

# Barefoot “Solar Engineers”

Since 2004, the Barefoot College—located in the rural village of Tilonia in Rajasthan, India—has brought more than 140 women from 15 African nations as well as Bhutan, Afghanistan, and Bolivia to train as “Barefoot solar engineers,” or, more accurately, solar technicians.

Few of the women had ever left their villages or even seen an airplane—much less flown in one. Most did not know how to read or write, and could not speak the local Rajasthan language. Yet, in only six months, the women, both young and old, learned to install, operate, and maintain solar power systems and technologies.

“In six months, how do we change these women? Sign language. You don’t choose the written word. You don’t choose the spoken word. You use sign language,” says Sanjit “Bunker” Roy, who founded the school in 1972.

Bunker was educated at two of India’s finest universities, but instead of pursuing a career in medicine and government as his parents had hoped, then-20-year-old Bunker chose to work as a laborer in remote villages. He observed the people and used what he learned to develop a new approach to education for the poor.

More than four decades of trial and error have given way to his unique process that has inspired the creation of 24 other rural colleges in India. The college is exclusively for the rural poor—and managed with collective decision-making and little hierarchy.

The solar technician program is just one of many training sessions offered. The college prepares “Barefoot professionals” with skills in everything from dentistry and midwifery to accounting and masonry. The college began with a group of urban-educated professionals who taught classes, but

## A Model of Self-Sufficiency

The Barefoot College campus is as impressive as the training being done there, and serves as a shining example of what’s possible with rural electrification. Completed in 1989 at a cost of \$1.50 per square foot, the 30,000-square-foot campus operates in tandem with the college’s original home—a leased, abandoned tuberculosis sanatorium where some classes are still held. Twelve “Barefoot architects” designed and built the 24-building campus over three years.

Designed to be self-sufficient, the new campus runs on various solar technologies. Electricity for computers, lighting, fans, a fridge/freezer, and communications is supplied by a 45-kilowatt PV system. “So long as the sun shines, we’ll have no problem with power,” Bunker says. All of the food served on campus—roughly 60 meals twice a day—is cooked in parabolic solar cookers fabricated by women trained at the college.

Water is harvested on-site from rooftops and stored in a 100,000-gallon underground tank. Today, the college helps other villages, both in India and abroad, implement similar rainwater-harvesting systems.

many would not stay long and returned to the city to make more money. Bunker realized that, if the school were to be sustainable, he needed to train local people to be teachers.

Skills are taught through a system that combines sign language, color codes, and even puppets. “It’s the only college where the teacher is the learner, and the learner is the teacher. And it’s the only college where we don’t give a certificate. You are certified by the community you serve,” he says. “You don’t need a paper to hang on the wall to show that you are an engineer.”

One lesson Bunker learned early on was the importance of women to the sustainability and ultimate success of the college. “Men are restless, men are ambitious, men are compulsively mobile, and they all want a certificate,” Bunker says. “Why? Because they want to leave the village and go to a city, looking for a job. So we came up with a great solution: Train grandmothers.”

Barefoot’s solar program aims “to decentralize and demystify solar technologies” by making them available to remote and non-electrified villages. In an initial meeting, community members are briefed on solar-powered lighting and its benefits. If villagers express the need for solar lighting, then a committee of elders, both men and women, is assembled to manage the program locally and select a few individuals to attend Barefoot College’s six-month training program. The village must also agree to build or donate



Courtesy: Barefoot College (2)

a building for storing the components and equipment needed for repairing and maintaining the solar systems.

Barefoot's program requires every member's family to make a small donation every month. This, according to Barefoot's methodology, is so that even the poorest of the poor can feel a sense of ownership.

Upon completion of the training, the technicians can install integrated circuit boards for solar lights and 500 W off-grid solar systems. They can also assemble simple solar lanterns, as well as parabolic solar cookers and solar water heaters.

The true success of the college can be measured best by the people and their accomplishments—like the two illiterate women from Gambia who used their training to install solar lighting systems to serve all the homes in their communities. Then, there are the three women who traveled from Afghanistan with their husbands and returned home to train 27 more women to bring solar electricity to 100 villages. One of the women—a 55-year-old grandmother—"actually went and spoke to an engineering department in Afghanistan and told the head of the department the difference between AC and DC. He didn't know," Bunker says.

—Kelly Davidson



## web extra

As a nongovernmental organization, Barefoot College relies largely on donations and grants. Bunker hopes to bring women from other countries to train as Barefoot professionals. To learn more, visit [www.barefootcollege.org](http://www.barefootcollege.org).



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