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CLIMATE RESILIENCE CASE STUDY

Quang Nam, Vietnam

COMMUNITY PARTICIPATION IN CROSS-BORDER WATER MANAGEMENT - THE CASE OF DAI HONG COMMUNE OF QUANG NAM PROVINCE AND THE VU GIA - THU BON RIVER BASIN

2017–2018 | Implementing Partner: Quang Nam and Da Nang Department of Natural Resources and Environment; CARE International in Vietnam

Sand deposited filled in Dai Hong Commune
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River Basin Cross-border Flood Resilience Support Platform is a project that ISET has been working with local partners under a Global Resilience Partnership (GRP), Water Window project since the start of 2017 to set up and strengthen an inter-provincial platform for water resource management of the Vu Gia – Thu Bon river basin.

The context

Dai Hong is a rural commune of Dai Loc district, Quang Nam province, consisting of 10 villages, with a population of 11,462 people (2017) and an area of 5,121 km^2. The commune is located about 45 km to the southwest of Da Nang City, and about twice this distance from Tam Ky city of Quang Nam province. It sits downstream to seven hydropower reservoirs in Quang Nam (A Vuonng, Song Bung 2, 3, 4, 5, 6, and Dac My 4), along the side of the Vu Gia river, which eventually flows into Da Nang Bay via the Han River estuary. Though the commune covers a large geographic area, it is dominated by mountainous and forested lands. The bulk of Dai Hong's population is located in low-lying areas situated between National Highway 14B and the river where they are highly vulnerable to the impacts of floods, droughts and other natural hazards. Much of this vulnerability does not arise locally, but has an intertwined relationship with processes and drivers at play in the entire Vu Gia – Thu Bon river basin. For this reason, Dai Hong commune was selected for engagement in the Global Resilience Partnership (GRP) funded project on integrated management of the Vu Gia – Thu Bon trans-boundary river system of Quang Nam and Da Nang.

The problem

The vulnerability of the people in Dai Hong to water-related shocks and stresses has increased greatly in recent years, not only because of climate change, but more significantly due to human driven processes such as infrastructure development, land use change, and water management in the river basin. 80% of the households in the commune depend on agricultural livelihoods, growing cash crops such as

TABLE 1

IMPACTS OF HYDROPOWER RESERVOIR OPERATION IN DAI HONG COMMUNE*

HYDROPOWER ACTIVITIES	IMPACTS
Daily electricity generation	• Daily fluctuations of the river water level, which destabilizes the riverbanks, causing erosion and loss of agricultural and residential land
Retention of water in upstream reservoirs in the dry season	• Reduced depth and width of the river. A survey conducted in 2017 by CARE experts recorded a 1.85 m lowering of the water level and 200 m retreat of the riverbank at Dock 14 location, compared to before hydropower development (2010). • Increased water shortages, which reduce the amount of water available for irrigation and affect crop productivity. • Less sediment flow in the dry season months, exacerbating riverbank erosion and affecting soil fertility.
Water releases in the flood season	• More sudden and violent flooding, sometimes consecutive flooding events, posing threats to people's lives and damaging houses, livestock and crops. Many people stopped growing the third season of crop for fear of flood damages. • Flood impacts exacerbated by new, elevated roads and construction which result in deeper floodwaters and slower floodwater retreat. • Deep, high velocity floodwaters, combined with upstream deforestation, are causing increased sedimentation (mostly sand deposits) of up to 50-60 cm in houses and fields. Field fertility is reduced, fields are harder to work, and yields are reduced and/or farmers must change to different, lower value crops.

** synthesized from CARE's vulnerability assessment report, 2017, and additional community consultations by ISET in 2018*

TABLE 2

AREA OF LAND AFFECTED BY EROSION AND SEDIMENTATION IN DAI HONG COMMUNE*

TYPE OF IMPACT	1989-2009 (20 YEARS)	2010-2016 (6 YEARS)	NOTES
Loss Of Residential Land	>20 ha	>20 ha	697 Households Affected (Relocated) Since 1989
Loss Of Agricultural Land	>14 ha	>10 ha	
Sandy Sedimentation	0 ha	80 ha	Mostly in Dong Phuoc and Duc Tinh villages, up to 50-60 cm thick

** synthesized from CARE's vulnerability assessment report, 2017*

rice, corns, peanuts, beans, pineapples and water melons. This leaves the commune particularly vulnerable to flood and drought events. The development of hydropower plants in upstream areas during the last 10 years poses particular challenges to local lives and livelihoods in Dai Hong commune in a number of ways (Table 1).

Table 2 and 3 provide specific examples about impacts related to erosion and crop production costs and productivity in Dai Hong commune.

A raw estimate shows that the income of an average rice farmer decreased from about 14 million VND per hectare per crop in 2006 to only 3 million VND in 2014[1]. Because agriculture crops are the main source of income for most households in Dai Hong commune, this sharp decrease in income of the farmers means a hard blow on their families' living standard.

1 Assuming that the price of rice is 70,000 VND/kg.

River bank erosion in Dong Phuoc village
© Tho Nguyen, ISET-International

Covering watermelon seedlings with plastic sheets to retain water and fertilizer © Tho Nguyen, ISET-International

TABLE 3

CHANGES IN COST AND PRODUCTIVITY OF SELECT CROPS IN DAI HONG COMMUNE OVER TIME*

TYPE	CROP	2006-2010	2010-2012	2012-2014
Productivity (ton/ha)	Rice	6	5	5
	Corn	8	6	6
	Peanut	3	2	2
Average cost (planting, watering and fertilizing, in million VND/sao)*	Rice	1.4	1.6	1.6
	Corn	1.3	1.5	1.6
* 1 sao = 1/20 ha	Peanut	1.5	1.6	1.6

** Source: indigenous knowledge research in the community regarding impacts of hydropower development on the environment and local lives (CSRD, 2014)*

Another problem experienced by villagers in Dai Hong is the lack of an effective early warning system. Flood warning sirens were installed in the commune by A Vuong Hydropower Company, but flood warning sirens are not always functional due to blackouts during periods of severe rainfall or flooding, and even when the sirens work, they are located near the commune center which is several kilometers from the at risk villages. In 2017 the early warning sirens were complemented by an SMS warning system set up to send warning messages directly to village chiefs' cellphones. However, the list of village chiefs and their phone numbers is not updated regularly so the messages do not always reach the right people. Both siren and SMS warnings are often delivered very late, not giving people enough time to move their assets and harvests to a safe place or to evacuate before the floods arrive.

Finally, flood warnings are often very difficult for people to interpret — SMS warnings frequently just communicate the rate of release from the hydropower dam in m^3/s. Consequently, even if they receive the warning, people are not clear when the flood will arrive, how severe it will be, the duration of release, and consequently how they should react. Better management

Flood warning sirents at the centre of Dai Hong commune (before relocation) © Thanh Ngo, ISET-International

TABLE 4

ESTIMATED AVOIDABLE COST RESULTING FROM THE INEFFECTIVE EARLY WARNING SYSTEM IN DAI HONG COMMUNE (OVER A PERIOD OF 10 YEARS)*

TYPE OF LOSSES	AMOUNT (VND)
a. Damage to household assets	2,973,000,000
b. Crop damages (before/after harvest)	3,587,500,000
c. Livestock loss	24,378,600,000
Total avoided loss (VND)	**30,939,100,000**
Total avoided loss (USD)	**$1,359,960**

** Source: ISET's Monitoring, Evaluation and Learning implementation report, 2018*

of the early warning system would help the community to avoid tremendous losses (Table 4). There are very strong linkages between flood and drought vulnerabilities in Dai Hong commune and how upstream hydropower reservoirs are operated, as well as how early warning and flood risk reduction are facilitated by hydropower companies. The operation of hydropower reservoirs in the Vu Gia – Thu Bon river basin is regulated by an inter-reservoir operation protocol (Prime Minister's Decision no. 1537-QD-TTg in 2015). However, this protocol has not been effective enough in providing flood and drought protection for downstream communities. Clearly, the problem has a cross-scale nature, which means that local actions alone can not fix the problem. Dai Hong is in the same province as the hydropower reservoirs, so in theory, provincial-level action might be sufficient to address their needs. Impacts to areas further downstream in Da Nang City, however, will require river-basin level policies and interventions to address.

Finding solutions

The cross-scale nature of problems in areas like Dai Hong is the reason why a River Basin Coordination Board covering the entire Vu Gia – Thu Bon river basin is needed. This River Basin Organization (RBO) involves the leadership and stakeholders in

Delivering early warning equipment and supplies to Dai Hong commune © Tho Nguyen, ISET-International. June 2018

both Quang Nam Province and Da Nang City[2], allowing a more integrated approach that traces problems to their roots.

In 2017 with the support of ISET and the Global Resilience Partnership (GRP) Water Window project, an RBO was established for the Vu Gia – Thu Bon river basin in Da Nang and Quang Nam provinces. The RBO is headed by Vice Chairs of the two Provincial People's Committees, and with members from all relevant line departments, leaders of lower level governments, hydropower operators, and non-government organizations in the two provinces.

To facilitate cross-department, cross-provincial dialogue, ISET introduced the Shared Learning Dialogue (SLD) process as the structure for members of the RBO to investigate issues, deliberate, and make decisions. An SLD event allows RBO members and other relevant stakeholders to engage, share data and perspectives, and clear up any pre-existing misinformation, prejudice or misunderstanding. A series of SLD events are required for new information to be gathered and new aspects of the issues to be explored, before equitable and feasible measures can be devised and agreed upon.

However, even with cross-provincial, cross-departmental collaboration, the RBO could easily be ineffective or even counterproductive without a key element — the participation of local community members like people from Dai Hong who personally experience the impacts of ineffective management of the river basin. Two RBOs have been organized previously in Vietnam[3], but no community participation was included. Even for the Quang Nam – Da Nang RBO, there is no formal requirement or mechanism for communities to participate in the inter-provincial platform.

This project facilitated local community representation in the platform in a number of ways:

- Community-based vulnerability assessment was organized in five pilot communes — Dai Hong, Dien Trung and Cam Kim communes of Quang Nam, and Hoa Khuong and Hoa Tien communes of Da Nang — followed by a community-based action planning process in each of the communes.
- Participation of community members in provincial SLDs was supported through coaching and assistance by CARE experts, allowing community members to voice their concerns through presentations and follow-up discussions with all other stakeholders.
- Site visits and meeting to affected areas were organized to offer other stakeholders an opportunity to see the impacts with their own eyes.
- A small amount of financial support was provided to Dai Hong and Hoa Khuong communes to buy equipment and supplies to strengthen their early flood warning and flood response systems.

2 Da Nang is a provincial level city, one of five such jurisdictional entities in Vietnam. The city and provincial boundaries are identical. Da Nang is typically referred to as a city, but for the purposes of the river basin organization, it is engaged in the RBO as a province on equal political footing with Quang Nam province.

3 For Red River and Mekong River

Ms. Tran Thi Kim Hoa from Dai Hong commune attended the third SLD event in Da Nang City in September 2017 and presented to the workshop about the impacts of exacerbated floods and droughts in her commune © Thia Nguyen, CARE. September 2017

Outcome

The inclusion of community in an RBO piloted by this project has led to changes that have never been seen before in Vietnam. Community members shared vivid stories of what they are experiencing personally, with nuances and aspects that otherwise would never be recognized at the provincial level discussion. These stories are much more convincing and easier to understand than scientists' numbers and figures. For example, as shared by Ms. Hoa from Dai Hong commune at SLD3, the problems at her community are not all about devastating flood — there are also severe issues with droughts and water shortages. After flood events, a thick layer of sandy sediments is left on the field, rendering the top soil impoverished and unable to hold water, so in the dry season more water and fertilizer is needed for crops to grow. Yet most of the limited dry season rainfall is held upstream in the reservoirs. Therefore, despite spending more on fertilizer and irrigation, productivity still decreases and people's lives are so much harder nowadays.

These stories brought a fresh new perspective to the provincial platform about chronic impacts on communities because of reservoir operation, something that was unknown or unacknowledged previously. As a result, line departments and other stakeholders are becoming more open in their opinions and more willing to reconsider their conventional practices. At the final project workshop in June 2018, a much higher determination was felt among stakeholders— the provincial leadership, technical experts, hydropower operators, departments and agencies—to speed up the deliberation process and address existing gaps in the inter-reservoir operation protocol in the river basin.

At the community level, changes also started to happen, in small yet significant ways. Representatives from A Vuong hydropower company acknowledged the inappropriate location of the siren system in Dai Hong commune, and have since taken action to relocate the sirens to a site closer to the high-risk areas in Dong Phuoc village. An additional siren system will also be installed in Duc Tinh village, another flood vulnerable area of the commune. The project also decided to allocate some of its funds to support Dai Hong and Hoa Khuong communes with some equipment and supplies for disaster reduction, such as generators, hand loudspeakers, flash lights and life-vests.

Notably, responding to the concerns of local communities regarding the contents of early flood warning messages, the provincial Center of Hydrometeorology is now collaborating with the hydropower reservoirs to rework the message structure and information in SMS messages so that the messages are useful to local people, such as by stating the expected flood depth, flood arrival time, and duration at the local areas, so people know how and how quickly they should react. This is a complicated task because it requires the flood / topographical map to be updated and integrated with rainfall projection, hydropower reservoir release volume, flow velocity and duration of flooding, and all calculations to be done very promptly for community warnings. Completing this task therefore will be a great achievement of the inter-provincial collaboration for improving community resilience to flooding in the future. This work will help to build momentum towards more substantial change in the operation of the early warning system, with key regional and local stakeholders stepping up and taking actions for resilience.

SUMMARY OF RESILIENCE MEASURES BY TYPE

INFRASTRUCTURE /ECOSYSTEM	CAPACITY	INSTITUTION
• Improving visibility and awareness of linkage between hydropower operations and ecosystem health, particularly riverbank erosion and dry season low flow impacts.	• Empowering and building capacities for local community to participate in the policy deliberation process at the provincial level • Strengthening disaster risk reduction capacity of local communities by developing a climate resilience action plan, which identify key challenges, needed preparatory actions and responses, based on community inputs and learnings from previously experienced shocks and stresses. • Strengthening disaster risk reduction capacity of local communities by acquiring new equipment and supplies for early flood warning and disaster response.	• Providing a structure for inclusive decision-making to address cross-boundary river basin management issues of Quang Nam and Da Nang. • Facilitating and promoting a mechanism for community participation in the provincial level decision-making process. • Promoting the generation of new knowledge and sharing of information and perspectives among all river basin stakeholders.

Lessons for policy and practice

The most tangible action taken under this project—the support to community flood warning and disaster reduction, as well as the majority of activities outlined in the community action plans—are still mostly local interventions. Other interventions that address underlying causes of local vulnerabilities, such as regarding the operation of hydropower reservoirs and the early warning messages—are critically needed, but will take a much longer timeframe to bring about.

However, this project has generated numerous valuable lessons:

- Community participation in the RBO decision-making process is beneficial in many ways. Not only did it lead to the identification of previously unrecognized problems such as community impacts and needs, and benefit communities by having these problems addressed, but it also modeled an approach for providing timely input into decisions and actions of regional actors. Such input could save them unnecessary corrective costs, such as in the case of A Vuong hydropower company having to relocate the flood warning sirens to improve the effectiveness of their disaster reduction effort. The provinces would also benefit from reduced community losses and improved economic outputs.
- How to make community participation a compulsory element of the RBO decision-making process, and how to deepen this participation so it can be even more useful, remains a challenge. This is a key question for the national level in establishing RBOs for all river basins in Vietnam. Community members' interaction with and presentations to the Vu Gia – Thu Bon RBO have led to a new level of interest in and engagement around community flood and drought vulnerability issues by RBO stakeholders. However, the information shared at provincial platforms still tend to be highly technical and difficult for a lay person to fully understand. River basin level platforms need to be organized in a way that not only enables community members' participation, but also fully acknowledge their key role in decision-making by facilitating their inputs into the agenda and understanding of issues discussed, and respecting the value of their knowledge.
- There is major gap in policy concerning the benefits and costs of hydropower development. While there are substantial economic and social benefits in producing hydro-electricity for the Vietnam's economy, living standard and social

Community Consultation Meeting © Thanh Ngo, ISET-International. May 2018

development as a whole, the costs being borne by local communities downstream of hydropower plants—such as those described earlier in this case study—are not being evaluated or recognized to their full extent. What is needed is a mechanism for evaluation and compensation to these communities for the impacts they experience, and more optimally, a benefit sharing mechanism between hydropower plants and all affected communities, similar to the Payment for Ecosystem Services (PES) system being applied for forest management in various regions of Vietnam. The RBO structure has a great potential and a major role to play in promoting this novel policy process.

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