

India's Super Solar Grannies

Source: wearesalt.org

Published: October 19, 2015



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By [David W. Smith](#)

Grandmothers in rural areas are quashing stereotypes and becoming solar engineers to help solve India's energy issues, writes David W. Smith

At first, Indian villagers are bemused by the vision of Indian grandmothers climbing on to roofs carrying toolkits and solar panels. There are sniggers from youngsters as though the solar mamas are India's answer to Monty Python's Hell's Grannies. Indian grandmothers are not supposed to be solar engineers. They have always been cooks, childminders and dispensers of homespun wisdom. So what are they doing carrying out technical installations beyond the ken of men decades younger?

But the "solar mamas" are well trained and highly professional. They have learned everything they need to know about solar panels on a six-month course at Barefoot College in Rajasthan. And the role they will play is critical in providing the energy supplies that allow remote areas of the developing world to surmount grinding poverty. In India, 320 million people remain unconnected to the grid and the figure for the whole world is 1.6 billion. These rural households rely on inadequate sources of energy such as candles and kerosene.

“These women have been written off in their communities as past their prime,” says Megan Fallone, head of global strategy and development at the Barefoot College. “They’ve never had a formal education so what could they possibly contribute beyond watching children and cooking and cleaning? But our model is about giving the least likely person the most responsibility. There’s an element of social justice as it’s empowering for them, but it’s also empowering for the whole community.”

Go granny

The grandmothers are perfectly placed to act as environmental stewards. Barefoot College realised long ago that it was pointless training men to install panels as they would invariably leave for the city. But the grandmothers stay embedded in the community and pass on their knowledge about sustainability to the next generation.

Bunker Roy founded Barefoot College in 1972 to help rural communities become more self-sufficient. There are Barefoot solutions for solar electrification, clean water, education, livelihood development, and activism. The illiterate solar mamas are trained from scratch to identify and code ‘colours’ using a local language for electricity system and tools. On completion of the course, their skills are impressive. They understand how resistors and electrical devices work. They can also handle charge controllers and advanced converters, as well as install solar panels and link them to batteries. And they are able to build solar lanterns and construct local electronic workshops where they carry out repairs.

International movement

The solar project started in India; since 1989, Barefoot College’s solar electrification programme has trained over 700 illiterate and semi-literate women as Barefoot Solar Engineers (BSE). Collectively, they have electrified 50,000 rural households in around 1,400 villages in 64 countries across Latin and South America, Africa, the Middle East and Asia to cover 600,000 people. Each solar mama fabricates, installs and maintains the systems for 50 households. Villages are divided into sets of 100 and two women work together. The solar mamas are also trained to train others. On average, each one teaches three other people to do the work. “If you asked the young men in the village, ‘would you want to be taught something by your grandmother?’, they would say ‘no way, my grandma has nothing to teach me’ and laugh,” says Fallone. “But the minute they see the solar mamas doing something they never imagined they could do, they feel able to do it themselves.”

Funding for the Barefoot College programmes comes from many sources, including the Government of India and the UN Development Programme. But the villagers also have to contribute financially. “We ask them to replace what they spend on candles, kerosene, batteries and other forms of lighting and charging for mobiles. Sums are democratically agreed in the community and 30 per cent of the contribution pays the solar mama’s wages. She returns to the community as a professional and deserves to be paid,” says Fallone.

A number of private companies are also selling solar power models to rural India. There are various business models. One of the most prominent is Simpa Energy, which has sold its pay-as-

you-go model to tens of thousands of Indians. Customers use their mobile phones to purchase an access code that they punch into a small box connected to solar panels on their houses. Within seconds, a bright LED light illuminates the room. Eventually, the customer pays for the system outright and power is free.

OMC Power has a different approach. The company builds mini solar power plants that charge everything from large cell phone towers to hundreds of small battery-powered LED lanterns. Each day, OMC delivers charged-up lanterns to customers, and then returns the following morning to pick up the lanterns for recharge.

Selco is another company offering loan instalments for solar systems that are comparable to monthly outgoings on kerosene and candles. After the initial expense, customers pay around US\$3 a year in maintenance and every six years they pay for a new battery. Once the instalments on the loan are paid, they become asset owners.

Founder Harish Hande says: “They become less of a credit risk for the banks and can take out loans for other assets such as sewing machines. This decentralised solar model makes sense because it works by leapfrogging the centralised power generation. It democratises choice, energy and innovation. It gives the poor the chance to become micro-entrepreneurs.”

Professor Ashok Jhunjhunwala, an engineer at the Indian Institute of Technology Madras at Chennai, says there is no viable alternative for rural communities in India. “Without solar power they will stay below the poverty line. It’s liberating in many ways. It enables children to study properly in good light and adults to see well enough to make things. Electric fans allow people to work longer hours and get more rest and cell phone charging allows people to make calls and access the Internet.”

The Indian Prime Minister Narendra Modi is keen on solar energy and he recently increased India’s 2022 solar energy target five times from 20 to 100 gigawatts (GW). International companies are jumping at the opportunities. For instance, US-based SunEdison is planning to install more than 10GW of solar power in India in the next seven years, including a US\$4 billion solar equipment factory. Meanwhile, India’s Adani Power has agreed to set up the country’s largest solar park, a 10GW facility in Rajasthan.

But most of this solar power will be transferred into the national grid. It’s not the democratised model Harish Hande speaks about. To achieve that on a mass scale, he says India needs to use its 20,000 vocational schools to teach the same techniques used by the solar mamas.

“The government can create an ecosystem that would create a solar revolution through local financial mechanisms and education. Right now everyone is still too fascinated by the national grid, which temporarily solves issue of power but not the issue of poverty. That’s what we can solve using solar.”

Professor Ashok Jhunjhunwala is confident that India can achieve the transformation it needs. “The government, NGOs and the private sector will do it together. To date the numbers of solar installations is relatively small, in the hundreds of thousands. But I am optimistic that through

solar power we will see rural areas moving away from poverty to a different, more positive mindset within a decade.”
