Promoting solar PV for poverty reduction in Bangladesh

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Promotion du photovoltaïque et reduction de la pauvreté au Bangladesh
Près de 80 % de la population du Bangladesh vit dans des villages. La majorité de cette population n'a pas accès à l'électricité. Grameen Shakti a joué un rôle de pionnier dans le domaine des énergies renouvelables au Bangladesh en diffusant des systèmes solaires photovoltaïques par le biais d'un financement adapté aux moyens de population à très bas revenu. L'électrification a permis de générer des emplois, favoriser l'éducation et les moyens de communication. Les conditions pour une large diffusion existent ce qui contribuerait à accroître l'impact sur la réduction de la pauvreté au sein des communautés villageoises.

Introduction

About 80% of the people in Bangladesh live in villages where the main source of income is agriculture. Most of these people are deprived of electricity, which is a necessity in today's life. Getting grid electricity to these villages has proved to be beyond their reach, thus making it much more reasonable to turn to renewable energy (which is available in abundance and cheaper) for electrification. Grameen Shakti (GS), the pioneer of renewable energy technology in Bangladesh, has worked tirelessly, and through a soft credit facility it has managed to bring solar electricity to these villages. GS emerged out of the Grameen family of companies in 1996. To date, GS has managed to install more than 8032 *solar home systems* (SHS) up to mid-April 2002 with a capacity of 400 kWp which provide electricity produced from sunlight.

There are mainly four components in a Solar Home System:

- solar panel: converts sunlight into electricity
- battery: stores the electricity
- charge controller: regulates charging and discharging of battery, and
- appliances: different types of electric appliances such as lamp, television, DC fan, mobile phone, computer, etc.
- other electric components: cables, cable clips, switches, switch boards etc.

These installations have completely changed the way of life in these villages.

Targeted areas

Bangladesh receives about 300 clear sunny days per year, and this is enough to produce an enormous amount of solar energy in a sustainable way. For this reason, venturing into SHS was a major step forward in the right direction. To develop the photovoltaic (PV) technology, GS targeted two types of areas:

- those with no current access to conventional electricity and which did not expect to have any access in the near future
- areas with low coverage by the Rural Electrification Board.

An increasing number of unit offices have been set up by Grameen Shakti, and there are currently 47 offices sited in Tangail, Mymensingh, Sherpur, Comilla, Motlob, Sylhet, Chittagong, Cox's Bazar, Bandarban, Noakhali, Khulna, Sathkhira, Morelganj, Patuakhali, Barguna and Panchagar areas. An in-house research and development department is complemented by a workshop to implement improvements. Most of the items used in PV technology (charge regulators, ballast, lamp holders etc), are manufactured within the GS workshop.

Figure 1 A fishing boat illuminated by solar power

Economic benefits

Increased use of PV technology in Bangladesh has lead directly to:

- improved rural economy by creating new jobs.
- a major new Bangladesh industry employing people to disseminate and implement the PV technology.
- reduced dependence on imported oil (kerosene/diesel) through the introduction of PV to charge the solar batteries and to light solar lamps at home.

Sustainable use of SHS

Solar energy has produced economic benefits including both self-employment and increased manpower hours. Rural people have realized that, with electricity at their disposal, there is a lot more that can be done to improve their welfare, education, agricultural production, to mention but a few. For example, new jobs have been created where technicians have been trained to

Figure 2 A tailoring shop doing business by solar-powered

Figure 3 A barber's shop under solar light

provide after-sales services to the customer, and educate the customer on how to operate and maintain the SHSs. Another example is the employing of more staff by small businesses, because of the extra hours they are able to put into the businesses after sunset. Teachers are also able to earn more money by providing after school lessons to students who can afford them.

Dissemination of PV technology

A programme run entirely by GS to sell, install, and provide after-sales services to the rural poor through a soft credit facility has turned out to be a very successful way of bringing much-needed electricity to the rural people. To popularize the PV technology, GS regularly organizes demonstration meetings in market places, schools/colleges and in the villages. Posters, leaflets, and brochures are also occasionally distributed to enhance the awareness of this technology.

Poverty reduction activities

Not only has GS helped in bringing electricity to rural people, but it has also helped in reducing poverty among them by allowing:

- business opportunities to spring up
- businesses to open till late in the night
- children to attend extra lessons after school hours
- engagement in extra activities, e.g. mobile phone charging shops, providing neon light traps for attracting and destroying insects, social TV halls, etc.

SHS success

When SHS got introduced in the rural areas, it turned out to be an opportunity for the villagers to open up small businesses like mobile phone charging shops, computer training centers, TV halls and mobile shops. The mobile phone shops have turned out to be a big success story that is yet to be told. In remote areas where electricity has previously been unknown, people are able to charge their mobile phones using the PV module purchased through a soft credit facility provided by GS. The shop owners also charge a small amount of money for receiving and making calls from their telephones.

Business takes advantage of SHS

People in the rural areas never thought it was possible to open up businesses that stayed open late until after the introduction of solar home systems. Today, most of the businesses stay open late in order to catch the late evening shoppers. A good example is a carpentry workshop that is able to increase its order book because it can open late and meet increasing customer demand.

PV technology brings IT to the people

In the rural areas a lot of students and other potential learners are deprived of the advanced education available to those in the towns. To address this need, GS is establishing computer education centres in rural and remote places to educate information technology professionals. GS has, to date, established eight-computer education centres in Kutubdia a remote island in the Bay of Bengal, Shakhipur, Kalihati, Patharghata, Dacop, Paikgasa, Cox's Bazar and Moheshkhali. With this education, students may improve the quality of their own lives as well as the community. At the same time they can make great contribution to the economy.

Improved quality of life

Before the introduction of SHS, families spent a lot of time by walking long distances looking for kerosene in order to have a small amount of light provided by the rather dangerous kerosene lamp. Today, all the families with SHS are able to utilize this time in a more positive way. Some examples of this are:

- women are now involved in women's empowerment activities, including fish farming, poultry farming
- men are now more involved in income generating activities e.g. fishing, river transportation.

Conclusion

Bangladesh is a country with enough solar radiation to provide potential for sustaining SHS projects. It is therefore a positive step forward to involve rural communities directly in SHS activities because this is the only guaranteed way of reducing (if not eliminating) poverty among these communities.

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Figure 4 Installing a solar home system

Figure 5 Solar systems make television accessible