# 'Hooch tech' put to good use by IITian

## Develops stove, lamp that run on ethanol

A woman cooks on an ethanol stove, which was designed by Anil K. Rajvanshi (inset) of the Nimbkar Agricultural Research Institute

By Abhay Vaidya/ TNN

**Pune:** The rudimentary technology which is behind the production of illicit liquor in rural areas could be put to healthy use in meeting the vast demand for lighting and clean fuel for cooking in India's five lakh villages.

Anil K. Rajvanshi, a Phaltan-based IITian who has devoted his life to addressing the energy needs of rural India, has developed an innovative stove and a lamp that works on locally-made 'low concentration ethanol.' This fuel is much cheaper than kerosene and has distinct advantages over biogas, which requires bulky equipment for gas production.

Rajvanshi, who heads the Nimbkar Agricultural Research Institute (Nari) at Phaltan in Satara, received the 2001 Jamnalal Bajaj Foundation award for the use of science and technology in rural development. His institute has pioneered a number of initiatives in agriculture, renewable energy, animal husbandry and sustainable development.

Speaking to TOI, he pointed out that illicit alcohol units in make-shift backyards across the country use rudimentary distillation units to produce alcohol with 40-60 per cent ethanol-water concentration. Taking this into consideration, Nari, developed a cooking stove and a lantern that is fuelled by a 50 per cent ethanol-water concentration.

The large-scale production of this fuel in rural areas, through simple distillation of any sugary biomass such as sugarcane or sweet sorghum, would not only provide a very safe and efficient cooking fuel but also go a long way in reducing the hardship of women who use firewood, biomass or kerosene for cooking.

The misuse of the ethanol concentration for drinking could be prevented by doping the fuel and making it unfit for human consumption.

Field trials by women farm labourers, who did their cooking on wood stoves, were immensely satisfying as they found it very easy to light and run the stove, there was no smoke or smell and the eyes didn't burn.

"Some women who cook on kerosene stove said this stove is much better than the kerosene stove because it is completely silent and no smell comes out after extinguishing it. Some of them also felt that it is much safer than kerosene stove since it requires much less pumping," Rajvanshi said.

Rajvanshi explained that the heart of the stove is the ethanol burner assembly, which allows the ethanol-water stream to evaporate and ethanol to combust. "The burner is designed so that the water in the fuel converts into steam. The resulting flame has no smell and the carbon monoxide emissions near the stove are well within the acceptable range."

While the stove could be mass-produced for Rs 800-1000/ piece, low concentration ethanol could be produced around Rs 16/litre, which is highly affordable as compared to Rs 25/litre for kerosene or Rs 310 per cylinder for LPG.

"There is a need to change government policies so that low-grade ethanol can be made available as a cooking and lighting fuel for household purposes. It will not only improve the quality of life for the rural population but also help in creating wealth in these areas," he said.

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