According to the baseline survey conducted in CARE project site of ADRA in Vietnam, the average livestock size of households (estimated 4 pigs and 2-3 cows/buffalos per house) will provide sufficient amount of biogas for domestic purpose, mainly for cooking.

The biogas model is a practical solution while searching for the alternative renewable energy, which at the same time contributes to the improvement of environment by managing the pollution of animal waste and reducing the need of cutting tree for wood. The biggest challenge posed to local community is initial investment of the setup and the technical knowledge to utilize the system and by-products.

Via CARE project, ADRA adapts a response to the situation by piloting 10 biogas models in the first phase (from July to September 2015). Selected households are from four villages of the project site in Bao Lac district (Cao Bang, Viet Nam), including Ban Rung village of Bao Toan commune; Na Tong village of Hung Dao commune; Na Vieng and Na Ten village of Thuong Ha commune. This is expected to trigger the interest and determination of the surrounding households to learn and make similar energy schemes, after seeing the benefits of biogas.

Biogas eases ethnic minority women's burden in mountainous regions of Vietnam

Photo: Mrs. Nong Thi Phong shows her biogas stove next to the traditional cooking stove heated by burning wood. The traditional stove is still used for cooking the animals' food. Credit: Le Thi May – CARE Project Officer.

Women in rural Vietnamese families, particularly those belonging ethnic minority groups, shoulder the burden of household tasks, whether those are heavy or light works.

“I take care of the animal herd, plant the forest trees and collect the firewood for our domestic usage”, shared by Mrs. Nong Thi Phong – a Tay ethnic minority woman living in Ban Rung village, Bao Toan commune (Bao Lac district, Cao Bang province, Viet Nam).

“That was normal when I used to carry home two bundles of firewood every day to fulfill the household’s demand. We raised ten pigs and cooking food for them on the traditionally firewood-burnt stove normally took two and a half hours” Phong said. In the rainy season, sometimes she spent her household’s budget to purchase wood from the suppliers, as it got too dangerous due to landslides’ happening.

The construction and handing over of biogas digester from CARE project, which utilize pig manure to produce biogas fueling the new stove, help cut the time and the expenses spent on food preparation for Phong’s four-member family. At the moment, it takes half as long for this lady to cook and to gather wood.

“We just switched to use the new source of energy. We haven’t abandoned the old stove entirely for not being able to equip the complete set of tools to cook food for the pigs. Moreover, the gas flow has not been regulated to remain constant. I and my husband are learning more to make the most use of the biogas plan. Hopefully in the next few months, especially when the winter comes, it will bring more benefits to my family by cutting the expenses on firewood and chemical fertilizers” told Phong.

Photo: Phong’s husband is helping her to adjust the gas influx. Credit: Le Thi May – CARE Project Officer.

Biogas at home is convenient for the whole family

Photo: Mrs. Tho prepares lunch for her family using the stove fuelled by biogas. Credit: Le Thi May – CARE Project Officer.

On the blue flame of new biogas stove, a 78-year-old lady was quickly preparing a simple lunch for her children and grandchildren. She is living with them in Ban Rung village, Bao Toan commune (Bao Lac district, Cao Bang province, Viet Nam). “My kids all work faraway. The traveling time in this remote area is hardly speeded up so I always cook the meals for whole family, to save the time and relieve their hunger” told Mrs. Luc Thi Tho.

“Cooking fuelled by firewood is time-consuming, because I have to check the wood if it’s too wet to ignite the fire, after that wait for the stove to be heated up”, said Tho.

Similar to the other 10 households assisted by the CARE project to operate the family-sized biogas plants, Mrs. Tho found great convenience while using the new source of energy, especially for the elderly like her and also for the children. She revealed the fact to master all the equipment related to biogas system including the biogas flow meter, the digester, and the stove is not a hard task.

When Tho ended up in the last sharing, it sparkled in her happy eyes saying that “It helps reduce the misery of my daughter-in-law and I believe also in the generation of my grandchildren, as less wood is demanded for the need of cooking food, and therefore less to be collected. I and my mother suffered this extreme weight of the wood bundles in too many years.”

Photo: Tho checks the biogas flow meter. Credit: Le Thi May – CARE Project Officer.

Waste to biogas energy

Photo: Trieu Van To uses his sponsored biogas stove by CARE project. Credit: Vu Lan Huong – Programs M&E Officer.

Owning twelve pigs, the issue of animal waste management had been always existing and worrying the family of Trieu Van To, residing in Na Tong village, Hung Dao commune (Bao Lac district, Cao Bang province, Viet Nam). “We utilized part of the waste to fertilize the rice field and other farms that we grow. The rest was still of considerable amount but not used for any purpose. Due to the family’s condition, we hadn’t built any proper place to contain the residue. The water mixed with excrement while cleaning animal shed therefore flowed freely to the surrounding area of the house, contaminating the general living environment and affecting the human health”, To said.

Thuy, his wife, added the thought, “particularly in the rainy season, our children stepped out of the house and it was animal manure everywhere, forming dirty messes. Sometimes they had the school clothes spotted the excrement.”

Given a nine-cubic-meter bio-digester by ADRA project, To and Thuy started utilizing the biogas model. All animal waste becomes input for the digester, which is a closed structure that helps reduce air, soil and groundwater pollution. Also, from the project’s encouragement and relying on the domestic effort, they constructed the basins under animal sheds to store excrement and pathways leading the waste to the digester. The whole system reduces the bad smells drastically right for the first sake. “It also helps prevent the spread of disease vectors, while the gas is safer because it is non-toxic and there is lower risk of accident or explosion” told To.

Photo: To stands next to the bio-digester. Credit: Dam Van Khoa – Project Officer

Alternative source of energy curbs the cutting of tree for firewood

Photo: Thong and his grandson. Credit: Dao Kim Trong – Project Officer.

"I hope the forest will remain as in my memory of the childhood's time. Last year happened the severe land erosion in the area, sweeping away abundant assets of the local residents. In my time, less people consumed less wood. Nowadays, they cut the trees and trim the branches to fulfill the human demand. It hurts but we have no other solution. My family also take forest wood to survive the winter's chill and on top of that, to serve the cooking purpose of daily meals", Ly Van Thong bared sincere words from his heart.

Thong's family of five adults and one little kid (2 years old) used to consume one bundle of wood per day, the volume doubled during winter time and the total was equivalent to 30m3 of wood per year. "The work of collecting firewood belongs to my wife and daughter in law. They normally trek a long distance, sometimes as far as four kilometers, to reach the forest. It is tiring and time-consuming but not yet counting the carry of wood bundle. A small amount of money is paid few times to hire the vehicles to replace the manpower."

In September 2015, being selected by the CARE project to pilot the household biogas models in Na Vieng village, Thuong Ha commune (Bao Lac district, Cao Bang province, Viet Nam), Thong gathered all people in his family to contribute the labor for construction. "I have been involved from the beginning of project that commenced in July. The project officers conducted different training sessions on a range of topics, including reforestation, sloping agricultural techniques, fermented eco-enzyme fertilizers and the alternative renewable energy. When they mentioned about the biogas, I reckoned that it would be really suitable for my household because we were raising three cows and five pigs, which would produce sufficient amount of fuel for the domestic need."

Thong continued "After changing to use the cook fuelled by biogas, I have seen many conveniences. The water is boiled faster, the house has less smoke, and no one worries about wood getting wet and exposing long-time to ignite."

"The most significant change happening to my family, and hopefully will be learned by the other households, is that this alternative source of energy will help curb the cutting of tree for firewood. The fertile soil will be protected and we can work on better farming", Thong concluded.

My kitchen is clean and smoke-free, which is good for our health

Photo: Hau is happy that this biogas stove does not emit indoor smoke; that renders less harm to the health of her 17-month daughter. Credit: Noi Nguyet Anh – Field Coordinator.

“I was concerned about the health of my new-born baby. The smoke from the traditional stove caused respiratory disease to my mother in law, and cough for most of the other members. Even it just swirled around as long as the meal was prepared, the harmful particulars stuck in every corner of the house”, To Thi Hau - mother of 17-month baby girl told us.

Like many families in Ban Rung village, Bao Toan commune (Bao Lac district, Cao Bang province, Viet Nam), Hau’ family was not an exception but using traditional wood-burning stove. When we arrived, a grim reminder of the particles she inhaled whenever she cooked was the soot dangling from the roof.

“Since we have the biogas stove, breathing while cooking for an hour is much easier. There is no harmful smoke that I do have to inhale, and so does my little daughter who is always slung in the blanket over

my back. I am hoping the disease of my mother in law will get improved and I don't have to worry anymore about the same problem happening to my kid", Hau happily shared.

That is even not the only benefit that Hau and her family are experiencing thanks to the installation of biogas system, she added "the new stove fuelled by biogas helps shorten the cooking hours and save the time from collecting firewood, so I can spend more time to care my baby."

The volume of firewood used in Hau's house, without utilizing biogas was falling into 40-50kg/day. That took half of a working day to gather.

Photo: Hau is standing next to the shed of her livestock, which was removed to a safe distance with human living area. Credit: Noi Nguyet Anh – Field Coordinator.

Better farming with the by-product from biogas plant

The installation of domestic biogas plants substitutes the use of not only firewood but also chemical fertilizers. In addition to the reduction of greenhouse gas emissions from cattle manure, less degradation of the forest, people directly profit from less indoor pollution, and higher crop yields with less contaminated products.

Photo: Phong takes water from the biogas digester. Credit: Le Thi May – CARE Project Officer.

As by-product of biogas plant, the digested water collected in the last tank after anaerobic digestion has been proven to be good for the farms in rural areas, avoiding the usage of chemical fertilizers, which is sometimes misused and therefore renders the harvest loss and harm for users' health.

The family of Mrs. Phong in Ban Rung village, Bao Toan commune (Bao Lac district, Cao Bang province, Viet Nam) was selected by ADRA to participate in the pilot phase of bringing biogas

models into life. They completed the set-up and made the plant ready-to-use in September 2015.

Being instructed by the project officers, Phong tried to water her vegetable garden by the by-product collected from the bio-digester. She found out that “The water doesn’t smell bad odor at all. And I am surprised to see my vegetable grows better after few times of being watered. If using this water from the digester is good for farming, I believe in the next cultivating season we can reduce expenses on the purchase of NPK fertilizer (i.e. name of a chemical fertilizer)”.

Not only has the water collected in last stage of biogas anaerobic digestion, the sludge created as last product can also be used as organic farming fertilizer. Beneficiary households in CARE project will be receiving more education throughout project duration to utilize the by-products of biogas plant, which help protect the environment and save the household budget.

Photo: Phong waters her vegetable garden. Credit: Le Thi May – CARE Project Officer.