PI·TECH

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IITs go Golden

Chandrayaan 1:
India Goes to the Moon

Innovation and
Entrepreneurship at IITs

MIT Dean Subra Suresh on tomorrow's leaders

Narayana Murthy
on Education

Anil K. Rajvanshi

Director of the Nimbkar Agricultural Research Institute (NARI)

Invention of LanStove

Dr. Rajvanshi was the recent recipient of The Globe Sustainability Research Award in Sweden which was given to him for NARI's originality, practicality, and contributions to humanity through economic gains, social development and environmental protection.

What made you choose such a career?

After doing my B.Tech and M.Tech in Mechanical Engineering from IIT Kanpur I went to the US in 1974 to do my Ph.D. in Solar Energy from the University of Florida (UF), Gainesville. After graduation, I taught for another two and a half years at UF. I decided to come back to rural India in 1981 after spending seven years in the US. In those days hardly any IITian ever came back from the US let alone went to rural India. There were many factors that contributed to this decision – my desire to do something useful in renewable energy for rural areas; to do something meaningful in my life; to do something on my own rather than being an employee, and also my arrogance that I could make a difference in rural India. Whether I achieved any or all of these goals is still debatable but the experience has been enriching. Most of these things including my US experiences as a student are written up in my recently released auto biography entitled "1970s America – an Indian Student's Journey" (www.nariphaltan.org/usexp.pdf).

What is NARI's work in renewable energy?

NARI (Nimbkar Agricultural Research Institute) is a NGO in India situated in the rural town of Phaltan in Maharashtra state having a small staff of about 40 people. It was set up in 1968 to do R&D in agriculture. In 1981, when I joined NARI on my return from the US, it started work in renewable energy. Since 1990 it has also been working in animal husbandry. NARI's mission is to use the best tools of science and technology to solve rural problems. In agriculture it has done pioneering work in breeding high yielding varieties of safflower and sweet sorghum. In animal husbandry it has developed high meat yielding sheep and goats. The details of the Institute are at: www.nariphaltan.org

Though small, NARI has done pioneering research work in renewable energy. It was the first to develop sweet sorghum for ethanol production and to set up the world's first pilot plant for solar distillation of ethanol. It pioneered the development of biomass gasifiers that run on loose leafy matter like sugarcane leaves. It also started the work on electric cycle rickshaws. In the early 1990s, NARI originated the concept of energy self-sufficient talukas. This became a national policy and was implemented by the Ministry of New and Renewable Energy (MNRE). This concept later morphed into PURA (Provision of urban Utilities in Rural Areas). Most recently NARI has pioneered the development of cooking and lighting devices running on low grade ethanol. As a result NARI, represented by Dr. Rajvanshi, was awarded the Globe Award 2009 in Stockholm, Sweden in June 2009.

NARI's LanStove provides light and heat for cooking

What was NARI's contribution in developing this technology?

The greatest challenge in developing a low grade ethanol lanstove was to first evaporate the ethanol/water mixture and then to combust it completely so that no Carbon Monoxide emissions would take place. This required very sophisticated heat and mass transfer calculations and device configuration. The flue gases from the lanstove were used to provide a very efficient cook stove by utilizing the principle of a heat pipe. Thus this lanstove could simultaneously produce light and heat for cooking a complete meat for up to six people. The details are given at www.nariphaltan.org/lanstove.pdf