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Rural Energy Planning in India

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Introduction

Energy is a critical input for economic growth and sustaining development processes. Over one third of the world's population, largely consisting of the poor in rural areas of developing countries does not have accees to electricity. It is estimated that a new power plant would need to be added every two days to meet the increasing global energy demand, this, however, is clearly anunsustainable proposition, and only emphasizes the urgent necessity for developing energy technologies that are environmentally sound,socially acceptable, and economically viable.

If we examine the nature of typical energy consumption patterns at the village level. Energy is used in rural areas mainly for the followactivities:-

- Agricultural operations.
- Domestic activities (grazing Livestock, cooking, gathering fuelwood, and fetching water for domestic use, particularly drinking,
- Lighting
- Industry and commerce (cottage industries, viz pottery, weaving iron smithy flour, mills, shops, etc. For a fraction of villages we may add telecommunication, transport of produce andentertainment also to this list.

Almost 75% of the total rural energy consumption is in domestic sector. A majority of the rural population continues to rely on human and animal energy and traditional fuels firewood, animal dung, and crop residues to meet most of their energy needs. For meeting their cooking energy requirements, villagers depend predominantly on biomass fuel like wood, animal dung and agricultural residues, often burnt in inefficient traditional cook stoves.

The main fuels used for lighting in rural house holds are kerosene and electricity, if and when available otherwise, they live in darkness. Irrigation is mainly through electrical and diesel pump sets, while the rural industries and the transport sectors rely primarily on animal power and to some extent on commercial sources of energy like disel and electricity.

Woman continue to suffer ill-effects on their healthbecause they have no choices but to burn poor qualitybiomass fuels in ill designed cook stoves . Children stillstudy in the poor light of a kerosene Lamp. The village economy continues to suffer as power supply is neitheradequate nor reliable.

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Issues and challenges:

Energy supply strategies for rural areas are closely linked to the economic, social and environmentalconcern of mainstream rural development. There aremany obstacle currently contributing to rural energypoverty and constitute the main challenges to effectiveenergy Plannning in rurual areas. These include lack of data that identifies and quantifies rural energy end user needs, lack of political will and institutional responsibility and effectiveness, fiscal considerations and lack of rural people's participation. It also involves the social and health costs of village people.

(a) Lack of Data

The bulk of rural energy supplies in the form of wood fuels cow dung, and crop residues etc are usually gathered by the villages themselves.They never enter the commercially traded system and there-fore do not figure in national energy statistics Data obtained through special surveys and studies is typically patchy. More over household consumption patterns in rural areas differ not only from region to region, but ever between locations only a few kilometers apart and there is great danger in extrapolating the available data to other localities. Very few resources are allocated for data collection and analysis, which is the important first step in developing energy policies and strategies

(b) Institutional Failures

Structural adjust programmes, privatisation of publicly owned utilities and the elimination of costly subsides are resulting in increase in price across the board. Commercially traded energy sources as well as the
lower cost rural energy sources such as wood fuel and charcoal arebecoming expensive by the day. This exacerbates existing rural energy shortage. Appropriate policies will have to be framed to encouragealternative institutional structures such as local co-operatives to become involved in improving the provision of energy in rural areas.

(c) Subsidies and Substitution.

It is necessary to accelerate the “modernization" of the rural energysector to facilitate and sustain productive economic activities in rural areas.Which will hopefully ensure economic and financial sustainabilityand increase rural people's self -reliance. The limited cashthat rural people do have needs to bespent on avariety of goods since energy has traditionally been considered a free resource, it may not enjoy the highest priority in spending. At the sametime all of these carry a cash price the rural people can afford this transition ?Are they not likely to be pushed further into energy poverty ? Theability and the willingess of rural people to make the transition from traditions to modern energy sources depend upon their financial resources. Energy & rural Development are mutually dependent and represent an important aspect of rural poverty.

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(d) The Technology Challenge

The Promotion of existing and emergent technologies capable of delivering efficient economical fuel (e.gbiogoas, methnol, ethanol and producer gas) from traditional biomass energy sources becomes important.

If technologies really are to help trans-form rural livelihoods, than it is essential the difficult challenges of financing, training, dissemination and establishment of true local participation are supported by and clustered around, teachnologies that work well andoffer real value to the customer.

(e) Lack of People's Participation

Several efforts on this front have been made both by governmental organization and non-governmental organization in the form of vast investments, national programmes for rural electrification and promoting renewable energy technologies like biogas, improved cook stoves and solar cookers. Inspite of these programmes being in existence for nearly two decades, their impact on the rural energy scene has been limited.

A typical rural energy planning exercise begins with the assessment of available energy technologies then proceeds to implement these technologies There is very little or zero flexibility to adjust the programme according to the local situation, users needs and preferences. An even bigger challenge is to find ways in which theprogrammes can be made more sensitive to the socio-cultural reality inwhich they have to function. **Costs of Rural Energy Poverty**

The rural poor pay a much higher price for their energy services thanany other group in society. The price can be measured in terms of timeand labour, economics, health and social inequality, particularly forwomen.

(a) Human Labour time costs

Meeting basic needs for fuel , food,fodder, and water consumes enormous time and labour of the rural poor, particularly women.

(b) Economic costs

The direct and indirect unit cost of energyneeded to fulfill basic needs is much higher for the poor than the relatively affluent. There is the ecological price of the poor people's forced dependence on inefficient biomass based Technologies (e.g. open cook stoves) in the absene of alternativeenergy sources.

(c) Health cost

Among the most serious costs of energy scarcity for the poor are the range and children are particularly affected both directly or indirectly.

For example, an early study in Gujrat state in western India found that fuels such asfirewood, dung cakes, and crop waste emit more TSPbenzo-a-pyrencecarbon monoxide

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and polycyclic organic pollutants than fossil fuels women inhale benzo-s pyrene equivalent to 400 cigarettes per day.

Health and Nutrition Effects of Energy Scarcity

Activities like cooking, fuel gathering, water fetching and grazing lead to higher calorie expenditure per day for rural wamer. Coupled with inadequate food, this affects their health.There is higher maternal / female morbity and mortality and increasedinfant and child mortality.

Lack of adequate water for bathing and washing is a major contributing Factor to the high rate of genito urinary and reproductive tract infections (RTIs) in poor women. Uterine prolapse is also related toexcess load carrying.

Social Costs:-

Energy plays a key role in achieving the goals of social justice including gender justice in eradicating discrimination on the basis of gender, caste, class, race, ethnicity and nationality. Low levels of energy services are a serious obstacle in the economic – development of poor people. Nation must invest in improved energy system to achieve social justice as well as economic growth.

Meeting the Challenges :

The Government through its various committees such as fuel policy communities (1974), working group Energy policy (1979), Advisory Board on energy (1985), Energy Demand screening group (1986), etc.has formulated programmesaimed at rural energy and implemented them through various ministries?

The vision of energy development of rural areas with the elimination of rural energy poverty as its goal should focus on the following :-

- Rural development in general and rural energy specifically shouldbe given much higher priority by policy makers.
- Rural energy development must be decentralized to put ruralpeople themselves at the centre stage of energy planningimplementation, operation and management of rural energysystems;
- Rural development policy must encompass rural energy issues and rural energy must be linked with economic growth.

Instead of focusing on subsistence and market based needs, energy planning and implementation have to address the development needs of the rural poor, e.g., meeting the basic needs, provision of rural infrastructureand services, increase in agricultural productivity, Local industry opportunities , income levels and marketing options, access and equity in resource use,etc.

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Rural energy programs should

Provide for minimum domestic energy needs for cooking heating and lighting purpose to rural people. Rural electrification andexpansion of grid should be accelerated to assure electric supply.

Provide the most cost effective mix of various energy sources and options for meeting the requirements of sustainable agriculture and rural development. Small scale and renewable energygeneration and storagetechnologies are particularly useful in remote areas.

Ensure people's participation in the planning and implementationas well as in the repair and maintenance of energy system and devices. This can be done by involvingpanchayats, voluntary organisations and institution at the micro level, such as Jointforestry Management committees, water user groups, women'sself-help groups

Develop and strengthen mechanisms and co-ordinationarrangements for linking micro level planning and implementation for rural energy with national and state level planning and programmes for energy and economic development.

The general considerations of managing the environment at impact, improving energy useefficiency and encouraging the use of renewable energy- resources apply here.

To sum up traditional energy supplies available in thevillages should be supplemented by new rural energytechnologies to meet the total energy requirements of therural areas. Integrated energy systems that incorporateboth modern and indigenous knowledge must be put inplace for better synergy at grassroots level.

Some Feasible non Conversational Energy Devices Include

- Biogas plants.
- Solar energy based devices such as Lanterns, domestic lightingsystems water pumps, solar cookers, hot water systems, hot airdriers, power plants etc.
- Biomass Gasifiers.
- Wind powered water pumps, battery chargers electricitygenerators.
- Mini micro hydro plants etc.

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