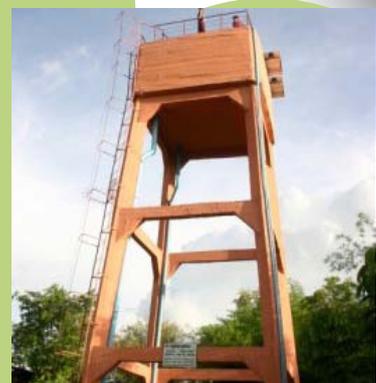


ENERGY FOR LIFE - BEST PRACTICE AWARD 2011

System / Location

Green water supply system / Cheung Kok, Cambodia



The lack of water infrastructures is a constraint on the development and improvement of sanitary conditions in Cambodian rural areas. Most of the population still has to hand-carry water from the closest well, pond or river. While many government programmes have been launched to enhance rural electrification, the water sector in Cambodia is dependent on private or NGO initiatives. With the financial support of the Agence de l'Eau Seine Normandie, AMICA has designed and implemented a water supply system for this 650 people off-grid village. Some 30m³ daily volume of water is drawn from a well with a solar powered pumping system, and is then stored in an elevated water tank as to supply water to every household using a gravity system through a PVC underground piping network. As such, the energy needed to bring water to 120 households is provided by the sun! This pilot project was meant to demonstrate the relevance of solar energy for rural water supply applications and to measure the impacts of water supply on the beneficiaries.

Planning/Installation

AMICA
<http://amica-web.com>

Donation/Support

Agence de l'Eau Seine Normandie (AESN)
<http://www.eau-seine-normandie.fr/>

Operator

Cheung Kok village committee

PROJECT DATA SHEET

Year the installation started operating	January 2008
Type of system	Solar water pumping system
Type of energy produced	Electricity
Location	Cheung Kok village, Ampil commune, Kampong Siem district, Kampong Cham province, Cambodia
Size of installation	11 m ²
Thermal Power of installation	1400 W
Use of energy produced	Water pumping
Quantity of energy produced per day	6 kWh/day
Type of financing	Grant
Source of financing	Agence de l'Eau Seine Normandie (AESN)
Biomass system investment cost	USD 2,541 for the 8 plants (USD 318 each plants)
System costs	Total water supply system: 32600 US-\$ - Water supply network (elevated tank, piping & fittings): 20000 US-\$ - Solar pumping system (solar panels + pump): 12000 US-\$ - Well: 600 US-\$
System cost per watt	8,6 US-\$/W if the solarpumping system only is accounted 23,3 US-\$/W for the complete water supply system
Income generated from installation	Cost of m ³ water: 0,125 US-\$ Annual water consumption: 9000 m ³ , Annual incomes: 1125 US-\$
Maintenance cost per year	Labour: 540 US-\$ Equipments (piping and fittings): 50 US-\$, Total: 590 US-\$
Fossil fuel savings per year	Assumed fuel consumption of diesel pump in similar conditions (30 m head & 5 m ³ /h flow): 2 l/h Daily operating time: 5 hours Yearly fuel savings: 3650 litres
Number of beneficiaries	650 persons / 120 families
Presence of renewable energy country programme	No



ENERGY FOR LIFE - BEST PRACTICE AWARD 2011

System / Location

Green water supply system / Cheung Ko, Cambodia

LEGAL FRAMEWORK

Unlike rural electrification, the national government of Cambodia has not set any target for rural water supply in Cambodia. As a consequence, programmes involving loans or grants in this field have not been implemented at national level yet. NGOs or private entrepreneurs have initiated the existing projects.

The Green water supply project in Cheung Kok village received approvals at the communal and provincial level but with no financial contribution. The initiative has been taken following an observation in the village and a survey among the inhabitants to assess the situation and needs.

FEASIBILITY, SUSTAINABILITY AND REPLICABILITY

Easy access to water is a priority for rural populations in Cambodia. Since the target areas are more or less areas that are not connected to the national grid, the only alternative for drawing water is a diesel powered pump. Depending on the location and the fuel cost, a breakeven of 4 to 6 years can be achieved with solar pumping systems. Considering the lifetime of the equipment in a solar pumping system (solar panels: minimum 20 years; solar pump: up to 10 years depending on the water quality), the fact that no energy storage / batteries are required (the pump is working when the sun is shining), and the many advantages versus diesel pumps (less operation costs, less maintenance, no noise, no fumes, no wastes), it makes a lot of sense to opt for the solar solution.

After the installation, a village committee has been created and two villagers chosen by the committee have been trained to perform the management, operation and maintenance of the water supply system. Main tasks are to look after the infrastructures, repair piping network if necessary, read water meters and collect the money from each household monthly. The price of water, 0.125 USD/m³, has been calculated to cover the salaries of the two employees, the maintenance and operation costs and the replacement cost of the pump within 5 years. The replacement cost of the solar panels has not been accounted as the village is expected to be connected to the national grid before the end of life of the solar panels. So far, the initial expectations have been met and no additional investments were required: the water pays for itself and the project is well managed by the community.

SOCIAL IMPACTS

The impacts of the project have been assessed for 3 years now. To sum up, the water supply system has changed the life of this 650 people village. Income generation activities requiring fair quantities of water have been developed by several families: pig raising and gardening. The time spent to collect and carry back water can now be allocated to other activities. Personal hygiene of the inhabitants has improved: they are now able to shower at home while before they had to do it at the communal well (Cambodian women are very prudish...). In 3 years, almost 20 households have built latrines so they do not have to relieve themselves in the rice fields anymore.

Finally, this community managed project helps develop relationships and gives responsibilities at village level. Decisions are taken collectively by a village committee that was created to control the water supply activity.

FINANCING AND FINANCIAL IMPACT

Water in Cheung Kok village is very cheap compared to prices offered in cities (minimum 0.25 USD/m³). The financial scheme makes the project sustainable because it has been 100% subsidized in order to make water affordable even for the poorest. It actually benefitted from a law ("loi Oudin-Santini") passed by the French government to promote North-South cooperation in the area of water and sanitation. This law enables French communes or French water state agencies to allocate up to 1% of their budget for water supply to emergency, solidarity and development water and sanitation projects. Beneficiaries were asked to pay for piping and accessories within their property and a piece of land has been offered to build the well and the elevated water tank. Villagers were also involved for digging trenches and to install piping. The financial management of the operation of the project is now fully under control of the water committee.

Similarly to rural electrification, water is not affordable without the contribution of the public sector (government, NGOs or North-South cooperation grants). A public-private partnership could possibly be implemented as a compromise to a fully subsidized solution. An adequate model would then be a public investment for its fixed assets (well + elevated water tank + piping network), and a private investment for its movable assets (solar water pumping system), with the private side in charge of the operation and maintenance of the water supply system.

The initial investment needed for this project was basically 50 USD per inhabitant. It enables a community access to cheap, fossil fuel free water for a very long period, and has numerous positive impacts on the development of this community (i.e. incomes generating activities, hygiene). As a reference, a family can earn 2000 USD in 6 months with a 10 pig farm...

ADDED VALUE

Following a survey in the village, it was realized that the water supply system has proven to be particularly beneficial for old disabled people who are living alone. Since they were not able to carry water from the nearest well to their house, they had to ask younger people to do it instead and often had to pay for this service! Now that this project has been implemented, they are not only pleased because they have access to water directly in their home, but also because they are actually saving money.

