ICEF renewable energy projects- some learnings

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ICEF mandate

- Enhance the capacity of Indian private and public sector organizations to undertake environmentally sustainable development and management of land, water and energy resources
- Provide support for programs that specifically address the inter-relationship between poverty and environmental degradation, especially as it affects women
- Provide support for public awareness of environmental issues, community participations, and for community-based management of land, water, and energy resources.

ICEF's "capacity-building" objectives

- Institutional development: Establishing or strengthening environment related institutions
- Conservation and restoration: Undertaking activities that redress environmental degradation with potential to be replicated
- Policy and national dialogue: Providing analysis and discussion that will have an impact on national and state policies and related practices
- Technology adoption: Adoption and dissemination of pollution abatement, energy conservation and renewable energy technologies

ICEF projects on renewable energy

- Locations where there exists no electricity supply or diesel gensets are used in the most inefficient manner and which pollute the clean and sensitive local environment.
- Locations which are remote that there is no possibility of the extension of the grid atleast for the next ten years or so.
- People who are generally not in a position to pay high costs of electricity, which could be the case if it was from renewable sources.
- Locations where electricity is available from the grid, there is a problem of poor reliability and poor quality of supply.
- People use devices which are extremely inefficient, and result in bad smoky environment
- Subsidies for devices distort the markets and technologies do not deliver the promised

ICEF renewable energy projects

- Electricity is supplied to the people in the target villages, where renewable energy sources would partially or completely replace the existing conventional sources of electricity
- Devices at the home or unit level is provided to the end users through a market based mechanism, which results in significant energy savings, and thus increased incomes for the target population.

Project plans

In all the project locations where there was a need for grid based electricity

As a first step, resource assessment was carried out to identify the technologies that could be deployed.

This is followed by an exercise to estimate the demand and to determine the capacity of the people to pay for electricity and related services.

This resulted in determining the installed capacity of the systems, and also the number of units required to meet the demand at varying times of the day.

Technical specifications were then drawn up, and bids called form various manufacturers.

Implementation plans were then drawn up, and time schedules for delivery and related activities prepared.

Institutional mechanism

- Simultaneously, meeting are held with communities appraising them of the new systems that are being planned and the changes that would be required in their life styles and payment related issues are discussed.
- A local peoples' institution is formed and registered to take over the management and running of the systems when commissioned.
- Bank accounts are opened and capacity building exercises are undertaken for money management and for other day-to-day matters.
- The NGO partner continues to do the hand holding with the peoples' institutions for some time before they get the confidence to run the systems.

Some ICEF projects on RE

- Sagar Island integrated wind diesel biomass hybrid project- WBREDA
- Bio- energy for rural India- BERI Society
- Integrated development of Durbuk Block using renewable resources- LEDEG
- Implementation of RETs through NGOs- TERI

ODAM Bio- diesel project

- Project objective- Demonstration Project on use of Bio-diesel in Tiruchuli and Kariyapatti Blocks of Virudhunagar District, Tamilnadu
- Implementing Organization: Organization of Development, Action and Maintenance (ODAM)
- Funding support- ICEF, Siemenpuu Foundation (Finland)
- Start and End Date: June 2005 –June 2007
- Development 500 acres of fallow lands by Jatropha cultivation in selected villages of Tiruchuli and Kariyapatti Blocks

Project details

About 16 acres of land for a nursery and 1 acre for a bio-fuel production centre has been acquired.

A nursery has been established in 2.5 hectares and 3,12,000 seedlings of jatropha were raised.

5,000 thousand neem seedlings, 5,000 tamarind and 2,500 pongamia seedlings were also produced for developing a model farm of 5 hectares.

Twenty training programs with participation of 800 SHG women on themes like importance of alternate energy, jatropha cultivation, ecological sensitization and land development have also been undertaken.

Exposure visits to TamilNadu Agriculture University Coimbatore have been organized and an association of Jatropha planters SHGs have been formed.

The apex body of these groups will purchase the seeds from the groups, convert it to bio-fuel, market it for local diesel motors and share the benefits with all the jatropha planters group members.

Project (contd.)

Since April 2007, the plant worked for 92 days for seed crushing, esterification and washing using Jatropha and Neem seeds as feedstock.

For the rest of the days, through our mini laboratory other non-edible TBOs of *Pongamia, Silk cotton, Cotton, Calophyllum inophyllum, Castor and Palm oil* were tried.

Seeds tried out

Source	Oil content	Bio-fuel potential
Jatropha seeds	25 – 33%	76%
Pongamia seeds	30 – 35%	75%
Silk Cotton seeds	15 – 20%	94%
Cotton seeds	5%	90%
Neem seeds	20 – 25%	85%
Castor seeds	30 – 35%	40%
Calophyllum inophyllum seeds	25 – 30%	80%
Palm oil	NA	96%

Production details

Source	Crude oil produced	Biodiesel produced
Jatropha	3400 litres	2700 litres
Neem	1300 litres	1100 litres
Pongamia	150 litres	7 litres in lab
Cotton	2 litres	2 litres in lab
Silk cotton	25 litres	4 litres in lab
Castor	10 litres	1 litre in lab
Calophyllum inophyllum	23 litres	3 litres in lab
Palm oil	----------	2 litres in lab
Total	**4910**	**3819**

Byproducts

By products of bio-diesel are under trials and experiments.

The crude Glycerine is used for soap making with different formulae. Seed cakes are used in the nursery. Experiment with Jatropha leaves for composting is completed.

- Tested bio-diesel in the regional testing laboratory, Madurai and from MK University
- Also, tested bio-diesel with Jeep and a diesel motor cycle for 2 weeks.
- Before and after the utilisation of bio-diesel noted the condition of diesel engine and nozzle- found no problem in engine and efficiency remains the same. Later, the bio-diesel produced by our unit is utilised in our diesel engine for pumping water and supplied to 12 farmers to apply in 2 tractors and 10 diesel engines.
- As a new fuel introduced, supplied 12 farmers 200 litres of bio-diesel free of cost to each for trail run
- Plantation by the time of monsoon has 100% survival in red soil and 85% survival in rest of lands.
- 23 women work from various SHGs raised Jatropha seedling in their kitchen gardens and sold the seedlings to the farmers at a cost of Rs.1 per plant, earning around Rs.2000 each

Conclusions

- Bio-diesel plantations have been an additional source of incomes for the SHGs
- Initial trials have shown no deterioration in engine performance
- More intensive testing and trial runs called for
- Need for procuring more seeds to increase oil production
- Need for sales of bio- diesel for income generation, and sustainability