

## Power from renewables

### Linking electrification and rural development<sup>i</sup>

In the dominant paradigm today increased energy intake is essential for a better quality of life. This need is starkly manifest in rural areas, which are literally left 'in the dark'. Today the poor in rural areas have to make a quantum leap to be considered at par with citizens of urban areas. To do this, I believe, they have to have access to more energy. Access to energy is essential to improve the quality of life of the rural poor, and to use the generic term, essential for Rural Development.

Today electricity is unarguably the most effective energy source with electricity driven systems being the most user-friendly for household use and in production processes. And hence, there is a direct link between electrification and rural development.

#### What has happened so far?

In the past fifty years we have seen more and more areas gaining access to grid electricity, from cities to towns to prosperous and accessible villages. Then again, a large percentage of villages are electrified only on paper. In reality many of these villages have standing poles and no wires. In others the supply is so erratic, that it would equal not having power.

Apart from these, there are poor, remote and inaccessible villages, which have remained out of the grid network. This is evident especially in less developed states like Orissa. The paradox is that Orissa produces "surplus" power, which it sells to neighbouring states of Andhra Pradesh, Karnataka, etc.

In the establishment of thermal plants, forests have been cleared destroying the homes of indigenous people residing there for centuries. An analysis of such projects across the country will reveal that the compensation has never been adequate. The poor become more marginalised, assetless and powerless in a very real sense.

The case is similar in setting up of hydroelectric power generation systems. Hundreds of thousands of villages are sunk without trace. In Orissa those displaced by the Hirakud dam have not been rehabilitated in the 50 years since it was constructed.

Where is the social justice in the conventional method of power generation? The injustices inflicted on a defenceless people impoverish them further. We have to evolve compensation packages, which improve the quality of life of the people substantially and see to it that the poor are also able to reap some benefits from such ambitious projects of national interest.

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## **The need for alternatives**

At the same time, I do admit that for reaching all the isolated and remote areas, inside forests, on islands, etc, conventional grid electricity may be an expensive proposition. This and the concern that conventional methods of generating electricity are not cost effective and environment friendly prompt an earnest look at alternative and sustainable sources of energy, and effective ways of reaching the unreached.

The options are many and there have been research and field demonstrations to demonstrate that such systems do work. However there is a gap when it comes to scaling up, and achieving large-scale dissemination.

There are very many rural areas, especially tribal areas where with proper planning and appropriate conservation measures springs and streams can be revived. A series of micro and mini hydel plants will generate adequate electrical energy to meet the needs of the villages dependant on it. Nepal has shown the way in effectively promoting this technology, whilst drawing effectively from traditional knowledge as well.

In many unreached areas the potential for establishing biomass-based gasifiers also has great potential. Communities need to be encouraged and supported to undertake energy plantations, which can feed the gasifiers. Here our research has to catch up. A dual fuel engine with a 20% dependence on diesel is still not good enough. The cost of accessing unadulterated diesel and then transporting it to these villages would make the operation unviable. We have to have a rugged 100% biomass based gasifier for electricity generation. It is in efforts like this that I would like to see TERI take the lead.

In areas where energy plantations are not possible and adequate water is not available, Solar Photovoltaic systems have proven potential for generation of electricity. This is one area where research has brought down costs by atleast five times in the past decade. However the start-up costs of the technology are still very high which makes it prohibitively expensive for large-scale application in rural areas.

## **Enabling conditions for scaling up renewables**

If a fraction of what is earmarked for nuclear energy is diverted to research on renewable energy I am confident that the scientific community will be able to identify appropriate technology solutions. This calls for strong commitment at the policy level and for the government to put renewable energy as a priority on their agenda.

To take it from the R&D laboratory to the field requires a markedly different set of skills. Most off grid solutions for electrification rely on a very high level of people's involvement in the operations and management of the systems. This involves making the product attractive enough for the community to come together and developing technical skills among poor and illiterate people. In the design of development interventions, this aspect is not acknowledged in full. Thus in the implementation process, the investment and support for community mobilisation, development of local institutions is rather marginal. In such a situation, without the accompanying capacity development, if the project fails to take off, the technology suffers.

NGOs have a significant role to play in propagating renewable technologies as they usually have a deeper and more sensitive understanding of rural conditions and a more sustaining link with rural communities than government institutions. They are also better placed from equity and

resource utilisation considerations. Local institutions need to be promoted vigorously to provide various types of services, and where feasible, on a commercial basis, for effective dissemination and management.

### **Right to Energy - a fundamental right**

I believe that the Right to Energy is a fundamental right of every citizen. Access to cooking fuel; energy for household lighting and power for operating small rural industries for undertaking processing and value added activities locally; power to operate cold storage units for food preservation; motive power for lift irrigation systems are not only an urgent necessity but also a fundamental right. Viable, sturdy alternative systems, adaptable to the country's myriad geographic and socio-economic conditions need to be developed and disseminated.

To mobilise and enthuse rural communities to take up alternative technologies, they need to be appropriately packaged. These include accessible loans, technology backup, and other appropriate incentives. Subsidies for one, are incentives for rural communities to not depend on conventional non-renewable power generation systems and rely on localised renewable multipurpose energy systems. Incentives need to be carefully planned and packaged to bring into the fray maximum number of end users from the hinterland of rural India. These incentives are necessary atleast till the technology is rooted, and can then be gradually phased out.

A classic example here is the case of liquid petroleum gas. During the time it was introduced there was a heavy promotional drive with free stoves, plastic buckets. Today that people have got used to LPG and even the ever-increasing costs do not deter them from remaining loyal consumers. It is my experience that even the poor can and will pay for products and services that they believe will improve their quality of life.

At the same time we have to recognise that there are Social Costs in electrification of rural areas, especially in reaching unreached isolated pockets. Poor living conditions and limited economic options in rural areas are driving people away from villages in search of a dignified life, and in most cases for sheer survival.

With the bright light of cities becoming more and more attractive, the rural poor are drawn to it like fireflies, to the ever-expanding urban slums, where they live like vermin losing every shred of their dignity. Each day the urban slums are getting choked, with human beings, with plastic; with untreated human and animal waste - posing serious health and environmental hazards.

Hence, atleast for the sake of the survival of cities and the people living there, we have to ensure that rural areas are developed simultaneously; villages are liveable and that even the poorest people have the opportunity to fulfil their aspirations and live a dignified life.