

PROJECT

by Adarsha Shivakumar



Changing the World, One **Seedling** at a Time

Every summer, my sister, Apoorva, and I visit our grandparents on their farm in south India, in a village near Hunsur. Over the years, we started to notice a disturbing trend: there were fewer and fewer trees, and, despite back-breaking work, farmers continued to live in poverty.

ISTOCKPHOTO

JATROPHA



Many farmers in south India grow tobacco, the only crop valuable enough to earn them a living. But it comes with significant environmental costs: Before being exported, tobacco must be cured, which involves hanging the leaves in a barn heated by wood-burning kilns. Not only does this process generate a lot of pollution, but because firewood is scarce, farmers rely on wood illegally harvested from Nagarhole National Park, a sanctuary for diverse wildlife including Asian elephants and tigers.

Tobacco farming leads to pollution, degradation of resources, and loss of habitat—and still the farmers are poor.

We knew there had to be a better way.

Seeds of Sustainability

Biofuels started attracting a lot of attention around 2006. During this time, concerned about both global warming and a looming

energy crisis, I started reading about various biofuels that might fulfill the growing demand for oil in China and India. In addition to corn ethanol and sugarcane-based biofuels, I learned about *Jatropha curcas*, a small perennial shrub that produces inedible, oil-rich seeds. *Jatropha* can grow even in marginal soil with little water and fertilizer. *Jatropha* biodiesel was already in use in India, so there was a ready market.

Jatropha helps replenish depleted soil, and its roots hold soil together and prevent erosion. In addition, two *Jatropha* plants can absorb a metric ton of carbon dioxide each year, while producing seeds that yield a cleaner-burning fuel than fossil fuels. I realized that by growing *Jatropha*, farmers could make money without depleting the environment.

Apoorva and I envisioned supplying the farmers near our grandparents' village with *Jatropha* seedlings—and a way out of poverty.

Left: The Project *Jatropha* team—Apoorva Rangan, Adarsha Shivakumar, and Callie Roberts—hold their Gold Service Awards from Teens for Planet Earth.

Right: *Jatropha curcas* is a perennial shrub that produces oil-rich, non-edible seeds.



Growing Roots

In the summer of 2007, we visited villages near Hunsur to see the work done by Parivarthana, a non-governmental organization that helps the rural poor by teaching them the mechanics of sustainable agriculture and by organizing women's self-help groups (SHGs) that allow women to save, lend, and borrow money. We hoped Parivarthana could help us identify farmers who might want to grow Jatropha and also help us carry out the project. During one visit, we met Mr. Rajegowda, secretary of Parivarthana. After we returned to California, we stayed in touch with him, eventually sharing our formal plan for Project Jatropha. Parivarthana agreed to partner with us.

Next, we needed to find a source of seedlings. My father suggested Labland Biotech, a company that had developed cultivation techniques for Jatropha specific to India's climate. During the summer of 2008, we visited Labland Biotech and met the CEO, Dr. Sudheer Shetty, to discuss our project. In the end, Labland Biotech agreed to partner with us and Parivarthana, committing to process the Jatropha seeds produced by farmers.

That summer, with the help of Parivarthana staff, we held several townhall meetings with villagers, explaining that we would provide high quality Jatropha seedlings, training on how to cultivate them at Labland Biotech, and funding to defray the cost of raising the seedlings for two years. After two years, we would purchase the farmers' seeds at market price.

With several motivated farmers on board, we negotiated with Labland Biotech for a price of 6 rupees, or 12 U.S. cents, per seedling. Using prize money I'd won in the California Spelling Bee, we bought and distributed 1,000 seedlings to leaders of five SHGs. Labland Biotech would train farmer leaders and field workers from Parivarthana, who would then teach the cultivation methods to members of the SHGs.

When we returned to India in December 2008, we took several SHG leaders and interested farmers from three villages to Labland Biotech's biofuel production facility. There, we saw the conversion of one quintal (100 kilograms, or 220 pounds) of dry Jatropha seeds into approximately 35 liters of biofuel, which we later distributed to the SHG members. They used the biofuel to run their irrigation pumps, later reporting that the pumps ran smoothly while producing little smoke.

We held more townhall meetings, convincing more than 50 farmers from two more villages to take part in the second phase of our project. We also visited local high schools and asked students to help us educate and motivate farmers, distribute seedlings, coordinate our efforts with the SHGs, and spread the word about Project Jatropha. We held a press conference in Mysore and gave a presentation at the Rotary Club of Hunsur. And we visited the plantation of the five farmer leaders who participated in the first phase of our project. Their seedlings, now over eight months old, were healthy and growing well. Project Jatropha had taken root.

Using prize money I'd won in the California Spelling Bee, we bought and distributed 1,000 seedlings to leaders of five SHGs. Labland Biotech would train farmer leaders and field workers from Parivarthana, who would then teach the cultivation methods to members of the SHGs.



Serendipity & Success

Phase II of Project Jatropha is now well under way. We have distributed an additional 12,000 Jatropha seedlings to farmers.

Our budget for this phase dwarfs the \$650 we spent in Phase I: We need \$13,875 over two years (2009-10). Apoorva, in the role of financial director, started looking for funding sources. Members of our advisory committee directed us to potential donors, and family and friends have donated generously. Perhaps the most significant contribution came from an 85-year-old woman from a village near my grandparents, who gave Apoorva 50 rupees (approximately one U.S. dollar) along with a blessing—that the project would help many poor farmers like herself.

By 2008, we knew we needed help, especially with fundraising, so we invited our schoolmate Callie Roberts to become our financial co-director. Callie suggested that we apply for nonprofit status to attract more donors. The biggest obstacle, we soon found out, was our ages. We couldn't even establish a bank account.

Then we had a stroke of good luck. I got an e-mail from Ms. Michelle Lacourciere, the director of Sirona Cares, a sister organization of San Francisco-based biofuel company Sirona Fuels. She had seen our website and press kit, and was interested in partnering with us. Sirona Cares was starting a

similar project in Haiti and wanted to expand their work to rural India. It was a perfect fit.

When we met their staff and gave a presentation, I took that opportunity to ask for help with applying for nonprofit status. They happily sponsored this effort, and Project Jatropha has attained a 501(c)(3) nonprofit status. This will help us enormously, as donations to our organization are now tax-exempt.

Meanwhile, in the Hunsur area of India, Project Jatropha has become famous. Farmers are approaching Parivarthana staff and asking to participate, but we have limited funds to include more farmers. My vision for Phase III is to establish a Jatropha nursery where farmers will have access to an unlimited supply of seedlings.

Project Jatropha has started on a small scale, but I hope it is the beginning of a mass movement in which farmers collaborate with the environmentally conscious youth who will inherit this planet. **i**



Adarsha Shivakumar is a sophomore at the College Preparatory School in Oakland, CA. He likes swimming, all things science, racquetball, transhumanism, and playing video games with his friends.

Left: A jatropha plant starts producing seeds in its first year. In its fifth year and beyond, the plant will produce four to six kilograms of seeds a year.

Right: The Project Jatropha team enlisted the support of local farmers and women's self-help groups to get the project running.

For more information about Project Jatropha, visit <http://projectjatropha.com>