



# LIFE UNDER THE HYDROPOWER

**Burdens from Cam Thuy I Hydropower**



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## Introduction

With over 100 river basins and nearly 3,500 rivers and streams that are longer than 10km, Vietnam is a country with abundant hydropower potential. The total hydropower capacity is about 35,500 MW, with about 300 billion kWh/year electricity generated.

By 2018, the country had 818 Hydropower Plant Projects (HPPs) with 23,182MW of installed capacity. Of these HPPs, 385 are operational, 143 are under construction, and 290 are in the research and investment stage. The whirlwind of hydro-power development has led to numerous small and medium-sized HPPs on Vietnam's main and tributary streams since 2015. These have sprung up with an average of 5 to 6 small and medium-sized hydropower plants per river.

These developments, however, come with their accompanying share of problems. The construction of such a substantial number of small and medium-sized HPPs has negatively impacted the environment, economy, and society. These impacts are no less severe than those caused by the larger plants. The HPPs fundamentally change the ecosystems of most river basins. Also, the dense construction of hydropower projects has disrupted rivers' ecological landscapes with riparian areas and affected the community's living environment and livelihoods.

In the context of climate change, the rise of extreme climate events and natural disasters have affected the rain cycle and evaporation, changed runoff, and increased erosion and sedimentation rates, amongst other problems. These changes directly influence energy safety, construction site safety, floods and droughts. Moreover, the massive development of HPPs has intensified doubts about their efficiency and the associated risks of environmental hazards.

In general, all HPPs require significant capital investment regardless of capacity. According to the Ministry of Industry and Trade of Vietnam and Vietnam Electricity (EVN) statistics, the small and medium-sized HPPs often depend on bank credit for 75% to 85% of the total investment value.

It has been eight years since the State issued the National Growth Strategy under Decision No.1393/QD-TTg. However, the current regulations on the application and implementation of the Environment and Social Safeguards Policy (ESSPs) of banks have not proven to be highly effective. The inefficiencies of these ESSPs can be attributed to many reasons, such as insufficient and incomplete application regulations, poor implementation, and insufficient investment.

The underestimation of ESSP in the management and implementation of HPPs can potentially pose credit risks for banks if these projects do not meet the requirements of ensuring environmental and social security, leading to suspension or delay of operations and thus delaying repayments.

With this photo book, the Centre for Water Resources Conservation and Development (WARECOD) attempts to bring the most realistic perspectives on the influence of the Cam Thuy I Hydropower Plant on the lives of the locals at Thanh Long village, Cam Thanh commune, Cam Thuy district, Thanh Hoa province through their own voices.



*Photo: Downstream of Ma River*

# Hydropower Development in Thanh Hoa Province

Thanh Hoa is one of the provinces with significant hydropower potential. Here, most HPPs were built on both the mainstream of the Ma River and its many tributaries, including the Luong river (102 km), Lo river (74.5 km), Hon Nua (25 km), Chu river (325 km), Sim stream (40 km) and the Xia stream (22.5 km). With its high-slope flow terrain, large valley and flow area, the Ma River system has tremendous potential for generating hydropower. According to research documents, the entire Ma river system can have an exploitation capacity of up to 900 MW. Besides, there are several small rivers and streams there that can be developed for hydroelectricity, such as Hoi stream (Tri Nang commune, Lang Chanh), Am river (Lang Chanh), and Khao river (Thuong Xuan). Proper planning and exploitation of these regions' hydroelectricity generation potential will add a significant amount of energy to the national grid while also contributing to economic and infrastructure development.

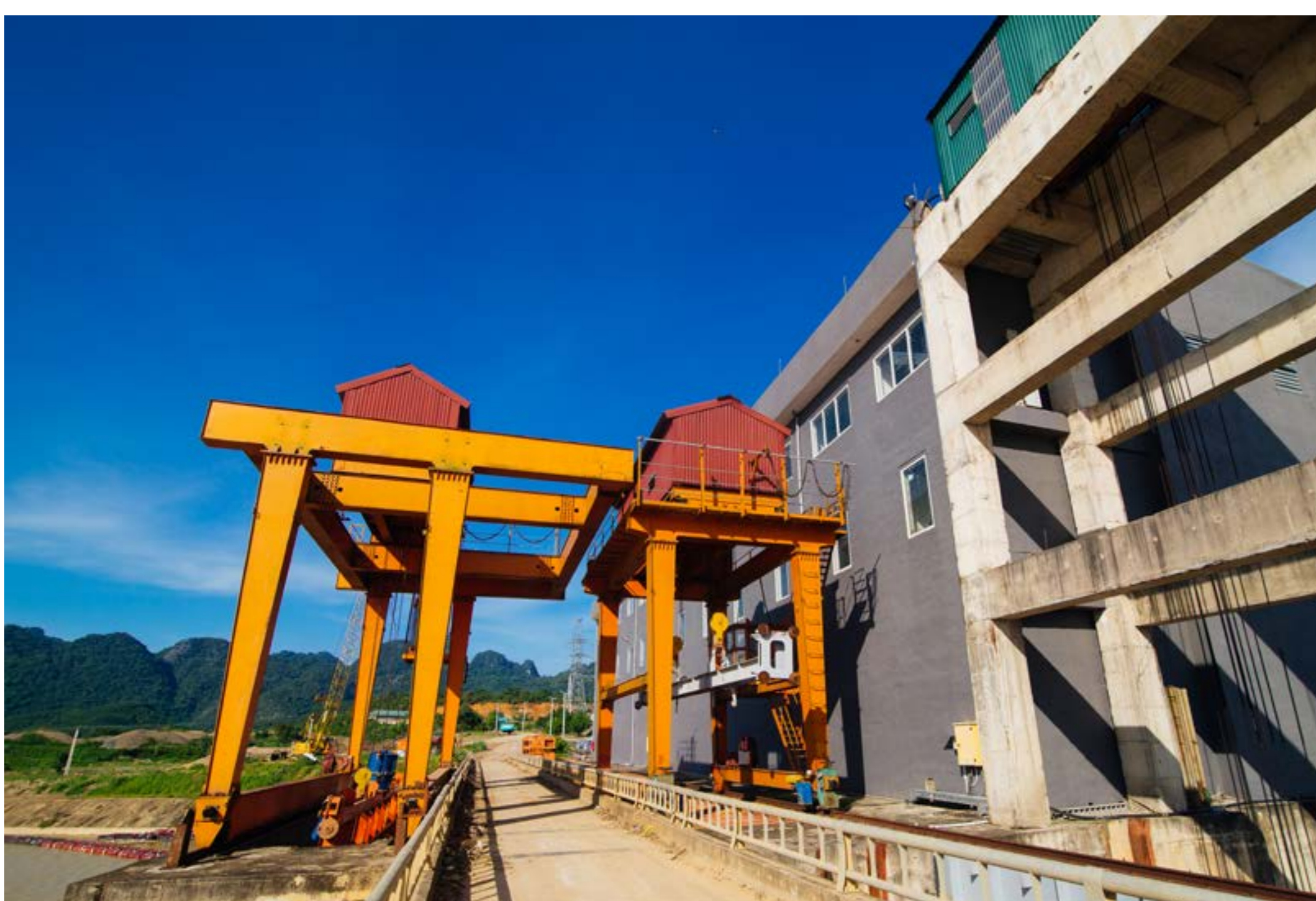


Photo: Cam Thuy Hydropower Plant

The Ministry of Industry and Trade has approved the planning of 22 HPPs in this province including: 7 HPPs (592,8 MW) in Ma river; 4 HPPs (133 MW) in Chu river; 5 HPPs (57 MW) in Luong River; 3 HPPs (24.5 MW) in Lo river; one HPPs in each Khao, Am, and Hoi rivers (total 24.9 MW). Among 22 HHP projects, the 9 projects belong to Ma River system are Trung Son, Thanh Son, Hoi Xuan, Ba Thuoc1, Ba Thuoc 2, Cam Thuy 1, Cam Thuy 2, Cua Dat and Xuan Minh. The other 13 projects under the National Small-Hydropower Plan.

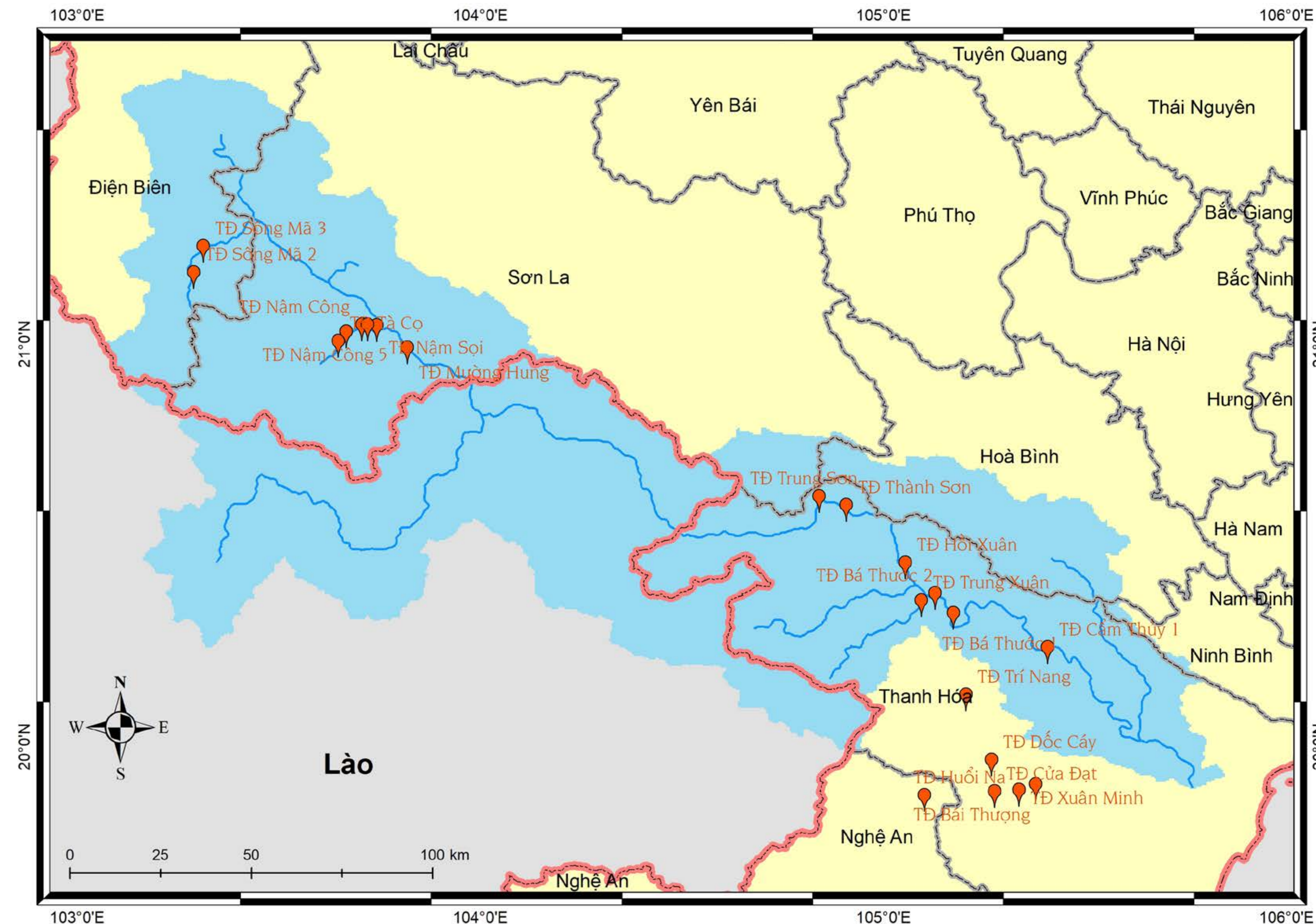


Photo: Satellite photo of Cam Thuy 1 Hydropower Plant area

## The Ma River Basin

The Ma River runs the length of 512 km, of which 410 km runs through Vietnam, and 120 km in Lao's territory, thus connecting both countries. Its catchment area is 28,400 km<sup>2</sup> wide, with 17,600 km<sup>2</sup> belonging to Vietnam. The average height is 762 m, the average slope is 17.6%, and the density of rivers and streams in the whole drainage basin is 0.66 km/km<sup>2</sup>. The mean annual flow is 121 m<sup>3</sup>/s in La commune and 341 m<sup>3</sup>/s in Cam Thuy. The river mainly flows between mountainous and midland areas, and its alluvium is the primary source of the Thanh Hoa Delta, the third-largest delta in Vietnam<sup>(a)</sup>.



Photo: Satellite photo of Cam Thuy I Hydropower Plant area

## Cam Thuy I Hydropower Plant

The Cam Thuy I Hydropower Plant is the last HPP of the Ma river hydroelectric system with the right bank area in Vac Street, Cam Thanh commune, and the left bank in Kim Man village, Cam Luong commune. It lies 10km away from the Cam Thuy district. Cam Thuy I Hydropower has two units, with a total capacity of 28.6 MW. It was built with a total investment of 1,322 billion VND, of which VietinBank lent 742 billion VND in 2014 and raised the amount to 902 billion VND in 2017<sup>(a)</sup>. The annual electricity output is 138 million kWh, and the total land area for project implementation is 481 ha.

According to the evaluation done by the Ministry of Industry and Trade at the workshop, "Small and Medium Hydropower Planning, Renewable Energy Development: Safety-Efficiency-Sustainability", for every MW of power generated by small and medium HPPs, they occupy an average of about 7.41 ha of land, of which about 3 ha is forest land. The Cam Thuy I hydropower plant has an inundated land acquisition rate of up to 16.71ha/01 MW which is 2.26 times higher than the average.



Photo: Intake gate of Unit 1, Cam Thuy I Hydropower Plant



Photo: Inside the Cam Thuy Hydropower Plant 1



## The Mission Of Cam Thuy I Hydropower Plant

The primary investor in Cam Thuy I Hydropower Plant is Infrastructure Investment and Transportation Construction Joint Stock Company (Intracom). Construction of the plant began in October 2013, and it was expected to be completed by December 2016. However, due to unforeseen circumstances, only Unit 1 of the plant was connected to the national grid by December 2018. This HPP exploits a riverbed type, low water column and a Kaplan turbine, with the energy line on the left bank. The plant's mission is to supply the national electricity system with about 120 million kWh of electricity annually. It also has several other combined tasks, such as serving as a reservoir for increasing water sources for agriculture<sup>(a)</sup>.



Photo: Abutment zone

## Worries Named Hydropower

Even with the considerable investment from Vietinbank and the active generation of electricity since 2018, the Cam Thuy I Hydropower has not yet been profitable<sup>(a)</sup>. It continues to lose around 15 billion VND Each year. The project has faced numerous difficulties in planning and technical design despite receiving approval from the functioning authorities. Force majeure and technical errors have forced the project to change the construction site after the initial plans were approved. Initially, the project's planned location was near the suspension bridge between Kim Man village (Cam Luong commune) and Thanh Long village (Cam Thanh commune). However, the current location is around 3km away, between Luong Thuan village (Cam Luong commune) and Cho village (Cam Binh commune). This change has brought about inaccuracies in the calculation of compensation for the affected area, affecting the community and local authorities.

Kim Man village in Cam Luong commune has 250 households. One hundred twenty-one of these have residential and field land lying lower than the hydropower lake's water level. The construction of the dyke on the left bank is still incomplete. While the Hydropower Management Board has designed a drainage plan for the area between the ring dike and the Truong Sinh mountainside, it has not yet been implemented due to unfeasibility, leaving the people waiting. On the Ma River's right bank, the Cam Thanh commune has seven households outside the ring dike and twenty one inside it. Their productive lands have been adversely affected by the hydropower plant. Three homes have not yet received compensation for their lost houses, and many families who have lost fertile land have not received the approved payment. The process of estimating the area of damage has also led to much frustration amongst the residents.

Because the two communes of Cam Thanh and Cam Luong lie in the reservoir area, there are 86 dug wells (65 in Cam Luong and 21 in Cam Thanh) that are heavily polluted and unusable. A surface water quality survey on the Ma river (rainy season, 2017 and dry season, 2018) was conducted in the area of Cam Thuy I hydropower reservoir found that many domestic wells were heavily polluted, and can only be used for irrigation and other similar purposes and not for domestic use without processing to ensure environmental standards according to QCVN 01-1: 2018/BYT of the Ministry of Health. Even irrigation is not possible for some well water samples due to their extremely low quality<sup>(b)</sup>.

After nearly three years into operation since 2018, the Cam Thuy I Hydropower Plant has not yet completed several required works like the construction of ditches, drainage culverts and dikes on the left bank of Ma River in the upstream area of the plant. Damming water to generate electricity has dramatically affected people living near the river because the rising lake water is not amenable to drainage. When it floods, the residential areas' wastewater flows into the sewers and then back into people's houses without draining away. The continual increase in flooding in recent years has caused much damage to the economy and the local people's spirits. Life is no longer peaceful in Cam Luong and Cam Thanh communes, the areas suffering the most damage from the hydropower plant. Even though the local people have repeatedly complained against irregularities in compensation for site clearance and resettlement, these issues remain unresolved even three years later. In addition to its direct impacts, hydropower has also caused much discord in the community residing in the affected areas. Local authorities caught in the tussle between the residents and hydropower are yet to find practical solutions.



Photo: Entrance of Cam Thuy I Hydropower Plant

The Cam Thuy I Hydropower plant has raised many concerns for both residents and authorities. They face dwindling incomes due to unemployment, flooding, crop failures and reduced crop yields. The state compensation price for crops is lower than the market price, causing significant economic losses. Not only were the people left out of consultations in advance, but they also felt disrespected when the Hydropower management board failed to fulfil its promises. Land disputes between locals due to inaccurate Land Use Rights Certificates have also significantly impacted land clearance inventory work and slowed construction progress. The HPP investors have failed to include all the affected land for the compensation and support plan as per regulations.



Photo: Provincial Road 217 runs through Thanh Long village

## Thanh Long Village

Thanh Long village is one of eight villages of Cam Thanh commune, lying close to the Ma River banks, adjacent to Cam Thuy I Hydropower Plant. It is the locality most severely affected by the hydropower plant. This village has a total natural land area of 134.7 ha. At the end of 2018, it was home to 317 households, with 1132 people belonging to the four ethnic groups of Kinh, Muong, Thai, and Dao living together.

Before the Cam Thuy I HPP arrived, residents of the village focused on investing in the farm economy. Every year, people were trained in the application of modern science and technology in cultivation and husbandry. They also invested their capital into these tasks and the trade and service sectors. They adopted current crop and animal upkeep patterns to yield higher incomes. The average income per capita in 2017 reached 30 million VND/ person/ year.



Photo: Section of Ma river in Thanh Long village. Embankments and no embankments

## Life By The River

By the river Ma, life has been changing every day. Before the construction of the Cam Thuy I Hydropower plant, the lakebed water levels remained steady, riverbanks did not have concrete embankments to prevent floods, and the local economy remained largely agrarian. Once the hydropower plant began damming water to generate electricity, the rise of the lakebed water took away most of the Thanh Long village residents' agricultural land. Areas that were once fertile fields now lie underwater or are isolated by river water. Many riverside houses are now close to the river's edge, with no dikes built to control water. The lakebed is far more extensive than it was before. Standing in the middle of the Cam Luong bridge offers a glimpse into the locality's rapid changes in front of the extensive lakebed. Some lonely houses are still visible near the fast-flowing water. The Ma River remains the same, but it is not as safe as it used to be.



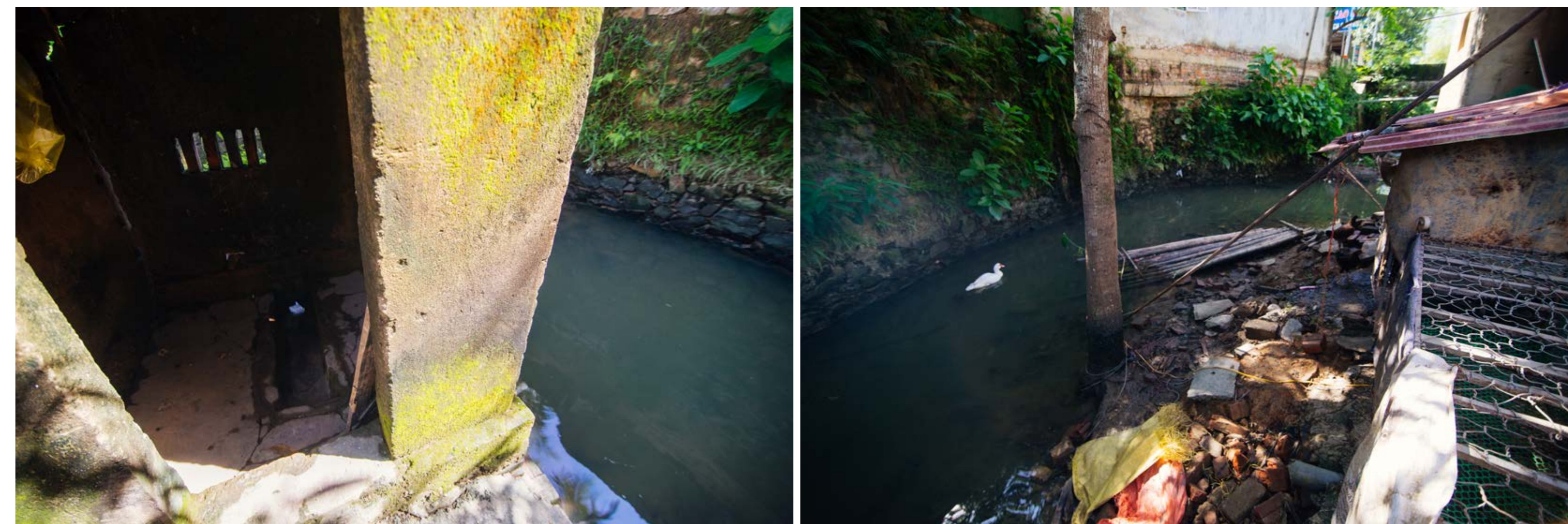


Photo: Mr Hoang Think's house on the bank of a drainage canal, the toilet is drained into the canal

## The House Is Flooded With Sewer Water Whenever It Rains

The Ma River plays an essential role in the local people's daily lives while also receiving wastewater from residential areas, including Thanh Long village, located close to the Cam Thuy I Hydropower plant. Domestic wastewater still flowed from the drainage canal into the river for many years even with its low topography. While the Cam Thuy Hydropower plant changed its design to account for a greater rise in the lakebed area than anticipated, there has been no accurate estimation of the damage people would suffer from these changes.

Mr Hoang Think and Mr Manh Hung currently live in the Lang Vac cluster in Thanh Long village. Both their houses are located next to the drainage canal. The rise of water levels in hydropower reservoirs has compromised drainage in the Lan Vac cluster in recent years. As the river water level rises, so does the drainage canal's wastewater, slowing down the drainage speed. The foul odour of the drainage canal wafts into houses, adding to the residents' woes.

Mr Hoang Think's wife, Mrs Quach Thi Thuy, a 35-year-old farmer, said:

*"I have been here as a daughter-in-law for more than a decade, mainly living on livestock. My family only has a little extra income from repairing bicycles, motorbikes, and washing cars. Before the hydropower plant, our life was pretty fine and stable. However, since the hydropower plant began operation, the river water rises every time it rains, and the drainage canal in the hamlet overflows into the house. The sewage from the village and the wastewater from livestock rise to the edge of the kitchen door. It gets flooded every time it rains, and the suffering is unbearable. In 2018, the flood came too fast, just in two days, leaving us in shock. The family could not leave in time, and we lost all our pigs and chickens. Other belongings like paddy rice and household appliances were nearly completely damaged. We had to start borrowing money in 2019 to enlarge the attic for storing our valuable assets. For daily life, we use the lower area."*



Photo: Ms Quach Thi Thuy in front of a new attic built to prevent floods



Photo: Ms Thuy's living area and an old well next to the drainage canal



Photo: Husbandry and sanitary areas

## Frail Life Beside A Drainage Ditch

Poor economic conditions compel Mr Think's family to live in a house that gets flooded whenever it rains. The house has not been repaired since it was built, and it is now so dilapidated that you can see the sky from inside. The entire husbandry area and toilet are close to the drainage canal, with the toilet waste discharging directly into the river. A foul smell, therefore, emanates every time it rains. The family relies on a 7-8 meter deep well for water for domestic use. With the hydropower plant's advent, the water source has become turbid and is occasionally smelly. An already difficult life has become even more so.

## Precarious future

Households living near the drainage canal can only expect the drainage ditch to be repaired by the Hydropower Plant authorities. However, they have not seen any such measures for nearly three years and do not know when it might happen.

*"I can't do anything about it, but I don't want my children to live like this. The future seems uncertain. I am distraught but do not know what to do. We just hope the local agencies urge the hydroelectricity team to solve locals' problems so that we have a better life. It is precarious to live like we do now."*



Photo: Mrs Hoang Thi Phong and Mr Mai Xuan Duc in the newly built house

## **A** Mother's Sorrow

Ms Hoang Thi Phong, 78 years old, has been involved in farming and animal husbandry her entire life. She is old now, and her health is not as good as it was before. She lives with her son, Mai Xuan Duc. For decades, Mrs Phong has had a close association with Thanh Long village, where she was born and raised. Not only is this place her homeland, but it also contains her most precious memories. For many years now, she has lived in a 4-level house next to Mr Duc's flat roof house. Because of its location only 20 meters away from the Ma River, the rising lake waters have made her home unsafe to live in anymore. She was thus forced to move out with Mr Duc into another house that is still under construction. She could not hide her sadness when mentioning her old home.



Mr Mai Xuan Duc standing in front of his mother's 4-level house, his house and factory, which are now flooded with water

## **T**he House Needs To Be Relocated

Mr Mai Xuan Duc, 49 years old, works as a freelancer. Before losing land to hydropower, the family had about 2,500m<sup>2</sup> of land and 1500m<sup>2</sup> of field land. 2,500m<sup>2</sup> of land was then used to grow sugarcane, generating an income of about VND 50 million / year (an average of VND 10 million / 360m<sup>2</sup> / year). Each crop's field land yields about nine quintals of paddy, equivalent to 18 quintals a year. The annual income from farming was more than 10 million. Since hydroelectricity arrived, he has lost all his upland and field land. His and his mother's houses, along with the welding factory, were also lost to flooding. The family bought a piece of land about 300 meters away from the old home to build a new one, with room for a store. Since his family has not received compensation yet, he turns to freelance and works in a roadside aluminium welding service. Since 2014, when the Cam Thuy I construction began, the government promised to compensate the land with land. Now, however, they have announced that the land fund is over.

Mr Mai Xuan Duc only wants his share of compensation to complete the new house. *"It has been a few years we do not know when we will receive the compensation money!" - Mr Duc shared*



*Photo: The overgrown grass road into abandoned homes*

## **S**mall Alleys With Overgrown Grass

Many houses in Thanh Long village lie close to the riverbank. These get flooded whenever the floods return, forcing the residents to relocate to new places. Affected households are on their own when they need to find a new place to move to due to the lack of a vacant land fund. The village's small roads look deserted, just like the abandoned houses that they lead up to. They are now covered in weeds, ferns and Mexican petunia. The edges of the stone walls lay covered with green moss.



*Photo: Mai Xuan Duc's workshop is now submerged in water. He has not received compensation yet*

## They Don't Want to Go Home

Ms Mai Thi Hien is a 45 years old farmer. She shared that her children do not want to go back to their hometown for work. She wants to be close to the children, but it seems impossible. She and her husband cannot leave and go to their children because her relatives, elders, and myriad responsibilities all reside in her hometown. Hydropower has gradually etched its associated sorrows onto the local people's social and spiritual lives. The young people have lost their attachment to their hometown because it has changed so dramatically.

*"I have two sons. One of them works in Hue province, and the other in Hanoi city. Due to the prolonged floodings the past few years, they didn't want to come home. They did not even visit us in 2018 when the flooding was terrible. When I call them and ask them to come back, they always refuse to settle here. We are purely agricultural, and in the past, the family had agricultural land for 0.5 hectare of acacia and crops growth. The income from acacia trees is about 9.5 - 10 million/ ton of wood. Now there is no more land for farming, so my husband has to work as a seasonal guardian in my son's city. The job is not stable, and his income is unsteady. As for me, I work as a seasonal labourer. Now I have no cultivable land and cannot raise pigs because the pigsty in the yard gets flooded easily. So, I do odd jobs if someone hires me. After the flood, we received 150 million VND as compensation which was just enough for repairing the house and building an attic as a backup place in case of floods." Ms Hien said.*



Photo: Ms Hien is discussing with the working delegation



Photo: Miss Mai Thi Hien's attic for flood prevention

## Attics For Escaping Floods

Due to the loss of agricultural land and flood damage after the 2018 floods, Ms Hien received 150 million VND as compensation. This amount, however, is barely enough to build a small attic, let alone find another livelihood. This attic is filled with all the family's belongings and valuables. Her family did not want to bring down any of the things stored in the attic because they were afraid. "If we bring them down and there is a sudden flood, we will lose everything. The flood is quick as a flash". The attic is about 3m tall because she wants it to be 20 cm more elevated than the streak from previous floods on the wall. She needs to use an iron ladder to climb up.

*"I always worry about floods, so blankets, clothes and dishes are all put in the attic. I dare not bring them down. We are always afraid."*



Photo: Shelf for the altar when the flood arrives

## Shelter for ancestors

Like many other Vietnamese, Ms Hien's family too has an altar to worship the ancestors. Ancestor worship plays a vital role in the cultural and spiritual life of most Vietnamese. In the house, which has gradually deteriorated over time, the altar is the most valuable asset. In 2018, the flood was so bad that the family could not move the incense bowls and the altar objects in time but had to put them in a foam bin to protect them from the floodwaters. This year, while building the attic, they also made an overhead stand and a wooden board for the altar if it floods.

*"Last year, when the flood came, I had to put the incense bowls into the pots and put them in a foam bin. See, this year, I made a room for the altar, if the flood comes, we just need to add a board to move it. People don't only live for themselves. They also live for the gratification of their ancestors."*



Photo: Ms Hien sitting in front of the family's altar



*Photo: Abandoned pigsty near the riverbank*

## **I** just wish I had compensation to rebuild the pigpen

While many households have received compensation for losing their land to Cam Thuy I Hydropower, the settlement has not accounted entirely for the loss of garden and residential land, leading to frustration and conflict. Previously, the primary source of livelihood for the people was livestock, and the backyards near the gardens towards the banks of the Ma River had many pig and chicken stables. Now, the waters rise and flood the garden land, but very few households receive compensation for their losses.

Agricultural has been the mainstay of most people in Thanh Long village, and without land and livestock, they do not know how to make a living any other way. Many livestock farms here now lie abandoned due to the fear of sudden devastating floods. Many villagers shared, *"I just wish to be compensated to rebuild the pigsty elsewhere. Now I do not know how to make a living."*



*Photo: The backyard of a household. The water was so dirty that they had to buy a water purifier*



Photo: Ms Ha Thi Quan

## Retired Female Cadres

**R**Ms Ha Thi Quan, 71 years old, currently lives in Cluster 2 of Thanh Long village, where she was born and raised. She is the Thanh Long People Committee's former secretary and now lives alone after retirement. Having been retired for many years and with unstable health, she is dependent on a pension of around 3 million VND/ month. Ms Quan was one of the most severely affected victims of the floods of 2018. Her house still bears the scars of those floods in the form of yellow flood streaks on the green wall. Successive floods have been continually damaging her home into progressive dilapidation.



Photo: The roof of Ms Quan's house still has mould and stains from the floods

## How Is It Considered Affected?

**H**Due to her weak economic conditions, Mrs Quan's house, built many years ago, lacks the repairs it needs. The house's foundation now lies lower than the surrounding areas. In 2019, the main building was flooded nearly 3m deep in water, and her garden was entirely submerged. However, she was not eligible for compensation since her house is more than 30m away from the Ma River dyke. Even though Ms Quan and Ms Ha, her neighbour, lived in the flooded area, they did not receive total compensation because the inspection team concluded that "The house is not affected". Even though it was in the same situation as their house, the communal house's football ground was compensated for flood damages, but Ms Quan and Ms Ha were not. Ms Quan's family used water from 11-12m deep wells, which provided abundant water before the hydroelectric dam was constructed.

*"We just need to use the pump once for two to three days' worth of water. The water is always full now when you lift the lid to see. You can even reach for the water with your hand."*

*"My house was flooded, but the inspection team kept saying that it was not affected. I do not know how it can be considered to be affected."*





## **F**loods became more frequent since the day the hydroelectric plant was built

*“Even though the land we lived in was lower than the other areas, our lives were more stable and peaceful before the hydropower plant was built. Floods occurred in the past too, but they were infrequent and only occurred once in a decade. Such floods brought some relief to our people because we knew that we would not have to worry about another one for the next ten years. As I remember, there was a flood in 1996, and the subsequent flood occurred in 2007, followed by another in 2017. Since 2018, the flood has been worse and more frequent, occurring up to three times a year. Since my house was built in 1998, I have never had enough money to rebuild it, and now it lies lower than the surrounding areas. Because it lies so low, the house was flooded like a pond for three or four days in the flood last year, and we needed to use a pump to drain the water. The flood this year has not arrived yet, and I am anxious about what will happen when the storm comes in.*”

*I lived alone for many years and have prayed every day that floods or storms stay away so that I would be less worried. The floodwater last year rose so high that it left a water stain pattern on the roof. The rising water was even higher than the altar and swept it out. Hydroelectricity has turned our lives upside down. The rainy season brings us insecurity. My life is full of worries now.”*



*Photo: Ms. Ha Thi Quan standing in front of the old house*

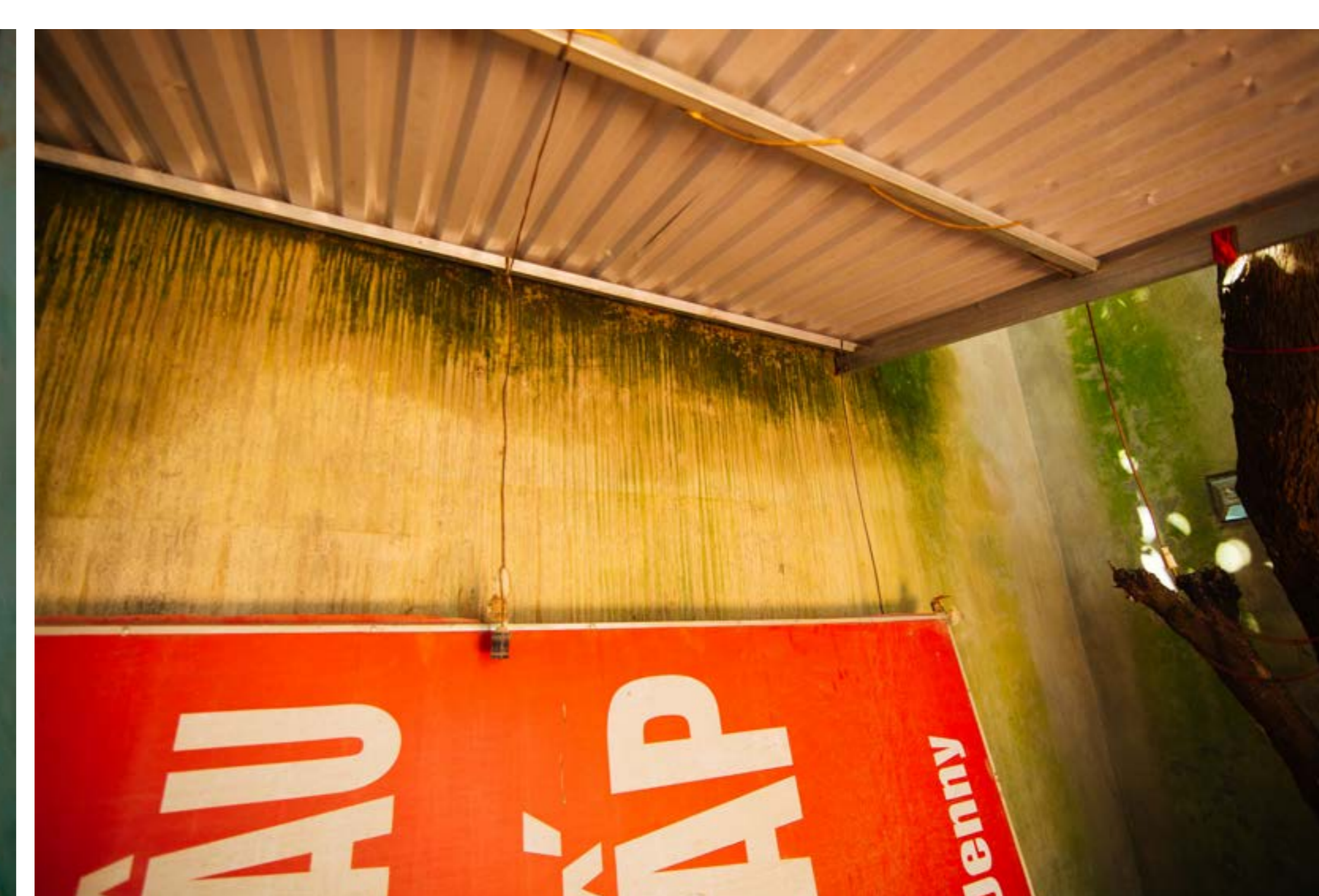


Photo: The walls with flood water stains

## Walls That Tell Stories

Many Thanh Long village houses have patch marks, wall stains, cracks and flaking, paint blisters, mould marks, moss, and water streaks. These make it very easy to recognise the traces of floods after they have receded. Before 2017, floods were infrequent in the locality, and the flood stage was low. However, since then, floods have occurred more regularly, with the flood stage rising progressively, reaching nearly as high as some houses' roofs. The water does not drain away even a week after the floods, and people need pumps to remove it. Thanh Long village people are now gradually equipping their houses with attics to keep their goods safe from floods.



Photo: Kitchen of a household with flooded water nearly reaching the roof



Image: Water level measuring markers at Cam Thuy I hydropower plant

## Flood Season On Ma River

The upstream of the Ma River sees a vastly disproportionate annual rainfall. Some areas receive up to 1,600-1,800mm of precipitation, while some parts of the mountainside receive below 1,300mm. 80-90% of the total rainfall occurs in the rainy season between May and October. Floods occur between June and October, with a total flow of about  $1.1 \times 10^9$  m<sup>3</sup>. The most significant rainfall occurs in July and August, but the most extensive flows and floods usually occur in August and September. The Ma River basin from upstream to downstream has varying terrains, including rocky mountains and barren hills. Even the forest area, which was limited, is now being destroyed. Therefore, heavy rains and floods both within the province and the adjacent regions contribute to the Ma River flood. Floods on the Ma River often have high intensity, usually 15- 20cm/hour, reaching up to 80-100cm/hour. This is due to the precipitation patterns, space and time fluctuations in the rain between areas and the river's ability to concentrate large flows. The flood transmission time is short, around 5-10 hours, with a flood transmission speed of 1.5-2m/s. In recent years, floods on the Ma River have been more erratic and frequent. The increase in the frequency and intensity of floods on the Ma River has been identified to have a prominent role of human factors and the increased impacts of climate change<sup>(a)</sup>.



Photo: Floating trash from the Cam Thuy I Hydropower plant



Photo: Phao chan rac



Photo: The abandoned house of Mr Thuy and Ms Hien

## **A**bandoned House

Mr Bui Duy Thuy and his wife Cao Thi Hien were both born in 1990. They got married in 2008 and now have a 5-year-old son. The family's sole source of livelihood was agriculture until 2014, when their land was acquired for the Cam Thuy I Hydropower Project. Having lost their sustenance, they followed their friends to Binh Duong to work in the industrial park in 2015. They have not visited home more than once in five years due to the long distance and high travel costs. Mr Thuy's brother looks after their deserted houses and gardens.

As the job at the industrial park is full-time, they cannot start a business. They aim to earn and save enough money to one day return to their hometown to start another career.



Photo: Mr Bien and Mrs Phuc



## **I** Do Not Know When They Will Return

Mr Bui Anh Bien could not help but grieve when talking about his brother Mr Thuy's family.

*"They lost all their fields. They had to leave for the South to work and make a living there. We have only met once in the last five years even though our houses are adjacent to each other. The houses and gardens left there are getting more dilapidated with each passing day. He had planned to live in the South for just a few years to earn and save enough so he could return, rebuild his house and start a business. But his salary isn't great, and I cannot tell when exactly he will return."*

Mr Bien's wife, Ms Duong Thi Phuc, also shared:

*"They have been working so hard there, and their children are all growing up. I am not sure whether they will come back."*

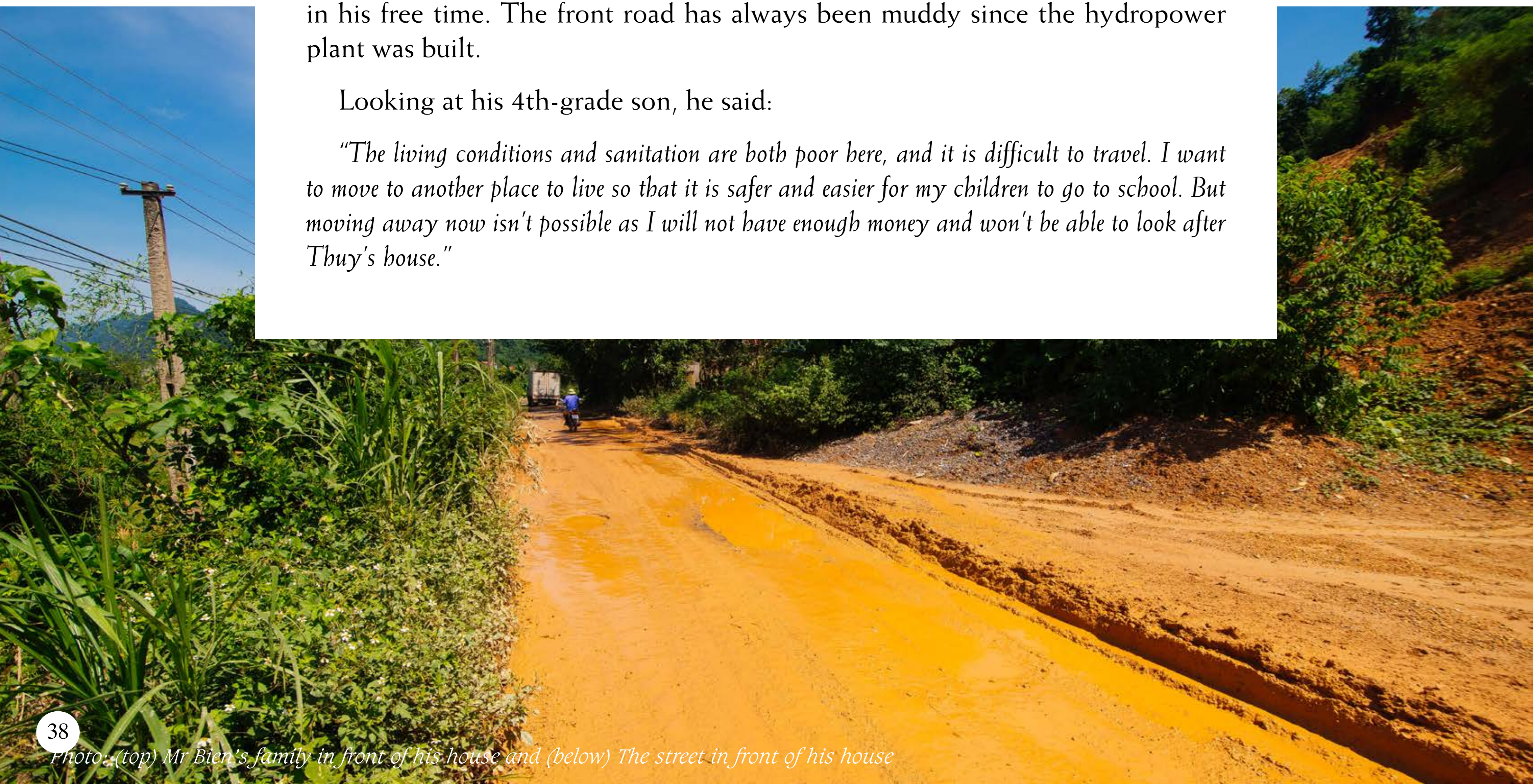


## A Father's Worries

Mr Bien's primary income is from farming and as a hired labour. Like Mr Thuy, he also lost his cultivated land when the Hydropower plant was built. Luckily, however, he still retained one-fifth of an acre of his paddy fields. The family has suffered immensely since the plant was built. Water for domestic use is from a cloudy and polluted well. They can only cultivate one crop of rice per year. To make ends meet, he also tries to work as a hired labourer in his free time. The front road has always been muddy since the hydropower plant was built.

Looking at his 4th-grade son, he said:

*"The living conditions and sanitation are both poor here, and it is difficult to travel. I want to move to another place to live so that it is safer and easier for my children to go to school. But moving away now isn't possible as I will not have enough money and won't be able to look after Thuy's house."*







*The field close to the irrigation canal was completely isolated after the Cam Thuy I Hydropower plant appeared*



*Photo: The field isolated by water*



## **F**ield Isolated by hydropower

In 2018, Cam Thuy I Hydropower began damming water to operate the power generators, simultaneously bringing about profound changes in the environment, natural conditions, and local socio-economic conditions. The newly formed lakebed completely transformed the Ma River. Many areas that were once fertile fields are now submerged underwater. Many parts of the riverbed are nearly twice as wide now. The canal in Thanh Long commune was dredged and widened to increase the area of the lakebed. The canal has been expanded so much that the distance between the two banks has increased from 2-3m before to 50-100m now. While the expanded canal increases the lakebed's water storage capacity, it leaves the field next to it completely isolated from the Thanh Long Commune. The only way to the field across the canal now is through Thanh Cam Detention Centre because people cannot walk across the canal as before. The inconvenience in reaching the field means that it is not cultivated anymore. While both the Cam Thuy I Hydropower Project Management Board and the local people had reached an agreement on the compensation and site clearance plan, many hurdles remain because the people cannot reach a consensus on the division of the fields' boundaries.



*Photo: Way to Thanh Cam detention centre*

## **T**he Detour Through Thanh Cam Detention Centre

The local people were forced to take a bypass road leading through the Thanh Cam Detention Centre to reach the field isolated by the rising lake water. Even the people living close to the fields must travel more than 1.6 kilometres to reach them. While people would easily walk to work before, they now need to walk for at least 20 to 25 minutes to reach the same place. The detour is not just far, but also inconvenient because it leads through the Detention Centre. This inconvenience has led to deep conflicts and differences in the community regarding the Hydropower Project Management Board and the local authorities' compensation and site clearance plans. The boundaries of the field are no longer clear, and in case of disagreements, determining exact areas has become very difficult.



*Photo: Field of Thanh Long village*





Photo: Contaminated wells and temporarily equipped water purifiers



Photo: Ms Quan in front of her house's domestic well



## Polluted Domestic Water

Most households in Thanh Long commune use dug well water for their daily needs. This water source was very clean before, and people only needed filter sand and gravel to purify it before using. Before the hydropower plant was built, the dug wells were around 7 to 12 metres deep, and water had to be pumped up for use. However, now the water level is always high, easily reached by hand, and a pump is no longer necessary.

"My house uses water from wells dug 11-12 metres deep. Previously, the tank would be empty after we'd use water for two to three days. Nowadays, though, it is always full, and it is easy to touch the water if we open the lid"- Ms Quan, 71 years old

"Ours is a dug well around 9 metres deep. People from the hydroelectric plant collected water for testing during the flood. Since the water was not usable, they gave us 10 million VND to drill a new well. However, it cannot be done now, and we have to wait until the dry season. We do not know what to do, so we still use the well water and have bought a water purifier to filter it before using."- Ms Hien, 45 years old

"Since the hydroelectric plant was built, it has greatly affected the daily water supply of my family because we are still using water from wells. The water is filthy. The groundwater level has risen so much that the wells that needed to be 15 meters deep before are always full of water now, causing problems like flies, water stagnation and the inability to use sanitation facilities.- Mr Duc, 49 years old



Photo: The Luu Mai wedding photography studio that has been rebuilt after the historic flood in 2019

## Being Empty-Handed After The Flood

Mr Luu and Mrs Mai had been running a wedding dress shop under their name for many years. The shop gave them a stable income that helped provide them with a decent living and send their children to school. The flood in 2018 arrived too suddenly and, in an instant, washed away the valuable assets they had amassed over the years. The floodwaters robbed them of cameras, printers, computers, and photo equipment. Says Mr Luu:

*"That year, I was empty-handed and lost all my accumulated assets."*



Photo: Mr Luu standing next to his family's fish raft. In recent years, more families in Thanh Long village have procured fishing nets.



## Fishing - a new means of subsistence

The expansion of the canal also heralded an increasing number of fishing cages. Now you can find more fishnets in people's houses. In the past, the Ma River's flow was unstable, erratic and unsteady, and only fishers could catch the fish found naturally. The stable and temperate canal makes it convenient for fish farmers.

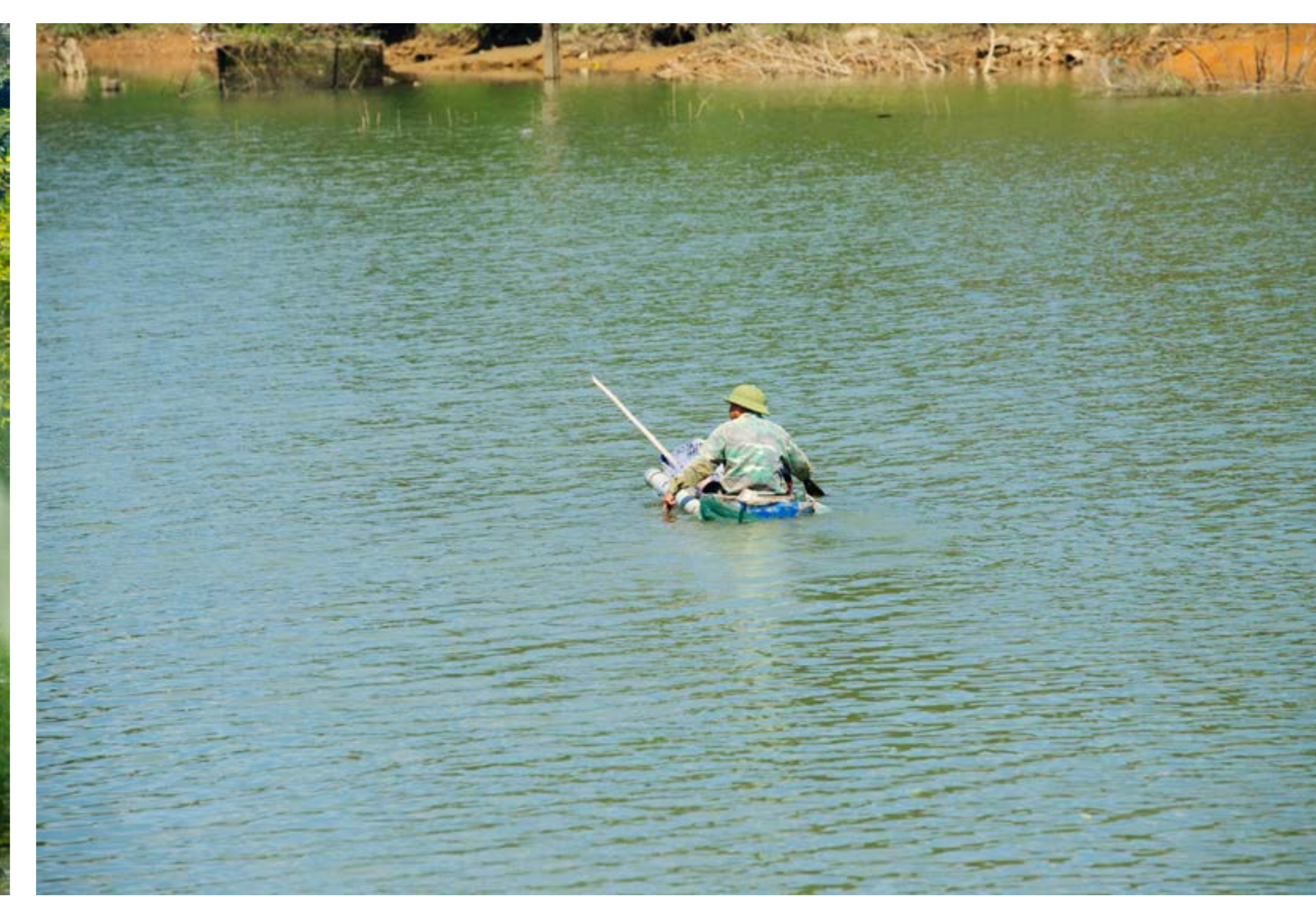
Mr Luu lives right across the street from the Luu Mai wedding dress shop. Standing next to the fish raft, Mr Luu shared:

*"Fisheries bring us food but very little money. I raised a hundred fish until they got bigger, and they only weighed around two quintals. Raising fish takes 6-7 months for a litter. Selling it brings around 20 million VND, out of which around 7-8 million VND accounts for the original capital. Raising fish also requires hard work, and when the fish get bigger, we need to feed them twice a day. Fish farming is just extra work, and its income just somewhat improves our life. There are 4-5 more households besides ours that also raise fish."*



## Fishing Rafts By The Canal

The number of fishing rafts on the canal is increasing every day. But for the sorrows from hydropower, the local people also have a new source of livelihood from raising fish with rafts. Many households in Thanh Long village have invested in fish farming. Fishing has gradually become a crucial source of income in the locality. Although not enough to compensate for the damage caused by hydroelectricity, it also brings new hope to people here.





## New Houses

All the new houses built in Thanh Long village are built high above the roadbed and have basements to avoid floods. Many new homes have been made by people who have moved to new places because they didn't feel safe living near the riverbanks anymore.

Only those households located within 30 metres of the Ma River have been officially considered affected by the Hydropower Plant and therefore eligible for compensation.





## The Bridge Between Two Communes

The Cam Luong suspension bridge connects the Cam Luong and Cam Thanh communes, the two localities most seriously affected by Cam Thuy I Hydropower. Standing in the middle of this bridge brings into sharp focus the profound changes brought about by the powerplant. The riverbed is much more expansive than before, and we also see many more concrete embankments on both sides. The houses on the banks of the river have all been abandoned.



Photo: Mr Le Dinh Hung on the abutment zone



## Hydropower Worker

Most of the workers at Cam Thuy I Hydropower Plant have arrived from Thanh Hoa province. They are not natives but belong to the surrounding districts. Their primary responsibilities include maintaining the plant's operations, managing and monitoring the plant's ancillary works, reporting to their superiors, and promptly reporting emergencies.

Mr Le Dinh Hung, a resident of Thanh Hoa city camp and currently a technical officer of the factory, said:

*"Our job is to monitor for any unusual changes in the water flow and promptly plan a response and warn the people. The top priority is always the task of ensuring people's safety."*



Photo: The shift before the Molave storm

## The Crew Is On Duty Before The Molave Storm

The research team came to work with Cam Thuy Hydropower just one day before the Molave storm hit the Vietnamese territorial sea. On the factory premises, the Operation and Technical department staff said that before big storms, all officers must be on duty at the hydropower plant, day and night, to prevent unusual incidents. The communication system is always open to promptly provide updates to senior management units and all other plant departments.



Photo: Civilian meetings ending in conflict



## Conflicts Arise In The Community

Cam Thuy I Hydropower Plant Project has brought much disquiet to people living in the Cam Thanh and Cam Luong communes. Besides the impacts from land clearance and flood damage, it has also fomented discord in the community. There are many disagreements around compensation and site clearance plans amongst relatives and also with the local authorities. The matter of compensation remains unresolved even though the plant has been generating electricity for almost three years. Frustrations concerning issues like drainage and compensation for crop loss remain. Economic conflicts and the inability to correctly identify rightful ownership or boundary demarcations have created deep community divisions. Most meetings called to resolve the property disputes end in quarrels. The local authorities, meanwhile, have failed to find any reasonable solutions yet.



Photo: Mr. Dao - cadastral official of Cam Thanh commune

## We Also Don't Know What To Do

Mr. Dao is a Cadastral official in Cam Thanh commune. With more than ten years of experience in the Department of Land Administration and having dealt directly with hydroelectricity issues, Mr Dao, of all people, can understand clearly the impacts of hydropower on the community. Mr Dao shared that this hydropower plant has been more problematic to the people than the other plants in the province. This can be proved by the paltry and delayed compensation provided, together with flawed community consultation and coordination between the district, commune and local authorities. The meagre site clearance compensation shows that people's interests have not been paid enough attention. Mr Dao also stated that the creation of compensation plans and support for relocation and resettlement after site clearance remains incomplete. Only semi flooded areas remain available, and they are yet to find any amicable solutions to improve people's lives and productivity. There is currently incredible frustration amongst the locals due to the worrying flood situation, but the authorities have no answers yet.



Photo: People's Committee of Cam Thanh commune

## Local Government Under Pressure

The People's Committee of Cam Thanh (CPC) commune receives numerous complaints regarding site clearance compensation and the damages caused by the Cam Thuy I Hydropower Project. Even though the HPP changed its design plan and construction location, its investors failed to implement suitable damage assessment and community consultations. This has dramatically impacted society and resulted in a multitude of problems. The CPC said that they had sent many request letters to the investors to grant the people their rights but have received no response or solutions yet. The CPC is thus caught between two sides.

Mr Cao Van Timb, Chairman of the Commune, said: "That hydropower site's lack of cooperation has put us in a tough spot with the hydropower plant on one side and the people on the other. We really want to ensure the rights of the people, but the options provided are not feasible. People are now complaining about the agricultural land lost due to the isolation of fields. They are unable to come together and make a final decision. Now, they want to sue the higher agencies. But going to court will only delay the resolution of the problem and the restoration of their rights. This will only lead to further animosity."





## Regulations On Environmental Protection Have Not Been Given Due Attention

Hydropower plant projects have brought power, helped advance socio-economic development in general, and created favourable conditions for agriculture, forestry, transportation and tourism. Nevertheless, hydropower plants' operation has caused several environmental changes and affected the natural habitats in the dam areas.

Although Cam Thuy I Hydropower has established an Environmental Impact Assessment (EIA) report based on State's regulations, the commitments to implement the Environmental Protection (EP) tasks have not been given enough attention:

- The process of community consultation under the provisions of Article 19 of the Law for Environmental Protection (2014) and Decree No.18/2015/ND-CP on environmental impact assessment has been implemented but in a cursory and ineffective way. The regulations state that while implementing the EIA, the project manager must consult the Commune People's Committee and organisations and communities directly affected by the project. The manager must then conduct research and consider the consulted stakeholders' objective opinions and reasonable recommendations to minimise the project's adverse impacts on the natural environment, biodiversity, and public health. However, the Cam Thanh Commune People's Committee said that they neither received any consultation documents from the investor nor were people's opinions heard. Residential communities are also not allowed to attend consultation meetings, and only a few households knew about the project before it is approved.

- Cam Thuy I hydropower plant changed the construction site after the planning was approved, leading to inaccuracies in calculating compensations for the affected areas, causing economic losses and dissent within the community. Even though the plant has been operational since 2018, the obligations to compensate the people for financial losses remain unfulfilled. This should ideally have been completed even before work on the project began.

- Although there exist commitments for constructing structures to improve people's lives (like drainage culverts and embankments) on the left bank of the Ma River upstream area, these commitments remain unfulfilled by the end of 2020. The plant remains in operation even though the solutions and implementation plans remain unclear. According to the provisions of Articles 26 and 27 of the Law on Environmental Protection 2014, Cam Thuy I Hydropower's investors must implement the environmental protection measures proposed in the EIA report before the project is put into operation.

Due to the project investors' failure to fulfil their obligations on compensation and resettlement for the people, many complaints have been sent to all levels of Government and caused deep-rooted conflicts within the community. Although the People's Committee of Cam Thanh commune has repeatedly sent request documents to the Cam Thuy I Hydropower's investors to cooperate to solve outstanding issues, they have not received any response from them. The deadlock between both sides has also placed the local authorities in a terrible dilemma.

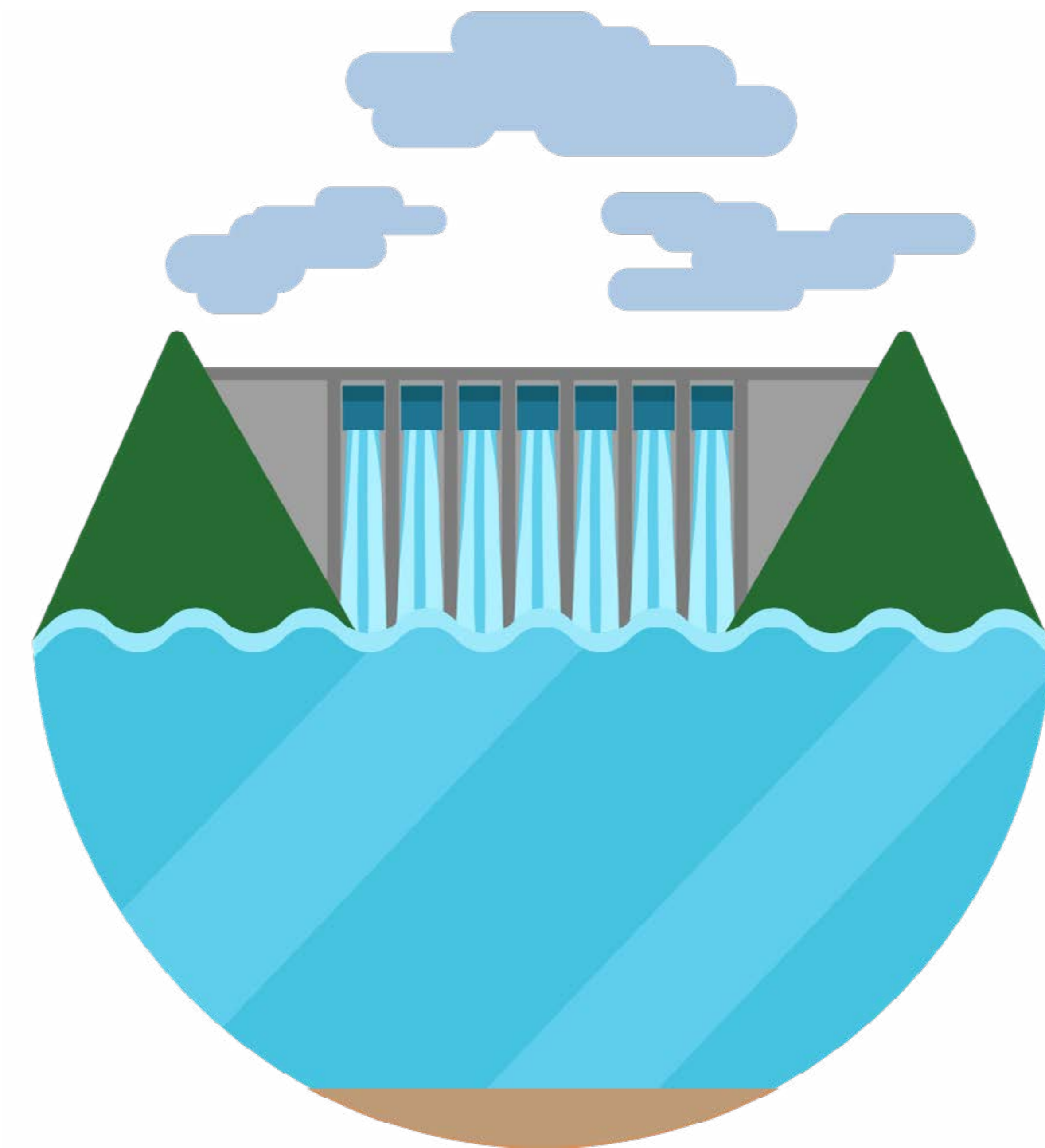




Photo: Cam Luong suspension bridge

## **E**nvironmental - Social Safety Policies of Commercial Banks for Hydropower Plants

### **The positives:**

In general, Cam Thuy I Hydropower plant has implemented legal procedures per the State's regulations on site clearance and prepared an environmental impact assessment report, even though the implementation process remains unsatisfactory. The compensation and support regimes have strictly followed the State's regulations for local people along with additional payment from hydroelectricity to help the households who have lost their livelihoods. Complying with the State's environmental protection regulations and encouraging the implementation of ESSPs by commercial banks has also helped raise awareness and changing attitudes towards protecting the social environment while executing hydropower projects.

### **The drawbacks:**

Besides some visible positives, much negativity remains. Research has revealed profound changes in natural conditions, the environment and local socio-economic conditions before and after the hydroelectric projects appeared. Both the local people and authorities realise that hydropower has not brought practical benefits to the locality but raised many problems instead. Recognition, assessment and implementation of environmental and social safeguards are still weak. Improper planning of the hydropower project resulted in changes to the original design plan and subsequent heavy damage to the region. Cam Thuy I Hydropower has continuously reported an average loss of 15 billion VND per year since it began operations in 2018, causing the authorities to doubt this expensive project's feasibility. Concerns have also been raised that Vietinbank, the project's primary investor, may not recover its capital. Although Vietinbank has implemented ESSP for all its crediting activities, it remains to be seen whether the region's extensive socio-economic changes before and after the hydropower have been considered.

In addition to the Cam Thuy I Hydropower plant, many other hydropower projects like Ban HP and Ta Thang HP have also not completed legal procedures and site clearance protocols before beginning operations. Other HPPs have also caused severe environmental problems. However, for several years now, not a single hydropower project has faced any denial of capital investment due to poor ESSP implementation. This shows that the regulations for commercial banks regarding HPPs are not strict enough.

The effectiveness of policies to support and redevelop people's livelihoods remain insignificant. Most of the HPPs only support and compensate the locality in cash. Other supportive actions like vocational training or livelihood orientation are also simply implemented through monetary means only. According to a survey, the benefits of the training and vocational training programs supported by hydropower have not reached every household.

Recent lawsuits between Cam Thuy I Hydropower and the locals in flood compensation or site clearance have exposed the project management board's weak coordination with local authorities and residents to solve everyday problems. ESSPs should be given due consideration to lend more teeth to current policies.

Although banks have issued ESSP implementation regulations for projects they currently invest in, the approach and application are not thorough enough, attracting scant attention from the project managers. The coordination of the banks with the project managers in checking and evaluating the implementation of ESSP has not proven effective.

# Epilogue

Hydropower is one of the most important energy sources of Vietnam. It cannot be denied that the development of small and medium-sized HPPs has created an abundant source of energy to promote the socio-economic development of the country in recent years. However, together with the positive side, the massive expansion of HPPs without proper control and attention has caused many consequences to the natural and social environment such as deforestation, changed river flows, increasing environmental hazards, loss of biodiversity, environmental pollution, loss of livelihoods, and rising social problems. HPPs can bring about significant benefits for the country, but in many places, this has not happened, and they have only ushered in complex environmental and social problems. Common features that can be found in localities with HPPs are the changing landscape, polluted environment, deeply divided societies and severe effects on people's lives.

Cam Thuy I HPP's perspective truly reflects the consequences of the shortcomings in the project's planning, design, and feasibility assessment. The lax EP management of state management units leads to the overlook in implementing ESSPs by investors. The banks are not thorough in the inspection and supervision of ESSP implementation. As a result, HPPs worth trillions of VNDs have continuously reported losses, the natural environment has been polluted, and people's lives have taken a turn for the worse. Cam Thuy I HP is a genuinely visible concern for the people of Thanh Long commune.

To develop sustainable hydropower while also minimising its adverse impacts on people's lives and the environment, it is necessary to carefully consider and evaluate the actual value of a project with the goal of reduced greenhouse gas emissions and a greener economy. Hydropower development requires the participation of all stakeholders, from planning, design, and construction to operation. The ministries and branches that have approved the hydroelectricity construction technology and technical standards must comply with the State's regulations, formulate due processes, conduct a safety inspection of dams, assess the level of risks when storing water, and prepare for response measures. It is also time to implement ESSPs of HPPs to ensure social and environmental security. To bring these ESSPs to life, besides raising people's awareness, the active participation of state management units and banks is necessary too. In consonance with the WTO, developing and implementing ESSPs is the foundation of green growth and the key to sustainability.



*Photo: Flooded house in the Ma river*



Intake gate of  
Cam Thuy I  
Hydropower Plant

### Acknowledgement

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- Thanks to the People's Committee of Cam Thanh commune and Cam Thuy I Hydropower Plant I for your helpful information and support to the team while we were working there.
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- Special thanks to the collective of locals in Thanh Long village, Cam Thanh commune, Cam Thuy district
- who have wholeheartedly shared truthful information for this book.

### Individuals and organisations contributed for the book

- People's Committee of Cam Thanh commune: Chairman of Commune People's Committee, Land Administration Office, Agriculture office, Fatherland Front
- Cadres and workers at the Cam Thuy I hydropower plant.
- The data and stories have been sourced from interviews with 18 households in Thanh Long and Kim Man villages. Among the interviewees, there were ten men, fifteen women and two children belonging to different age groups and occupations such as farmers, fisherfolk, small traders, government and retired officials, elementary and high school students, freelancers, migrant workers and retail salespersons.

### Pledge

The information and pictures in the photo book reflect the truth. The officials and people who provided data for the project did so voluntarily. All the interviews and photos taken for the compilation of this photo book implementation were supervised by Cam Thanh Commune People's Committee representatives.

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