SOLAR POWER TO EMPOWER

A Case Study of Barefoot College
Village Tilonia, District Ajmer, Rajasthan

At A Glance

Location
Barefoot College, Village Tilonia
District Ajmer, Rajasthan, India

Number of Beneficiaries
0.9 Million People

Implementing Agency
Barefoot College

Funding Agencies
Ministry of New & Renewable Energy (MNRE) and Indian Renewable Energy Development Agency Limited (IREDA)

Technical Support
Indian Technical & Economical Cooperation (ITEC) with United Nations Economic & Social Commission for Asia & Pacific (UNESCAP)

The Barefoot College has been pioneering solar electrification in rural, remote, non-electrified villages, since 1972. The institute comes under Tilonia Gram Panchayat of Kishangarh Block in Ajmer District of Rajasthan.

Respecting the traditional knowledge and needs of the local population, Barefoot College adopted an innovative approach. The approach involved, using local skills to achieve people-centric and participatory development that is sustainable, rather than neglecting the local population by using knowledge external experts. The approach followed by Barefoot for rural solar electrification has been replicated across 751 villages in 16 states of India and 20 other underdeveloped countries. Nearly 2 Lakh (0.2 million), people have been provided with clean energy and electricity across the globe. Collective efforts have benefited at least 8,96,000 men, women and children worldwide.

OVERVIEW

The Barefoot college started with the modest beginning of 145 Watt mini solar power plant has now became first fully solar electrified campus (80,000 square feet area) located in rural India. What makes all the interventions unique is that all the installations are being carried out by "Barefoot Solar Engineers" who are either illiterate or semi-literate men and women. The college has demystified solar technology and is decentralizing its application by making it available to poor and neglected communities.

Partners

The main funding sources are the Ministry of New & Renewable Energy (MNRE) and Indian Renewable Energy Development Agency Limited (IREDA). The technical support is being provided by The Indian Technical and Economical Cooperation (ITEC) with United Nations Economic and Social Commission for Asia and Pacific. (UNESCAP).

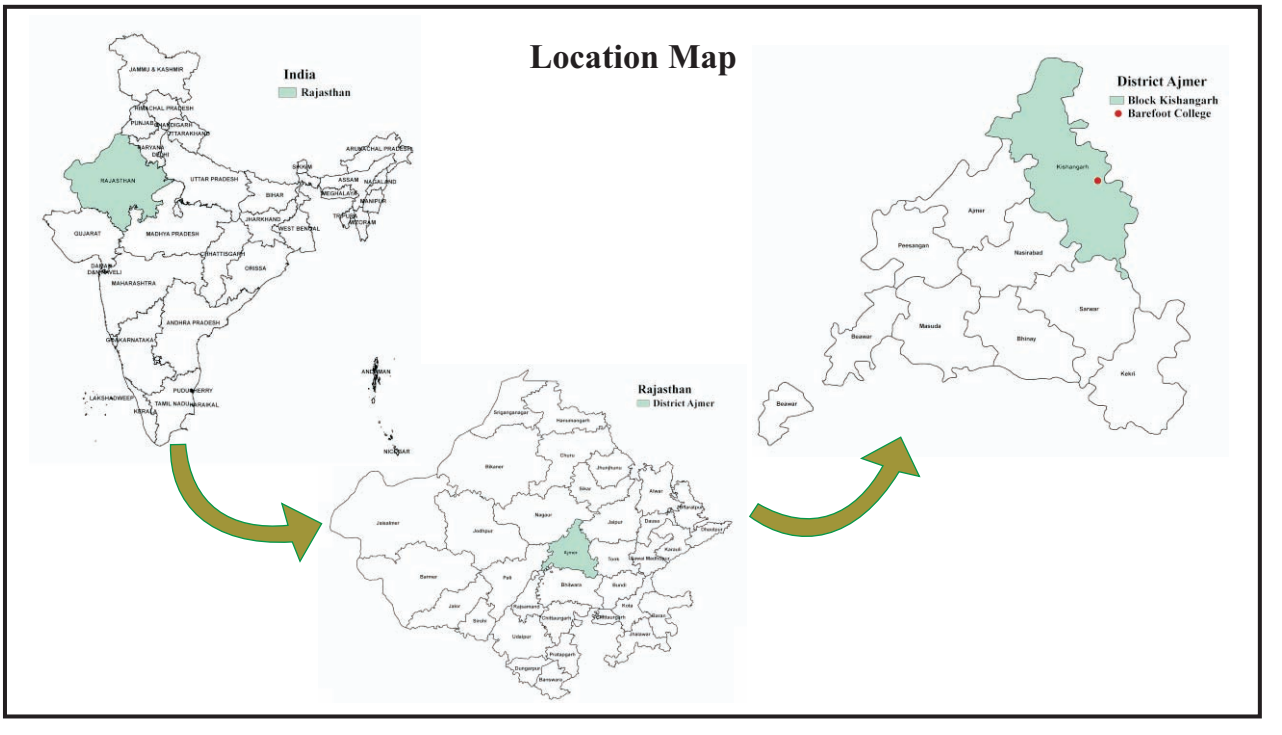
'Demystification' of solar technology is – putting the fabrication, installation, repair and maintenance in the hands of the semi-literate rural men and women thus making the solar electrified villages technically and financially self sufficient

Process and approach

The approach followed by the Barefoot College for rural solar electrification is unique. Only those villages that are inaccessible, remote and non-electrified are considered for solar electrification. The process starts with the orientation of community members on solar lighting and its benefits. A consultation takes place between the community members and 'Village Environment Energy Committee' (VEEC) to map needs, aspirations and willingness of the village community towards the responsibilities that need to be assumed during the project implementation.

The VECC essentially prepares the village community to take responsibility and ownership of solar units introduced in the village. It consults the village community to identify the households that are interested in acquiring solar lighting units. The institute provides a choice between two kinds of solar lighting units – Fixed Home Lighting Systems and Solar Lanterns.

As part of the decentralization and demystification process, the college imparts training on leadership qualities and willingness to work for the village as 'Barefoot Solar Engineers' (BSEs), to the community members, who essentially have a low economic status. A 'Rural Electronic Workshop (REW) is also set up by the trained BSEs in the village to install, repair, and maintain solar lighting units.



Business model

Each household that desires to obtain solar lighting system needs to pay an affordable contribution every month, irrespective of their economic status. This ensures that even the poorest of the poor can have a sense of ownership towards their unit and take care of it. The VEEC is responsible for making sure that the BSEs install, repair and maintain all the solar units properly.

The monthly fee to be paid by each electrified household is determined on the basis of the amount a family spends on kerosene, candles, torch batteries and wood for lighting every month.

OUTCOME

The Barefoot college has harnessed solar energy not only to provide electricity for domestic use but also to create employment, to save the environment by reducing carbon emission, to prevent millions of litres of kerosene from polluting the atmosphere and to conserve thousands of trees from being cut for energy generation purposes.

The college also provides the basic services and solutions to solve various problems of rural communities - like drinking water, education of women, health and sanitation, rural employment, income generation, electricity as well as social awareness and conservation of ecological systems.

Socio-economic changes

Education & skill development

Introduction of solar lighting units in rural communities has helped children to study even after dark. More than 50,000 children in India are attending Barefoot Night Schools after sunset (as they work at home and herd livestock during the day).

The very belief that educational qualification is not a barrier for picking up practical skills, and serving communities makes Barefoot college's every initiative unique. Infact, this is reflected in the selection of community members to be trained as Barefoot Solar Engineers.

Jobs created

The illiterate men and women irrespective of their age are being trained to work as school teachers, doctors, midwives, dentists, health workers, solar engineers, water drillers, hand pump mechanics, architects, artisans, designers, masons, communicators, water testers, phone operators, blacksmiths, carpenters, computer instructors and accountants.

As of May 2010, 480 people have been trained as Barefoot Solar Engineers (BSEs), of whom 230 are women. These BSEs have fabricated, installed, repaired and maintained nearly 16,000 fixed solar units and 9,762 solar lanterns across 16 states of India and 20 of the least developed countries like Afghanistan, Bhutan, Cameroon and Kenya etc.

Gender concerns

With the advent of the Barefoot movement, most of the village women have started studying and working, which has addressed the problem of the gender discrimination. Employment (after training) has made women financially independent.

Women who used to spend hours in fetching water and collecting fuel wood can now spend quality time doing other productive work with the installation of nearly 16,000 solar units and construction of more than 1500 rain water harvesting structures.

Environmental changes

Barefoot College has been applying solar energy as an alternative source of lighting (solar home lighting units), heating (solar water heaters), cooking (parabolic solar cookers) and drinking water (solar powered desalination plant) since its inception.

Preference to physically challenged people was given to boost confidence in them

Rural Electronic Workshop

The collective efforts of many illiterate and semi-literate rural men and women, have managed to save more than 30,000 litres of kerosene per month from polluting the atmosphere and have reduced the drudgery of women across 3 continents. The total carbon emissions reduction from 1986 to 2008 is estimated to be nearly 1.86 millions tonnes annually.

LESSONS LEARNT

- Difficult and varied social beliefs of the village communities posed a major challenge in terms of handling the dominating families of the big and powerful local politicians. Dominance of a few families was nullified by creating space for all the households to have their say on every social issue.
- Checking the migration to cities was handled by providing sustainable livelihood opportunities in the village itself, like repairing work, marble work and other local services.

Rural women serving as Barefoot solar engineers

WAY FORWARD

The Barefoot College has the vision of evolving a global solar village by creating sustainable livelihoods for the rural communities (especially for rural women) by converting renewable technologies into trades. The community managed, controlled and owned approach adopted by the Barefoot College is innovative and ensures the complete participation of the rural community and therefore can be replicated to other areas.

HIGHLIGHTS

- Barefoot College Campus meets its energy needs through 50 kilowatt solar modules with 5 battery banks.
- Estimated cost of one unit of power generation is INR 11.
- Nearly 16,000 solar units and 1500 rain water harvesting structures have been established.
- Total carbon emission reduction from 1986 to 2008 is 1.86 millions tones per year.
- A community radio and digital empowerment foundation have been established by the college.
- The college has set up the Women Barefoot Solar Cooker Engineers Society (WBSCES) in Tilonia. It is the first association of illiterate and semi-literate women who can independently fabricate, install and maintain 2.5 square metre parabolic solar cookers.
- In September 2006, college established India's first ever solar powered reverse osmosis plant for water desalination at a small voluntary organisation called 'Manthan' established in Kotri.

About the Partners

Barefoot College is a non-government organization established in 1972, to provide basic services and solutions to address the problems of the rural communities, with the objective of making them self-sufficient and sustainable. These 'Barefoot solutions' can be broadly categorized into solar energy, water, education, health care, rural handicrafts, people's action, communication, women's empowerment and wasteland development.

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