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Project Level

INSTITUTE FOR SOCIAL AND ENVIRONMENTAL TRANSITION-INTERNATIONAL

CLIMATE RESILIENCE CASE STUDY

Can Tho, Vietnam

CO-MANAGEMENT OF RIVERBANK EROSION CONTROL IN CAN THO

2013 –2016 | Implementing Partner: Can Tho Climate Change Coordination Office (CCCO Can Tho)

THE CONTEXT

Can Tho is situated in the centre of the Mekong Delta, with a population of approximately 1 million people. An Binh ward, a densely-populated middle to lower income residential area in the central Can Tho district of Ninh Kieu, has 10 local canals with a total length of approximately 10 km. About 10-15 years ago, these drainage channels played an important role in community life; facilitating waterway transportation, providing water for domestic and agricultural use, and providing drainage for residential areas.

In recent years, during high-water season, tidal flooding has become more common in these canals. Commercial shipping has also increased along the main canals in the city. The combination of these factors has led to increased riverbank erosion and loss of bank stability along the Cai Son river in An Binh.

Some households already build bamboo fences, grow water hyacinth and plant trees along the riverbank to reduce erosion. However, there has been no official support for these activities, no study of their comparative effectiveness, no technical advice to local households to improve practices and not all households can afford the cost. As such, riverbank protection is inconsistent and ineffective. The situation is complex. Some residents do not hold title to the land on which they have built, different sections of the riverbank are at varying degrees of risk as a result of soil and vegetation conditions and in some places erosion threatens public infrastructure such as roadways or utility distribution systems, while in others it solely affects private property.

For more information about our project and publications, please visit: i-s-e-t.org/projects/can-tho-erosion.html

The problem

Urbanization along Can Tho's historical system of rivers and drainage channels has led to greater damage from riverbank erosion. Erosion risks are highest for households in traditional Mekong riverbank houses in peri-urban areas that are now experiencing rapid development. Each year, there are several major erosion incidents leading to deaths and property damage. The city is building concrete embankments but this is only affordable for high-value central areas. Peri-urban residents and businesses along river channels remain highly exposed to erosion.

Finding Solutions

The project developed new institutional mechanisms that combine community initiative and oversight with government technical and financial support. The processes of community engagement, the mechanisms for joint planning and management, and the biological erosion control techniques may all be replicable in other similar contexts in Mekong Delta communities.

In an experimental approach, the district level government, ward leaders and the local community collaborated to test low-cost bank stabilization measures. Innovations

FIGURE 1

ROLES OF STAKEHOLDERS AND COMMUNITY

Local government	Local community	Scientists/Experts	NGO and Donor
• Co- funding • policy guidance. • Co-monitoring and co-management. • Negotiate with households as needed. • Organizing, monitoring the construction. • Materials management, asset and investment for the project.	• Co-management. • Provide input on construction plans, financial mechanisms. • Community leadership and initiative. • Contribute materials and labor. • Develop regulations or conventions in order to operate and maintain the project. • Operation and maintenance.	• Conduct studies of riverbank conditions, flood flows and erosion control methods. • Conduct Cost benefit analysis (CBA). • Work with community to define solutions. • Support community to develop the construction plan.	• Co-funding. • Support for co-management model. • Technical assistance.

included the recognition of community knowledge of bank vulnerability and stabilization, formal technical assessment of *Malaleuca cajuputi* poles for bank stabilization and community involvement in planning, decision-making, construction and project oversight, together with government authorities. Together, these measures constitute a model for co-management of adaptive infrastructure.

In June 2014, as a result of local initiative and project support from ISET and the Can Tho Climate Change Coordination Office, a Community Management Board was established. Members of the Community Management Board were trained and took part in surveys, measurement, classification and planning for biological embankment construction. They discussed within their community the estimated cost of each measure and responsibilities of affected households to contribute resources. Roles of different project partners were defined as shown in the Figure 1 above.

Co-management is a new approach that has many points of contradiction with current management practices. As such, it has been challenging for all the actors to establish new ways of doing things. Some of the procedures have not worked well and need to be improved. For example, mechanisms to negotiate and manage conflicts between community benefits and private land use rights need to be improved and communication mechanisms with local residents should be strengthened.

To address these needs, the project organized a series of Shared Learning Dialogues (SLDs) through meetings between the local community and relevant stakeholders at ward and district level. The intention was to develop common agreements among community members first and then with government.

FIGURE 2

SPEED LIMIT SIGNS

FIGURE 3

BIOLOGICAL EMBANKMENT OF CAI SON RIVER

Outcomes

The construction of the biological erosion control measures took only two months and was completed by September 30th 2014. The total length of biological embankment is 3,086 m along both sides of the riverbank, which is about *twice the originally planned length.* The length of riverbank protection was able to be increased due to lower than expected costs for the *Malaleuca* poles, and because of community contributions (980 person-days of labour and VND 170 million or roughly USD $7,700 in cash). The communities along both sides of Cai Son developed a collective regulation for riverbank management that was approved by An Binh ward. The key message shared with households in the community is "**my riverbank, my responsibility**".

After two flood seasons in 2014 and 2015, there has been no erosion damage so local men and women are very happy with the results of the project in protecting their property and their shared access roads to the community.

A cost benefit analysis showed that at 10% discount rate, the net present value was estimated as VND 7.4 billion (roughly USD $350,000), the internal rate of return was 60% and the benefit cost ratio of the project was 3.4. We conclude that the biological embankment project along the of Cai Son River brings significant economic benefits, primarily to riverbank residents. Some of these residents have low incomes and lack legal tenure, so the project also has distributional benefits.

In addition, the community successfully influenced the city government to install *speed limit signs* for commercial boat traffic, not only at Cai Son but along all rivers in the city (see Figure 2).

The key message shared with households in the community is "my riverbank, my responsibility".

Summary of Resilience Measures by Type

INFRASTRUCTURE	ECOSYSTEMS	CAPACITY	INSTITUTIONS
Riverbank biological erosion control measures tested and installed along Cai Son riverbanks	Some elements of erosion control involve living plants (water hyacinth in the river, trees on bank)	Increased community technical capacity for supervision of construction and maintenance of erosion control measures	New mechanisms for collaboration between community and local government
Local access roads and bridges secured from erosion damage		Community learning from trials of different protection materials	New community organization and regulations to support planning, installation and maintenance of erosion control measures

LESSONS FOR POLICY AND PRACTICE

Large scale, steel and concrete river embankments may not be feasible in peri-urban contexts where the costs are high and economic benefits are moderate. Yet poor residents in these areas may be most vulnerable to climate hazards such as flooding, sea level rise and extreme storms because their population density is increasing more rapidly than infrastructure investment. This case demonstrates the feasibility of an alternative mechanism for funding, building and maintaining low-cost infrastructure for riverbank stabilization and erosion control. The transferable innovations tested in this case include:

- integration of community knowledge of riverbank vulnerability and stabilization measures;
- selection of appropriate biological materials (*Malaleuca* poles and water hyacinth) for bank stabilization; and
- community engagement in planning, decision-making, construction oversight, contribution of labour and finance jointly with government authorities.

The city government should encourage other districts of Can Tho to replicate this model for riverbank management. Lessons from this case can also be applied in other urban communities facing similar problems in the Mekong Delta or elsewhere in the region.

Local partners

- District of Ninh Kieu Dept of Construction;
- An Binh ward; and
- Can Tho University.

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