

Hydraulic Ram Pump: A Practical Solution to Climate Change

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Children surrounding a hydraulic ram pump produced by AIDFI on the island of Negros, Philippines

Anangue is an upland village located in Murcia, Negros Occidental, Philippines. The primary livelihood in the village is farming. However, the villagers experience low agricultural productivity due to the lack of access to sufficient water.

The nearest source of water in the village is a freshwater spring located 240 meters away and elevated by 80 meters. Thus, the community greatly depends on rainfall for domestic consumption and agricultural production. However, with the onset of climate change causing variations in the rainfall pattern and distribution, access to water became more difficult and costly.

To respond to the challenges of agricultural areas like Anangue, the Negros-based organization Alternative Indigenous Development Foundation, Inc. (AIDFI) was established. AIDFI aims to address water problems including those faced by small-scale farmers using various adaptation technologies such as its hydraulic ram pump.

Ram Pump Technology

The ram pump is a 220-year old technology. In the last three decades, there have been some attempts by appropriate technology groups and universities to come up with cheap alternative models but these alternatives remained inferior, and the programs short-lived. The model that AIDFI developed, on the contrary, is efficient, durable, and cheap. Moreover, the AIDFI model is the only one with 10 different sizes, each with a particular flow range. Thus, in May 2009, AIDFI established its first hydraulic ram pump system in Anangue to address the water problems in the village.

The hydraulic ram pump is an inexpensive and efficient technology that can deliver water to elevated areas by simply using the natural kinetic power of flowing water from rivers or streams. For every meter drop from the water source, the ram pump can deliver water up to 30 times higher in elevation. With seven meters drop, it can pump water as high as 210 meters.



AIDFI team poses with the varying model sizes of the ram pump



Because of the ram pump, chores that require water can be done near home

The ram pump uses neither fuel nor electricity, making it suitable for remote rural communities; it uses the energy of falling water. All it needs is a source (spring or river) situated higher than the pump itself.

Ram pumps are made from locally available materials, which include ordinary door hinges and a check valve made from a piece of a car tire. Moreover, the setup is simple enough that it can be operated, maintained, and repaired by the local technicians. Hence, it is easy to adopt and sustainable to operate.

Furthermore, ram pumps provide water to elevated areas without emptying the water source. Unlike other water pumps, it only pumps five to 40 percent of the flowing water, leaving enough water to flow back to the source. This makes multiple ram pump systems possible, enabling more communities to have access to water.

Coordinated efforts

The hydraulic ram pump shows that renewable energy does not always require advanced and complex technologies. However, any technology, perfect it may seem, requires operation and maintenance. To operate a simple technology such as the ram pump also requires coordinated efforts among all stakeholders. This is why AIDFI involves

the members of the community in construction and hauling, for them to get the feeling of ownership of the project.

Subsequently, adoption of the technology requires establishing a local water association that would assign the tasks and responsibilities to the members in operating the ram pump. The association would also decide on the service fees that the villagers will pay monthly.

Together with the villagers, they also assign local technicians who will be trained by AIDFI to operate, maintain, and repair the ram pump. The payment for the services of local technicians, repair costs, and the general maintenance of the ram pump will come from the monthly service fee collection. In the case of Anangue, the monthly fees also enable the villagers to implement other development projects, such as raising hogs and growing cash crops.

Impacts

Many ram pump systems have triggered further community development or empowerment. In the case of Anangue, a new livelihood activity has been identified. AIDFI introduced lemongrass production and processing. The community now has a distiller which the beneficiaries operate themselves with AIDFI to produce and market essential oil.

Moreover, the ram pump system in Anangue has helped the villagers save time and effort, as the device provided them with steady potable water supply near their homes.

In terms of agricultural production, the villagers started building earthen ponds and other storage devices to accumulate water from the ram pump for irrigation purposes. They have become less dependent on rainfall. The availability of more water has enabled them to grow different vegetables and other cash crops throughout the year; hence, increasing their production and income.

Scaling up

Through the help of various government and non-government organizations, AIDFI has installed ram pumps in 280 remote and marginalized villages across the country with some 125,000 beneficiaries.

AIDFI has also trained five independent installation teams in different parts of the Philippines.

Aside from the Philippines, other countries have also recognized and benefited from the inexpensive but efficient technology. In fact, numerous ram pumps have been installed in Afghanistan, Peru, West Timor, Japan, Cambodia, Nepal, France, Malaysia, and South America.

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