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RESOLVING POVERTY-GENDER-ENERGY-NEXUS BY STAKEHOLDER ENGAGEMENT

No development is real that does not address poverty, as it is one of the world's most fundamental and urgent issues. Throughout history human developments depended on access to basic facilities, food commodities, energy as well as clean water.

Poverty is a complex and multidimensional phenomenon. Though it is without any precise definition, it can be conceptualized in a number of ways. In economic terms, income poverty means surviving on an income of less than US\$1 per day; while in social terms, poverty is defined as the deprivation of material requirements for minimal acceptable fulfillment of human needs, including food. Poverty is also defined from a sustainable development perspective whereby poverty is the denial of various choices and opportunities basic to human development.

Poverty influences and determines energy choices of poor households. Secure and improved energy services are a necessary condition for development and poverty reduction, and yet energy security has not figured prominently in the development agenda. Thus though energy is not mentioned as a separate goal, addressing the energy and poverty linkage is going to be a critical factor in the attainment of the Millennium Development Goals.

Poverty had increased with industrialization. Development must not be equated with mere economic growth, as measured by GDP). Energy must be an instrument for advancing economically viable, need-oriented, self-reliant and environmentally sound development -- what is now referred to as sustainable development. Alleviation of poverty and the promotion of gender equity are the primary goals of sustainable development. Lack of access to affordable energy services is a serious barrier to sustainable livelihoods and emergence from poverty.

Poverty is particularly acute in rural areas in developing countries, and the problem is growing, since the number below the poverty line is increasing in absolute numbers if not as a percentage. Poverty is not static but rather a dynamic process: people can move out of, or into, poverty. This needs to be taken into account when policies and strategies are being designed to help people lift themselves out of poverty.

Lack of energy services is directly correlated with the major elements of poverty, including inadequate healthcare, low education levels and limited employment opportunities. Energy is a commodity that provides services and offers job opportunities as it is one of the most essential inputs for sustaining people's livelihoods. It is a basic necessity, for survival and a fundamental input to economic and social development. Access to energy is fundamental for fulfilling basic human needs, driving economic growth and fuelling human development. Services such as electricity and/or energy are necessary for improved health, education and agricultural productivity.

Energy poverty can be defined as the absence of sufficient choice in accessing adequate, affordable, reliable, clean, high quality and safe energy to support economic and human development (Reddy, 2000).¹ It is the inability to cook with modern cooking fuels and the lack of minimum electric lighting to read or for other household and productive activities.

¹ Reddy A K N (2000), Energy and Social Issues, in "World Energy Assessment", UNPD, New York.

Typically, a poor urban family spends 20% of its income on fuels (Barnes, 1995).² Energy has an equity dimension: Poor households use less energy than wealthier ones in absolute terms. Further the energy-poverty nexus has distinct gender characteristics. Poor people pay high price in health, labour, and time for the type of energy they use. Moreover, they spend much of their income as well as time on energy than wealthy people. In most culture, staple foods are subjected to lengthy cooking.

At the most basic level, energy provides cooked food, boiled water and warmth. The energy-poverty nexus has distinct gender characteristics. It is estimated that 70% of the 1.5 billion people living on less than a dollar a day are women (UNDP)³ (Clancy and Skutsch 2003)⁴. Many of them live in female-headed households in rural areas. More than half of the world's households cook with wood, animal waste, crop residues and untreated coal. Biomass collection to meet a household's energy needs is the burden of women and girls. This was christened 'the other energy crisis' by the World Resources Institute as early as 1975, when the world was still reeling from the international oil crisis (Eckholm, 1975)⁵. The responsibility for household energy provision affects women's health disproportionately to men's.

In most developing countries, energy consumption patterns are characterized by a high dependence on biomass, and a heavy bias towards the household sector, with cooking as the primary energy consuming end use. Population increase and the resultant environmental degradation has severely impacted the traditional biomass-based energy sources, especially in rural areas and because the responsibility for nearly every aspect of the domestic energy system rests squarely on the shoulders of the rural women, they are by far the most significantly affected by ever increasing fuel scarcity. Energy scarcity is a problem that has a disproportionate effect on women and girls.

India, with a population of slightly more than one billion people living in 25 states, is the second most populous country in the world, behind China. At a growth rate of 1.6% per annum, the country's population is projected to grow to 1.16 billion by the year 2010.

The Indian economy uses a variety of energy sources, both commercial and non-commercial. The 2001 census finds nearly 700 million people without access to modern energy. Nearly 300 million people do not have access to electricity, but what is more, even larger number viz 625 million do not have access to modern (cooking) fuels. Nearly 3 billion days are spent in gathering fuels and 700 million days in processing them i.e., chopping, drying, turning, storing, stacking and handling. About 800 million days are spent due to diseases

Household energy – Rural India

- ❖ 95.6% of households use biofuels
- ❖ 89 million households spend 31 billion hours annually in bio fuel gathering
- ❖ 16.5% use kerosene for cooking
- ❖ 5.4% use LPG for cooking. Most of them however use multiple fuels
- ❖ 0.3% households use Biogas for cooking
- ❖ 63% of households are electrified

2 Barnes D (1995), Consequences of Energy Policies for the Urban Poor. FPD Energy Note No7, The World Bank, Washington.

3 UNDP, (1995)Human Development Report.

4 Clancy, J. and Skutsch, M. 2003. 'The Gender Energy Poverty Nexus, Finding the energy to address gender concerns in development' DFID Project CNTR998521

5 Eckholm, E. (1975), The Other Energy Crisis: Firewood. Washington DC: World watch paper no 1

Accessibility of electricity vs. use of clean fuels for cooking in ⁶(population in million)

Fuels	Electricity (Yes)	Electricity (No)	Total
Kerosene/ LPG(Yes)	94	23	117
Kerosene/ LPG(No)	352	273	625
Total	446	296	742

SOURCE: *Census 2001 data*

“People without fuels much larger in number than without electricity”

Drudgery in Collection of Fuels

Women have to walk every month in the state, spending 23 hours during 8 trips, each of about 3 kms to fetch fuels

Time and efforts for collection of fuel woods

Distance traveled	Households
Households collecting from up to 1 km	42%
Households collecting between 1 - 2 km	50%
Households collecting from 2 - 3 km	5%
Households collecting from more than 3 km	3%
Average time spent per trip (hours)	2.9
Average no. of trips per household per month	8.0
Average time spent per month per household	40.8%

IRADe survey : Uttar Pradesh

Health impacts of Collection of Fuels

óResults in backache (50%), neck ache, headache and bruises every week (80%)

ó19% persons in HP have some symptoms -IRADe survey : Himachal Pradesh

In poor households, biomass collection to meet a household's energy needs is the burden (physically and metaphorically) of women and girls. In rural areas, it can mean spending several hours a day collecting fuel wood loads of 20 kg or more. According to the World Bank (2001)⁷ women of all developing countries spend between 2-9 hours a day collecting fuel and fodder, and performing cooking chores.

Further according to the World Health Organization, exposure to indoor air pollution is responsible for the nearly two million excess deaths, primarily women and children, from cancer, respiratory infections and lung diseases and for four percent of the global burden of

⁶ Indian Census 2001 data

⁷ World Bank. 2001. *Engendering Development through Gender Equality in Rights, Resources, and Voice*. Washington, D.C.

disease.⁸ Shifting from fuel wood to cleaner sources of energy, like kerosene or LPG, halves the mortality rate of children under five (World Bank, 2001)

The term ÷genderø refers to socially constructed roles of women and men rather than biologically determined differences. Gender roles are learnt by children as part of their socialization process. The roles change over time and vary widely within and across cultures. Gender roles of men and women, with their accompanying responsibilities, constraints, opportunities, and needs, are defined by a particular society. In most of the developing world, food processing, water and fire wood collection are traditionally female gender roles and takes much of women and girls time and energy.

A more serious and long term implication of fuel shortage is that as the daily search for fuel wood, fodder and water becomes more difficult, children are taken off school and put to help their mothers. More often than not, it is the girls who are held back from school to look after younger siblings and assist their mothers, missing out on education and perpetuating the cycle of illiteracy and poverty. In the southern state of Tamil Nadu in India, a major reason for keeping girls of ages 10 to 12 is to help the mothers in collecting cow dung (Mencher 1989)⁹.

Gender issues have a key role in energy policies primarily because gender differences and inequalities have consequences for energy needs, use and priorities. In many developing countries women are particularly affected by lack of accessible and affordable energy services due to their traditional roles, household responsibilities, and low social and political status. The absence of gender in policy and practice is most evident in the energy sector. Further the energy sector is also technical in nature and is characteristically male dominated.

According to Barbara Bamberger (2003)¹⁰ based on her study in Kenya, observes that as energy is an input to other sectors, energy needs have been ÷invisibleö and therefore ignored. This is also due to the absence or scarcity of sex-disaggregated data related to energy consumption and production. The gender divide with respect to energy needs becomes more obvious when one recognizes womenø role within the household and beyond, such as in agriculture, food processing, services and manufacturing, micro enterprises, and the local market and community. Further planners view energy as a technology-driven issue that is gender- neutral, that they do not recognize it as part of the poverty and economic development agenda.ö

Since men and women have different energy needs, they have different ideas about sustainable livelihoods. A gendered analysis to the Indian household biogas programme also yielded useful insights into gender differences in priorities, values and benefits (Dutta, Rehman, Malhotra and Ramana, 1997)¹¹.

Women remain largely invisible, in ÷people,ö ÷households,ö or ÷communities.ö Implicitly, womenø views will be taken into account in renewable energy projects under the general

8 Nigel Bruce, et al., "Indoor air pollution in developing countries: a major environmental and public health challenge," Bulletin of the World Health Organization 2000: 1078-1092. quoted in <http://www.rice.edu/energy/research/poverty&energy/index.html>

9 Mencher, J. P. 1989. "Women Agricultural Labourers and land Owners in Kerala and Tamil Nadu: Some Questions about Gender and Autonomy in the Household" In: Krishnaraj M., Chanana K. (Eds), Gender and the Household Domain-Social and Cultural Dimensions, Women and the Household in Asia-Vol.4, Sage Publications, New Delhi.

¹⁰ Bamberger, Barbara. 2003. "Bottlenecks of Rural Energy Planning: A Gendered Perspective." Working paper. Yale University, New Haven, Conn.

¹¹ Dutta, Soma, Ibrahim H. Rehman, Preeti Malhotra, and Venkata Ramana. 1997. Biogas: The Indian NGO experience, AFPRO-CHF Network Programme. New Delhi: Tata Energy Research Institute.

category of users. A unitary model of households and communities is assumed, with no diverging interests between men and women. Women are assumed to be a homogeneous and largely passive, benefits-receiving group. (Cecelski)¹². The gender variations in rural household energy management can be studied from four angles:

- ❖ **Division of Labour:** Women have always shouldered the responsibility of managing the household energy needs, playing a key role as the collectors, processors and users of biomass fuels. In rural areas of India, wide differences are known to exist in the work burden of men and women. While women are engaged for six hours daily in collection of fuel wood and fodder, and cooking, men spend approximately ten times less time on these tasks (World Bank 2000)¹³. Women are the chief repositories of knowledge concerning the use and management of trees and other forest products. Thus their knowledge of ecosystem management systems can provide significant contributions to energy planning processes
- ❖ **Decision-Making:** The decision-making structure in rural households is normally segregated along gender lines. In households where there are adult men and women, the gendered division of labour generally allocates to women the responsibility for household energy provision related to their spheres of influence in the household, in particular activities centered on the kitchen. Men are mainly responsible for technical decisions and investments while the women have the responsibility for energy conservation. Men will often decide on the stove technology if it is to be purchased (Tucker, 1999).¹⁴ In many rural areas, acceptance and popularity of any technology by rural women are socially administered by the male head of the household (Hafeez 1998)¹⁵. In such situations the success of any pro-women technology is largely linked to the parallel motivation and involvement of the family's male members with the technology itself and their involvement throughout the process.
- ❖ **Access and Control:** Women and men have different degrees of access and control, especially with respect to biomass resources. In spite of the fact that women are closely involved with obtaining resources from the surroundings, they rarely have control over them (UNDP, 2000)¹⁶. The lack of resources devoted to indoor air pollution has been cited as a sign of gender bias in the energy sector due to the fact that cooking is a major area of women's invisible work and women are the main group affected (Parikh, Smith and Laxmi, 1999)¹⁷.
- ❖ **Perception of Benefits of Energy Services:** Women and men have different perceptions about the benefits of energy, for example, men see the benefits of electricity in terms of leisure, quality of life, and education for their children, while women see electricity as providing the means for reducing their workload, improving

¹² Elizabeth Cecelski =ENERGIA/EASE Discussion Paper May 2004

¹³ World Bank(2000) World Development Report 2000-2001: Attacking Poverty. New York: Oxford University Press

¹⁴ Tucker, M (1999) Can Solar Cooking save Forests? Ecological Economics 31:77-89

¹⁵ Hafeez, Shaheena (ed.), 1998. Appropriate farm technologies for cold and dry zones of the Hindu Kush Himalayas. International Centre for Integrated Mountain Development, Kathmandu

¹⁶ UNDP 2000. Bioenergy Primer: Modernized Biomass Energy for Sustainable Development, United Nations Development Programme.

¹⁷ Parikh, Jyoti, Kirk R. Smith, and Vijay Laxmi. 1999. "Indoor air pollution: A reflection on gender bias." Economic and Political Weekly, XXXIV:9, pp. 539-44.

health, and reducing expenditure (Clancy and Skutsch 2003)¹⁸. There benefits from modern energy carriers also have distinct gender aspects. For example, the evaluation of a rural electrification project in Tamil Nadu in India showed that men benefited more than women since the electricity was used to run irrigation pumps substituting for oxen-drawn water (Rengasamy et al., 2001)¹⁹. As a result, limited access to energy resources is a problem that has a disproportionately greater effect on women, especially in rural areas.

Sketch (1998)²⁰, argues that it is important to see energy as not just an efficiency or welfare element in development, but also as an indirect means for enhancing gender equity.

In most countries, the primary emphasis of energy policy is still on petroleum fuels, and efforts are focused on increasing the efficiency in the electricity sector through privatization, and reducing subsidies on fossil fuels, with little attention to the energy demand characteristics of women and rural communities. It may be said that women's energy needs have been left out of energy planning because they do not fit into the traditional energy paradigm.

The effects of fuel wood use have adverse impacts on both the safety as well as health of women. Sometimes girls have to forgo their education to fetch wood for the family trapping them in inter-generational poverty. The amount of time women spend on domestic work reduces the amount of time they can devote to income generating activities to enhance their livelihoods. These roles change over time and vary widely within and across cultures

Gender issues have come to the forefront in many development sectors including agriculture, forestry and water but the energy sector has been slow to acknowledge the links between gender equality, energy and development

Energy is a commodity which both provides services and offers job opportunities. Therefore, women and men should, on equality principles, have equal opportunities not only to make use of energy but also to be able to participate in making choices about energy both at the policy level and in their own lives.

Burning of solid biomass in unventilated spaces produces air pollutants such as carbon monoxide resulting in indoor air pollution. There is a strong correlation between air pollution and respiratory infections which affects most of the rural communities. This further leads to increased absenteeism as schools obstructing effective human development. Women and girls are also exposed to sexual abuses during the course of fuel wood collection. They are also subjected to injuries resulting from the process of wood collection.

It would be incorrect to view women as passive victims of biomass use. Women have responded to fuel wood shortages by adopting management strategies to conserve fuel: they shorten cooking times, explore less fuel-intensive cooking and food processing methods, cook fewer meals, serve cold leftovers, change the types of food eaten, and purchase other

18 Clancy, J. and Skutsch, M. 2003. "The Gender Energy Poverty Nexus, Finding the energy to address gender concerns in development" DFID Project CNTR998521

19 Rengasamy S et al, 2001 *Thaan Vuzha Nilam Tharisu - The Land Without a Farmer Becomes Barren: Policies that Work for Sustainable Agriculture and Rural Livelihoods in Virudhunagar District, Tamilnadu*. London, IIED.

20 Skutsch, Margaret. 1998. "The gender issue in energy project planning: Welfare, empowerment, or efficiency?" *Energy Policy*, 26:12, pp. 945-55.

fuels. Women are important managers of natural resources and also producers of biomass fuels. They make rational decisions about which resources to use and how to use them. When women are given energy on a sustainable basis they feel empowered and freed from daily drudgery. They move ahead in human development indicators and find new ways to enrich life.

The most obvious burden is that as fuel resources become increasingly scarce, women must walk longer distances and invest a greater portion of time each day in gathering fuel wood and water.

A key objective of rural energy must therefore involve the displacement of this manual labour with appliances. In the case of cooking, the perspective should be to go from the present inefficient, unhealthy stoves using arduously gathered fuel wood through improved woodstoves to gaseous-fuelled stoves to clean, efficient and convenient stoves operating on electricity or on gaseous biomass-based bio fuels. The advance can then be from simple electrical appliances to efficient appliances and super-efficient appliances. Appropriate technologies are very likely to be region-specific, location-specific and culture-specific. And, the local culture may have many surprises

Lighting is of particular significance for women. Global evidence has shown that the availability of lighting in the home increases women's literacy and educational levels, and extends their working day and thus their scope for income-generating activities. Lighting in public places increases the safety of communities, particularly for women, and allows women greater access to public gatherings. Street lighting also opens up opportunities for extended trading hours by street vendors, an income generating activity favored by women. Women's survival tasks, based on their own metabolic energy inputs are, like biomass, invisible in energy statistics (Cecelski, 1999)²¹.

In most developing countries, the majority of informal sector enterprises are owned and operated by women, with women making up the largest proportion of the work force. They are often the best agents of disseminating technologies for rural development. Hence they should be able to act upon the energy choices provided by the energy sector in the provision of equipments using modern energy forms that reduce the drudgery of women's labour at affordable price

Smoke from wood-stoves is essential to control termite attack on the thatched roofs of villager houses. Hence it is unlikely that smokeless stoves will be accepted unless they are accompanied by a solution to the termite problem, for instance, a termite-proof roof. It is therefore a Hobson's choice for the poor -- on the one hand, traditional technologies are inadequate, and on the other hand, modern technologies are inaccessible

Electricity is unlikely to meet the basic energy need of cooking. As such, electricity cannot be a basic good but rather a high quality and expensive energy source that only becomes appropriate at higher levels of income or productive potential. In particular, although electricity has many benefits, it does not help address the major energy problem that most women in rural areas face in terms of their practical needs: their daily cooking requirements.

²¹ Cecelski, E (1999) The Role of Women in Sustainable Energy Development, Report to the National Renewable Energy Laboratory, Bolder Colorado, USA.

Cooking with electricity is not cheap in terms of either the energy itself or the stove. Thus it would appear that electricity could empower a society only if the necessary complementary factors are available. Advocating for electrification of women would hence not address the fundamental sustainable development issues.

The nexus between women, energy, water, environment and poverty is still poorly understood and rarely treated in an integrated way. Finally, policy makers and planners continue to treat energy projects as gender neutral based on the assumption that energy bottlenecks and solutions impact men and women in similar ways. In most countries this does not reflect reality as men and women have different needs and they use and benefit from energy services differently.

This vicious cycle of energy poverty needs to be broken. The invisibility of energy-poverty issues leads to decision-makers not being fully aware of their significance, and so policies and strategies fail to address the issues fully like the introduction of stoves in India in 2003.

Integrating gender issues into energy programs is complex and challenging because it involves social, technical, and policy considerations. Approaching energy planning in a manner that accounts for changing gender relations can do much to transform the situation of women and their relations to men.

If gender aspects of the energy-poverty nexus are to be adequately dealt then two major transformations have to take place.

- ❖ Women have to be empowered to make choices about energy. Enabling choice is linked to issues of sustainable livelihoods and poverty alleviation, including access to income generating activities. They should be able to act upon the energy choices open to them, and their scope for this type of action is linked to decision-making within households. Such a shift in decision-making requires women's social and political empowerment.
- ❖ It also requires changes on the energy supply-side. It will require responsiveness by the energy sector in the provision of equipment using modern energy forms that reduce the drudgery of much of women's labour, and that at affordable prices.

Ironically, in countries in which the Government has taken it upon itself to deliver development, the poor have less. This is because high government control and redistribution of GDP only slows growth. Countries with high government intervention also have greater economic inequality. Quite strangely, it is rich countries, which traditionally have less government that can afford higher levels of government intervention than poor ones.

Most Improved Cook stoves (IC) programs, especially the large-scale government initiatives, met with limited success, the reasons identified included poor targeting (i.e. women were excluded), inappropriate technologies not meeting the real needs of the purported beneficiaries, i.e. women, and men not meeting their responsibilities.

Stoves programs have assumed that women will easily accept a new type of stove that use less firewood because it will save time in collecting it. However, women have varied criteria for assessing utility of stoves of which fuel economy may be only one.

The women's choice to continue using a traditional biomass stove in a fuel scarce region may be quite rational if the design of alternative products is not user-friendly and if repair service is not available in case they need some assistance. Furthermore, the scale of operation and the dissemination rates of stove programmes are very low.

The Indian stove programme, the largest renewable energy programme of the country, has so far managed to cover only nine percent of the total rural households (TERI 1996)²² Besides improved cook stoves, development of alternative fuels like green charcoal, and adoption of solar cookers, have been some of the other initiatives undertaken by NGOs as well as governmental programmes, none of these however have been very successful.

Recent programmes by the Tamilnadu government in supplying cycles to girls going to school and free LPG gas stoves have not really changed much. This is due to the reason that more often it does not reach to the right persons due to corruption. Further people have a tendency to sell them and continue using biomass.

In India, only one per cent of rural households have switched over from firewood and chips as a source of cooking since 1987-88 (GoI 1997)²³. Only 1.3% households in the rural areas use LPG for cooking (CMIE 1996)²⁴ and 1.34% rural households use kerosene (CMIE 1996)²⁵. The use of firewood in form of logs, on the other hand, has tripled over the last fifteen years. Between 1978-79 and 1992-93, the share of firewood in the form of logs has risen from 18.95% (percentage of households using fuel) to 32.49 % (Agarwal 1998)²⁶. Hence, it can be inferred that while conventional modern forms of energy (fossil fuels, and electricity) will remain the fuel of first choice for many poor people for many years to come, traditional biomass fuels will remain the main fuel of necessity. The need for improving the efficiency of biomass use can hence not be over-emphasized

Looking at these issues the options available for resolving this poverty-gender-energy-nexus is by a combination of the following:

- **Raising awareness of policymakers:** Policies should specifically target rural household energy needs, and politicians should recognize the importance of gender sensitive participation when formulating energy programs. Rural energy is an effective entry point for reducing poverty and promoting sustainable development. Women's lives are intimately connected to and affected by water and energy resources because of their central role as primary collectors, users and managers of these resources for households use. The primary end users of energy, in particular women, need to be provided with the necessary knowledge to better influence energy projects, programs, and policies.
- **Engaging the stakeholders especially females:** Women should be involved at all levels of management and implementation of community-based energy programs. Proven approaches are self help groups and income-generating activities for women. More involvement of women in the energy sector would make a significant difference in meeting the challenge. Involvement needs to be at different levels, not only in terms of the decision making about energy choices in the household, but also as active agents, such as energy entrepreneurs and as managers of forests for sustainable biomass fuel supply.

22 TERI, 1996. Rural energy sector in India. Report submitted to the Royal Danish Embassy, New Delhi. Tata Energy Research Institute, New Delhi.

23 GoI. 1997. Energy used by Indian households. Fifth Quinquennial Survey on Consumer Expenditure. NSS 50th round (July 1993-June 1994). Report No. 410/2. Calcutta: National Sample Survey Organization, Department of Statistics, GoI

24 CMIE. 1996. India's Energy Sector. Centre for Monitoring Indian Economy, Mumbai

25 CMIE. 1996b. India's Social Sectors. Centre for Monitoring Indian Economy, Mumbai

26 Agarwal. 1998. 'False predictions' Down to Earth. 7(1): 29-39. Centre for Science and Environment, New Delhi.

A recent evaluation of the National Program on Improved Stoves in India found that: although most women said that they were satisfied with their stove and valued its smoke reduction qualities, still 20–50% of households had modified their new stoves to accommodate larger pots and pieces of wood; most women continued to use their traditional chulha as well as the improved stove; many had only accepted the stoves because they had been led to believe that other benefits such as new roofs would follow; and few planned to purchase the improved stove once their nearly-free improved stove wore out (ESMAP, 2002)²⁷.

At present women are managing 1/3rd of the energy systems of India by gathering fuels. Hence, they need to have the power to decide on the type of energy they want. Women energy needs attention does not confine to meeting household energy only but also for meeting the strategic and productive energy needs. The productive activities in which women engage also use energy, usually human and often biomass energy. The numerous smaller scale technologies which women can take control of and manage themselves to meet their needs continue to largely remain overlooked in government planning and donor investments {Sharma and Banskota (2005)}²⁸. This has to change.

- **Training and thus improving women's entry into technical positions:** Women have to be trained to make best use {of available energy options, they must have access to credit and information and their capacities must be built to operate and manage energy systems. A more basic requirement, however, is to provide or create enabling conditions for women to meaningfully participate in energy policies and programmes at various levels. Women's promotion into technical jobs can be accomplished by favoring organizations that strive to achieve this goal or by providing incentives to do so. Steps need to be taken to reduce and eliminate the gap between men and women in the fields of science and technology. Women's participation in commercial energy provisions need to be encouraged.

Women may in fact be ideal candidates to become energy entrepreneurs, as has been argued by Batliwala and Reddy (1996)²⁹. Madhu Sarin's work in India has indicated that improved stove programmes run by women tend to be rather successful because they are able to more easily approach their clients (Sarin, 1984)³⁰.

- **Educating women and men on different energy technologies.** Men and women need to be educated about the various types of energy technologies. They must be provided with adequate information about the advantages and disadvantages (for example Price, environmental effects, health impacts, maintenance) of various energy technologies. They also need to be trained on how to maintain, and repair etc so that they will be able to make concerted, choices in terms of energy uses and technologies.

27 ESMAP (Energy Sector Management Assistance Program). 2002. India: Household energy, indoor air pollution and health. World Bank: Washington, DC.

28 Sharma, B.; Banskota K. 2005 Women, Energy and Water in the Rural Himalayas. Project Learning. Kathmandu : ICIMOD, UNNEP and SIDA

29 Batliwala S and Reddy A K N (1996), Energy for Women and Women for Energy: A proposal for women's energy entrepreneurship, Energia News No1, pp11-13

30 Sarin, M. (1984) Nada Chula: a Handbook. Delhi: Voluntary Health Association of India

Further the benefits of mainstreaming gender issues into the energy sector need to be given wide publicity through networks, workshops, and conducting training in the local language is critical for both women and men.

- **Building upon existing resources.** Biomass fuels (wood, charcoal, dung etc.) are likely to remain for some time the primary fuels for process heat and cooking because electricity is in almost all situations more expensive for such applications. Continuing to promote improved cooking stoves; pricing mechanisms to encourage a shift from biomass to alternative energy sources, such as LPG; and developing biogas etc can be used to decrease traditional biomass use and indoor pollution.
- **Using gender analytical tools and frameworks:** Gender analytical tools and frameworks that are in standard use in the agriculture, health and water sectors (the Harvard Matrix, Gender Analysis Matrix etc.) are hardly used in energy planning. This is partly because these tools do not fully meet the needs of energy planners, focusing on general aspects of women and men's relative situations, rather than on the specific energy dimensions of poverty.

To an extent the existing gender tools can be adapted to the energy sector to bring to light hidden aspects of the poverty-energy-gender nexus, but there is a clear need to develop tools specific to the energy sector to ensure that all aspects are analyzed. These gender and energy tools need to be user friendly to help social planners incorporate energy dimensions in their work and energy planners to see the gender and poverty aspects of theirs.

- Taking the help of NGOs and Corporates as part of their Corporate Social Responsibility (CSR) programme to address these issues. If LPG companies are able to supply the stoves as part of their CSR program, they will be able to monitor the usage in a better way and the problems of corruption and misuse can be removed. Similarly if organizations that make LPG gas stoves are involved directly in the free LPG gas stove schemes, the benefits would go to the most deserving persons and misuse can be greatly avoided. NGOs and media can contribute in increasing the awareness and in act as a watch dog that these programs are not misused by the politicians.

While energy is a critical input to development, it is clear that access to modern forms of energy is not a sufficient condition for development. Many complementary inputs are required, which facilitate the end-use technology to convert energy into useful outputs.

The four pillars or bases of the community mobilization are

- ❖ Participation,
- ❖ Transparency,
- ❖ Consensus Decision and
- ❖ Inclusion.

These bases call for people's involvement (community participation) in every stage of the development process, so that community would be more productive and capable in decision making, implementation, benefit sharing and self evaluation. This ensures efficiency and efficient use of resources, equity, sustainability and empowerment – the four essential pillars of human development.