Remote Village Electrification through the Biofuels Route: The WII Experience

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Presentation Contents

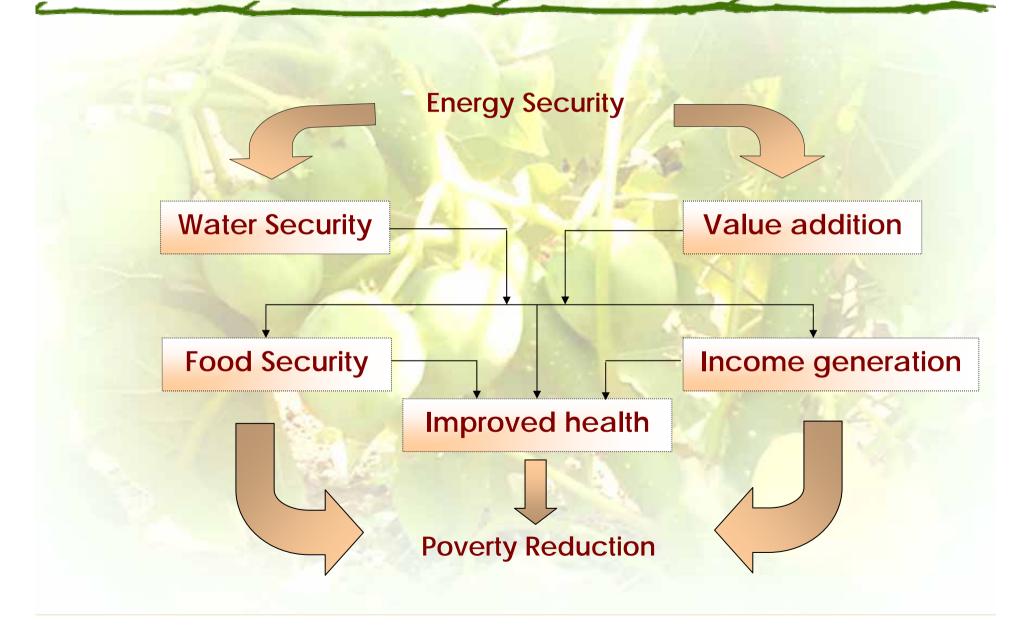
- **○** About WII
- Access to energy an India specific perspective
- **⇒** Bio-fuels as an option for rural energization
- ➡ WII's experience in remote village electrification based on straight-run Jatropha oil

About WII

- An independent, not for profit research organization established in 1998
- Mission: To develop and implement solutions which balance the need for food, income and environmental quality
- Program areas: Energy & Environment; Natural Resource Management & Climate Change
- Staffed by more than 50 professionals drawn from diverse disciplines
- **Affiliated to Winrock International, US**



Access to energy & development



Rural electrification

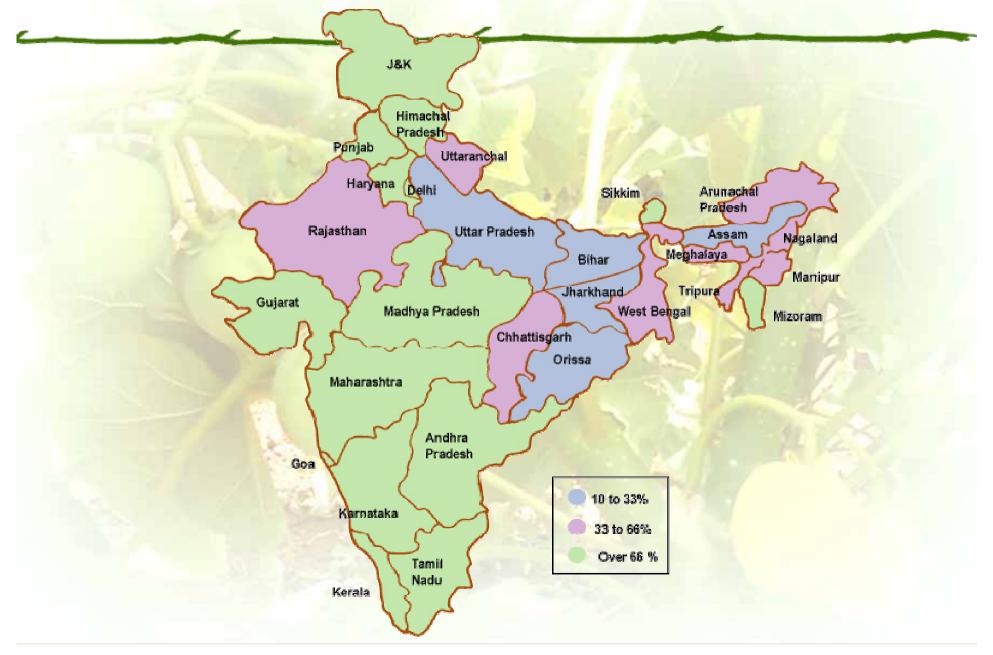
Impressive gains

- > Number of villages electrified before 1947 3000
- > Number of villages electrified as in 2001- 505,040
- But...

Only 44% rural households have access to electricity

The per capita electricity consumption of 606 kWh is among the lowest in the world 100% household electrification by 2012

% households having access to electricity





Introduction

Objective

To set up sustainable decentralized village electrification plants based on diesel generating sets running on straight run Jatropha oil.

Location

Village Ranidahra, Bodla Block, Kabirdham district

Partners

British High Commission; CREDA; P M Diesels; Castrol; MNRE; village community

Features of the project area

- Number of households 110
- * Population 600
- Major community Gond, Baiga
- Distance from highway 5 km
- ❖ Distance from the nearest substation 19 km
- Major occupations agriculture: primitive in nature; forests; migration

Major activities

- System design
- Community mobilization and capacity building – to build ownership and capabilities in operating & maintaining power plant, tariff setting, bill collection, etc.
- **❖** Formation of Village Energy Committee (VEC) for running the power plant, tariff setting, bill collection, etc.
- Installation of improved cookstoves

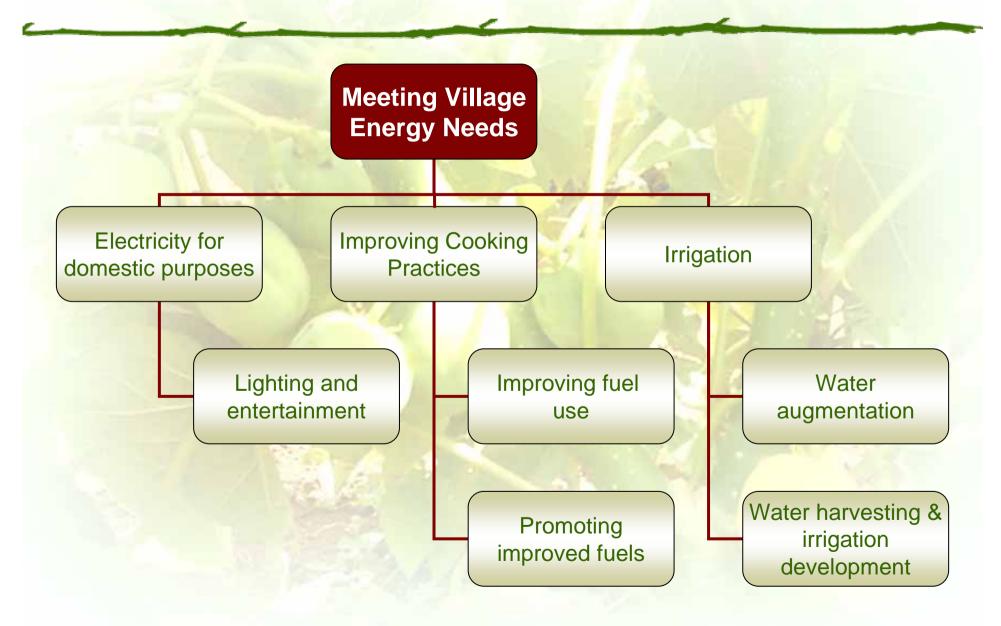
Major activities...

- Plantation of Jatropha saplings more than 25,000 saplings, through Shramdaan. Plantations are on farm boundaries, roadsides and not on agricultural land
- Installation and commissioning building, DG sets, oil expeller, filter press, boiler, distribution network; commissioned on April 9, 2007
- Periodic training of operators, both on-site and at P.M. Diesel

Some technical details..

Generation capacity power	3 x 3.5 KVA gensets
Back-up generation capacity	7.5 kVA
Oil expeller	35 kg/hour
Oil expeller prime mover	10 HP engine
Inverter capacity	1 kW
Hours of supply (households) *	6 p.m. to 9:30 p.m.
Hours of supply (street lights)	7 p.m. to midnight
Total households covered	107
Households with single light points	31
Households with two light points	76
Households with sockets	65
Streetlights and other light points	30
Poles	97
Luminaries at power plant	12

Additional interventions



Additional interventions....

- Briquetting of seed cake designed a manual briquetting machine; tested at the field
- **Complimentary project:**
 - > Develop the surface and groundwater resources; and
 - Build community capacity for effective management of the irrigation infrastructure
 - Supported by Sir Dorabji Tata Trust

Sustainability of the project

***** Technical sustainability

- Zero down-time till date
- > Operators fully managing the equipment
- Simple technology

Social sustainability

- Interest and ownership increasing in the VEC and community at large
- Realizing the benefits of electricity

***** Financial sustainability

- Tariff of Rs 20/ light point, Rs 30/ socket; excluding community points
- Since May 2007, 100% payment salaries of operators, running expenses
- Need to promote income generating activities flour mill;
 briquetting of seed cake

Sustainability of the project

Institutional sustainability

- > VEC comprises representatives from the village
- > Equal representation of women
- > Rules and regulations have been framed
- A strong institution is necessary before withdrawal

Environmental sustainability

- Apparent lack of scientific data
- ? Is the project 'really' eco-friendly?
- ? Which processes have high environmental impacts?
- ? What is the GHG mitigation potential?
- EMPA and WII are conducting a Life Cycle Analysis (LCA) of Jatropha based rural electrification Day 2 (Session V)

Conclusion

- **Transport sector receiving a lot of attention on the use of biofuels**
- However, biofuels offer tremendous potential to improve access to energy in rural areas
- The project offers a lot of learnings and can serve as a model for electrifying other remote villages



