting climate change adaptation and disaster risk reduction:* As noted above, the cooperation between DARD and DoNRE in Hau Loc and Nga Son on mangrove management, climate resilient livelihoods, and disaster preparedness planning provides a model of good practice. Across Vietnamese provinces, climate change adaptation planners have the opportunity to work closely with CBDRM programming. This approach helps to share insights and budgets, and reduces confusion among local people.

***Local government in Da Loc and Nga Thuy Communes, Hau Loc and Nga Son Districts***  
***Promote sustainability of community-based approach through extension of management authority, allocation of budget, reelection mechanisms for CMMB, and revision of regulations and benefit sharing mechanisms.*** Hau Loc district-level authorities can extend the rights of Da Loc villages to manage and share benefits from mangrove forests. Nga Son district should extend the same recognition to villages in Nga Thuy district. These arrangements must include a budget for management activities under the commune CMMB. At the commune level, CMMB members should hold a new election, and create a mechanism for elections at least every five years. This will help assure representativeness and accountability of board members going forward. In both communes, PLUP processes should also be conducted again after several years, to review status of resources and appropriateness of regulations and benefit sharing mechanisms.

***NGOs and Mass-organizations:***

The contributions of CARE and mass organization staff underline the critical role for civil society in fostering a community-based approach. NGOs and mass organizations are well positioned to support facilitation, provide external technical assistance, and to promote transparency and accountability of management institutions.

***Provide technical and facilitation support for communities:*** Internally, INGOs and VNGOs have frequently initiated community-based adaptation and natural resource management. As a facilitator, they are often able to access and gain trust among government officials and community members alike, acting as a bridge and broker. Likewise, NGOs can provide technical capacities not available within local government. This will be particularly important for processes such as PLUP, which are complex and require external expertise. Mass organizations can act as trainers of trainers for risk assessment, planning, and implementation of integrated activities.

***Support and educate constituents on integrated approaches to adaptation:*** There is a critical need for local people and officials to understand the relationship between natural resource management, climate change, and disaster risk. Activities supported by CARE and Green Teams demonstrate the need for innovative trainings and communications strategies to build this awareness. NGOs and mass organizations are well positioned to support local governments in this role.

***Ensure accountability and community participation in management institutions:*** Although CMMBS and other community-based management institutions should have their own mechanisms for assuring accountability, it is also the role of civil society to monitor these institutions. This is critical for assuring that decision-makers remain accountable and do not disproportionately represent the interests of certain group. Nation-wide NGOs networks can help to facilitate this “watchdog” function nationally, to promote equitable adaptation practices that fully support the needs of poor and vulnerable populations.

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# Annex 1

## CARE's Community-Based Adaptation Framework

CARE's Framework for Community-Based Adaptation				
	Climate-Resilient Livelihoods	Disaster Risk Reduction	Capacity Development	Addressing Underlying Causes of Vulnerability
<b>National Level</b>	<ul style="list-style-type: none"> <li>Government is monitoring, analyzing and disseminating current and future climate information related to livelihoods</li> <li>Climate change is integrated into relevant sectoral policies</li> <li>Climate change is integrated into poverty reduction strategy and/or other development policies</li> </ul>	<ul style="list-style-type: none"> <li>Government is monitoring, analyzing and disseminating disaster risk information</li> <li>Government is engaged in planning and implementing disaster risk management (including prevention, preparedness, response and recovery)</li> <li>Functional early warning systems in place</li> <li>Government has capacity to respond to disasters</li> </ul>	<ul style="list-style-type: none"> <li>Government has capacity to monitor, analyze and disseminate information on current and future climate risks</li> <li>Government has mandate to integrate climate change into policies</li> <li>National policies are rolled out at regional and local levels</li> <li>Resources are allocated for implementation of adaptation-related policies</li> </ul>	<ul style="list-style-type: none"> <li>Government recognizes specific vulnerability of women and other marginalized groups to climate change</li> <li>Policy and implementation is focused on reducing these vulnerabilities</li> <li>Civil society is involved in planning and implementation of adaptation activities</li> </ul>
<b>Local Government/Community Level</b>	<ul style="list-style-type: none"> <li>Local institutions have access to climate information</li> <li>Local plans or policies support climate-resilient livelihoods</li> <li>Local government and NGO extension workers understand climate risks and are promoting adaptation strategies</li> </ul>	<ul style="list-style-type: none"> <li>Local institutions have access to disaster risk information</li> <li>Local disaster risk management plans being implemented</li> <li>Functional early warning systems in place</li> <li>Local government has capacity to respond to disasters</li> </ul>	<ul style="list-style-type: none"> <li>Local institutions have capacity to monitor, analyze and disseminate information on current and future climate risks</li> <li>Local institutions have capacity and resources to plan and implement adaptation activities</li> </ul>	<ul style="list-style-type: none"> <li>Local planning processes are participatory</li> <li>Women and other marginalized groups have a voice in local planning processes</li> <li>Local policies provide access to and control over critical livelihoods resources for all</li> </ul>
<b>Household/Individual Level</b>	<ul style="list-style-type: none"> <li>People are generating and using climate information for planning</li> <li>Households are employing climate-resilient agricultural practices</li> <li>Households have diversified livelihoods, including non-agricultural strategies</li> <li>People are managing risk by planning for and investing in the future</li> </ul>	<ul style="list-style-type: none"> <li>Households have protected reserves of food and agricultural inputs</li> <li>Households have secure shelter</li> <li>Key assets are protected</li> <li>People have access to early warnings for climate hazards</li> <li>People have mobility to escape danger in the event of climate hazards</li> </ul>	<ul style="list-style-type: none"> <li>Social and economic safety nets are available to households</li> <li>Financial services are available to households</li> <li>People have knowledge and skills to employ adaptation strategies</li> <li>People have access to seasonal forecasts and other climate information</li> </ul>	<ul style="list-style-type: none"> <li>Men and women are working together to address challenges</li> <li>Households have control over critical livelihoods resources</li> <li>Women and other marginalized groups have equal access to information, skills and services</li> <li>Women and other marginalized groups have equal rights and access to critical livelihoods resources</li> </ul>

**NOTE:** Local institutions refers to both government and civil society organizations at the local level.

## Annex 2

### ***Example village - level regulation on community - based mangrove forest management, protection and development - Dong Hai village***

Da Loc Commune Peoples' Committee  
Dong Hai Village

Socialist Republic of Vietnam

Independence - Freedom - Happiness

Da Loc date ...../...../ 2009.

## REGUALTIONS

### **On Community-Based Mangrove Forest Management, Protection and Development of Dong Hai Village**

*(These regulations are attached decision of Da Loc Commune Peoples' Committee)*

- Pursuant to the Law on Forest Protection and Development dated 3rd December 2004;
- Pursuant to the Decision No. 23/2006/ND of the Law on Forest Protection and Development enforcement dated 3rd March 2006
- Pursuant to the Decision No. 38/2007/TT - BNN of MARD dated 25th April 2007
- Pursuant to the Resolution adopted at the meeting of household consensus in Dong Hai village

## I Location, purpose and meaning of 'Community-Based Mangrove Forest management:

The Community-Based Mangroves Forest in Dong Hai which invested by CARE international organization for farmers to plant, maintain, protect that is protection forest in coastal areas. It is about 77, 1 ha.

To the East is the sea

To the West is the sea dyke is staying in Dong Hai Village

To the North is Dong Tani forest

To the South is Dong Hai forest commune



Mangrove forest isn't only plays an important rule in protecting environment in Dong Hai but it also protects the around residential community, ecological balance, keeping the touch line, protecting the dyke, blocking the wave - restricting entry of the sea into the land and create of favorable conditions for species of coastal to develop.

Management and protection of the Community Mangroves forest is responsibility of all people to protect the environment that protect natural resources and exploit logical and effectively these resources.

## II / The specific Articles:

### **Article 1: Rights and obligations of people:**

#### **1/ Rights:**

- a. To make a plan on Mangroves forest management, conventional protection and developing forests development and implementation of plan and the convention/regulations.
- b. To set up and implement plan on aquatic resources use and exploitation in the community
- c. To vote members of Community Based Mangroves management Board and Protection group and revoke them if they do not meet their responsibilities
- d. To exploit the forest resources such as firewood,, collect seeds to sell, , bee keeping etc
- e. To exploit the seafood such as fishes, crabs, small hard and soft crabs, shrimps etc
- f. To exploit the source of ecotourism such as: Do consistent sales, food service, stay at home.
- g. The state compensation for results work, results from the first Community Based Mangroves Forest in accordance with laws and regulations when the State revoked the forest areas

#### **2 / Obligations of the community in protecting and developing forest:**

- a. To use forest land as t purpose and effectively that comply with regulations which approved by authority.
- B. Have responsibilities to monitor,, watch for happening forest sources, prevent epidemic disease, barnacles attached young trees
- C. To maintain the Mangrove forest together such as: barnacles clean, collect the wastes on the young tree, tidy up the beach.
- d. To protect the mangroves forest together, finding out and preventing in time with all of the harmful activities to Mangrove forest. Reporting to the protection staffs, the border army No 114, and the police officer to deal with promptly in law.
- e. To contribute to build fund of the community forest, management and protection

- f. To return the forest to the Government when have returning decision.
- g. To help together in protecting, exploiting seafood source and to organize services, access the markets for selling products

***Article 2: Structures, Functions and responsibilities, rights of the community Based Mangroves forest management Board***

It is about 3 people including a leader of the Village who is voted by Villagers democracy and directly. They have responsibilities to manage, monitor the Mangroves forest and arrest and solve any illegal person who is made damaged mangroves forest and get allowance from the fund of Community Based Mangroves Forest protection and development.

The community Based Mangroves forest management Board who is elected by citizen of Dong Hai Village has function and responsibility on behalf of people to manage, protect develop the Mangroves forest directly.

1. To set up plan, on mangroves development and mobilize labors force of community to plant, maintain and protect the Mangroves forest
2. To set up and manage the fund of mangroves forest protection; organize to exploit the forest resources in a reasonable and effective;
3. To organize the village meeting to make plan of growing, maintaining, management, protection of the Mangroves forest.
4. To Organize and mobilize people to plant, maintain, and protect the Mangroves forest areas as plan
5. To establish plan on sharing the benefits from exploitation of forest resources for the communities
6. To set up time plan on natural resources exploitation and notify for local people to exploit natural resources such as thinning activities to get firewood, exploit crabs, shrimps, fishes, mollusks etc
7. To be communicative bridge between Village community Mangrove Forest management, Board with People's committees, Border army No 114 frontier post management in forest management and protection
8. To combine activities with Dong Hai, Dong Hai Villages to protection as well as growing and maintaining, exploiting the Mangrove forest source effectively.

***Article 3: Duties and rights of the Community Based Mangroves Forest protection group***

The Protection group is including 2 people who are elected by people of Dong Hai Village, regularly and directly. It has responsibility to protect, prevent, and dispose timely the harmful

activities to the Community Based Mangroves Forest. Protection group receive remuneration accounts from people in the village contributed.

1. To send protection staff to patrol and protect the community Mangroves forest
2. The Protection staff is responsible to watch and manage the exploiter seafood by fishing-basket, mollusks, and people feeding ducks, cattle
3. To monitor to arrest persons who has illegal activities in the mangroves forest and record minutes to submit Da Loc Commune people Committee for punishing as regulations and forest protection and development law;
4. If members of the protection does not complete tasks or breach shall not be paid remuneration and recalled.

**Article 4: The exploitation of products and land-use mangrove forests:**

1. In the 7 years old forests, each year, the people in the village can exploit the dry wood under monitoring of the protection staff - about 3-5 times/ year.
2. To trim the branches, tree in the forest by correct technique of forestry.
3. With 1 year old up forest, people can drop the ducks.
4. About exploiting seafood; crabs, small hard and soft crabs, fishes,... Each flow can exploit about 5 days.
  - crabs are exploited only in the day time, in the 2 years old forests up. And only by re-entering (no use large rakes. Dig mollusks with distance between 2 rows about 30 - 35 cm avoid corrupt root mangroves

**5. Exploitation Time (Lunar Calendar):**

- crab is exploited from February - June about April - August.
  - small Hard crabs February to August about April to October
  - small soft crabs from April to June lunar month and about May - August.
- Calendar exploiting is informed on the Speaker of the village radio by the management.
5. The exploitation of the plot is divided into each group, depending on the number of people, upholder responsibility to protect forests.
  6. All activities and exploitation time has to under the supervision, guidance of the management, protection staff

**Article 5: Acts prohibited:**

1. to Prohibit hunting birds in the mangroves
2. To block ducks drop out, and kinds of cattle in the young forests (except duck flocks

released in forests planted after 1 year old).

3. To Prohibit digging mollusks, hunting birds, catching crap and exploiting, transport, trade in all kinds of seafood in the forest with out acceptance of forest management or protection staff.

4. To prohibit using large scratches to dig crabs, make harmful to the forest.

5. To prohibit going walk, anchor boats parked illegally damage to plantation forests.

6. To prohibit using of explosive, offensive power, three phase power to run ... exploit, destroy the source of seafood.

7. To prohibit cutting down the forest to take wood illegally.

8. To prohibit damaging the protected forests such as billboards, play cultivation column landmark protection.

9. To tempt dirty trash, defecate dissolutely at Dyke, beach, forests.

10. To prohibit harmful behaviors to the mangroves forest and benefits of the forest.

***Article 6: Provisions on dealing illegal activities on forests development and protection:***

The protection staff has responsibility to record minute's illegal person who has the illegal activities to the mangroves forests. To keep illegal evidences, means and transfer to commune policeman, People's committees, and the border army No 114. And depending on the level of violation that the penalty or submit to the agencies authorized access of criminal cases.

1. Who have the illegal activities will be informed on the commune and villages speakers, radio system.

2. Money penalty shall use for compensation of replanting mangroves forest that damaged by illegal person that comply with Decree 139/2004 of Government.

3. Children violate which cause the damage to the mangroves forest; their parents must be responsible for compensation, to overcome the consequences of the regulations and legal notices to the school to respond to education management.

***Article 7: Provisions on the mobilization of communities to mangroves forest maintaining and development:***

1. To contribute labours to replant the mangroves forest where damaged by waves and barnacles

2. To contribute labours to maintain the mangroves forest such as cleaning dirty materials and barnacles attached on young trees. (one time per month and one household contribute

one labour for this)

3. To contribute money for the funds of the mangroves protection and development

***Article 8: Provisions on purposes, forms of mobilization of construction funds to protect and develop community mangroves forest:***

1. Purpose of building the fund that focus on protection and development of the community based mangrove forest in the village, source of seafood, as well as other source from the forest. Guaranteed source of funds is more and more develop to sever mangrove forest protection.

2. Resource of fund is: the contribution of people in villages in the exploitation of the marine resources of forest products; funding, supported by the State Budget, on the (661 Program) and from other sources.

3. The source of funds contributed by people in the village. Each household contributes about T 20,000 VND per year

- Contribute for the funds of Mangroves forest protection about 5.000 VND per day from people who exploiting aquatic resources like mollusks
- Contribute for the funds of Mangroves forest protection about 100,000 VND per month from people who exploiting fishes, by net around the mangroves areas
- Mangroves forest Management Board has responsibility to collect the income, open track records reflect fully and timely, exactly.

***Article 9: The management and usage mechanism***

1. Community Based Mangroves Forest Management Board makes plan on expenditure levels for each activity to ensure the principle of balance - read, presented through the financial plan before the village meetings

2. To ensure for the activities protection and forest development must be exacted (according to the priority expenditure), timely, proper laws and regulations. Must track records, recorded clearly; Fund must be checked their surveillance of the inspector appointed by the village, the head of village and Da Loc. Commune Mangroves Management Board

every six month one time to report on collecting and expenditure funds before village meeting

3. Funds use for

- To support the protection and forest development such as replanting, maintaining activities
- To pay for protection staff, it is about 400,000 VND per month

### III / Organization implemented:

This regulation is effective from the date signed and adopted for all people in Dong Hai village and is to be implemented by all of people in Dong Hai village.

To:

- Dong Hai village leader
- All villages in Da Loc commune
- Community-Based Mangrove Management Board
- Mangrove protection group
- Border Army No. 114





