

## Generating Energy Consciousness among Rural Households

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### **Abstract**

Government of India has been on its mission to empower villages with renewable energy resources as electricity supply is either not available in these areas or its supply is highly irregular. Several programmes undertaken by them by installing renewable energy technologies (RETs) in rural areas are not gaining momentum despite Governmental continued and persistent initiatives. The rural residents seem to be either ignorant or apathetic towards the new energy equipment installed in their residential areas. Perhaps they do not associate themselves with RETs and fear that they cannot handle them. The project presumed that there is a gap in the programme implementation and peoples' felt needs and practices.

The objective of the project was to plan an energy consciousness programme for rural residents to make them aware towards use of RETs such as solar energy, wind energy, biomass, etc. as these are the future energy resources. By the energy consciousness programme residents were told to use all energy resources judiciously owing to energy crisis in the country and reducing pollution. Energy consciousness will encourage rural residents to adopt the eco-friendly energy practices for a better and sustainable future.

**Keywords:** Awareness Generation, Energy Consciousness, Renewable Energy Technologies, Rural Residents, Solar Energy.

### **1. Introduction**

Rural population prefers to use locally available resources for fuel, etc. as they are within their vicinity and available free of cost. Due to such a practice there is depletion

of natural resources which is leading to ecological issues of concern. There are several reasons why rural energy deserves special attention distinct from energy in general. First and foremost, if rural energy is not treated separately, it is bound to be deprived of appropriate and deserved emphasis because it 'would fall between the cracks'. Second, the demography of rural areas differs fundamentally from that of urban towns, cities and metropolises. Rural areas consist of dispersed populations in contrast to the population concentrations of urban conglomerations. This fundamental distinction leads to a third reason for treating rural energy differently.

Centralized generation of energy may be a feasible option for urban areas but not for rural as it may be costly and inefficient for the dispersed population in areas that are remote, scattered and require low loads leading inevitably to greater transmission and distribution losses. Beyond certain break-even distances from the grids/transport systems associated with centralized generation, it may be more cost-effective to implement decentralized village-scale generation coupled to mini-grids.

## **2. Findings**

Rural households were selected from U.P and Haryana villages. Visits were made to two villages namely, Gharoda (Faridabad) and Rabupura (Ghaziabad). The selected villages are located 16-23 kms from the block headquarter i.e., Ballabgarh (and 20-30 km from district HQ Faridabad) and Ghaziabad. In both the villages the occupation was primarily agriculture.

## **3. Energy use Practices**

The energy needs were predominantly met by women (who were at times assisted by young children) for collecting wood, biomass or dung and making dung cakes for cooking and other purposes (such as heating water, warming room in winters, etc.). Besides these energy resources, they were also using kerosene, LPG, diesel and electricity. Electric supply was erratic as there was heavy load shedding and power was available only for 6 hours either in the morning or in the night. Two families were found to be possessing biogas plant in Gharoda and they used it for cooking while its residue was used as fertilizer in the fields.

It was found that maximum share of energy was of dung cake (45.79%) followed by fuel wood (17.78%) in the two villages surveyed. Solar energy did not occupy significant share as informed by the rural residents and also observed in their practices. Reason for poor usage of RETs was ineffective method used for the installation of solar devices, i.e., poor involvement of rural residents during planning, installation and after care (maintenance). Therefore many of them due to lack of knowledge, did not choose to use the improved energy source. Only a few families showed interest to use the solar equipment. In Faridabad villages, solar energy equipments installed were 5 KW power plant, solar home lighting systems, solar lanterns (kissan torch) and solar street lights. In Rabupura, Ghaziabad, solar street lights and solar lanterns were provided. In Gharoda, Emu hatching was done using solar energy wherein the eggs of

emu were sold to pharmaceuticals companies to make medicines for treating cancer patients.

Residents seemed interested to use the RETs as they felt these provided them safety from theft, wild animals, visiting fields at night, performing household chores, studying of children etc. However, the system to repair and charging of batteries was not in place due to which most of the solar RETs were not functional. The residents were neither informed nor was there any provision for additional cost due to battery replacement every 3-5 years. Among various RETs installed, solar lanterns seemed to be a favourite option among hawkers as they were able to sell effectively late in the night. 150 hawkers benefitted under the Urja Unlimited Solar Lanterns project.

#### **4. Road blocks in using RETs**

Several constraints in the adoption of RETs were reported by rural residents, which were later shared with the MNRE officials during the project meetings.

1. Inadequate knowledge about RETs and their benefits.
2. Inadequate training to use, operate and repair.
3. Inadequate financial assistance/loan available for purchase. Grameen Banks were not too keen to provide loan for solar products due to high risk perceived by them.
4. Inefficient functioning of repair shops and changing of batteries. Replacement and repair of products took time.
5. Theft of solar panels, batteries and poles, etc.
6. Due to quota benefit powerful people and certain castes like SC, ST and OBC got the benefits i.e., higher subsidy amount. Common people got neglected.
7. High initial cost of RETs.
8. Lack of community participation and ownership particularly the women.
9. Spurious RETs provided by some private companies led to misbelieve of rural residents in RETs. Lack of product standardization and certification due to which quality control of RETs was not possible.

#### **5. Energy Consciousness Programme**

Based on the survey findings, observations and interactions with residents, the research team planned an energy consciousness programme for Gharoda, Alumdipur (Haryana), Rabupura (Ghaziabad) and Morni hills (Panchkula) and motivated them to adopt RETs in their day to day life activities. This was done by demonstrations, role play and learning the construction of RETs. Working models of RETs were prepared to show the operation of solar and biomass RETs. It helped them to befriend the new technology rather than feel alienated from it.

The rural residents seemed to be inclined towards individual ownership of renewable energy devices rather than the community bound products like solar street lights, solar power grid, etc. The primary motivating force was saving in individual

electricity bills. Based on survey results, the energy consciousness programme was designed focusing on Solar and Biomass RETs covering the following aspects –

- **Importance of RETs** based on the constraints and problems experienced
- **Information about the technology** involved in RETs, its repair and maintenance.
- **Comparative analysis of saving** in electricity bills with conventional energy resources
- **Applications of RETs** in rural households.
- **Understanding the construction** of RETs by working models. This method proved highly effective in information sharing.
- **Games** (such as, match the energy equipment with energy source, wheel of renewable energy resources) were used to reinforce the understanding of RETs.

Participation of residents in the programme was encouraging as they wanted more information concerning repairs, subsidy and financial assistance.

## 6. Benefits to Society

The project dealt with the rural families of the two selected villages where Government had already installed some RETs but were not being used by the residents to their benefit. Since the families did not gain enough knowledge about the new technology by Government installations, the project team was able to reinforce the existing programme by providing relevant information concerning functioning of RETs. Thus interventions during the project helped in not only addressing the barriers in adoption but also befriending the new technology and bringing it to practice s part of day to day life. There was change in their way of living and immense power saving in households which had electricity available, as reported by the residents. The project findings also revealed certain critical factors that should be looked into, when any such programme takes place in future for introducing RETs in a rural area.

## 7. Further Plans

The project team plans to undertake the following activities further –

- **Prepare a self instructional booklet** for rural families on RETs covering aspects like, information about the renewable energy technologies, find solutions to frequently occurring problems, instructions for use, care and maintenance, people to contact when need help, and so on.
- **Develop products for day to day use using renewable energy resources** to enable rural families to adopt the new technology in a more friendly manner as the RET driven products will enable use of non-conventional energy resources thereby relieving the load from the conventional energy resources.