

Sustainable development for rural poor

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<http://nariphaltan.virtualave.net>

<http://nariphaltan.virtualave.net/ISEStalk.pdf>

Introduction

- **3 billion people earn < \$2/day. Live in primitive conditions.**
- **With increasing exposure to TV and mass media they aspire to “affluent lifestyle” of the West.**
- **Western lifestyle is unsustainable. Yet it provides role model for the developing world. However this lifestyle needs to be changed. Spirituality may help in doing so.**
- **Spirituality is understanding of self. It increases internal security and helps in reduction of greed ⇒ sustainability.**
- **Difficult to impose in a democratic society. Seduction, awareness and education of young needed.**
- **3 billion people cannot wait for the west to change. They need to improve their quality of life now.**

What can be done?

- **Technology intervention can help bring 3 billion poor people in mainstream development process.**
- **We all have responsibility to develop and deploy technologies specially for upliftment of these people.**
- **Helping poor to improve their lives is highest spiritual work.**
- **Tinkering approach has not helped. Need to develop technologies from ground up.**
- **Sophisticated technology needed. It allows very efficient energy and material conversions. Nature's way.**
- **Less resources and low grade energies available in rural areas. Need for high “conversion η ” systems.**
- **Decentralized energies \Rightarrow decentralized society.**

- Three major areas for intervention; Cooking, lighting (75% of total rural household energy in India) and clean drinking water.
- Use of local resources like biomass, solar and wind for end products.
- Increased agr. \Rightarrow increased biomass. Will help in increasing employment.
- Nano and biotechnology as possible solutions.
- **Cooking**
 - high tech biogas digesters with space age storage materials.
 - liquid fuels (ethanol, biodiesel, etc.) from biomass.



Ethanol stove

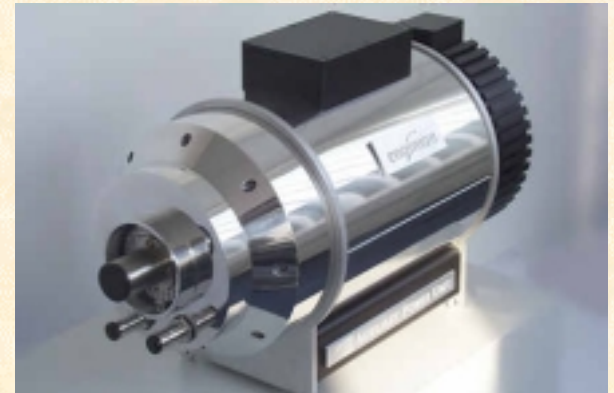
- 50% (w/w) ethanol/water
- Very safe mixture
- $2.5 \text{ kW}_{\text{th}}$ (max); $0.7 \text{ kW}_{\text{th}}$ (min)
- Easy to light and use
- Very silent

Strategy (contd..)

- **Lighting**
 - **Liquid fuel lighting; ethanol/biodiesel**
 - **Can be very efficient with new materials.**
 - **Small steam engine elec. generators.**
 - **Nanoengines with LED lamps.**
 - **High efficiency PV systems.**
 - **Duplication of firefly technology?**
- **Clean water**
 - **Microutilities for simultaneous power and water production.**
 - **Rainwater harvesting.**
 - **Photocatalyst based water purification.**



Multifuel Noorie lantern



6 kW steam electric generator

Conclusions

- **The strategy will help in**
 - **Improving the environment.**
 - **Conserving energy resources. Reduction in world conflict.**
 - **Increasing employment and rural wealth through energy production and downstream processes. \$6 billion/yr. industry.**
 - **Providing huge market for technology providers.**
 - **Bringing the rural poor in mainstream of development.**
- **The rural population have a great strength of being satisfied with few material comforts. It is spirituality.**
- **This strength coupled with high technology to improve their quality of life may provide a new model of sustainable development for the world.**

THANK YOU

- <http://education.vsnl.com/nimbkar/spiritual.html>
 - Book “Nature of Human Thought”. Essays on Technology and Spirituality.
 - <http://nariphaltan.virtualave.net/ISEStalk.pdf>
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