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Ingenious use of indigenous tree reaps award

Roy Environmental Award goes to international partnership

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Livinus Manyanga of Kakute Ltd. discusses the use of jatropha oil for energy.
Staff photo Dominick Reuter/Harvard News Office

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The jatropha tree is a humble — some might even say homely — plant, with large, maple-like leaves and clusters of inedible fruit that, when mature, look too brown and shriveled to be of much use to anyone. But to thousands of rural eastern and southern Africans, the jatropha is a beautiful thing. It represents hope that they'll someday have electric lamps to light their homes, refrigerators to keep medicines and vaccines cold in local clinics, and computers and telephones in the schools and orphanages — hope for sustainable energy. And on Tuesday (May 8), the people behind that hope were honored with the 2007 Roy Family Environmental Award in a day of events at the Kennedy School of Government (KSG).

The award, established in 2003 to recognize outstanding efforts by public-private partnerships that enhance environmental quality through novel and creative approaches, is coordinated by the Environmental and Natural Resources Program of KSG's Belfer Center for Science and International Affairs. The prize this year went to HSREA, a partnership between German solar technology provider Energiebau Solarstromsysteme and InWEnt-Capacity Building International, a German nonprofit with expertise in human resources development, along with their African colleagues, including the technology-training company Kakute in Tanzania, the Vincentian Sisters of Mbinga, Tanzania, and RENERG (Renewable Energy) Ghana.

The jatropha has been known among Africans for many years. The Masai use it as a natural fence to protect crops, and as early as 1992 Kakute was promoting the commercial use of its viscous oil among women's groups for soap-making. But it wasn't until 2003 that the German companies came on board to bring the technology that wed jatropha oil's properties as a biofuel to solar power, creating a mini-grid system that can provide 24-hour-a-day power to rural communities.

Several visitors from Germany and Africa showed a short film and spoke about the system at a lunch seminar in Belfer's Bell Hall prior to a forum talk given by U.N. Environment Programme director Achim Steiner on a related topic — "Earth Out of Balance: Rethinking Global Environmental Security" — and an award ceremony dinner that evening.

Before the jatropha oil-solar power system was introduced, villagers had little or no electricity in their homes and schools, instead using expensive and dangerous kerosene lamps for light only when it was absolutely necessary. Diesel-fueled generators offered the small towns some electric power, but were too expensive to maintain. The new system combines diesel generators modified to run on the jatropha oil, along with standard solar panels, offering efficiency and flexibility. It is currently being used in six projects, the largest being the convent and girls' boarding school run by the Vincentian Sisters in Mbinga.

“We were asked to participate because our congregation is very big now, with four dioceses and 18 convents,” said Sister Kaja Peric, who led the pilot hybrid-system project that now provides electricity to 150 people and 12 buildings, including a school, an orphanage, and a clinic. “We started planting the trees three years ago, with help from the villagers and the students, and now we have 70,000 of them. I think it will be very, very good, this planting. Before we planted, we had to remove all the thorns, bushes, and so on. Now it looks much nicer.”

But Sister Peric is sold on jatropha’s many benefits beyond straightening up the fields. Because it’s native to these parts of Africa, the trees thrive in arid soil and allow for the simultaneous cultivation of food crops like soy, mace, and hops. When planted around a field’s perimeter, they help to keep animals away, and the biofuel production process results in a byproduct that acts as a powerful fertilizer.

Villagers benefit directly from the increased availability of inexpensive electrical power. “It can liberate rural people by making more time available to do things at night,” Barnabas Mawire, a branch manager of Environment Africa, said in a short film shown during the lunch meeting. But the mini-grid system can also have a strong impact on local economies: Not only does cultivation make extra money for farms both big and small, but every system employs two full-time maintenance workers and, perhaps most important, the increased energy resources allow for metalworking and other factories to move in, creating jobs for men and women.

The hope of all participants is that the mini-grid system will be expanded — but “until our project, there was no interest on the part of the government,” said Sister Peric. “Now, they have discussed it in Parliament. We tried first and then they came to see if it worked.”

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