



Situated in the northernmost tip of Vietnam, Bao Lac district of the Cao Bang province lures visitors from the outside world by its magnificent beauty of nature and the diversity of ethnic minority groups. The lush hillsides are circled by incredible rice terrace fields and a maze of streams and rivers. The tribal cultures are glorified by distinctive features without losing the identity while the people reside together.

Apart from the exquisiteness, most of population in Bao Lac are self-subsistent but linger in remoteness and poverty. They lack reliable sources of energy in order to prosper sustainable livelihoods.

Detecting the existing problems from conducted research, the International NGO – ADRA in Vietnam designed and brought in practice the project Climate Resilient Agriculture and Renewable Energy for Sustainable Livelihood Improvement (CARE) from July 2015. The 18-month-project is funded by three organizations, ADRA Germany, ADRA Austria and ADRA Netherlands.

CARE project embraces a core component of identifying, developing and installing the relevant renewable energy models, which are able to replace the traditional fuel sources of degrading the environment and harming human health.

Of the start, project provides two expedient solutions, which are hydro-electric power and biogas.



Photo: Xuyen and her grandson happily stand under the new indoor light. Credit: Vu Thu Trang – Development and Marketing Officer.

Pico-hydro electrifies the remote Na Tong village

“Everywhere was silent and monotonous when there is no electricity. It was in the evening when most of family members gathered in the house, but we didn’t have much to do. Children went to bed really early and could not revise the lessons. I knew that few dropped out of school because they were not able to catch up. Then light came to our village, the children were able to do recreational activities. It changed our way of life. Now there’s much more happiness”, the ethnic minority woman named Xuyen (featured in photo) told. She is living with her family of five in Na Tong village; they are all from the Dao group – one of ethnic minorities in the area. Xuyen and her direct family members are experiencing the change created by a new source of reliable electrical power, similar to her people in Na Tong.

“There is light in the stilt house, that keeps my two and half-year-old grandson playing safer on the floor made of raw bamboo canes. My husband is the one mostly turning on the television in the evening, but he asks people to join in watching and sometimes he shares with us the news. We all feel happy of the change”, Xuyen said.

Na Tong of Hung Dao Commune, Bao Lac District, Cao Bang, Viet Nam is one of villages belonging to CARE project site. Due to the complicated topography and features of the population, connection to grid electricity is not yet available to 100% of households here. The area, however, is naturally endowed by abundant water source from the system of rivers and streams, which is possibly harnessed for hydro-electricity.



Pico-hydro becomes the responding solution of CARE project to the villagers of Na Tong, with the aim of bringing electricity to every single of total thirty-six households. According to the organization's baseline survey, five families already set up the small hydro-plants (under 1kWh capacity) for the period of 5-10 years before project. These systems sustained solely the families paying investment with unstable supply, due to the energy loss on electrical wiring and the risk of natural disasters.

In the phase of Climate Resilient Agriculture and Renewable Energy for Sustainable Livelihood Improvement (CARE) project, ADRA provided twelve hydro generators of 2kWh capacity, which allow the power supply for lighting, televisions and few production tools. The local communities divided by themselves into groups of three households to share the power from one generator. Their involvement was up to every stage, from labor contribution to setting up the management and maintenance of the machine and the wire.

Everywhere now in Na Tong village, the people are talking about the benefits of off-grid hydro schemes, like good quality light, the operation of electrical equipment that help form new livelihood, leisure and educational opportunities and a window on the wider world.



Photo: Mrs. Xuyen happily tells the difference in her house when electricity is available. Credit: Vu Thu Trang – Development and Marketing Officer.



Photo: The electrical equipment that can be used in the Xuyen's house now, thanks to the stable power supply from hydro generator. Credit: Vu Thu Trang – Development and Marketing Officer.

More powerful electric current brings our modern tools to life

There are a number of resident households in Na Tong village (Hung Dao Commune, Bao Lac District, Cao Bang, Vietnam), who already invested and set up the electrical power source to serve the demand of families, mostly used for lighting purpose. One of those is the family of Dang Mui Khe, belonging to the Dao ethnic minority group.

Khe with Lin – her husband, a daughter and a married couple of her son with two grandchildren whose ages are less than five years old are living under a shelter together. Their livelihood relies upon few acres of arable land, which is structured in the terrace fields. Rice and maize are two main crops to be grown. In addition to those are cassavas, peas and vegetables thriving under good climatic condition; that adds some more nutrition to rather poor quality meals of the family, and some extra income for buying new house and farming equipment.



Photo: Dang Mui Khe with her grandson.
Credit: Vu Thu Trang – Development and Marketing Officer.

Khe told the ADRA project officers, who crossed an hour trekking route while reaching her house, “at first my husband participated in the project of ADRA. I remember he learned about the electrical safety and first aid for electric shock. He came back home that day and told us about the safety rules he had practiced in the training. That is useful, I think, especially for the time when we get the new electrical power supported by project.”

Khe and Lin’s house is often selected as the meeting place for the surrounding community, simply because there is electricity. It is weak light emitted from three old light bulbs sustained by the 0.7kWh generator.

“At least it is brighter than the other houses. People here have to work whole day and the only time for meeting is in the evening” shared by Lin.

Better light and more stable power supply at the moment content all the residents of Na Tong. Particularly in the house of Khe and Lin, the 2kWh generator replacing the formal generator powers five traditional and one U-shaped LED light bulbs, and a television.



Photo: The more powerful electricity helps illuminate Khe's house.
Credit: Vu Thu Trang – Development and Marketing Officer.

“We installed the generator at the foot of a small waterfall to utilize the water power. The good point is we are even able to run the house rice milling machine automatically by electricity rather to manually. This saves the time for my daughter and daughter in law to do other works, and to take care of the children”, Khe exposed her satisfaction.



Photo: The rice milling machine of the house. Credit: Vu Thu Trang – Development and Marketing Officer.



Photo: Khe's daughter and daughter in law use the rice milling machine run by electrical power. Credit: Vu Thu Trang – Development and Marketing Officer.



Photo: Lin, Khe's husband, comes the place to check the hydropower generator. Credit: Vu Thu Trang – Development and Marketing Officer.

While there is electricity, we learn to sing along with the instrumental accompaniment



Photo: Mai and her friends at school. Credit: Vu Thu Trang – Development and Marketing Officer.

“We used to sing a cappella with the teacher, there was no instrumental sound along with. The whole class did not synchronize the rhythm and I don’t think it’s nice enough”, Mai spoke and flashed her lovely smile.

Mai’s school is situated in Na Tong village of Bao Lac district, Cao Bang province, Viet Nam. This is one of border areas with 100% of population has not yet accessed to the national electricity grid, due to remoteness and local capability to meet the setup requirements of the electricity company. The so-called Na Tac school of Mai provides primary

education to seventy-two ethnic minority pupils, classified in five classes. The school equipment is assisted by the Department of Education and Training, however it has not been utilized for no existing power source.

Commencing from July 2015, the Climate Resilient Agriculture and Renewable Energy for Sustainable Livelihood Improvement (CARE) Project of ADRA selected Na Tong village to pilot electricity generating model. Twelve pico-hydro power generators that reflect the most locally adapting source were granted to the village, while the community involvement was recognized in all stages, from assigning households to share one generator, to contributing labor and construction materials, and setting up management groups and maintenance activities.

Na Tac school was prioritized by the community to share connection to one power plant with the nearby family. The household is responsible for operating and maintaining the generator. After setup, each classroom is installed an electric plugin to be used for lightening purpose and powering other school supplies.



Photo: Electrical plug-in in each class. Credit: Vu Thu Trang – Development and Marketing Officer.



Photo: Electricity from the pico-hydro generator powers an electronic musical instrument. Credit: Vu Lan Huong – M&E Officer.

“We plug in the electronic musical instrument to play during the music lesson. The pupils show great excitement on this”, shared by the music teacher.

“Our school contributed construction materials to make the leading pathway for water while the household installed generator. After completion, the village gifted school another 200m electric wire from project. Thanks to this support, our school becomes more active in educational activities; at the same time, we don’t have to ask the other households for electricity to run equipment in special events. This is the most significant achievement from my point of view”, said Mr. Hoang Van Huyen, Principle of Na Tac school.



Photo: Overall view of the way leading to spot where the hydro power generator is installed. Credit: Vu Thu Trang – Development and Marketing Officer.



Photo: Closer view to the generator. Credit: Vu Thu Trang – Development and Marketing Officer.

Electricity helps to widen the knowledge on farming

Electricity powers the television. “That lets me update the weather news and proper farming techniques, from that increases the product quality and productivity”, shared by Mrs. Luc Thi Thien, a resident of Na Tong village, Hung Dao commune, Bao Lac district, Cao Bang, Viet Nam.

The four-people-family of Thien was assisted to connect to a 2kWh hydro generator, sharing the produced electricity with another two households. She now has the new television and can listen to the news or approach entertaining channels.



Photo: Luc Thi Thien watches television, which is powered by the new electrical source. Credit: Dao Kim Trong – Project Officer.

“We are classified as medium income family, based on the ranking applied to this mountainous area. My family of four labors still relies on raising cows, pigs and cultivating paddy rice and maize for living. The income earned from the former is the main source for expenses, such as family businesses including special occasions of funerals or weddings; and to afford the studies of my children at university. The latter mainly serves household consumption”, Thien shared with ADRA project officers coming to visit her house.

For us, the observers of the change in her life after participating in project, this forty-two year old woman was deemed to be full of positive energy while sharing her opportunity to get more engaged in the wider world, thanks to the power of new electric supply.

“My family used to study and install a 0.7KWh electric generator five years ago. That was a lot of investment but the supply could sustain only three to four light bulbs. There was light but it was not luminous inside the house and it was not able to run any electrical equipment”. She continued “the current electricity allows some U-shaped LED light bulbs to operate maximum capacity, providing enough light for me to do chore work and keep caring the animals in the evening. Furthermore, it powers a television so all people in my family can keep posted of the public news. Personally, I have gained new knowledge on pig raising and preventing the cattle’s diseases while following the experts’ instruction on TV program titled Friend with the farmers. I will continue learning in the coming time on the cultivating techniques”.

The more reliable electricity in Na Tong village is, the more opportunities to the local people in exploring the new knowledge through modern channel reveal.

Feeling useful at the end of life, the light gives me more confidence



Mrs. Dao is at the age of 79. Her life is a story of sadness and inconfidence. All degrades her self-esteem and hope for life.

She got married since the early age as the traditional custom from her ethnic group. Unhappy marriage led her to a single lady life and being dependent on one of the nephews' family. Dao has spent years living with them.

"I feel like the burden of the family, because when was young I couldn't find seasonal job to make some income for the family. Now I am old and can't help the housework because my eyesight is getting worse."

The living conditions in family of Dao's nephew particularly, and of the others in Na Tong village generally speaking still confronts numerous challenges. None of the households has access to national electric grid, causing the delay in economic development.

The daily life of Dao remained in slow pace, indoors and unlimited opportunities for her willingness to support the family. Until one day, her nephew said the house would get brighter. At the same time, he installed the four lightings in the living room, the kitchen and the other two common places.

Dao recalled "that's the first time in my life, the room was lighted that much. I already felt my eyes could see things better."

By the time ADRA project officers visited Dao, she was preparing lunch for total five people living under the roof. She was content seeing and greeting us. From the first sharing, Dao said "thank you ADRA for giving us better light. I can do some light housework now, for instant preparing the meal and cooking, cleaning the house. In my heart, that makes me feel more useful person at the end of my life, and more connected to every single member of the family as well."

For officers who are involved in the project, this was one of unforgettable moments, hearing about a human life story and the change that she still experiences via project activities.

Quality Lighting: The way to better future

Light is necessary to the existence of life itself. Along with the development of lighting, the mankind can utilize dark time to do many works; they can cook and clean after meals at night as the lighting illuminates a whole room. Lighting brings up the continuity of humans' activities, from educational, medical, defending to recreational. The quality light can mean much more by increasing safety, enhancing productivity and reducing the risk of health problems.

Quality light and the power to sustain it, however, is not yet available everywhere, despite of numerous efforts across the globe to eliminate the inequality situation. Are a considerable number of poor households living in remote areas of Vietnam not accessing to the reliable power source to enjoy proper light.

The Tay ethnic minority family of Thi Thi Vy mentioned below was one of the stories revealing drastic change after getting benefit from the more reliable and efficient electric power.

Her name is Vy and she is twenty-nine years old. She got married and has a daughter studying at first grade now. Relying on farming as many neighbors in Na Tong, Vy's family earns money on few acres of planting paddy rice, maize and seasonal vegetables. The valuable asset of the five people, two of them are Vy's parents in law, is two cows which are used for supplement labor power on terrace fields.

Speaking about the energy used in the house, Vy shared that "before we had only one light bulb powered by the hydro generator installed close-by to the house. We utilize few oil lamps to create extra light but the inside remained pretty dim."

It is continued that her daughter, while received education, was unable to study at home after 6pm. "This was because the electricity for lighting was so weak and unstable, and the oil lamp did not provide enough light for her. My girl said her eyes were hurt sometimes, and most of the time they got tired before she could finish all of homework. I felt embarrassed, and hopeless for not being capable of providing her the best condition", those words fell heavy on Vy's heart.

Since Vy and her husband participated in the ADRA project, which supports to initiate alternative and locally-based energy schemes, they have nurture more hope for the better future of their daughter.

"My husband was present at the training of Electrical Safety Rules and First Aid in case of electric shock organized by the project. He was so excited to study the new knowledge and practice at once. When he got home, he showed me how to do it and now we are teaching our parents in turn", Vy smiles while telling.

"We are blissful since we got involved in the pico-hydro power initiative. The up-front costs were paid via project grants. The families contributed manpower and construction materials to fulfill the entire

set-up. Now in the house there are three LED light bulbs to illuminate the whole common room and one electrical lighting is reserved for my daughter to study. The biggest happiness is perhaps to see her not struggling under the oil lamp's light."



Photo: Vy feels blissful under the powerful light in the house. Credit: Dam Van Khoa – Project Officer.

Vy said her family was also planning to buy a television, "so that all family members can approach the outside world and learn useful knowledge, broaden our horizon. We think soon we can do it."

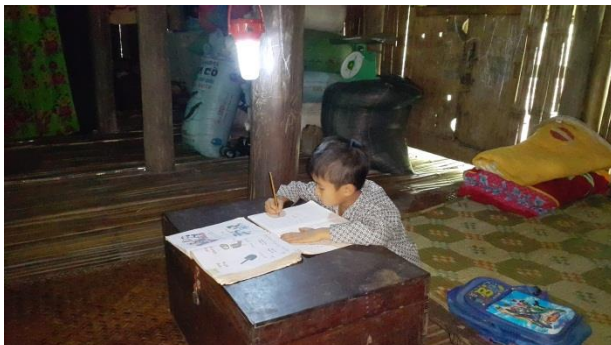


Photo: Vy's son studies under the lamp light. Credit: Dam Van Khoa – Project Officer.



Photo: During the day, Vy's stilt house utilizes the natural light. Credit: Dam Van Khoa – Project Officer.