Integrated Research and Action for Development
IRADe

ENERGIA: International Network on Gender and Sustainable Energy

Gender Analysis of Renewable Energy in India :

Present Status, Issues, Approaches and New Initiatives

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February 2009

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सत्यमेव जयते

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MINISTRY OF NEW AND RENEWABLE ENERGY

MESSAGE

The initiative taken up by IRADe-ENERGIA team to conduct a gender analysis of some of the renewable energy projects and programmes in India is indeed a positive step and would serve as an important input to integrate gender concerns in the implementation of various programmes under the Ministry of New and Renewable Energy.

2. Of the energy used in rural Indian households, around 86% comes from non-commercial fuels such as fuel wood, agricultural wastes and animal dung that are primarily managed by women. It may be useful to have an effective inter-ministerial system involving concerned Ministries, which may lead to a more gender-responsive programmes and efficient delivery mechanism resulting to enhanced women's well being.

3. The Ministry of New and Renewable Energy (MNRE) congratulates IRADe-ENERGIA team and thanks them for useful recommendations on gender concerns in renewable energy sector. I hope to discuss these at MNRE to ensure that the benefits of MNRE programmes and schemes accrue in appropriate proportions to men and women.

New Delhi,
26.2.2009.

(Deepak Gupta)

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उजाला ऊर्जा से देश विकास
गांव गांव बिजली, घर घर प्रकाश

वी. सुब्रमणियन
V. Subramanian

सचिव
भारत सरकार
नवीन और नवीकरणीय ऊर्जा मंत्रालय
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FOREWORD

India is now on a growth-path that has given to the citizens hope for a better future. Accessible, affordable and clean energy is an integral part of that dream, especially for the poor. Unfortunately, despite the high growth, more than 500 million persons still do not have access to modern energy services. This further increases the drudgery for the already over-burdened women who struggle to provide food, fuel and water for their families.

I am happy to see that IRADe-ENERGIA team has taken up the challenge to make the energy sector gender sensitive by taking up gender audit of the Ministry of New and Renewable Energy (MNRE). This is done in the overall context of the Integrated Energy Policy (IEP), which provides a way forward for energy policy in India, in the wake of the 11th Five Year Plan. The Plan has envisaged economic empowerment of women and improvement in their health conditions. As part of the gender audit exercise, a methodology is developed for rating the various programmes of MNRE with a view that such programmes become gender inclusive.

This study has further reinforced the importance of integrating gender issues in the programmes starting from the conception stage itself and also determining the criteria for monitoring and evaluation as part of the programme guidelines, as an integral part of the energy development process and not something added later on. MNRE has been a part of several consultations process over the last six months. We hope to carry this work forward by interactive discussions with MNRE and the Planning Commission. MNRE would take the constructive suggestions to make them part of on-going programmes. We are pleased to note the initiative that has fostered South-South exchange and mutual learning built on lessons learnt from previous gender audits of energy policies in Kenya, Senegal and Botswana.

With oil prices reaching an unprecedented levels, fossil fuels becoming more difficult for the poor to afford. Given this, the MNRE has to shift gears to reach out to wider segment of population, especially women and the poor, who are the most vulnerable segments of the society. This report not only focuses on the gender equality issues, it also provides a way forward for efficient implementation of the renewable energy programmes.

We congratulate the IREADe-ENERGIA team and thank them for these recommendations. I hope they will be further discussed at MNRE and will be implemented in the near future in line with the Government policy for inclusive growth that has to reach out to a large number of women, especially from the economically weaker sections.

Dated 27.06.08

(V. Subramanian)

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27.6.2008

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PREFACE

This report is primarily addressed at policymakers and others concerned about gender and energy issues in India. The ministerial structure as it relates to energy in India is given as an appendix for the benefit of readers both within and outside India.

Typically, a gender audit exercise is carried out by experts at the organisational level. The present gender analysis exercise is different from such other exercises in its approach and methodology in that it tries to look from the other side of the prism and brings energy expertise to tackling directly the question, at the **macro-economic level**, of how much investment and imports at the national level are addressed directly at women's needs. What investment, management and technology efforts are going into ensuring a sustainable supply of traditional energy sources, since these constitute a large share of total energy supply? Indeed, asking the questions did give a wake up call to those who deal with energy.

Next, a second level enquiry was held at the **meso-level** and examined various MNRE programmes that are oriented towards technology or finance. Even a quick and simple method using weights produces a result that is both thought-provoking and useful. It challenges MNRE to increase gender-friendly investments from a meagre 12 per cent. Ideally, with a larger scope of the exercise and a budget to match, a **micro-level** analysis at the level of beneficiaries could complete the full exercise. Nevertheless, this limited exercise has added a new dimension to gender budgeting.

As Dr May Sengendo, a senior technical advisor for ENERGIA, has rightly pointed out, the uniqueness of the exercise for India is related to the methodology used. This exercise highlights gender concerns in the content of energy policy and programmes, in gender relations among stakeholders and in those gender and institutional mandates that are part of the process of planning, implementing and monitoring energy policies and projects. It provides tools that can identify the extent to which gender concerns have been considered at the policy and project level in ways that may illustrate gender, energy and poverty linkages.

The Secretary of the Ministry of New and Renewable Energy, Mr. V. Subramanian pointed out that gender audits typically deal with the past and could consequently be seen as judgmental. He saw a future-oriented exercise, showing the way forward, as more valuable. This suggestion was taken on board and for each programme, suggestions are made to that effect. The methodology used and the caveats are described in detail when explaining the rating exercise. This exercise was found to be very useful and thought provoking by officials from the Ministry.

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THINK TANK GROUP

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The team expresses their gratitude for invaluable inputs made by Dr Kirit Parikh and Dr Syeda Hameed, Members of the Planning Commission, Mr V. Subramaniam, Ex-Secretary, Dr. A R Shukla, Scientist "G", Ministry of New and Renewable Energy, Mr Surya P. Sethi, Principal Adviser (Energy) to the Planning Commission, Ms Elizabeth Cecelski, Energy, Environment and Development, the ENERGIA International Secretariat and Dr May Sengendo in preparing this report. We thank Mr. V. Subramaniam, former Secretary, MNRE for valuable suggestions and participating in all the activities and events . Mr. Deepak Gupta, Secretary, MNRE has also taken keen interest in gender analysis. We thank him and Dr. A.R.Shukla, Scientist "G", MNRE for their support.

ABBREVIATIONS

ARI	Acute Respiratory Infection
CBO	Community Based Organization
CSWB	Central Social Welfare Board
DRDA	District Rural Development Agency
EBP	Ethanol Blending Programme
FTBP	Family-Type Biogas Plant
GBC	Gender Budgeting Cell
HPCL	Hindustan Petroleum Corporation Limited
IAP	Indoor Air Pollution
IEP	Integrated Energy Policy
IREDA	Indian Renewable Energy Development Agency
KVIC	Khadi and Village Industries Commission
LPG	Liquefied Petroleum Gas
M&E	Monitoring and Evaluation
MDGs	Millennium Development Goals
MNRE	Ministry of New and Renewable Energy
MOEF	Ministry of Environment and Forests
NBMMP	National Biogas and Manure Management Programme
NCAER	National Council of Applied Economic and Research
NG	Natural gas
NGO	Non-Governmental Organization
NBDP	National Biogas Development Programme
NPIC	National Programme on Improved Chulhas
NREGA	National Rural Employment Generation Act
PEO	Programme Evaluation Organization
PRIs	Panchayati Raj Institutions
RGGVY	Rajiv Gandhi Grameen Vidyutikaran Yojana
RVE	Remote Village Electrification
SEWA	Self Employed Women Association
SHG	Self Help Group
SPV	Solar Photo Voltaic
UNDP	United Nations Development Programme
VEC	Village Energy Committee
VESP	Village Energy Security Project
WHO	World Health Organization

EXECUTIVE SUMMARY

A gender analysis of national energy policies has been completed as an exercise to draw attention to the lack of gender concerns in national energy policies in India. In India, the demand for energy is increasing to fuel a rapidly expanding economy, and large investments are being made in exploration, fuel production, the generation, transmission and distribution of power and in setting up grid infrastructure. These massive efforts in energy development do not consider the needs of women, their access to and control over energy resources or support a gender-based empowerment process. The 11th five-year plan (2007-2012) expects to invest more than $100 billion in the energy sector, including coal, oil, hydropower and other renewables and nuclear - but less than 2% of this may go towards alleviating the drudgery suffered by women and children. Together, women and children collect close to 28% of all primary energy. However, no inputs in terms of investment, management or technology are provided to them- something that all other energy sectors take for granted.

This is partly due to a lack of gender mainstreaming in the energy sector and a lack of understanding of how to incorporate gender concerns in a sector that has primarily been technology-driven. Against this backdrop, a gender analysis exercise has been carried out to promote an approach that would lead to national energy policies becoming more gender-responsive in terms of content and process. A sound gender-responsive energy policy and, more importantly, its coordinated implementation are the keys to successful economic development.

Approach and Methodology

The methodology of the exercise involves a multi-pronged process consisting of a literature review; a background study of gender, energy and poverty issues; interactions with key stakeholders in the energy sector and an analysis of energy policies and strategies in India. Unlike a gender audit of an organisation, the gender analysis of the energy sector in India concentrates on the concerns over gender in the content of energy policy and strategies, and their impact on gender relations, in terms of addressing women's practical and strategic needs within a framework of gender, energy and poverty linkages.

The gender analysis exercise reviews those national energy policies and programmes that have the greatest implications for women. These include the Integrated Energy Policy (IEP), an important policy document prepared by the Planning Commission of the Government of India, which describes and evaluates the nation's energy policies and programmes in a comprehensive manner plus those projects/programmes of the Ministry of New and Renewable Energy (MNRE) that deal with women's practical and strategic needs. MNRE programmes that are reviewed include the National Biogas and Manure Management Programme, the National Programme on Improved Chulhas (stands discontinued), the Village Energy Security Project (VESP) and some solar-based programmes. A review on the prospects for biofuels, which could cater for women's needs, is included and emphasises their potential in income-generating activities.

The gender exercise also presents a methodology, and preliminary results from using it in a 'gender rating' exercise, which rates, on the basis of gender considerations, the budgetary outlays of MNRE and identifies the likely benefits filtering down to women. The report describes the rating process and suggests ways to improve it in future. The analysis is synthesised in the form of key findings and recommendations in terms of policy formulation and a suggested action plan.

Findings and Key Recommendations

For its successful implementation, the energy sector policy, like policies in other sectors, needs to be supported by programmes for gender equality and social relations and enacted through appropriate institutions at the micro- and macro- levels. Self-help groups, Panchayati Raj institutions and community-based organisations can be efficient models for institutional arrangements at the local level. Involving these institutions in energy policies and programmes would help to reduce transaction costs in energy service delivery linked to energy access enterprises at the local level (related to sources such as wood lots, biogas, solar energy and LPG) and also reduce the problem of a failure to implement policy.

When the budgetary outlay of MNRE under the 10th five-year plan was rated using a gender-rating procedure devised by IRADe to substantiate the effective benefit accruing to women from the various MNRE programmes, it is found that a mere 12.67% of the total ministry's outlay addresses women's specific energy needs. One of the reasons for this imbalance is intra-household inequities, with various surveys showing that women are not even equal beneficiaries of grid electricity as they do not read and have too many work pressures to enjoy the benefits of electricity such as entertainment through television.

The following are the key recommendations that emerged from the gender analysis:

1. **Reorient monitoring and evaluation mechanisms to reflect gender concerns in energy programmes**

   - Improve the accountability of various ministries, in terms of their performance in including gender concerns in the energy sector, by incorporating Monitoring and Evaluation (M & E) with selected gender indicators as a regular part of the implementation process.

   - Gender budgeting within each ministry should reflect women's priorities, and be employed to see how women are being helped with regard to their gender-strategic needs, including their involvement in energy infrastructure and management.

2. **Linking women's empowerment with energy development**

   The first important step would be to include women in the planning, execution and monitoring processes of programmes and schemes. The monitoring and evaluation of the programmes should differentiate the benefits accruing by gender: for example, the productive hours 'lost' by women in the collection of fuelwood should be counted, and

whether the ownership of and control rights to energy resources are transferred to women examined. The priority should be to make cooking with cleaner energy a *right* for all households, and to couple this with creating economic space for women's work and mobility. Other identified needs include:

- Set up an enforcement mechanism within MNRE to efficiently utilise the budget earmarked for addressing women's specific needs, to develop more programmes that address gender-specific energy needs and to simultaneously incorporate gender components in existing schemes. There is a need to give clear mandates to the various programmes to ensure gender benefits.

- Hire more women at the MNRE to increase the number of women professionals in the Ministry.

- Incorporate NGOs and other private sector experiences in MNRE's programmes and planning processes.

- Publish an annual renewable energy report that highlights data concerning the functioning and benefits of installed systems in terms of improving women's social status. Other topics to be highlighted include employment, gains in decision-making in the community and the household and energy assets managed by women. This would help in the formulation of policy and in monitoring programmes leading to a narrowing of the gender gap in energy programmes.

3. Inter-ministerial coordination

- Providing affordable and sufficient energy is the responsibility of several ministries including those of Power, Petroleum and Natural Gas, New and Renewable Energy, Rural Development, Environment and Forests, Agriculture and the Ministry of Women and Child Development. This requires coordination and an inter-ministerial set-up, involving the various energy ministries and other ministries with stakes in women's wellbeing and empowerment would help ensure that gender concerns are not overlooked. The lack of coordination combined with negligible accountability from the above-mentioned ministries. This results in minimal interest from them and a lack of investments directed at addressing gender concerns in the energy sector, which leads to a continued perpetration of gender based implications such as negative impacts on women's health and well-being and also lack of economic development for women and gender inequalities.

- A stakeholders' meeting at the Planning Commission recognised the need to develop a working relationship between ministries and to have regular consultations with MNRE to establish programmes that see women and energy issues as a priority. Further, a need was identified to make use of gender budgets in each ministry for training and capacity building. This is likely to motivate the concerned ministries to implement plans and use gender budgets for women's empowerment. The collective actions of

the various ministries will enable them to undertake concrete programmes that implement gender-specific policies.

- As an example, the Gender Budgeting Cell (GBC) at MNRE could collaborate with GBCs in other ministries in integrating energy issues in their programmes and lead the process through the linking of women's empowerment to gender budgets.

4. Make cooking fuel available within 1 km of rural habitants

The IEP suggests that fuelwood plantations should be available within one kilometre of all habitations where the inhabitants do not have access to, or cannot afford, even the subsidised cleaner fuels, and this is now included in the 11th five-year plan. Biomass fuels are likely to remain the primary fuels for process heat and cooking for some time because the commercial energy options are still inaccessible and too expensive for rural poor women who will continue to rely on gathering wood and other biomass residues. This goal could be strengthened through other strategies, such as expanding the access to other fuels such as LPG, kerosene and biogas, in addition to as wood from plantations. Enabling access to cleaner and affordable cooking energy is an important energy intervention that needs to be addressed if one is to reduce women's drudgery, the time they spend gathering fuel and the health impacts of indoor air pollution. Achieving the suggested goal at the practical level will require coordination among various ministries and a mission-mode approach (with a specific target within a given time- frame). Different approaches from the various ministries will need to converge to achieve this goal, and these will depend on the state, the district, the ecosystem and the economic status of the local inhabitants.

CHAPTER 1

Introduction and Background to the Study

1.1 Introduction to Gender Analysis of National Energy Policies in India

Approximately 2 billion people throughout the world do not have access to clean energy for cooking and about 1.7 billion people are without electricity for either cooking or heating. Grid-based electrical power fails to reach many rural and poor urban areas in developing countries, and there is also inadequate distribution of gas or other fuels for cooking and heating. The impact of such precarious situations is more pronounced on poor women than men because of the 1.2 billion people worldwide living on less than one dollar a day, 70 per cent are women.

In India, the 2001 census showed that nearly 700 million people do not have access to modern energy services. While nearly 300 million people do not have access to electricity, an even larger number (625 million) do not have access to modern cooking fuels (Parikh. J, 2007). Poor quality biomass such as crop residues, animal dung and fuelwood are widely used in rural India and have detrimental impacts on women's lifestyles, status and health and also on the environment. As women are generally the managers of household biomass energy, poor access to domestic energy has profound effects on them. Women primarily collect the biomass, which often involves walking long distances and spending considerable time foraging for the fuels. Whereas LPG and kerosene are the dominant cooking fuels in urban households in India, these are not commonly used in rural areas due to the absence of markets and distribution networks and also to the very limited cash incomes in most rural households.

In most developing countries, including India, women suffer the most from conditions of extreme poverty. Given their traditional responsibilities for collecting fuel and water, women and girls have more to gain from access to improved energy services. Targeting cooking fuels addresses perhaps the most important household-level need of the poor especially in terms of the impact on women (UNDP, 2004). The type of cooking fuel used in a household has significant consequences for the environment, for the health of family members and on women's lives. Most people in developing countries rely on traditional fuels for cooking and heating because they can be collected without any cash expense on the part of the households. Literacy rates and school enrolment levels are dramatically different for women and men in many developing countries and a factor is the fact that much of women's time is taken up with difficult and time-consuming chores related to producing and processing food without mechanical or electrical equipment, and cooking without modern fuels and energy-efficient appliances. Women are also exposed to a variety of health hazards from cooking over poorly ventilated indoors fires, resulting in respiratory infections, cancers and eye diseases. Smoke from indoor fires accounts for between 410,000 and 570,000 premature deaths each year in India (Parikh et al., 1999).

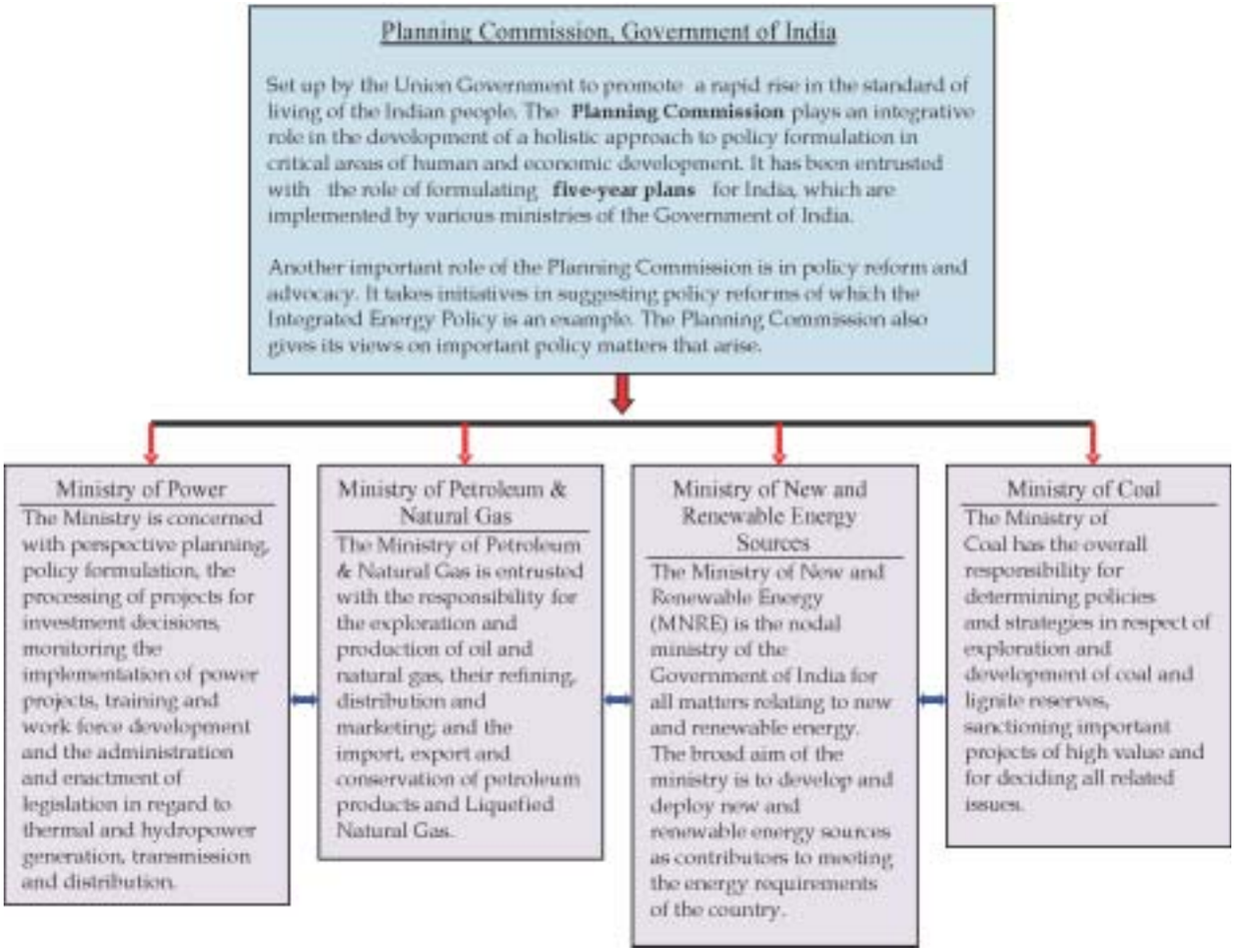
Therefore, energy development should not be viewed in isolation. It is a factor in women's lack of empowerment and should be part of the government's commitment to development since it is closely linked with health, literacy and even the right to life. How do we hold the government

accountable for ensuring that provision of energy services that address these needs of men and women? What means and methods can be used to improve governance? Gender analysis is one such method.

IRADe, with support from ENERGIA - the International Network on Gender and Sustainable Energy, has carried out a gender analysis of national energy policies in India. ENERGIA, through its experience, maintains that the lack of attention to gender concerns in national energy policies in developing countries is in part due to a lack of gender mainstreaming in the energy sector and partly due to a lack of understanding about *how to* incorporate gender concerns in a sector that has primarily been technologically driven. Against this backdrop, a gender analysis exercise has been carried out to introduce an approach that could make national energy policies more gender responsive in terms of content and process. A sound gender-responsive energy policy and, more importantly, its coordinated implementation is the key to success in our economic development.

To understand the institutional setting of energy policy and planning in India, a simple diagrammatic framework is presented below:

Fig. 1.1 Framework for energy planning in India



Box 1.1: Policy Framework for renewable energy in India

The importance of increasing the use of renewable energy sources was recognised in India in the early 1970s. Since 1980, emphasis has been on the development, trial and introduction of renewable energy technologies for different sectors.

India has a policy framework for renewable energy in place to tap the potential for renewable energies such as solar, wind, biomass and small hydro, irrespective of capacity. The Indian scientific establishment has been working on the development of various renewable energy technologies/systems. In 1981, the Government of India established a Commission for Additional Sources of Energy (CASE) in the Department of Science and Technology, along the lines of the Space and Atomic Energy Commissions. The mandate of CASE was to promote research and development activities in this area. In 1982, CASE was made part of the newly created Department of Non-Conventional Energy Sources (DNES) that, in 1992, became the Ministry of Non- Conventional Energy Sources (MNES). However, CASE is no more in existence now. Recently, the Ministry changed its name to the Ministry of New and Renewable Energy (MNRE) because it does not believe that renewable energy deserves the non-conventional tag. India is the only country in the world that has a ministry exclusively dealing with new and renewable energy sources. (www.coreindia.com/renewable).

MNRE supports the implementation of a broad spectrum of programmes covering the entire range of new and renewable energies. The programmes broadly seek to supplement conventional fossil fuel-based power, to extend the reach of renewable energy, including electricity, to remote rural areas for a variety of applications such as water pumping for irrigation and drinking purposes and for drying farm produce, to introduce biogas plants, and to encourage energy recovery from urban, municipal and industrial wastes. In addition, the exploitation of hydrogen energy, geothermal energy, tidal energy and biofuels for power generation and automotive applications is also envisaged.

There has been a growing awareness of the benefits of renewable energy, mainly due to sustained public awareness campaigns. Resources were provided in the 10th five-year plan to achieve the aim of electrifying around 25,000 remote non-electrified villages and hamlets by 2007. It should be mentioned here that solar power is seen as an important player in India attaining energy independence in the longer term. However, even with a concerted push and a forty-fold increase in their contribution to primary energy, renewables may still only account for 5 to 6 per cent of India's energy mix by 2031-32.While this figure appears small, the distributed nature of renewables can provide many socio-economic benefits.

1.2 Scope of the Gender Analysis Exercise

The major energy challenge facing India is providing domestic energy to rural areas, and the burden of this energy crisis is borne by the poor in general and women in particular. Although the issues of gender and energy encompass a wide spectrum of energy services, for cooking, lighting, income generation, agriculture production, etc., the present study concentrates on household energy and the transition from biomass to modern fuels. This is primarily because of the critical nature of the problem and its implications for the labour, health and income generation of poor women in India, which are seen as obstacles to gender equality. The reliance on traditional biomass for cooking continues to be a daunting challenge for most poor rural women, and an issue that has received scant attention. The role of women in various activities linked to energy supply and energy services such as biogas, biofuels and other renewable energy technologies, and the impact of these technologies on women's lives, has been the main focus of this study. Against this backdrop, the gender analysis exercise specifically focuses on renewable energy options, including biofuels, with women's empowerment and poverty

reduction as crosscutting issues. It focuses on the government's efforts towards satisfying the energy needs of rural India for cooking and lighting through the promotion of alternative sources of energy such as biogas, solar, wind and small hydro, and the promotion of improved cook stoves.

1.3 Why the Ministry of New and Renewable Energy as a case study for gender analysis exercise?

There is every reason to believe that renewable energy sources can play a major role in addressing energy security issues and gender issues in the longer term. In India, rural energy technologies are being promoted through various policies and programmes of the Ministry of New and Renewable Energy (MNRE). The exercise primarily concentrates on the policies and programmes formulated by the Ministry of New and Renewable Energy, and particularly on the programmes that address household energy. The selection of the MNRE as the key ministry for the gender analysis is justified on the basis that renewables are important to India's energy sector in developing domestic supply options and in diversifying energy sources to meet the growing energy demand. This view is further enhanced by the fact that the distributed nature of renewables can provide many social benefits, especially to poor rural populations, by providing employment and livelihood opportunities besides meeting basic energy requirements. MNRE was also appropriate for gender evaluation because it is the ministry closest to the end users (relative to the other energy ministries) and thus the one most likely to benefit women directly – provided appropriate policies and programmes are pursued. While we recognise that the other energy ministries also have a role in providing energy access to poor women, they are not reviewed here, as it was not possible to cover all ministries under the present terms of reference.

Addressing household energy does not mean a micro-approach or dismissing women's needs as no more than improved stoves, although surveys do seem to show that cooking is, by far the greatest need. In addition, there are issues such as subsidies, pricing and supply, which affect the access to energy services. For this reason, the gender analysis also focuses on the Integrated Energy Policy (IEP) report prepared by the Planning Commission of the Government of India, which links the energy policy to sustainable development, encompasses all sources of energy and addresses all aspects including energy security, access and availability, affordability and pricing, efficiency and the environment.

1.4 Objectives of the study

The specific objectives of the gender exercise were:

a. To identify and analyse the factors which hinder efforts to mainstream gender in energy policies and programmes

b. To identify and assess gender gaps in energy policies and programmes, i.e. the mismatch between commitments and implementation

c. To work with stakeholders to formulate strategies that can address these gaps at the national level

d. To make gender and energy issues visible to a wide audience in ways that support national and international networking and advocacy initiatives that can influence energy policies and programmes.

1.5 The Study Methodology

Typically, a gender analysis exercise is carried out by experts and focuses on the organisational level. The present gender analysis exercise is different in its approach and methodology: it tries to look from other side of the prism and brings energy expertise that directly tackles the question at the **macro-economic level** – to what extent do national-level investments directly address women's needs? Which investments and management and technology efforts are going into ensuring a sustainable supply of traditional energy, since this constitutes a large share of the total energy used? Indeed, such questions did give a wake up call to those who deal with energy.

The second level of the enquiry was at the **meso-level** and examined various MNRE programmes that were technology or finance oriented. Even a simple method, involving *gender-rating* the programmes using weights, produced a result that is thought-provoking and useful. It challenges MNRE to increase its gender-friendly investments from a meagre 12 per cent to 30 per cent. Ideally, with a larger scope of and a budget to match, a **micro-level** analysis at the level of the beneficiaries would round off the gender analysis. Nevertheless, this exercise has added a new dimension to gender budgeting.

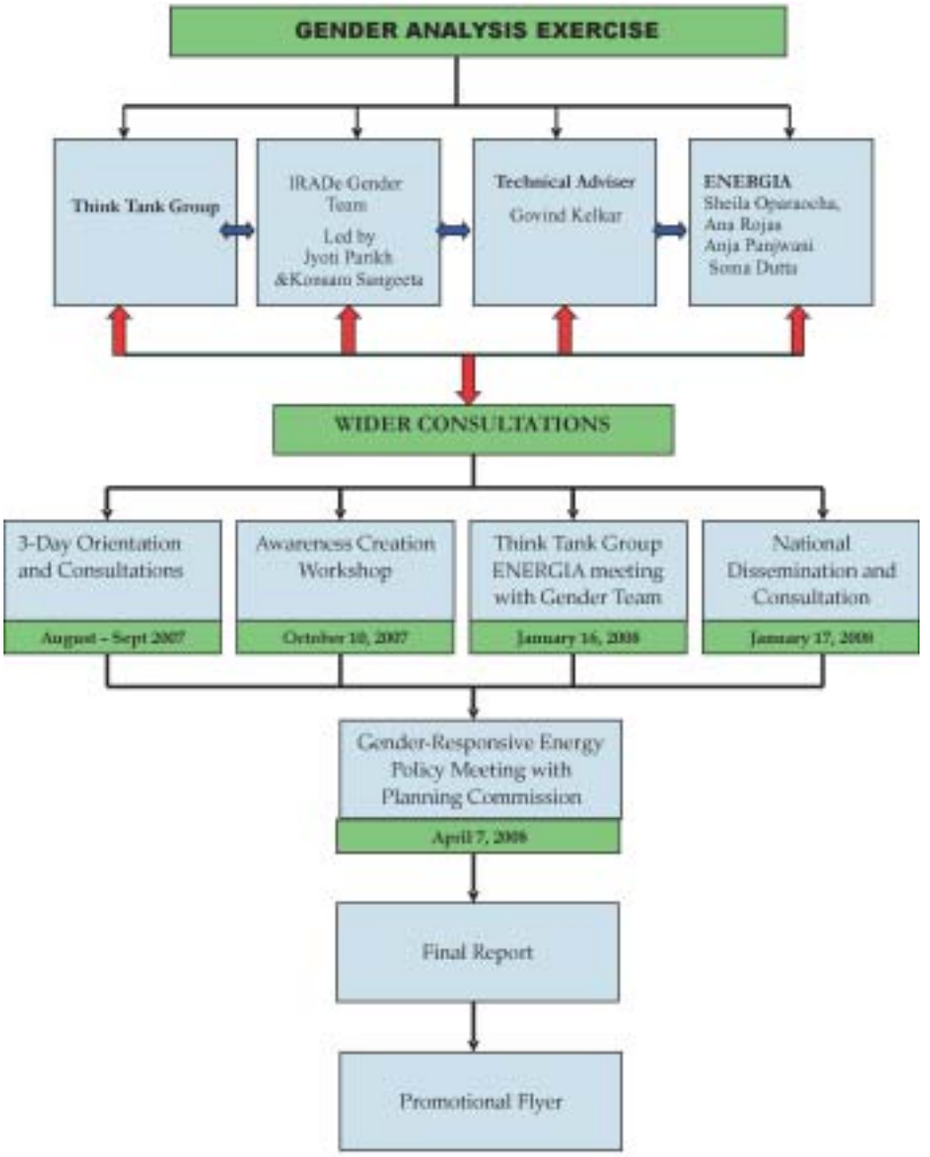
As Dr May Sengendo, a senior technical advisor for ENERGIA, has rightly pointed out, the uniqueness of this gender exercise lies in the methodology used. This exercise highlights the gender concerns in the contents of energy policy and programmes: gender relations among stakeholders, and the gender and institutional mandates that are part of the process of planning, implementing and monitoring energy policies and projects. It provides tools that can identify the extent to which gender concerns have been considered at policy and project levels in ways that can illustrate the gender, energy and poverty linkages.

The methodology involves a multifaceted process consisting of a literature review; a background study of gender, energy and poverty issues; focus group discussions with officials from relevant ministries; and a discussion and analysis of energy policies and programmes in India. Along with the IRADe team and the Technical Adviser, a Think Tank Group also provided strategic guidance, advice and feedback on the exercise. Since it is not possible to get all the members together due to their busy work schedules, additional experts were co-opted to improve output quality and ensure efficiency.

Four steps were undertaken within the gender analysis of energy policies:

1. Planning and preparation
2. Information collection and analysis
3. Action planning
4. Dissemination of results and advocacy

Fig. 1.2 Process Methodology of Gender Analysis



The first step was the formation of the gender analysis team and the advisory Think Tank Group. The Think Tank was made up of experts in the field, who were consulted on a regular basis on the approach and provided inputs to the various drafts of the report, suggesting new directions, and serving as a sounding board for the gender analysis team, which comprised of IRADe staff. This was followed up by formal communication with the concerned ministries, and the selection of a representative from MNRE to be the contact person between the gender analysis team and MNRE. A planning workshop, led by the technical adviser, was organised as three days of orientation and planning consultative exercises for the project team. The workshop consisted of one day of initial orientation and team familiarisation, followed later by two days spent refining the planning and finalising the methodology, a process spread over a period of 5-6 weeks.

In the second step, an awareness creation workshop brought together key stakeholders and decision-makers from the energy and related fields at the national level, to discuss the approach that was to be used in the gender analysis exercise and also to receive their feedback and opinions. This was followed by the gender analysis itself, which was carried out at the policy, institution and programme levels, through reviews of documents. This was followed by the National Stakeholders Consultation and Dissemination workshop where the initial findings of the exercise were shared with the stakeholders led by MNRE. These were then deliberated upon and developed into policy recommendations. The final event in the process was a validation meeting with the Planning Commission and MNRE where the final findings and the policy recommendations from the gender analysis were presented and validated. This sequence of the events differed from that in a similar exercise in Africa in that the national dissemination workshop was held before the validation workshop. It was felt that sharing the initial findings of the gender analysis with concerned stakeholders, deliberating upon the findings and clarifying policy recommendations were necessary before the report could be validated by the Ministry. The final technical report has been summarised as a four-page flyer that can be used as an easy-to-understand advocacy tool for focusing attention and mobilising opinion and action on the importance of gender issues in national energy policies.

During the process, a broad cross-section of stakeholders ranging from government representatives, Non-Governmental Organisations (NGOs), Community Based Organisations (CBOs), women's groups, academic institutions and research organisations to the private sector, plus existing gender, as well as energy, networks and funding agencies were consulted and involved in the exercise.

1.5.1 Review of Policy Documents

The team mainly focused on two types of documents:

(i) Integrated Energy Policy Report (IEP) – This is a comprehensive document prepared by the Planning Commission of the Government of India that explains and evaluates the current national energy policies in a broad framework, and then offers recommendations and guidelines for the future. Its significance for the gender analysis lay in its comprehensiveness, the wide audience it reaches and last, but not least, and its acknowledgement of the importance of gender sensitisation in energy policies. It is also a document that explicitly explains gender issues in energy, a first in the energy sector in India.

(ii) Programmes and Schemes of the Ministry of New and Renewable Energy (MNRE) - The gender analysis exercise mainly concentrated on MNRE programmes that deal with women's practical as well as strategic needs. These were identified as the National Programme on Biogas Development, the National Programme on Improved Chulhas[1](NPIC), the Village Energy Security Project (VESP) and various Solar Energy programmes. Presently, the NPIC stands discontinued and has transferred to the state government. It should be noted here that a review of the prospects for biofuels, which are identified with women's needs, took into account the potential of the using biofuels for income-generation activities.

[1] *Chulhas*, in Hindi, means cookstoves

In addition, various reports and papers on gender, energy and poverty issues were analysed to explore how gender theory can explain linkages among gender, energy and development.

1.5.2 Information Collection and Analysis

The gender analysis of energy policy involved an in-depth analysis of the energy planning, programmes and implementation of the Ministry of New and Renewable Energy as part of the Government of India. As mentioned earlier, the study reviewed the Integrated Energy Policy (IEP) report - an integrated energy policy linked to sustainable development and covering all sources of energy and addressing aspects of energy security, access and availability, affordability and pricing, efficiency and the environment. It should be noted that the analysis of the report concentrates on those chapters that are relevant to gender and renewable energy.

The IEP also takes into account critical reviews of policy documents, poverty reduction approaches as well as relevant civil society discourses, including the views of women's organisations on women's needs for an adequate supply of energy. These would help identify specific ways in which gender issues have been addressed or been overlooked, plus critical gaps in the inclusion of gender concerns in national energy policy formulation and implementation.

The present study endeavours to assess the benefits to women of the energy-intensive programmes and initiatives developed by government, semi-government and non-government organisations. The content analysis of policy documents and programmes was intended to achieve this, using broad indicators, such as increasing income, reducing drudgery and improving access to better health through energy services, to assess how far they went in addressing gender issues in the energy sector in India. However, this was not possible as gender-disaggregated data on various economic and technological sectors, including the energy sector, are widely unavailable in India. This was a stumbling block in our attempt to carry out a gendered analysis of policies and programmes. Therefore, the assessment is instead based on secondary data collected from stakeholders (energy-related ministries, other independent data collection agencies, research papers etc.) in an attempt to provide deeper insights into the level and integration of energy gender perspectives in sectoral and institutional policies and programmes.

In view of the general lack of gender-disaggregated data in the relevant areas, attention was focused on gender-rating the budget outlays of MNRE in its tenth five-year plan. The expenditures planned in MNRE's programme were assessed using three main criteria as follows:

(a) *Women specific* allocations: specifically targeted at women and girls (improved stoves, biogas, etc.)
(b) *Pro-women* allocations: composite schemes with a clear pro-women component (home lighting, street lighting, etc.)
(c) *Mainstream* expenditures that have gender-differentiated impacts (e.g. training and capacity building)

The outlays made in the tenth plan on various items were classified into four separate categories, and weights proportional to the benefits directly accruing to women were attached. The numerical values assigned to the different categories of schemes are an indication of the proportion of benefits accruing to women and addressing their exclusive concerns. Therefore,

each budget line is rated on qualitative considerations but assigned a quantitative weight.

To sum up, a gender analysis is a process that reviews the budget, projects and activities of an organisation, aiming to identify gender gaps in its energy and poverty policies and making gender and renewable energy issues visible to a wider audience. Key stakeholders can then be consulted to formulate actions that have specific targets and time frames for mainstreaming gender in national energy policy and its implementation.

1.5.3 Tools of Analysis

A specific set of gender analytical tools was used to extract the gender dimensions embodied in policies, programmes and activities as follows:

(a) Quick scan – A quick scan of key documents helps to identify which issues need to be studied as part of the policy analysis; these include policy statements, measures and policy processes.

(b) Gender-responsive appraisal of policies and programmes – This focuses on identifying modifications required to overcome mismatches between policies and implementation, and any lack of consistency and sustainability in integrating gender into policy formulation, institutional norms and implementation mechanisms.

(c) Policy assessment – Involves using gender indicators related to poverty reduction and mainstreaming gender in energy policies to assess gaps in policy and implementation in the energy sector related to gender needs. This was carried out on three levels (but primarily focused on the first two):

- Macro-level - National
- Meso-level - Ministry level and individual MNRE programmes
- Micro-level – End-user considerations

1.6 Organisation of the report

This report consists of five chapters.

Chapter 1 introduces the gender analysis exercise of national energy policies in India, the scope of the exercise and its objectives. It also describes the methodology, including the tools and indicators used in the exercise.

Chapter 2 focuses on the energy situation in India, the gender-energy-poverty nexus, its linkages with the Millennium Development Goals (MDGs) and women's critical need for energy access.

In Chapter 3, those national energy policies and programmes that have implications for women are reviewed and analysed from a gender perspective. These include the Integrated Energy Policy and selected programmes of the Ministry of New and Renewable Energy (MNRE), namely: the National Programme on Biogas Development, the National Programme on Improved Chulhas (stands discontinued), the Village Energy Security Project (VESP) plus various Solar Energy programmes. These reviews also include the prospects for biofuels, in terms of catering for women's practical and strategic needs.

Chapter 4 presents our gender-rating of budgetary outlays, an attempt to identify the components of government programmes that benefit women.

Chapter 5 discusses the key findings of the study and draws recommendations for policy and an action plan.

CHAPTER 2

Gender and Energy Situation in India

This chapter describes the national level context within which the gender analysis exercise was undertaken and explains the gendered implications of the energy situation, political economy and social-cultural setting of India. Baseline data and current information on the energy sector, gender and poverty in India are documented. The chapter includes a literature review and some of the findings on the gender and energy situation, which is one of the key components of the gender analysis. Section 2.1 presents a gender analysis of the implications of the historical energy situation on sustainable energy in India. Section 2.2 provides an analysis of the gender implications of the current energy supply situation in India. Section 2.3 discusses the energy supply options, analysing the gender, energy and poverty linkages revealed through the gender analysis. Section 2.4 analyses the impact of access to energy on health, security, livelihoods and agricultural production from a gender perspective.

2.1 Gender and Energy Situation in India

A major energy challenge facing India is providing domestic energy to its people, particularly in the rural areas. India, with a population of more than one billion people living in 28 states, is the second most populous country in the world. The Indian economy uses a variety of energy sources, both commercial and non-commercial. The 2001 census indicated that nearly 700 million people do not have access to modern energy services. Nearly 300 million people do not have access to electricity, and an even larger number, 625 million, do not have access to modern cooking fuels. Each year, the equivalent of nearly three billion person-days are spent gathering fuels, and a further 700 million in processing them (chopping, drying, turning, storing, stacking and handling). About 800 million days are of potentially productive work are lost due to diseases related to indoor air pollution. Despite all of this, the primary emphases in energy policy and investment remain petroleum fuels and electricity, a reduction in subsidies on fossil fuels, and only limited investment in non-commercial energy. The 11th five-year plan (2007-2012) foresees an investment of more than US$100 billion in the energy sector but less than 2 per cent of this is likely to help alleviate the drudgery of women and girls who in fact collect close to 28 per cent of primary energy.

The energy investments made in high productivity areas do not necessarily lead to significant changes in rural areas. The scant attention paid in terms of investment and time by the government to low productivity sectors means that rural areas fail to benefit from energy investments. The brunt of such limited investment in basic infrastructure falls disproportionately on the poor in general and on women in particular. Women's energy needs have been left out of energy planning and investment because they do not fit into the traditional energy paradigm. Further, women tend to have less access to productivity-enhancing resources such as labour, collateral, credit facilities, market information and training. These inequalities often restrict women's ability to benefit from opportunities that are available. To put it starkly, energy planning

in the country is not based on an adequate understanding of the socioeconomic factors that lie at the root of the rural energy problems.

2.2 Gender implications of current energy situation in India

About 70 per cent of India's population live in rural areas. The rural energy scenario can be characterised by an inadequate, poor and unreliable supply of energy services and a large dependence on traditional biomass fuels. Non-commercial energy sources, predominantly fuelwood, wood chips and dung cakes, constitute almost 30 per cent of the total primary energy consumption and about 80 per cent of India's domestic energy needs are derived from these traditional fuels *(See Box 2)*. Without access to efficient and affordable energy sources, women have very few opportunities for economic and social advancement. The energy needs of women are quite different from those of men. In most cases, men tend to see energy as a status symbol for the community and also as having recreational uses in the home, whereas women look for valuable benefits from energy access such as timesavings, drudgery reduction, increased security and study opportunities for children. Many studies point to the increasing feminisation of poverty in the patriarchal structure of households and communities in India. However, the government, despite its commitment to inclusive growth, has paid limited attention to women's needs and strategic interests.

Box 2.1: Household Energy in Rural India

- 96.6% of households (HHs) use biofuels, 4.9% use kerosene and 4.95% use LPG for cooking. Most households use more than one fuel
- 39% of the fuelwood comes from forests
- 56 million tons of biofuels are ***gathered*** annually
- 23 million households spend 8 billion hours annually collecting biofuels
- 35 million households use 1.74 million tonnes of kerosene per year for cooking and lighting
- 34% of those HHs that use kerosene for cooking obtain some of it on the open market, and 97% but it from fair price shops
- 49% of HHs are willing to pay more than the market price for kerosene used for cooking
- 0.2% HHs use biogas for cooking
- 63% of HHs are electrified
- 33 % of households are willing to contribute to reducing kitchen smoke by modifying kitchen characteristics and installing ventilators, etc.

Source: Parikh J. et al. 2000

As women are largely responsible for household energy procurement and management, access to energy has a specific and strong gender dimension. The bulk of energy consumption in rural India is for cooking and lighting. Grid-based electrical power does not reach many rural (or

urban) poor areas and the distribution of gas and other cooking fuels is often inadequate, in some areas they are not available at all. The tasks linked to biomass usage are left to women and girls. The situation has not improved significantly over the past six decades. Women in India still toil daily collecting fuelwood, crop residues and animal dung. Billions of days of women's time are spent collecting and processing traditional fuels (e.g. chopping, drying, turning, storing, stacking and handling) and fetching water. Apart from the drudgery, the time and effort spent collecting fuel limit women's opportunities for income-generating activities or educational and leisure pursuits. Such tasks, though essential for the family's survival, remain unrecognised and monetarily unrewarded. Time that could be spent on income-generating work, which could leverage woman's status both inside and outside the household, is seriously compromised by such unpaid and unrecognised responsibilities. Further, women's decision-making within the household and community is restricted, and this limits their ability to influence processes and resource allocation including those related to energy. According to the National Family Health Survey 2 (1998/99), the decision-making power of women in India is mainly limited to choosing what to cook (85.1 per cent). When it comes to money, only 59.6 per cent enjoy the liberty to choose purchases. Further, women, constituting a large percentage of the poverty figures, lack ownership or control over productive assets. Women's poverty could be reduced by increasing access to energy technologies. The present scenario of energy uses in India, however, depicts a depressing and unsustainable picture, and there remains much to be done.

2.3 Energy supply options

The 2001 Census indicates that almost 140 million households in India (72 per cent) rely on traditional forms of energy for cooking, of which more than 124 million households are in rural areas, and the remaining 15 million in urban areas. Firewood remains by far the major cooking fuel in India, used by more than 100 million households, of which more than 88 million are in rural areas. Among the modern energy options, LPG is the most widely used for cooking (in 26 million urban and 7.5 million rural households). Kerosene is used by 12.5 million households, again mostly to be found in urban areas (10 million), while electricity is hardly used at all for cooking. Lack of access to clean cooking fuels is a serious problem in India. Even though replacing their traditional fuels with commercial fuels, such as kerosene and LPG, would be a welcome change for most rural women, poverty and a lack of access to infrastructure inhibit such shifts.

Overall, there is a gender imbalance in the management of energy resources and other productive assets in India. Despite the main sources of energy being biomass and fossil fuels, the structural adjustments in the energy sector focus on the privatisation of electricity, and so fail to really address the real energy access issues for the poorer parts of the population, which revolve around biomass and, to a limited extent, fossil fuels. Women, relative to men, face additional barriers - social, economic, political and cultural - that impede their economic and technological development and this constrains any move towards gender equality. Rural energy supply issues therefore need to be seen in the broader context of the overall economic development of women.

Household energy use is significant in India's national energy consumption picture. Household energy consumption (excluding energy used for private transport) amounts to 30 per cent of the total final energy consumption of the country - reflecting the importance of the sector (Reddy and Balachandra, 2003). Recent years have seen a sharp increase in overall household energy demand with economic development leading to an increase in prosperity as well as population growth. In 2000, there were about 200 million households consuming a total of 7000 PJ of energy, or about 35 GJ per household per year on average (CMIE, 2001).

In India, household activities involving energy are women-centric. Both the choice of energy carrier for the various end-uses and their pattern of usage are women-driven. Moreover, it is women who are, first and foremost, the victims of inappropriate fuel choice, its collection and the inefficient technology adopted in its usage. So, energy activities are instruments that influence the status of women and, in turn, are influenced by them. In that sense, greater access to modern energy services would imply significant social and economic developments and psychological benefits to women.

Energy consumption in Indian households mixes non-commercial (fuelwood, dung etc.) with commercial (bio- and fossil) fuels and with other energy sources. The mix depends on several factors such as geographical location, disposable income and local availability. Historical trends in household energy consumption for the period 1950-2005 indicate that total primary energy use has more than doubled between 1950 and 2005: from 2,938 to 5,642 PJ, but that *per capita* consumption has steadily fallen. There has also been a change in the fuel mix. Over the period, the proportions of oil and gas in secondary energy use increased while that of biofuels reduced. Overall, there is thus a shift, albeit modest, in energy consumption away from traditional sources to modern and clean energy forms (Table.2.1).

The use of different sources reflects the asymmetric availability of resources and the uneven access to the infrastructure required to avail oneself of them. Even if the required energy carrier is available and accessible, households may not use them simply because they cannot afford to. Households simply have no choice but to use traditional forms of energy, i.e. traditional biofuels, as the higher quality energy carriers are unavailable, inaccessible or unaffordable. Also, in a few instances, a potentially available energy carrier, such as biogas, is considered 'inferior' to conventional form of energy, and rejected.

One significant difference between the traditional biomass forms of energy that dominate the energy spectrum and their modern counterparts is that, with the former, collection, transportation and processing (cutting, stacking, patty-making, etc.) are carried out by the households themselves. The primary responsibility for these tasks falls on the women and girls in the family. A typical day in a rural household begins at dawn, with women and children walking great distances to collect wood and other biofuels, before returning home to process them and light their traditional stoves.

Table 2.1 Household Energy consumption in PJ: 1950 – 2005

Year	Population (millions)	Biofuels	Kerosene	LPG	Electricity	Total	Per capita consumption (GJ)
1950	370	2884.5 (98.18)	50.4 (1.72)	0 (0.00)	2.7 (0.09)	2938	7.94
1960	446	3348 (96.26)	124.2 (3.57)	0 (0.00)	5.85 (0.17)	3478	7.8
1970	555	3906 (95.71)	157.5 (3.86)	2.7 (0.07)	14.85 (0.36)	4081	7.35
1980	687	4765.5 (93.61)	235.8 (4.63)	54 (1.06)	36 (0.71)	5091	7.41
1990	841	5242.5 (90.62)	301.5 (5.21)	117 (2.02)	123.75 (2.14)	5785	6.88
2000	1012	5130 (85.60)	282 (4.70)	288 (4.80)	292.5 (4.88)	5992.5	5.92
2005	1100	4950 (81.25)	265 (4.34)	265 (7.00)	450 (7.38)	6092	5.53

Source: NFHS (National Family Health Survey) 2004
Note: Figures in parentheses are percentages

2.4 Impact of limitations in energy access on women

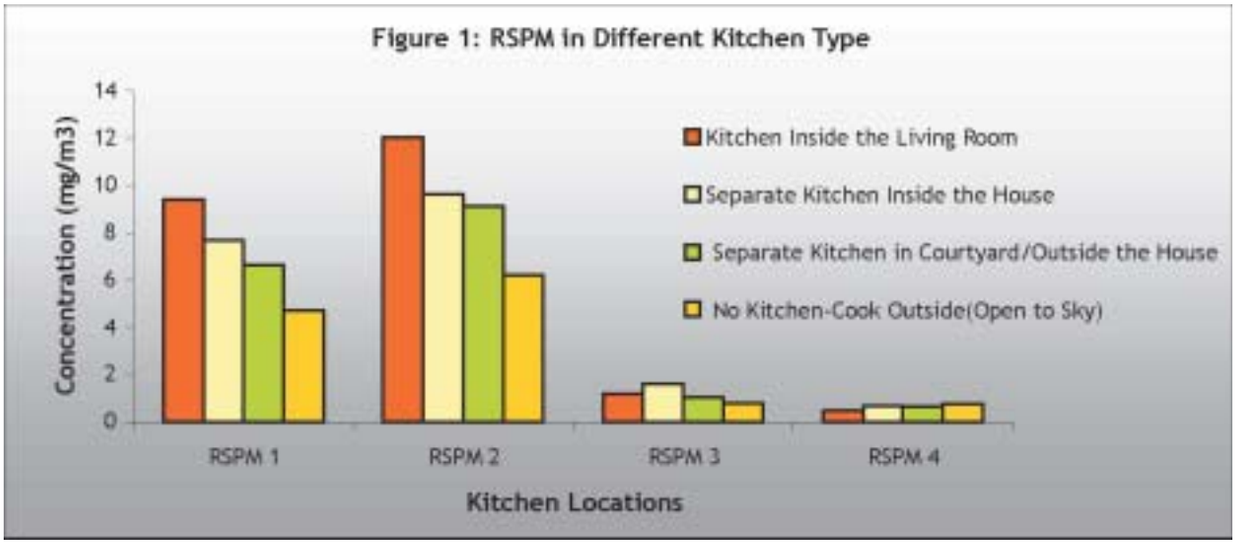
2.4.1 Health

"There are close linkages between health issues and energy use, and between the quality of health services and the availability of quality energy services" (Modi, 2005). The availability of clean cooking fuels, as well as of electricity, is vital for improving women's and children's health since the use of traditional fuels for cooking has severe health consequences for them. "Respirable articles are strongly associated with acute respiratory infections (ARI) among children accounting for the largest number of child deaths in India." (World Bank, 2004 p.1) "There is strong evidence linking Indoor Air Pollution (IAP) with acute lower respiratory infections such as pneumonia and with chronic lung diseases such as chronic bronchitis and lung cancer" (Sigdel, 2007 p.1). An earlier study (Mavalankar, 1991) found that pregnant women using biofuels for cooking face a higher risk of stillbirth. Referring to India, The World Bank (2004) reported, "Illness from the use of solid, mainly biomass, household fuel costs the country over 11 million years of health life per annum".

A study into the impact of the lack of modern energy forms on health in rural North India revealed the severe health implications of the widespread use of biofuels among rural Indian women (Parikh et al., 1999). In the three states surveyed, Rajasthan, Uttar Pradesh (including Uttaranchal) and Himachal Pradesh, 96.6% of households used biofuels, whereas kerosene and LPG were the primary energy sources in just 4.9% and 4.95% of households respectively.

Apart from exposing the overwhelmingly traditional nature of cooking patterns in rural North India, the study highlighted the fact that "those who assist or are [in] close proximity to the stove are exposed to even higher level of pollution than the cook". Hence, indoor air pollution from cooking with biofuels not only affects adult females but also, and even more severely, children and any other household members who happen to be in close proximity during cooking.

Fig 2.1 Respirable Suspended Particulate Matter (RSPM) in different kitchen types



RSPM 1 = Personal exposure of the cook, RSPM 2 = Concentration two metres away from the stove
RSPM 3 = Concentration in the living room, RSPM 4 = Concentration outside the house

"The disease burden due to indoor air pollution is disproportionate –women and young children in rural areas are most affected with more than 400,000 dying every year in India. Of these deaths, almost 90 per cent represent children under the age of five. Rural households have linked an additional 450 million cases of acute or chronic illnesses to the use of biomass fuels. The disease burden decreases productivity and livelihoods of the poor and reduces the time children spend in school, thus contributing to the vicious cycle of poverty and ill health." (World Bank, 2004 p.1)

Health impacts of biomass use are not limited to respiratory diseases caused by indoor air pollution; women suffer other physical effects from collecting fuelwood. "These impacts may range from cuts, falls, bites, and back injuries to sexual harassment." (Government of India, 1988 quoted in UNDP, 2000). Another study carried out by Jyoti Parikh in Himachal Pradesh in 2004, which examined the nexus between energy, poverty, health and gender, addresses these other health impacts. The main findings of this study were:

- Women are the main energy users as well as primary energy suppliers. Parikh (1995) had previously observed that, apart from being the main energy users, women supply biomass energy that amounts to 10% to 80% of the total energy supply in many developing countries.

- Long distances are walked to collect biomass. There is an economic burden on the poor in terms of the equivalent number of days spent in fuel collection and suffering from ill health.

- Regular exposure to harmful indoor air pollution has negative health effects. Exposure to this type of pollution is associated with a number of health risks, and increased mortality rates are now well-documented (Smith, 1999; Parikh et al., 1999). However, many other diseases and discomforts, such as backache, bruising, headaches and stiff necks, also regularly result from transporting fuels and should receive similar attention.

Cost-benefit analyses of interventions involving switching from solid fuels to cleaner fuels and reducing exposure through the use of cleaner burning, more efficient stoves demonstrate the numerous advantages of such interventions in terms of social and economic gains. The benefits of introducing cleaner fuels and improved stoves clearly outweigh the costs of such interventions, not only socially but also economically. *"Economic benefits include reduced health expenditure due to less illness, the value assumed productivity gains due to less illness and death, time savings due to less time spent on fuel collection and cooking, and environmental impacts at the local and global level.* (WHO, 2006).

In addition to indoor air pollution and physical drudgery, energy (and especially electricity) plays an important role in maternal health, and in preventing and treating diseases. "The bundling of services like water, sanitation and education with electricity has disproportionately larger benefits; the whole is substantially larger than the sum of the parts" (UNDP, 2007). In fighting maternal health risks and all kinds of diseases (in addition to other health problems and sicknesses), proximity to health centres as well as the ready availability of vaccines and medicines that require cold storage is very important. Hence, access to electricity is vital for health centres.

2.4.2 Livelihoods

Livelihood strategies are constrained when biomass is the main source of energy and there is a lack of access to modern energy services. Poor women in particular are badly served by the energy forms they presently use, and the increasing scarcity of biomass-based fuel is making matters worse. Access to modern energy services is recognised as one of the most important needs in sustaining people's livelihoods and in enabling communities living in subsistence conditions to move to higher levels of prosperity.

If, in rural areas, energy projects can be coupled with development initiatives, small amounts of energy can bring about big gains in productivity and income, particularly in agriculture-related areas. This can be done by encouraging the creation of micro-enterprises, stimulating income by directly engaging people in using local resources and selling energy services, as well as indirectly through gains in productivity or expanded economic activity resulting from new energy inputs. Productive uses of energy can be seen as including services that are indirectly linked to income generation such as clean water, health-care, education, telecommunications, since developing skills and maintaining health are both essential for productivity and human development.

Renewable energy projects have also demonstrated that renewable energy can directly contribute to poverty alleviation by providing the energy needed to create businesses and jobs, turning locally available resources into productive economic assets. As many such informal sector activities are fuel-intensive, their viability and costs are sensitive to energy prices and availability. Women's informal sector enterprises often involve unwaged labour in household production systems and these tend to be invisible in energy accounts. Yet the energy consumed by these industries, in the form of human labour as well as biomass fuel, is significant. Such biomass-based small-scale industries have been severely affected by rising costs, fuel shortages and deforestation. Such industries tend to be low-waged, require large amounts of labour and effort, and are hence exhausting as well as sometimes dangerous to women's health. Women in such industries are exposed to more burns and smoke than women who use biomass only as a domestic fuel.

The problem can only be resolved if women are able to afford new energy technologies. Engaging in income-earning activities may be the only way that many women can afford to purchase labour-saving energy technologies for their households (Cecelski, 2004). Women have proven themselves capable of not only operating but also manufacturing/ installing renewable energy technologies once they have been provided with appropriate training and support. Efficient fuels and technologies will be effective only if the income generated from women's time saved exceeds the cost of these fuels and technologies. Women's development through education and training has multiple benefits: not only on their income and social position, it is also crucial to many important development programmes involving population control, children's welfare, women's health etc.

Micro-credit may offer some women the initial boost needed for sustainable self-employment and, in some instances, enables them to question gender and caste subordination. However, at a time when macro-policies are eroding smaller scale markets and promoting large-scale export-oriented production, which is beyond the reach of rural women, the ability of micro-enterprises to lift women out of poverty may be exaggerated. If ever there was a mantra for poverty reduction, women's empowerment, development and economic growth all rolled into one, micro-credit is it. Touted as a one-stop cure for several ills, the glitter on the magic wand may just be dimming as the reality of micro-credit begins to show through the hype.

2.4.3 Agricultural Production

Women have extensive agricultural workloads with responsibility for both farm and household production. Women's work is getting harder and more time-consuming due to ecological degradation and changing agricultural technologies and practices. Women contribute considerably to household income through farm and non-farm activities as well as through working as landless agricultural labourers. Women's work as family labour is underestimated and unaccounted for. In India, there are significant inter-state and intra-state variations in gender roles in agriculture, environment and rural production. Because women's activities are weighted more towards the non-market sector than men's, the use of economic measurements has important gender implications. The lack of significance that rural planners attach to women's

family labour is one of the main reasons for the under-representation of women in calculations of the agricultural workforce.

Rural Indian women are extensively involved in agricultural activities. The role of females in agricultural production varies with the landowning status of the household. Their roles range from managers to landless labourers. In India, about 33 per cent of cultivators and nearly 47 per cent of agricultural workers are women. This feminisation of agriculture is due to the increased casualisation of work, unprofitable crop production and the migration of men for higher paid work, in agriculture and non-agriculture sectors, leaving women to take up low paid casual work in agriculture (Kelkar, 2007). As a result, women's agricultural work burdens have increased with relatively little increase in productivity. Now, the question is how to decrease this burden. One way is through energy technology interventions. Efficient energy forms are needed to operate agricultural equipment such as tractors, grinders and crushers, to carry out numerous agricultural tasks and irrigation, to support enterprises and other productive activities and to transport their produce. These options currently rely on the availability and affordability of common transportation fuels such as diesel. When available in rural areas, mechanical power can displace human and animal labour and greatly increase economic productivity and enhance livelihoods. Access to mechanical power for water pumping, transporting produce, grain milling and agricultural processing has a direct effect by freeing women's and children's time for human development. In areas where there is no electricity grid, decentralised mechanical power from renewable energy sources is an extremely important option for reducing poverty and increasing economic options.

Moreover, women generally do not own land or assets, and this deprives them of all facilities that go with ownership such as access to institutional credit, training and extension facilities. As such they are not being perceived as 'farmers' even though they devote more time to agriculture than men. As a result, agricultural extension facilities and information on new technologies are almost exclusively directed at men.

The role of women in agriculture needs to be promoted in an integrated manner with support from various sectors. Renewable energy technologies could reduce women's drudgery from agricultural work, especially in remote areas, through providing electricity. What is required is convergence among the various schemes; for example, the Ministry of Agriculture's focus on machinery and technology for women farmers could be aligned with the Ministry of New and Renewable Energy's provision of renewable energy. The two components promoted by the Ministry of Agriculture for women's empowerment in agriculture are capacity building and access to inputs/resources/markets. Agricultural technologies that reduce women's workloads need to be developed and promoted giving particular attention to awareness raising and accessibility

CHAPTER 3

Gender Review and analysis of Energy Policy and Programmes

This chapter presents a summary of various important policy documents and programmes in the energy sector which have been reviewed from a gender perspective to examine how far they go in addressing gender issues in India. The gendered issues considered are increasing income, reducing drudgery and improving access to better health through energy services. Those national energy policies and programmes that have the most implications for women are reviewed and analysed including the Integrated Energy Policy (Section 3.1) and selected MNRE programmes (Section 3.2): the Village Energy Security Project (3.2.1), the National Programme on Biogas Development (3.2.2), the National Programme on Improved Chulhas (stands discontinued)(3.2.3) and some solar energy programmes (3.2.4). Further, a review of the prospects for biofuels (Section 3.3), which could help meet women's needs, was undertaken to understand the potential of biofuels for income-generating activities.

3.1. Integrated Energy Policy Report

The Integrated Energy Policy (IEP) Report of the Expert Committee, prepared by the Planning Commission, explains and comprehensively evaluates the nation's energy policies and programmes. By including a focus on household and non-commercial energy resources (and not only on the industrial and commercial sectors), the document paves the way for a more gender-aware approach in terms of energy policies. One purpose of reviewing the IEP is to understand the context and framework in which gender mainstreaming in energy policy programmes and projects should be assessed. The report aims to set out the current energy scenario and to devise efficient configurations of the various forms of energy available to fuel India's continual growth. The document is prepared with a view of clarifying the direction in which India should move in terms of energy security, research and development, addressing environmental concerns, energy conversation etc. In the section Overview and in the chapters The Challenges (*Chapter I*), Energy Requirements (*Chapter II*), Supply Options (*Chapter III*) and Household Energy Security: Electricity and Clean Fuels for All (*Chapter (VIII*), the needs of women and the problems they face are explicitly addressed. In that sense, this policy document plays a revolutionary role in integrating gender-focused approaches in the policy-making process.

For the wider purpose of ensuring women's access to and control over energy assets and resources, the manner in which new energy policies and projects are shaped is of vital importance since their implementation will determine rural women's empowerment. The IEP is crucial to the analysis because its views are tantamount to the government's stance in terms of managing energy resources. Hence, the recognition of women's specific needs and issues within these policies is an important step towards gender mainstreaming in energy policies. As this policy document is the expression of the government's view on energy and seen as "a broad overarching framework" for building future energy policies, its significance in terms of gender analysis is unquestionable.

The IEP is a clear departure from earlier efforts, and also current exercises by other ministries, in that it addresses gender issues explicitly. However, the challenge lies in its implementation, for which we review two MNRE documents (Tenth Plan and Approach to Eleventh Plan). Detailed summaries of chapters of the IEP report where gender aspects are addressed, and our own gender analysis of them, are presented below.

3.1.1 The Overview

The Overview chapter of the IEP report constitutes an important component of the whole document for it serves as the executive summary, outlines the framework and vision of the policies to be implemented, and is more widely circulated than the complete document. For that reason, the emphasis it puts on ensuring electricity and clean fuels for all while addressing women's disproportionate burdens is crucial for gender mainstreaming. The IEP report chapter includes the following important points:

- Empowerment of women and energy security are closely linked since a sustainable supply of energy is vital for the energy-intensive income generating activities conducted by rural women.
- Under the section 'Role of Renewables', the report underlines the importance of renewable energy resources. In spite of their relatively small contribution, which is projected as 5-6% of India's energy mix by 2031-32, the report states that, "the distributed nature of renewables can provide many socio-economic benefits".
- The report supports subsidies for renewable energies and justifies them on several grounds. It states that the local availability of these resources would enable an earlier energy supply than would a centralised system, and that renewables may provide employment and enhanced livelihoods for the poor.
- The Expert Committee of the IEP also envisages publishing an annual renewable energy report providing details of the actual performance of various renewable technologies at the state and national levels and which would also evaluate "social benefits, employment created, and women's participation and empowerment".

Gender Analysis

This section of the IEP is largely focused on ensuring a sufficient energy supply at a competitive price without focusing much on the demand side of energy management. We feel that, in order to address women's issues, a more demand-side oriented approach would be appropriate since this would take into account the diverse sources of energy needed by women in accordance with the activity involved. The potential impact of these renewable energy systems on women's empowerment is not fully recognised. Since rural women living in remote and mountainous regions suffer most from the lack of energy resources, off-grid renewable energy schemes would benefit them the most and improve their livelihoods. For that reason, when allocating subsidies for renewable energy, the needs of women should be taken into account. Further, involving women in Operations and Management of installed systems would facilitate not only employment for rural women but also ensure the financial viability of the systems and sustainability of the programmes. Women when they are trained or exposed to new energy

options or technologies are able to contribute to energy solutions leading to better uptake and adoption of the schemes.

Furthermore, in order to ensure that women are empowered through using renewable energy systems, it is important to take into account women's socially subordinate status and their specific needs. For example, as was argued in a report on Kenya, "solar home systems fit well with meeting men's needs for entertainment but not at all with women's cooking needs. Even biogas systems have often not lightened women's work load, and in some cases have increased it by the need for a daily addition of dung and water which have to be head loaded" (Denton, 2002). Publishing of an annual renewable energy report, as proposed by the IEP, would help in formulating policy and in designing and monitoring programmes leading to a narrowing of the gap between gender sensitisation and the policy-making process in energy programmes in India.

3.1.2 The Challenges

The chapter on "The Challenges" lays out the contemporary energy scene, highlighting issues of concern, and then makes the case for an Integrated Energy Policy to address these. Some of the challenges that India is facing are listed below:

- Vitality of economic growth for human development requires access to clean, convenient and reliable energy for all.
- The report notes that per capita consumption of energy in India is one of the lowest in the world, and that the per capita consumption of electricity is far below that in other countries and that access to electricity is very uneven.
- The document highlights the high usage of traditional fuels such as dung, agricultural wastes and firewood for cooking food, and the indoor air pollution these fuels cause.
- In the IEP report, the heavy burden borne by women as a result of dependence on traditional fuels is explicitly recognised as an important challenge to overcome. It is stated that women and especially girls are deprived of education and other activities which could play an important role in their development and empowerment.
- The IEP also underlines the disproportionate health impacts of intensive and widespread use of traditional fuels on women (eye infections and respiratory diseases). The crucial role of energy in women's micro-enterprises is also emphasised in the document.
- The social and practical constraints (related to ownership and control over productive resources) that limit and confine women to traditional roles are also highlighted.

Gender Analysis

The document recognises the importance of addressing the above issues in order to create energy policies that are more "responsive to social welfare". To achieve the goals of meeting women's s energy needs, as outlined in the IEP, it is important to address the whole issue of the subordination of women and the lack of ownership and control over productive resources by women in energy projects and programmes. These subjects cab be divided into two categories: long-term and short-term issues. Among the long-term issues, defining the role of renewable

energy supply and the ways to promote women's development are relevant for gender mainstreaming. Among the short-term issues, providing clean cooking energy for all and developing an energy system that is poverty- and gender-sensitive are key aspects of gender and energy programmes.

3.1.3 Energy Requirements

The IEP report predicts India's future energy requirements using projections for the next 25 years. Important findings include:

- Household demand for non-commercial energy will increase from around 109 Mtoe in 2000 to 131 Mtoe in 2031. The expectation is that the additional requirement will be met from agricultural residues and increased livestock activity that can be expected with 8-9 % growth rates.
- The report also sets a goal of progressively replacing these traditional fuels with cleaner and more convenient fuels.
- It notes that apart from being used as a household fuel; non-commercial energy is also used in the informal small and cottage industry sector in brick kilns, potteries, jaggeries, etc. It is estimated that the consumption of non-commercial fuels in this area was around 23.5 Mtoe in 2003-04, and is expected to reach 54 Mtoe by 2031-32. Women largely carry out such activities.

Gender Analysis

As in other Asian countries, women in India run large numbers of informal micro- and small-scale enterprises. These micro-enterprises are often intensive consumers of heat, light and labour (especially weaving and cottage industries). Women often carry out such work from home, often unregistered, and see relatively low rates of return when compared to men's activities. Hence, programmes that would improve the efficiency of the tools used to produce the existing products/items would not only ease the demand for non-commercial energy, and decrease deforestation, they would also increase the financial benefits for women by virtue of improving production efficiency and saving time. This aspect is very relevant to the gender mainstreaming of energy policies in the sense that the situation regarding the supply and demand of non-commercial and renewable energy resources has important consequences especially for women and, more generally, for the whole household.

3.1.4 Energy Supply Options

The IEP report acknowledges that biomass (along with dung cakes), which accounts for almost a third of India's primary energy consumption, is essentially managed by women without any significant technical or investment inputs, and that its domestic use involves unsustainable practices, back-breaking drudgery and health problems that especially affect women and girls. In order to make this energy resource more sustainable, the report urges improving the "efficiency and convenience of using biomass through wood gasification or biogas plants".

Gender Analysis

Adopting a "technology based approach for enhanced and efficient use of biomass/biofuels" is not likely to ensure that such programmes are indeed taken up among rural people. This is

demonstrated by the fact that, despite 40 years of biogas plant programmes, only half of the impressive 3.7 million installed plants are actually in use. One has to question why only half of these plants are being used. Rural communities have their own traditional ways (cooking methods etc.) and, to facilitate adopting new technologies and methods, technical installations need to be coupled with gender-inclusive community-level adaptation programmes that explain and train local women and men on the various aspects such as usage, maintenance and benefits of these plants. Since women are the primary beneficiaries of clean fuels, it is important to inform them on the health improvements as well as the cost savings implied by the use of biogas plants and stoves.

Apart from programmes that target improving the efficiency of stoves, a price regulation mechanism that takes into account poor people's ability to afford clean energy fuels should be developed to ensure energy security. In meeting cooking and other household energy requirements, women bear the burden of price increases and "evidence would suggest that household energy in urban areas primarily remains a woman's responsibility. Poor urban women appear to have swapped the drudgery of fuel wood collection for the stress of juggling tight household budgets to buy fuels" (Clancy et al., 2004). In the case of rural women, increasing prices for LPG, kerosene and other commercial energy sources typically lead to a shift to lower quality and health-hazardous fuels such as biomass.

3.1.5 Household Energy Security

The IEP discusses "Electrification of All Households", "Provision of Cooking Energy" and "Other Sources" as helping to meet household energy security goals. It further suggests empowering women's self-help groups to manage franchisees running local electricity networks and encouraging decentralised distributed generation systems so that communities can organise their own reliable electricity supply.

The Ministry of Power's Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) electrification scheme aims to electrify the 125,000 non-electrified villages, connect all the estimated 23.4 million non-electrified households below the poverty line and augment the backbone network in all 462,000 currently electrified villages by 2010.

i. Provision of Cooking Energy

Ensuring access to clean and affordable cooking energy is an important energy intervention that needs to be gender-sensitised in order to reduce women's drudgery, the time they spend gathering fuel and the health impacts they have to bear.

The IEP suggests the following:

- Setting "a goal to provide clean cooking energy such as LPG, natural gas (NG), biogas or kerosene to all within 10 years from now" and estimates "the total amount of LPG required to provide cooking energy to 1.5 billion people at around 55 Mtoe (Million tons of oil equivalent)" (IEP, 2006 p. xxvii).
- Well-targeted subsidies addressing households in need that could also provide socioeconomic empowerment through women's entitlement to debit cards for receiving clean fuel subsidies.

ii. Energy Access and Energy-secure Villages

- The IEP defines "energy security" as the ability to "supply lifeline energy to all our citizens irrespective of their ability to pay for it as well as meet their effective demand for safe and convenient energy to satisfy their various needs at competitive prices, at all times and with a prescribed confidence level considering shocks and disruptions that can be reasonably expected."
- It also states that "safe and convenient energy is desirable as use of traditional fuels such as wood or dung cakes causes indoor air pollution and leads to adverse impact on health, particularly that of women and children." (IEP, 2006 p. 54)
- The IEP underlines reducing energy requirements as one action that could be taken to improve energy security. As a measure to reduce energy usage, the use of "smokeless improved woodstoves" is suggested.
- It proposes establishing neighbourhood fuelwood plantations within one kilometre of each habitation to ease the burden and reduce the time taken in gathering and transporting wood.
- To create energy secure villages, it suggests financing a large-scale socioeconomic experiment to operate community-sized biogas plants and also for women's groups to form cooperatives to develop and manage fuelwood or oilseed plantations requiring the same effort as they currently put into searching for and gathering fuelwood.
- It also suggests improving the efficiency of domestic chulhas (stoves) and lanterns for any who may have to continue using fuelwood, and the generation of electricity through wood gasifiers or by burning surplus biogas from community biogas plants.

Gender Analysis

The IEP suggests an important measure that could not only facilitate women's access to and control over energy resources but also ensure the sustainability of the RGGVY scheme. If women were entitled to carry out operation and maintenance tasks, they would be better integrated into the decision-making process at the community level. In order to truly involve communities in the distribution and management of electricity supply, it is important to have equal numbers of men and women on the energy infrastructure committees. Decisions regarding the use of electricity are often made by men and, as a consequence, women may not always benefit from electricity being made available. Supply hours and power levels have different impacts on women and men. Women need high power levels for cooking, heating, ironing etc. and, hence, electricity provided by solar photovoltaics (SPV) fail to meet their demands. Low-power systems mostly benefit men because they use electrical appliances that require small currents such as TVs and radios. Therefore, the quantity and timing of electricity supply largely determines who will benefit. Electrification *per se* should not be viewed as the ultimate solution to the energy problem most women face in rural areas since it does not meet their daily cooking requirements. Rather, the benefits accruing from electrification should be seen as improving a society's welfare and enabling its social and economic development and, together with other energy interventions, ensuring livelihoods and survival.

In terms of providing cooking energy, one should not forget that the women most prone to the effects of polluting cooking fuels are also those with the lowest purchasing power. Hence, in order for this programme to meet its objectives, well-targeted subsidies and complementary measures (that enable women to purchase stoves etc.) should be introduced. Further, enforcing price regulation for these improved energy sources will determine the sustainability of the programme since price hikes in fossil fuels hit rural households hardest and lead them to shift to lower quality fuels. To facilitate women's entitlement to debit cards, as envisaged in the IEP, there is need for legislative reforms to remove social barriers to women's control over and rights to energy.

Improving energy access and establishing energy-secure villages are seen as ways to enable women to reduce their drudgery and the time spent on wood collection. Since, in rural areas, women "comprise a large share of the labour force in industries - nurseries, plantation establishment, logging and wood processing- and depend on these activities for their livelihoods", they are the "chief repositories of knowledge concerning the use and management of trees and other forest products" and "their knowledge of ecosystem management systems can provide significant contributions to energy planning processes" (Dutta S. 2003).

Community-size biogas plants would reduce the initial cost to each individual compared with constructing a plant of their own. Further, the management of these plants by the local community would ensure sustainability and generate income for local people. In order to maximise the benefits of these plants for both male and female household members, this initiative could be rendered more gender-sensitive by introducing measures that ensure women's participation in the project (both in operations and management) such as training husband and wife teams. There has been only limited progress in the promotion of community biogas plants mainly due to serious organisational questions relating to waste collection, plant management and benefit distribution. This could be resolved through greater commercialisation and specialisation involving commercial firms with biogas service organisations and construction teams to handle the management in a professional manner.

Increasing the efficiency of chulhas (for cooking), providing an electricity supply (for lighting) and improving kitchen ventilation are all important measures that would enhance women's wellbeing and, hence, energy security should go beyond providing energy for subsistence. It is important to recognise the need to provide energy to poor women to enhance their livelihoods, production capacities and incomes so that, eventually, they can afford cleaner and more convenient energy sources. These improvements would reduce the time spent in cooking, collecting firewood, provide light so that women could read and engage in other income producing and leisure activities and, most importantly, cut indoor air pollution. It has been noted that leisure is crucial for productivity as well as for self-development (Kelkar, 2006). Since women who cook with biomass are generally the ones living in the poorest conditions, they have the most to gain economically and would also have some leisure time to rest and recuperate from their hard labour and thus benefit in health terms.

3.1.5 Renewable and Non-Conventional Energy Sources

The IEP report states that renewable energy sources provided 32% of primary energy consumption in 2003-04. However, the vast majority of this was traditional biomass used in

cooking. The actual contribution of modern renewables (wind, solar PV, solar thermal, ethanol, bio-diesel, biogas etc.) is only 2% of the total. As shown in Table 3.1 below, India's renewable energy potential is very high; yet for many reasons this potential has not been realised. Significant among the barriers impeding the spread of renewable energy systems is their high initial costs. However, their distributed quality and low generation costs make them an attractive energy solution, especially for the rural poor. For those who are not likely to receive a grid connection in near future, renewable energy systems offer not only power but also employment opportunities.

Table 3.1: Renewable Energy Source

Resources	Unit	Present	Potential	Basis of assessing potential
Hydropower	MW	32,326	1,50,000	Total Potential assessed is 84,000 MW** at 60% load factor or 1,50,000 MW at lower load factor
Biomass				
Wood	Mtoe/year	140	620*	Using 60 million hectare (ha) of wasteland yielding 20 metric tonnes /ha/year
Biogas	Mtoe/year	0.6** 0.1	4 15	In 12 million family-sized plants In community based plants if most of the dung produced is used
Biofuels				
Bio-diesel	Mtoe/year		20*	Plantations totalling 20 Mha of wasteland or 7 Mha of intensive cultivation*
Ethanol	Mtoe/year	< 1	10	From 1.2 Mha with intensive cultivation with required inputs
Renewables				
Solar Photovoltaic	Mtoe/year		1200	Expected from utilising 5 Mha wasteland with a PV panel efficiency of 15%
Solar Thermal	Mtoe/year		1200	MW scale power plants covering 5 Mha
Wind energy	Mtoe/year	< 1	10	Onshore potential of 65,000 MW of installed capacity at 20% load factor
Small Hydropower	Mtoe/year	< 1	5	

Source: Respective Line Ministries

** The availability of land and inputs to achieve the projected yields is a critical constraint*

*** Based on 50 % plants under use*

The IEP report (p. 90) also states "renewable energy may need special policies to encourage women". The report underlines the need for large amounts of land to install biogas and biofuel plantations and solar systems. The report suggests formulating different policies for implementing distributed generation for rural electrification in different regions and adds (p. 92) that "the village panchayat aided by the state energy agency and technical experts should decide the appropriate technology option (biogas, biomass gasification, wind-diesel, micro-hydel, bio-oil engine) for their village".

Gender Analysis

The IEP report is one of the few planning documents that recognises the relevance of gender issues across the entire energy sector. It makes specific policy recommendations on promoting household energy security, gender equity and empowerment through targeted entitlements for the poor. However, it will not have an impact if the policy framework suggested is not followed up by road maps for development and the implementation of specific policy measures.

Women are more likely to benefit from renewable energy sources if their participation can be ensured at the policy-making and implementation level. Important barriers to women's participation in renewable energy system projects are their lack of access to financial resources and their social neglect resulting in inadequate technical education and training. To facilitate women's inclusion in renewable energy programmes, a broader approach that addresses these fundamental socioeconomic problems needs to be first adopted. Without addressing the underlying structural sources of women's socioeconomic disadvantages, programmes concerned only with immediate impacts are not likely to lead to women's empowerment. It is important to recognise the need to integrate women into renewable energy programmes, based on a realistic assessment of their capabilities and requirements, and how these can be enhanced.

The gender inequality problems associated with the management of these energy resources also stems from the prevailing land ownership traditions. As highlighted by several academics and activists (Dutta, 2003; Agarwal, 2003; Kelkar, 2007), women in India are deprived of ownership of land. Hence, renewable energy systems that require land (such as solar systems, wind turbines and biofuel plantations) are inherently controlled by, and prove beneficial to, men. In order to integrate women in the management of these systems, policy options that enable land to be granted to groups of women need to be explored. In particular, biofuel production offers an enormous window of opportunity, not only in terms of improving women's welfare and that of the whole nation, but also to channel women's experiences with plantation management into creation of efficient, financially viable and sustainable oilseed projects.

Summing up, the IEP report perceives the "provision of electricity and clean fuels to all" as the main challenge facing India in terms of household energy security. Emphasising the link between the availability of clean energy and the promotion of gender equality, the report envisages several individual-level energy security requirements in meeting the challenge at the nation level:

- Electrification of all households
- Provision of clean cooking energy (LPG, NG, biogas, kerosene) for all within 10 years
- Provision of fuelwood plantations within 1 km of all habitations
- Formation of women's groups to run oilseed plantations and tree-growing cooperatives to produce biofuels and fuelwood.
- Provision of financial assistance through self-help groups to transform women from today's energy gatherers into tomorrow's energy management micro-entrepreneurs.

3. 2 MNRE Policies and Programmes

3.2.1 Village Energy Security Test Projects (VESP)

India's Ministry of New and Renewable Energy launched its Village Energy Security Projects (VESP) in 2004 in an upgrading of their Remote Village Electrification (RVE) programme. VESP is a comprehensive village level energy programme that aims to go beyond electrification and address total energy requirements for cooking, electricity and motive power. It represents an attempt by the Ministry of New and Renewable Energy to integrate various renewable energy technologies and so provide a complete solution for village level energy needs. VESP aims to deliver energy security in villages by meeting all their energy needs through various forms of biomass using available biomass conversion technologies, and other renewable energy technologies where necessary. The benefits of such projects could be immense, including employment generation and enhanced incomes for rural households through the active and full participation of local communities including women.

Currently, 120 test projects are being implemented in 10 states under the VESP umbrella. These are being undertaken by Village Panchayats[2] and facilitated by implementing agencies such as District Rural Development Agencies (DRDAs), Zila Parishad[3], Forest Departments and NGOs. State nodal agencies have constituted State Level Coordination Committees for overall coordination and monitoring of the projects. A Village Energy Committee (VEC) is constituted through the Village Panchayat for village-level planning and then operation and maintenance of the energy system.

Gender Analysis

VESP calls for a minimum level of energy services for cooking, lighting, street lighting, pumping drinking water plus lights and fans for schools and primary health-care centres. Such interventions will tend to benefit women and children more than men. The project also emphasises electricity distribution through local mini-grids for productive activities with a focus on micro-enterprise development, backed by microcredit facilities, with a view to facilitating job creation, income generation, increasing purchasing capacity and reducing migration from villages. This would help improve the quality of life and facilitate sustainable livelihoods. Energy facilitates economic development at the local level by improving productivity and thus enabling income generation through improved agricultural practices (irrigation, crop processing, storage and transport to market) and through non-farm employment, including new micro-enterprises.

The project foresees full participation at the village community level from the start but it does not define men's and women's roles in decision-making, management and maintenance of the installed energy system. Several implementing agencies have been making an effort to involve women in the energy committee. For example, IRADe in its project in two hamlets in Patan District, Gujarat, has ensured women's involvement in many ways.

To ensure the successful participation of women, women's groups can be mobilised by allotting them specific assignments/responsibilities within the project. To see the impact on women, a

[2] Panchayats – local government bodies at the village level in India.
[3] Zila Parishad – a local council that governs an administrative district in India

social and gender analysis of a scheme is required along with a gender-disaggregated needs assessment; which to date is still to be included as a standard procedure under VESP. The tasks allocated to women have to be in line with the local capacity to develop and maintain the technologies/systems.

Box 3.1: IRADe's VESP project in Patan District, Gujarat

- Half of the Village Energy Committee (VEC) members are women
- Women self-help groups (SHGs) are involved in the development of livelihood activities such as flour milling, sewing machine activities and soap making
- SHGs used to distribute improved chulhas to each household on behalf of the VEC
- Women are involved in the operation and maintenance of biogas plants
- An energy plantation (growing *jatropha curcas*) is managed by the women's groups

3.2.2 Biogas Activities

The National Project on Biogas Development (NPBD) was started by MNRE in 1981-82 to promote family type biogas plants (FTBPs). The implicit objective of the programme was to reduce the consumption of non-renewable fuels and fuelwood. In order to help the poor and the disadvantaged who could not own and operate family-scale biogas plants, a programme to promote large community-level biogas plants was introduced in 1982-83 (stands discontinued). The NPBD was renamed the National Biogas and Manure Management Project (NBMMP) in 2002-03 for its implementation during the tenth five-year plan.

The objectives of the programme are (i) to provide fuel for cooking purposes and organic manure to rural households through family type biogas plants; (ii) to mitigate the drudgery of rural women, reduce the pressure on forests and accentuate the social benefits; and (iii) to improve sanitation in villages by linking sanitary toilets to the biogas plants. (MNRE, 2007)

The institutional network for the programme's implementation includes State Nodal Departments, State Nodal Agencies and the Khadi and Village Industries Commission (KVIC). These agencies, in turn, involve their state/district level networks of institutions, trained turn-key workers[4], NGOs and others.

The biogas programme has been evaluated periodically through involving NCAER, PEO, IIT Delhi and APITCO, Hyderabad. In addition, it has also been evaluated by the State Agencies and MNRE –Regional offices. The recommendations has been considered by the Ministry and programme modified to the extent possible. However, as the biogas plants help women folks more efforts are required to be made to involve them within constraints of socio-economic situations locally existing in the country where these plants are getting installed.

Gender Analysis

A minimum number of stall-fed cattle and an easy availability of water are prerequisites for biogas plant operation. However, an evaluation study of the NPBD carried out by the PEO in

[4] Turnkey workers are trained masons who take up the construction of biogas plants and satisfy the consumer with the initial commissioning and operation of the unit.

2002 concluded that, even if these were in place, when alternatives fuels such as electricity, kerosene and LPG are subsidised or where fuelwood can be collected at little cost to the household, the development of biogas would not progress unless higher financial incentives were attached to it. Further, until the markets for dung, enriched slurry and biogas in rural areas are developed and the day-to-day operation of biogas units is commercialised (community-type biogas plants), the use of biogas would be nominal as the people are having access to subsidized LPG and kerosene fuels for cooking.

The PEO study has shown that installing plants does not ensure their use, many plants were found to be abandoned for various reasons. First of all, many local people were not aware of the existence of a repair scheme for the FTBPs, and they were viewed as a reliable source of

energy. Even if they own a plant, they use it together with other cooking devices such as *chulhas* (traditional stoves) as their cooking requirements are of different types and the size of the biogas plant may not be adequate. This is the point where one sees it is essential to include women's training and participation in energy programmes. Since the vast majority of plant users are women, their commitment to the programme will determine its effectiveness.

Women's needs in terms of the size, operation and use of plants need to be incorporated in the project in order to increase its overallefficacy. Similarly, if women do not understand fully the health, environmental and long-term economic benefits of this programme, they are less likely to make an effort to get non-functioning plants repaired. In addition to raising the beneficiaries' awareness, another measure to increase the effectiveness of the project is suggested. As observed in the PEO study, turnkey workerswho are trained as masons to build biogas plants are not committed to their task as they receive a low wage for three years and, moreover, the skills they attain through NBPD training prove more lucrative in other businesses such as house building. Of the 500 turnkey workers trained annually, barely half become remain involved in the programme. If local women could be trained to build and repair these plants, not only would this generate additional income but it also would improve the programme's sustainability. That is why training turn-key workers and masons are continuously taken up through the programme.

The top-down approach in implementing the biogas project has resulted in many internal inconsistencies. Hence, implementation requires to be further improved upon both for enhancing installation and increasing efficiency of biogas plants higher levels of local involvement, in terms of planning and implementation is urgently needed. Rural communities have their own ways of living and it takes more than technical assistance and training to ensure novel practices are adopted. Women, who have been using wood all their lives for cooking will not automatically switch to an unfamiliar device/technique for cooking unless they are informed about the benefits. For the purpose the administrative approval of the programme continuously gets modified based on the inputs from the field.

3.2 3 Improved *Chulhas* (Stoves)

The National Programme on Improved *Chulhas* (NPIC) (stands discontinued) was launched by MNRE in 1985 and lasted until 2002. The aims of the programme were primarily to conserve forests, reduce pressure on rural women who collect fuelwood and to protect them against

indoor air pollution. Today, the programme operates at the state level. Presently, MNRE has stopped the financial support and is giving only the technical support. By 2001-02, nearly 34 million improved *chulhas* had been supplied under the programme against an estimated potential total of 120 million. As of 1994-95, improved *chulhas* had only been supplied to 16 per cent of the targeted households after ten years of this programme. At the level of funding, it would have taken another 40-50 years to meet the target number of households set for this programme.

Recently, installation of improved *chulha* has also been taken up in India by both domestic and international NGOs and business organizations at the grassroots level (Greenglass and Smith, 2006). The approach adopted is bottom-up, based on demand-driven marketing techniques that involve establishing self-sustaining commercial enterprises in rural communities. The NGOs involved in such activities include Gram Vikas, Orissa and Development Alternatives. However, these chulhas are costly and work on specific/processed fuel and will meet a very limited penetration in rural areas for various reasons of cost, specialized fuel availability, cooking requirements and food habits. Women's status and the involvement in commercial, income-generating activities that has also played a role in their ability to influence household decisions about such purchases.

Gender Analysis

The central government has now closed the improved cookstoves programme as a separate programme and transferred responsibilities to the state governments, but without any allocation of funds. The reasoning being that the programme supported by the central government has demonstrated the practicality of the improved stoves, and now it is for the states to take this forward. After being handed over to the states, the programme suffered from three major problems in most states, with the exceptions in some states.

The poor performance of the NPIC can also be attributed to several factors. The approach used in introducing the improved stoves was highly technocratic with men as the main designers of the stoves. The scheme did not pay adequate attention to other issues such as traditional cooking habits including aspects of taste (some foods are considered to taste better when cooked on traditional stoves), fuel types and heating style, and the size of cooking pots to be used. All of these are aspects which women, as cooks, understand better. There were additional issues related to women's social position, including women's control over income, which influence the adoption of improved cooking devices and were ignored. The improved stoves were not necessarily more efficient than traditional ones and, moreover, women have a range of criteria for assessing stoves which may not even include fuel economy (Dutta, 2003).

In Table 3.3, it can be seen that, at the national level, about half of the improved *chulhas* were not in a working condition and about one-fourth were not in use even though they were in working condition. It can be inferred here that the device has a faulty design and operational problems, that women perhaps do not find the design user-friendly and that the fuel saving is not as great as they had expected.

However, it has been shown that the use of improved *chulhas* does result in fuel efficiency gains of 25-30 per cent through more efficient burning of fuel and through better heat transfer.

Two direct advantages are a saving of fuel and a reduction in indoor air pollution. Their use also reduces the drudgery of women since they have to spend only a third of the time they used to spend collecting fuelwood if they have access to improved *chulhas*. In areas where programmes have been successful, such as those promoted by NGOs and private firms, this has often been due to involvement of local women in the design of the stoves, and particularly in the dissemination process. There have been successful cases of women being trained as stove masons who are also responsible for finding markets for these stoves designed by women.

Some suggestions that would help to spread improved *chulhas* and make a difference to the lives of women are:

- To improving stove design by incorporating women's perspectives and what appeals to them in the product. Attention should be given to finding out what features of stoves appeal to women as users (types of pots that can be accommodated, types of foods cooked, comfort, smoke reduction, appearance and so on) through surveys and focus groups. Measurement of stove efficiencies in field conditions and follow-up surveys would improve the design. Women should be involved in stove construction and extension services because they are likely to be able to communicate better with other women.
- There should be greater participation by women at higher levels - in the planning and management of stoves projects and also in research on biomass and improved stoves, in both technical and economic areas.
- Commercialisation of chulhas with greater collaboration between women users, producers and designers, can lead to better design, cost effectiveness and a wider spread due to competition. To ensure quality control, training should be provided to address local issues and understand local habits, and also on how to repair the stoves.
- There should be greater emphasis on the smoke reduction and the significant social benefits stemming from improving the health of rural women and children.
- Micro-credit facilities should be made available to improve access to improved chulhas.
- To achieve a wider spread, improved stove projects should be integrated into other development sector activities such as forestry or agriculture, or into multi-sector projects dealing with health, urban planning, education, environment etc. since focusing on stoves in isolation (for example as a way of addressing indoor air pollution) risks missing other important aspects of gender and poverty.

3.2.4 Solar Energy

India receives solar energy equivalent to over 5,000 trillion kWh per year. The annual average global solar radiation on a horizontal surface across India is about 5.5 kWh per square metre per day. Depending on local features and geography, the figure varies between 4 and 7 kWh per square metre across the country. There are about 300 clear sunny days in most parts of the country. Although solar energy has tremendous potential, it is not extensively harnessed. The fact that solar energy is convenient (available everywhere in abundance) and clean (environmentally friendly) makes it a good choice for satisfying energy demands (lighting, water heating, cooking etc.) in remote rural areas.

Global evidence (UNDP, 2001) shows that the availability of illumination in the home increases female educational attainment and literacy, and extends the working day of women so that they can take advantage of income-generating opportunities related to cottage industry activities. Lighting in public places increases the safety of women and communities and allows women greater access to public gatherings. Availability of clean energy in sufficient quantities will improve the overall welfare of women vis-à-vis society at large by allowing them greater participation in social activities and employment by reducing the time they spend cooking.

MNRE started a programme to demonstrate the use of Solar Photovoltaic (SPV) systems in the mid 1980s. In view of large number of non-electrified villages and rural homes, solar lighting and community PV systems were the first to be designed and developed in India. The first lighting system to be developed was for street lighting, followed by a community lighting system, a domestic lighting system and solar lanterns. The solar home systems offer a quick and convenient method to provide lights to households in remote villages and hamlets. Besides providing lighting, such systems can also provide electricity for televisions, radios, fans and other small rural household needs. Solar lanterns are not only being used in homes, but also in rural clinics, hostels, police stations, shops etc.

The Ministry has also been running a scheme whereby solar lanterns are provided to girl students studying in the 9th and 10th Standards, so that they do not drop out of school. There are also Aditya solar shops run exclusively by women.

Gender Analysis

Good lighting acts as a critical facilitator in the household for livelihood and educational activities, by increasing the productive hours in a household. Poor quality or non-existent lighting forces women, who are the main managers of household activities, to rely heavily on daylight hours. A lack of home and street lighting can increase chances of violence against women. As already noted, illumination in homes can increase attainment of education and literacy by women and extends the working day of women to provide time for income-generating opportunities related to cottage industry activities and other home-based enterprises. Lighting in public places increases the safety of women and communities, and allows women greater access to public gatherings. Installing solar lights in homes enables children to study in the evenings and improve school performance.

Solar dryers are a boon in remote hilly areas, enabling vegetables and fruits to be dried. Many women's groups are using such dryers on a commercial scale. Incentives and training should be developed for these women.

Even garment workers have been using solar energy to save electricity costs while running their sewing machines. Solar energy could become a potential means of earning a livelihood for women. Using solar energy to cook with would reduce women's drudgery by reducing their workload in collecting biomass.

The experiences of several NGOs show that using solar lanterns has made the business of many women entrepreneurs profitable. The SEWA Bank and the SEWA Academy (SEWA, 2006) launched an energy park for women based on solar energy and biogas which has attracted women street vendors as it has made their business profitable now they can sell late into the

night. Further, birth attendants now have a specially designed lamp which enables them to assist in deliveries in homes which do not have electricity.

3.3 Biofuels

Biofuels are seen as an alternative to petroleum sources and are derived from renewable bio-resources such as *Jatropha curcas, Pongemia pennata*, palm oil and other vegetable oils. The topic has attracted a great deal of attention over the last two decades as a potential substitute for mineral oil-based fuels in the transportation sector.

Biofuel plantations could be successfully used to improve the livelihoods of poor rural women on a sustainable basis and to rehabilitate degraded lands and improve the environment. The Government of India has provided good policy support for enhancing the production and the use of biodiesel. Technical options to produce biodiesel using mixed feedstocks also exist. However, as yet, there is no sustainable supply of raw materials. The proposed strategy of the government is to turn vast areas of wasteland and other unproductive land over to biodiesel plantations.

A major step forward in India's ethanol programme was the Government's announcement of its Ethanol Blending Programme (EBP) which made it mandatory, in nine states and four territories, to blend 5 per cent ethanol in petrol with effect from 1 January 2003. Presently, it is planned to increase this to 20 per cent in 2011-12. After announcing the Biodiesel Purchase Policy in 2005, the Government of India implemented its National Mission on Biodiesel in 2006, with the Ministry of Rural Development as the nodal ministry. The specific focus of the National Mission was on planting *Jatropha* on wasteland. At the state level, several states have initiated biodiesel programmes and policies. However, the Mission document does not pay specific attention to the role of women while emphasizing the rural employment generation and livelihood options.

Biofuels are gaining worldwide acceptance as a solution to the problems of environmental degradation, energy security, restricting imports, rural employment and the agricultural economy. Both *Jatropha* and *Pongamia* could contribute directly to alleviating poverty and improving the environment, not only through the production of biofuel but also as multi-purpose trees providing a range of products and services. *Jatropha* can provide oil for domestic energy needs, including lighting; an additional source of household income and employment through the markets for fuel, fertiliser, medicines, bio-pesticides and industrial raw material for soap and cosmetics; and can contribute to reclaiming wastelands.

Gender Analysis

The multiple uses of the *Jatropha* plant and its hardy nature (not many inputs required and can adapt to extreme climatic conditions) make it one of the most promising plants and one, which women could easily cultivate. Rural women, with their knowledge on agriculture, are well placed for nursery development, the cultivation and harvesting of *Jatropha* plantations and could extend their skills to the processes of oil production and marketing.

To enhance the livelihoods of rural women, *Jatropha* plantations could be run by user groups or self-help groups (SHGs) on common pooled land such as degraded forests, community-

owned lands, low quality lands unsuitable for crop production, railway backyards and canal embankments. In this way, the usufruct rights to harvests are ensured for the groups who manage the plantations, but the rights of land ownership are not extended. Once the market demand is assured, SHGs could handle collections from the decentralised plantations and so enhance the livelihoods of their members. It is also important to promote and use locally available oil expellers as this will minimise transport costs and also generate employment in rural areas. The groups could also manage seed-raising nurseries and so gain income from the sale of seedlings.

After undertaking this gender analysis, our main conclusions are:

- The establishment of extraction units for biodiesel could provide additional income for women through the sale of oil and oil cakes. The oil can also be used for running generators to produce electricity in remote areas. For instance, in a tribal village in Andhra Pradesh, a 7.5 KVA generator is run on Pongemia oil and uses 5-6 litres to produce 10-12 kwh of electricity, which is then used to light tribal homes. The power system is run by village women. (Wani et al., 2006).
- Although the economic value of biofuels has been proven, there are concerns about a conflict between food security and biofuels. Some NGOs have raised strong opposition to the reallocation of land and water needed for agriculture to biofuels. The gender analysis team is, however, of the opinion that food security issues arise not necessarily from food (and land to grow food) shortages but more often from an inadequate income to pay for food. If, biofuels do provide employment for poor men and women, then the incomes generated can be used to purchase food. Another common misconception is that biofuel crops require prime agricultural land. While this is true for ethanol from sugar cane, there are many types of non-edible oilseeds that can grow with little water on arid or waste land; these include *Jatropha* and neem which pose little threat to food security.
- By establishing plantations and extraction units managed by communities, the decentralised biofuels could be used to provide local energy, especially in remote areas. They could also provide employment for the poor including women. Local people could produce their own oil from non-edible seeds, and use this oil directly for cooking, lighting, irrigation pumps and agricultural machinery or to power biodiesel generators to produce electricity.
- Government support for the production of biofuels has been motivated primarily by agricultural and energy policies with the overall aim of using biofuels in place of imported oil and supporting farm incomes and agricultural sector industries. The strategic goals of subsidising biofuel production include reducing greenhouse gas emissions, improving energy security and promoting rural employment. While the advantages of *Jatropha* biofuel to India (huge employment opportunities in the agricultural field and the substitution of imported crude oil) are well understood and appreciated, there is a lack of long-term strategies and clear directives on the part of the Government of India, that could help overcome some of the basic problems of the biofuel industry.
- Socio-economic and impact assessment studies are needed to guide a gender-responsive, pro-poor approach that ensures that women benefit and that the gains are sustainable. These could help achieve a better understanding of economic efficiency, land tenure,

equality and other crucial issues so as to be able to advise policymakers on ways to encourage pro-poor biofuel systems. Linkages could be set up between biofuel plantations involving SHGs and private entrepreneurs to ensure market access and income generation for the SHGs.

- One aspect of *Jatropha* plantations worth exploring is their capacity to earn carbon credits for neutralising carbon dioxide emissions. For example, 'Trees for Travel', a Dutch Foundation (www.treesfortravel.info), is an initiative for establishing sustainable forestry projects in developing countries that generates funds through compensation for the fossil fuels consumed during air travel and other activities. It has already planted over one million trees that have neutralised 125,000 tonnes of carbon dioxide emissions.

Box 3.2: Experience of Andhra Pradesh in Biofuel Plantation

Powerguda, a remote tribal hamlet in the Adilabad District of Andhra Pradesh, became an environmental pioneer when its biofuel plantations earned carbon credits by selling the equivalent of 147 tons of verified carbon dioxide emission reductions to the World Bank in October 2003. The World Bank paid US $ 645 to women SHGs in Powerguda to neutralise the emissions from air travel and local transport used by international participants attending its international conference in Washington, USA in October 2003.

Source: Raju K.V. 2006

CHAPTER 4

Gender Rating of the Tenth-plan Budget outlays of MNRE and MOEF Programmes

4.1 Introduction

There is now comprehensive evidence demonstrating gender differences in access to opportunities, resources and participation across a wide range of civic services, and social and economic activities. Women are only marginally represented in decision-making and are disproportionately burdened with task loads. Women have limited access to energy services in both rural and urban locations. This harms their livelihoods and the related conditions of household health and education.

In this chapter, the budget outlays for the tenth five-year plan of both MNRE and MOEF (Ministry of Environment and Forests) are analysed to substantiate the differentiated benefits of various programmes for women. Gender auditing has a close relationship with gender budget analysis. This analysis of the Plan's outlays has been carried out to enhance a gender-responsive implementation of available energy resources.

Typically, a gender audit exercise is carried out by gender experts using a methodology that deals with gender indicators relating to the final end-users in terms of the empowerment and wellbeing of women at the micro-level. However, the present exercise raises a question at the **macro-economic** level – how much investment and importance is directly attached to women's needs at the national level? What investment, management and technology efforts are going into ensuring a sustainable supply of traditional energy, which continues to represent a large proportion of the total energy supply?

There is also a second level of enquiry at the **meso-level** that examines various MNRE programmes that are either technology or finance oriented. The simple method adopted uses a weighting system to rate various MNRE programmes on to the extent to which they address gender concerns. This is a preliminary analysis, concluded within the limited framework of the present study. Ideally, with a larger scope and a budget to match, a **micro-level** analysis would complete the picture. Nevertheless, this exercise has added a new dimension to gender budgeting. We should add that the present analysis is done more in a developmental spirit than to pass strictures. This exercise has been carried out in the hope that, within the energy sector framework, the funds allocated for women can be increased and, further, that the actual use of the these funds contributes to improving women's agency and economic development in subsequent five-year plans. The findings from the study were shared with the Planning Commission of the Government of India in a meeting convened by them.

4.2 Gender Concerns in India's Five-Year Plans

During the first five five-year plans, women's welfare was looked after by a statutory body, the Central Social Welfare Board (CSWB), which was set up in 1953 to promote welfare-oriented activities for women and children through the involvement of voluntary agencies at the grassroots

level. There was a change in the approach during the **Sixth Plan** (1980-85) when attention moved from women's welfare to women's development. This plan paid special attention to three core items: education, health and employment. A gradual shift in policies has been seen since then, and following the **Seventh Plan** (1985-90) attention has been explicitly given to allocating resources to programmes/schemes that directly benefit women. The **Eighth Plan** (1992-97) highlighted, for the first time, a gender perspective and the need to ensure a definite flow of funds from the general developmental sectors to women. The **Ninth Plan** (1997-2002) adopted 'Women Component Plan' as one of the major strategies and directed both the Central and State Governments to ensure "not less than 30 per cent of the funds/benefits are earmarked in all the women's related sectors. Special vigil advocated on the flow of the earmarked funds/benefits through an effective mechanism to ensure that the proposed strategy brings forth a holistic approach towards empowering women. **The Tenth Plan** (2002-07) reinforces commitment to gender budgeting to establish its gender-differential impact and to translate gender commitments into budgetary commitments. The **National Policy for Empowerment of Women 2001** envisaged introduction of a gender perspective in the budgeting process as an operational strategy. For the first time, the Union Budget for 2005-06, included in the Budget document a separate statement highlighting the gender sensitivities of the budgetary allocation. Gender Budgeting Cells (GBCs) have also been set up in most of the central Ministries/ departments following advice from the Ministry of Finance and Planning Commission. At present GBCs have been set up in 35 departments of the Government of India (*Economic Survey 2005-2006*)

4.3. Assessment of the Annual Budgets of MNRE

The present study concentrated on the Tenth Plan Budget Outlays of MNRE. At the time of the gender analysis, this had come to an end, which made it possible to analyse the performance and benefits accruing to various target groups, including women and examine what it was unable to address. The Eleventh Plan (2007-2012) was not part of the analysis as it had only just started.

4.3.1 Tenth Five-Year Plan: Budget Outlays of Energy Ministries

India depends on a mix of different fuels to meet its energy requirements. The growing dependence on energy imports has been a matter of great concern. The outlays of the energy-intensive ministries in the 10th five-year plan are not in proportion to their respective shares of the total energy supply (*See Table 4.1*). This is not surprising since the available technologies open to the various ministries and their capital to output ratios are different.

It is significant that the percentage share of non-commercial energy in the total energy mix is around 28.5%, while the share of budgetary allocation is 1.2%. It can be argued that considerable amount of investment is going into the agriculture, fertilizer, livestock and irrigation sectors and some portion of this could be considered as going to non-commercial energy. However, this would be valid only if there were any specific programmes for utilization of agriculture waste and animal waste. As of now, this is not seen as an activity that calls for targeted investments. Investment made for the agricultural sector is not tantamount to investments for providing fuels to women. Biogas plants use animal dung; crop residues are also used for industrial purposes.

However, crop residues and dung collection become high- value activities only when investments take place in energy technologies such as biogas plants, wood gasifiers, etc. These investments are already shown under other heads e.g. renewable energy or small-scale industries and cannot be again shown under non-commercial energy. An example to illustrate the point is as follows: many districts let *Prosopis julifera* proliferate as a wildly growing shrub tree. This could potentially be used for fuel. While this is "allowed", no investment is made for wood-fuel from *Prosopis juliflora,* either towards improving the fuelwood utilisation or towards converting it into user-friendly fuels such as briquettes or towards measures to reduce indoor sir pollution caused by the burning of these. However, some investments by the Ministry of Environment and Forests and state government for their programmes for fuel wood plantations may be shown under non-commercial energy investments.

The total budgetary outlay is tilted towards commercial energy while the primary energy source used by households (biomass) or non–commercial energy (presently representing 28.51% of total energy consumption of the country) does not receive an adequate budgetary support. In India, fuelwood, cow dung and crop waste are the principal sources of non-commercial energy used to meet household energy needs, and the collection of these is the exclusive responsibility of women. Introducing incentive schemes by assigning commercial values to these energy sources will encourage their efficient use. Against a backdrop of a shortage of energy sources and an ever-rising demand, this non-commercial energy could be developed into an efficient source and, at the same time, become a business activity for the women who are involved in it. By realising the commercial value of the currently non–commercial energy resources and providing budgetary support to the sector, it would be possible to harness the full potential of these energy sources.

Table 4.1 Energy supply scenario and budgetary outlays under the 10th Five-Year Plan

Ministries	Outlay (Billion US $)	Percentage share in total budget outlay of energy-intensive ministries	Energy Supply (Mtoe)	Percentage share in total energy supply
Coal and Lignite	10.26	12.3	166	33.08
Nuclear Energy	8.09	9.7	5	1.01
Oil and Gas	25.91	31.2	148	30.14
Renewable Energy (a)	1.79	2.1	6	1.22
Ministry of Power (b)	35.85	43.2	26	5.29
Non-Commercial Energy (c)	1	1.2	140	28.51
Total	**82.9**		**491**	

Source: 10th Plan document (2002-07), Appendix A1 to A91Planning Commission, New Delhi
Integrated Energy Policy (IEP) Planning Commission, New Delhi,
(a) Includes biogas, micro- and mini-hydro, solar, wind, etc.
(b) Outlay for conversion of coal or gas into power and large hydropower.
(c) Approximate figure taken at US $ 1 billion that includes expenditures made by various ministries such as Ministry of environment and Forests, Ministry of Agriculture and so on for their indirect contribution to non-commercial energy. (Please see explanation in section 4.3.1)

4.3.2 Methodological Framework: Gender Rating of a Ministry's Budgetary Outlay under the Tenth Five-year Plan

Gender-disaggregated benefit incidence analysis of public spending reveals the distributional impact of budgetary outlays that percolate directly down to women. Theoretically, all expenditures, whether it is for steel production or power generation, are made for people, of which about half are women and girls. However, in reality, some expenditure address women's needs and will benefit women directly, while others do not. To assess this gendered impact of government programmes, an exercise has been carried out with assigned weights given to different programmes depending upon their effectiveness in addressing women's needs. Looking at the objectives of schemes within ministry programmes, in terms of their relevance to women, it is observed that in most schemes, women are viewed as beneficiaries rather than as equal participants.

The expenditures in a ministry programme are studied using three main categories:

(a) Women-specific allocations: these are specifically targeted at women and girls

(b) Pro-women allocations: the composite expenditure of schemes with a women component

(c) Mainstream expenditures: where they have a gender-differentiated impact

The numerical values assigned to the various categories of schemes are an indication of the proportion of benefits that accrue to women and address their exclusive concerns.

The outlays made under the Tenth Plan on various items are classified into one of four categories to which weights (the proportion of benefits going to women directly) are attached as follows:

Each budget line is rated based on qualitative considerations and then assigned a quantitative weight.

Category	Example	% Weight
S = Specifically relevant for women	Biogas plant	100%
M = Relevant for both men and women	Solar PV	40%
P = Partially relevant for women	Small hydropower	20%
N = Not directly relevant for women	MNES Institution	0%

The total gender effectiveness "G" of all expenditures is then

$$G = \sum^{n}_{i=1} \quad TE_i \times W_i \times E_i$$

where

TE_i Total expenditure allocation on item 'i'
W_i Gender weighting of item 'i' (based on placing it in one of the above categories)
E_i Effectiveness of expenditure 'i' in actually delivering the benefits to women. This depends on several factors such as the socioeconomic structure of society, customs and traditions etc. In this exercise E_i is set to unity, *that is, it is assumed that all expenditures are effective in meeting their objectives*

Ideally, the values for E_i should come from micro-level surveys and monitoring exercises using gender-disaggregated data on indicators such as increased income, reduced drudgery and improved access to better health services. This variable is especially important in retrospective gender rating. By first gathering gender-disaggregated data on the indicators mentioned above, it would become possible to propose a better allocation of funds to projects and programmes that actually benefit women.

There are other ways to carry out such an exercise, however given our terms of reference and budgetary limitations, the above analysis was carried out. This approach was thus used in our analyses of the budgetary outlays of MNRE and MOEF under the tenth five-year plan.

Limitations of proposed methodology

a) A distinction between capital outlay and revenue expenditure is not made.

b) The approach does not examine how effective was a particular expenditure. For example, a small hydropower plant may not be working at full design capacity or might have been more expensive than budgeted because of corruption or inefficient delivery.

c) When an item is relevant to women's chores such as cooking or water collecting, it is given a full (100%) weighting. However, as above, the service delivery may be poor - a biogas plant may not function properly, or a water lifting system may be largely dysfunctional if there is no power supply.

d) When an item is relevant to both men and women, it is given a 40% weighting rather than 50% because it is *assumed* that it is more likely to be used by men (e.g. electricity).

e) The population is assumed to be made up of equal numbers of men and women but the actual proportion varies from one state to another.

f) Private sector outlays and expenditures are not included.

g) Only budgetary outlays under the tenth five-year plan are considered.

4.3.3 MNRE's Budget Outlays under the Tenth Plan

The analysis of MNRE's budget outlay under the Tenth Plan estimated that only 12.67% of the budget directly or partially helped women. Although there are uncertainties in attributing weights, the share is unlikely to be below 10% or above 20% although these are only indicative figures given the limitations of the study in terms of funds, time and scope. Further work would be beneficial in improving the ratings of each budget line by assessing each programme and budget line in more detail (see Table 4.2).

Table 4.2 Tenth Plan MNRE Programmes

Programmes	10th Plan ($ Million)	Gender Category based on Plan Specification	Pro-women component ($ Million)
Wind Power	27.5	M	11
Small Hydropower	7.5	M	30
Biomass Power	31.25	M	12.5
Biomass Gasification	7.5	M	3
Solar power (Thermal and PV)	31.25	P	6.25
Solar Photovoltaics	125	M	50
Biomass Gasifier	8.75	S	8.75
Survey, Investigation, etc.	6.25	P	1.25
Biogas plants	87.5	S	87.5
National Project on Clean Energy Services for rural areas	6.75	S	6.75
Rural energy entrepreneurship/ Institutional development	2.5	M	1
Women and renewable energy development	1.5	S	1.5
Awareness and Extension Programme	21.25	M	38.5
MNES Institutions (IREDA, Solar Energy Centre, Centre for Wind Energy Technology etc)	874.25	N	0
Other Programmes	487.75	N	0
Total Allocation to Ministries	**1794**		**228**

Source: Data are taken from 10th five-year plan document, Planning Commission, Government of India.

In weighting the budget lines, we have kept the final beneficiaries, or the end-users in mind. Thus, biogas, which is used for cooking, is considered a specific investment for women as it provides a direct benefit to women, and receives a high weighting in the exercise. However, wind power, which may give light or be used for agricultural or entrepreneurial purposes, will only benefit women indirectly because they neither read nor derive direct income from such activities and therefore this receives a lower weighting exercise. Funds for R&D institutes and loans to industries (through IREDA) are not considered directly relevant to women and therefore have a zero weighting. Table 4.3 below rearranges the information in Table 4.2 by category.

Table 4.3 MNRE Budget Allocations benefiting Women

Category	Allocation ($ Million)		Percentage of total ministry budget	
	Pro-women component	Not relevant to women	Relevant	Not relevant
Specially relevant for women (S)	104.5	0	5.86**	0*
Important for men and women (M)	117	174	6.45**	9.67*
Partially relevant for women (P)	7.5	30	0.42**	1.67*
Not directly relevant to women (N)	0	1362	0**	75.71*
Total Outlay by Ministry	**228**	**1566**	**12.67****	**87.05***

*** Percentage is calculated after assigning weights (as discussed above) to the respective programmes.*
** Simple percentage of total allocation to the scheme of the ministry's allocation under the 10th Plan.*
Source: IRADe Analysis

By looking at the programmes through a gender lens, we see only a small overall benefit accruing specifically to women from the MNRE programmes. A better outcome for women can be achieved by moving from programmes that are not women-specific to ones that specifically address gender-sensitive issues and needs. This is an important aspect of this gender rating exercise: how can we improve the gender rating by moving away from gender-neutral programmes to more gender-specific programmes, i.e. from N to P to M to S?

Fig.4.1. Preference ladder

It would not be fair to blame MNRE's existing administration for this low ranking. This is a systemic failure that has roots in inequity within households, the low status of women in terms of literacy and health, and the responsibilities, inbuilt bias and rules of society. However, it is these very conditions of women's socio-economic existence that deserve special attention from MNRE and other ministries. For example, even grid power will not benefit men and women equally if women do not read and need fuels to cook rather than electricity.

MNRE has intervened with various programmes involving improved stoves, biogas, biomass gasifiers, solar home systems and solar lanterns, etc. which have acknowledged the direct and indirect benefits for women. Although this is a good step, major funds are still allocated to other programmes where the specific benefits for women are not considered. The table below shows the different MRNE programme interventions, coupled with different technologies which generate direct benefits to women:

Table: 4.4 MNRE programmes relevant to women

Intervention	Relevance to women
Solar Thermal Energy	- Solar cookers- Solar dryers for drying vegetables, fruits, spices, etc.-Domestic solar water heaters
Solar Photovoltaic (SPV)	- Lighting in remote areas where grid-based power is not available- Better Safety (reduction in violence)- A boost to businesses, especially women vendors. - Solar electricity to run TVs, fans etc. in villages suffering from long periods of load shedding- Solar lanterns for village markets- Solar torches for mobility in villages at night
Biomass Gasifier	- Income generation opportunities- Lighting- Involvement of women's groups in feedstock arrangements and also in operation & management, thus creating additional employment opportunities
National Project on Clean Energy Services for rural areas including biogas programme	- Clean cooking fuel for cooking, lighting, heating etc. - Clean kitchen - Reduction in time spent on fuel collection - Organic manure for agriculture
Rural energy entrepreneurship/ |Institutional development	- Enhanced income opportunities - Economic freedom - Control over income
Women and renewable energy development	- Women are trained under the biogas programme
Awareness and Extension Programme	- Promote effective use of renewables especially among women
Improved Stoves	- Reduces time spent in kitchen- Reduces time spent on fuelwood collection - Cleaner kitchen- Reduced indoor pollution

Table 4.4 lists programmes that have already been implemented by MNRE with intended benefits for women.

Women-specific aspects of wind and hydropower:

Wind Power: Wind energy can be harnessed for power generation to meet increasing energy demands (both commercial and non-commercial). The MNRE programme has not addressed the social aspects related to wind farms on agricultural and fallow lands which have a direct bearing on women's activities in agriculture and fuelwood and fodder collection.

MNRE could involve women in their wind energy programmes. Women could benefit by cultivating crops and from fuelwood plantations on wind farms. Some private sector firms, including Suzlon Energy, are exploring this possibility.

The operation and maintenance of wind power systems is a specialised task and requires training and capacity development. Women and girls could be trained to maintain wind power systems in the villages.

Small Hydropower: Small and micro-hydro units can provide a solution for energy problems in rural, remote and hilly areas where extending the grid is relatively expensive. Small hydropower projects provide electricity in remote areas, which benefits the local women. A number of mini- and micro-hydropower projects have been set up in remote and isolated areas, mainly in Himalayan regions, where women's income-generation opportunities have increased through woodcarving, yarn spinning, food processing etc.

Improved Intervention in MNRE Programmes

To make a programme successful and reach the intended beneficiaries, it has to be coordinated at all levels. Although non-commercial energy falls within the responsibilities of MNRE, it has to be related to other sectors when it comes to programme formulation and implementation. As shown in Table 4.5, it requires inter-ministerial coordination with various players having stakes in women's well-being. At the ministry level, financial allocation for those programmes, which directly benefit women, should be increased. Some suggestions in this regard are given in the table:

Table 4.5 Interventions and Suggested Actions

Stakeholder	Mechanism	Suggested Action
Macro- or National level	Investment Management Technology Formulate policy and determine prices	- Planning Commission to supervise priorities - Allocate specific tasks to different ministries to ensure wider access to energy, including cooking fuels within 1 km in a time-bound manner, say 10 years from now-Inter-ministerial convergence
Meso- or Ministry level (MNRE)	Allocations under various programmes	- Developing women-focused programmes - Monitoring of programmes - Delivery of services - Beneficiary needs assessment - Redesign programmes - Identification of gaps and barriers
Micro- or Final end-users level	ImpactSustainability	- Ensuring delivery-Awareness creation at the community level

4.4 MOEF Budget Outlays under the Tenth Plan

Energy and environment are issues that go hand in hand. Various uses of energy sources lead to environmental concerns. In the future, deciding the types of energy to be used by society will involve taking the environmental impacts of the energy source into account. This close integration of these two sectors has prompted the present analysis to carry out a similar exercise to that above for the Ministry of Environment and Forests' programmes.

The quality of the rural environment directly affects women's livelihoods. The nodal agency for activities relating to the environment is the Ministry of Environment and Forests. Gender-sensitive

resource management could be encouraged through several schemes, and an assessment of various activities is given in Tables 4.6 and 4.7:

Table 4.6 MOEF Budget Outlays under the Tenth Plan

Name of scheme	Tenth Plan Outlay ($ Million)	Plan categorisation from a gender perspective	Pro-women component ($ Million)
Clean Technologies	6.25	N	0
Environment Education, Training and Awareness	31.25	P	6.25
Environmental Health	2.5	P	0.5
Strengthening Forest Division	8.5	P	1.7
Hazardous Substance Management	17.5	P	3.5
Integrated Forest Protection Scheme	111.25	M	44.5
National Afforestation Scheme	256.25	M	102.5
Greening India	11.25	M	4.5
Eco-development Forces	18.75	M	7.5
Other programmes	1022.75	N	0
Total	**1486.25**		**170.95**

Table 4.7 MOEF Tenth Plan Cumulative Allocations for Women

Category	Cumulative allocation ($ Millions)		Percentage of total ministry budget	
	Pro-women Component	Not relevant to women	Relevant	Not relevant
Specially relevant for women (S)	0	0	0**	0*
Important for men and women (M)	159	238.5	10.69**	16.03*
Partially relevant to women (P)	11.9	47.75	0.80**	3.2*
Not directly relevant to women (N)	0	1029	0**	69.23*
Total	**171**	**1315.25**	**11.50****	**88.50***

*** Percentages calculated after assigning weights (discussed in Subsection 4.4) to the respective programmes.*

** Percentage of total allocation under 10th FYP to the ministry*

Our analysis of the budget outlay shows that a mere 11.5% of the total budget of the ministry addresses women-specific needs. As with MNRE, these figures are indicative only and could be fine-tuned through a more intensive analysis of the individual programmes. However, it is clear that more effort needs to go into ensuring programmes address women-specific needs. Can we propose more gender-specific schemes? How can we ensure programmes go from N to P to M to S? The onus is on the MOEF to set up a mechanism to deal with women's specific needs and priorities.

CHAPTER 5

Findings and Recommendations

5.1 Introduction

An important suggestion that emerged from several consultations and workshops during the process of the gender analysis was about the need to understand the close link between women's empowerment and energy development. An integrated approach that links energy resources with women's empowerment through policy implementation is needed for the sustainable management of resources as well as for human development. Sustainable development and the MDGs can only be achieved if women are freed from daily drudgery and are available to use and manage energy.

Further, the policy framework should also address gender-specific problems related to social and cultural structures. There is without doubt a need to build women's capacity and adequately include them in the management of energy resources. In the context of the growing market economy in India, women also need appropriate skills and unmediated productive assets (assets on which a woman has sole ownership) that they can afford and successfully manage in their communities.

5.2 Women's energy situation in India

Major points that emerged from the gender analysis of national energy policies were:

- 625 million people do not have access to modern fuels suitable for cooking and approximately 70% of the energy used in Indian households comes from non-commercial fuels such as fuelwood, agricultural wastes and animal dung.
- Non-commercial energy accounts for 32% of primary energy consumption, most of which is traditional biomass that is used for cooking. Unfortunately, there is little investment in the management and technology that goes with this important resource. The contribution of modern renewables (wind, solar PV, solar thermal, ethanol, biodiesel, biogas etc.) is only 2% of the total.
- Important barriers to women's participation in renewable energy projects are the lack of financial resources and the social neglect of women embedded in intra-household inequities in resource management and technical education and training.
- In India, about 33% of cultivators and nearly 47% of daily waged agricultural workers are women, and a large part of the energy input in agricultural production is from women. Reliable and improved forms of renewable energy could make these activities more efficient and less of a burden, yet there is no mention of these options in either the agriculture or the renewable energy sectors.
- Women are often deprived of the right to own or manage land, and hence renewable energy systems that require land (solar systems, wind turbines, biofuel plantations etc.) are inherently controlled by men who reap the benefits.

- Women tend to be involved in the informal small and cottage industries sector where the consumption of non-commercial fuels was around 23.5 Mtoe in 2003-04, and is expected to reach 54 Mtoe by 2031-32.
- Gender-disaggregated data are not widely available, which makes it difficult to assess the benefits of policies and programmes intended to improve women's wellbeing.

5.3 Persistent Challenges to Policy and Implementation

The lack of gender-sensitive project planning, monitoring and evaluation (M&E) emerged as a common issue throughout our analysis. Gender-sensitive policies need to be implemented in practice or there will be a mismatch between policies and implementation. Gender mainstreaming that recognises the impact of energy on women and articulates the issues that affect women is required in policies and programmes. Some of the challenges faced in gender mainstreaming the energy policy and its implementation are:

- *Lack of gender-disaggregated data* - Gender-disaggregated data are not widely available to quantify and articulate the benefits of any policies and schemes pertaining to women. Gender-disaggregated information would provide quantitative data on gender differences and inequalities that could be used for gender analysis to determine the differential impact of programmes and policy.
- *Limited impact of energy programmes on women* – Most energy programmes with a specific focus on women fail to recognise the importance of looking at energy issues within the overall socioeconomic context. The programmes should ensure that they assist women in meeting their daily needs while also seeking greater social rights and economic benefits. For example, the National Programme on Improved *Chulhas* (NPIC) was restricted to constructing improved stoves, treating women as beneficiaries alone. It failed to put sufficient emphasis on cookstoves as a potential instrument for either strengthening livelihoods or improving the status of women.
- *Continued reliance on biomass fuels and the attendant implications* – Poor women are unable to accumulate the investments needed to use higher quality energy sources. They continue to use traditional fuels such as wood, charcoal and dung cakes, which are characterised by low energy efficiency and harmful emissions. This situation and the reliance on traditional biomass are likely to continue in the medium term.
- *Need for inter-ministerial coordination in order to address gender and energy issues* – Implementing energy projects in isolation, without integrating them with other sectors such as forestry, agriculture and rural development runs the risk of overlooking important aspects of gender and poverty. Energy projects should be integrated in a holistic way with other improvements relating to health, education, agriculture and income generation.
- *Mismatch between policy and implementation* – We had expected that the increasing inclusion of women representatives in local bodies and other institutions would automatically improve the lives of rural women. However, this has not been the case, primarily because of the misplaced assumption that elected female representatives would advance a women's agenda. The reality is that many of the women representatives in local governments are poorly educated or unaware of their rights. As a result, their voices in

solving issues relevant to them such as those of water, sanitation and fuel are neither systematically raised nor addressed. Further, poor women in rural areas, on account of traditions, culture, and ethnic, religious and social backgrounds, are far more vulnerable than women in the urban, formal sector. Hence, these groups of rural women require special attention. This is recognised as such, and there are a large number of government programmes directed at women's issues. However, most have problems at the implementation stage, and this highlights a mismatch between policy and implementation. Successful implementation of policies and programmes could be aided by regular monitoring and evaluation processes, and through mid-course corrections of identified problems.

5.4 Linking women's empowerment with energy development

For their successful implementation, energy sector policies, like those in other sectors, need to be supported by programmes for equality-based gender and social relations and by the necessary institutions at the micro- and macro- levels. As widely recognised in the development literature, effective institutions are essential for the sustainable management of energy and other natural resources, for reducing social problems and to encourage better conditions for economic development. Such a situation will enable poor rural women and men to gain greater access to institutional credit through group borrowing, strengthen the poor through greater bargaining power against unfair market practices, as well as facilitate the implementation of energy and other policies. Self-help groups, Panchayati Raj institutions and community-based organisations can be efficient forms of such institutional arrangements at the local level. They can encourage farmers, and particularly women farmers, to actively participate in energy management and community decision-making. Their participation in energy policies and programmes will result in reduced transaction costs for the inputs and outputs related to energy access enterprises (such as woodlots, biogas, solar energy and LPG) at the local level and reduce the problems associated with the lack of policy implementation.

At present, women manage one-third of the energy system in India through gathering fuels (biomass). In the current economic valuations, this enormous effort by women does not have a market value. There is a need to clearly identify the currently non-monetised activities undertaken by women, and to assign an economic value to them. Although non-commercial energy accounts for 28.5 % of the total energy used in India, the budgetary allocation for this activity is minimal and indirect. There is no systematic or coordinated scheme for supporting women in areas of sustainable management, investment and technology. In order to address and ease the hardship of women, energy policies that focus on the needs of agricultural and domestic rural women users, as against industrial, commercial, urban male users, are needed.

5.4.1 Gender Rating For MNRE Programmes for Gender Sensitivity

The budgetary outlay by MNRE under the 10th five-year plan was evaluated from a gender perspective using a gender rating procedure devised by IRADe to calculate the effective benefits accruing to women from various MNRE programmes. It is found that a mere 11.5% of the ministry's total outlay addressed women's specific energy needs. The ideal weight could be increased to a maximum of 50% i.e. one that have equal weight to both women and men.

MNRE programmes were classified into one of four categories (N- Not relevant; P- Partially relevant; M- Mostly relevant: and S- Specifically relevant) based on the women-specific component (i.e. addressing women's specific energy needs) of the programmes. Depending on the category, weights were assigned of 0, 0.2, 0.4 and 1 respectively. The weighting signifies the usefulness of programmes from a women's energy perspective. For example, women mostly use the energy generated from a biogas plant so it is assigned a weight of 1. That is, the end outputs of a programme dictate its assigned weight. There is need for more micro-level data in order to understand the impacts on women and from there to identify which type of projects should be financed, or how to modify projects so that they better address women's needs.

5.4.2 Women-specific MNRE programmes

MNRE is implementing various programmes that have direct and indirect implications for women. While this is a promising step in the right direction, major funding is still allocated to programmes where the implications for women are neither recognised nor identified. A gender dimension to show the effective benefits accruing to women from different programmes and interventions has been identified as detailed below:

Solar Energy (Thermal and Photovoltaic)- There are various gender-relevant applications in the solar thermal area, such as solar cookers and dryers for food preservation, while in photovoltaics they include solar lanterns and solar home systems. There are several benefits that accrue to women, and the programme guidelines could have a greater focus on the impact on women in general.

Biomass Gasifiers – Although electricity generated in this way could help in an income-generating context, there is a need to consider how they could benefit women and what role women can play.

Biogas Programme – Women's perceptions in terms of the size, design and operation of biogas plants need to be incorporated in the programme in order to increase its efficiency. If women do not understand the health, environmental and long-term economic benefits of this programme, they are less likely to make an effort to get malfunctioning plants repaired. They are also unlikely to switch to an unfamiliar device or technique for cooking if they are not informed about the benefits.

Improved *Chulhas* – The way to greater efficiency and wider use of improved *chulhas* lies in improving the stove design by incorporating women's perspectives and increasing the appeal of the product through surveys and focus groups discussions. Women should be involved in stove construction and extension services, as they are able to communicate better with other women who are the potential users.

There should be greater participation by women at a higher level, in the planning and management of stove projects and in research on biomass and improved stoves, in both technical and economic areas.

To achieve a wider spread, improved stoves projects should be aligned with other development programmes such as forestry and agriculture projects dealing with health, urban planning, education and the environment. Focusing on stoves in isolation (for example in addressing indoor air pollution) risks overlooking other important aspects of gender and poverty.

The semi-commercialised, market-driven approach taken by some private firms (including the Shell Foundation) can be seen as one way to revive the improved stoves programme. In this approach, private firms look after the supply chain while NGOs or women's groups act as 'agents', convincing people of the health and environmental benefits of improved stoves.

5.5 Reorient Monitoring and Evaluation Mechanisms to reflect Gender Concerns in Energy Programmes

To strengthen the accountability of various ministries with regard to their performance in including gender concerns in the energy sector, monitoring and evaluation (M&E) using selected gender indicators should be made a compulsory and regular part of the implementation process. It is important to first identify the gender goals of energy projects in an explicit and measurable format because trying to measure impacts when gender goals are not explicitly part of a project might amount to measuring changes that have happened incidentally. Using gender-disaggregated data during the M&E phase of policy and project interventions can highlight the gender distribution of benefits and identify any inequalities between men and women.

Gender budgeting within each ministry will lead to a reflection on women's priorities, and M&E can be used to see how women are being helped with regard to their gender strategic needs, including their participation in energy infrastructure and management. Also raising the awareness of policymakers to the different energy needs of women will help in formulating better gender-responsive energy policies. Many renewable programmes in India are not successful because they fail to incorporate the views of women alongside those of men as users of energy services and technologies.

5.6 Departmental Coordination in Addressing Energy Security

(i) Inter-Ministerial Coordination: Non-commercial energy does not fall squarely under the authority of the renewable energy ministry, because fuelwood and agriculture products are also the concerns of other ministries such as those of the environment and forests, agriculture, and rural development. Similarly, electricity, kerosene and LPG also come under other energy ministries. Inadequate and poor supply networks, as well as poor delivery mechanisms, for all these energy sources has major implications for women. Improving affordable and adequate energy is the combined responsibility of several ministries: Power, Petroleum and Natural Gas, Agriculture, Rural Development, Environment and Forests and the Ministry of Women and Child Development. This requires coordination and an inter-ministerial set-up with the various energy and other ministries having stakes in women's wellbeing and economic development.

(ii) NGO and Private Sector Coordination: Besides the government departments, coordination with NGOs and the private sectors is equally important. There are pioneering areas of NGO activity in the field of gender and development, such as increasing women's asset base and resource rights and the promotion of rural livelihoods. Such activities need to be seen in more positive way, learning from their experiences and innovations. For example, the successful introduction of improved stoves by some private firms can provide ideas that are worth incorporating in revived ministry stoves programmes.

Some proposed areas for ministerial action are:

Ministry of New and Renewable Energy

- Incorporate NGO and other private sector experiences in its own programmes and planning processes.
- Biomass fuels are likely to remain the primary source of process heat and cooking energy for some time because the commercial energy options are still expensive and inaccessible to poor rural women. A coherent policy addressing all the relevant ministries is needed to achieve a sustainable biomass fuel supply.
- Setting up an enforcement mechanism at the ministry level to ensure the budget earmarked for addressing women-specific needs is appropriately utilised and also to ensure that more programmes are gender-inclusive and address women's practical and strategic needs.
- Promotion of solar lanterns and solar home systems through an approach where solar lanterns and solar home systems can be maintained or rented out by women to others.
- Women's self-help groups could sell fuel briquettes and charcoal, cow dung cakes and other fuels made from biomass.

Ministry of Power

- Ensure access to electricity is used to meet women's needs and emphasise women's empowerment under its RGGVY scheme.
- Encourage women to participate in the management of local energy distribution networks.
- In rural electrification schemes, women's self-help groups should be trained to read meters, collect fees and carry out minor repairs.

Ministry of Petroleum and Natural Gas

- Achieve wider kerosene and LPG access through financial assistance schemes and efficient subsidy programmes using Debit Cards and Smart Cards. This could be tried out on an experimental basis in a few districts to ensure that the kerosene and LPG reach the households and not used to adulterate fuel for transport.
- Women should be enabled to run Public Distribution shops and kerosene distribution shops.
- LPG community kitchens as run by some private sector organisations (HPCL's Rasoi Ghar) could be encouraged.

Ministry of Environment and Forests

- Community forest management should involve women in planting and management of fuelwood.

Ministry of Rural Development

- Promote linkages between gender and energy issues in NREGA programmes, through the involvement of SHGs and PRIs.

Ministry of Agriculture

- Promote the supply of energy and extension training to women farmers.

Ministry of Panchayati Raj

- Encourage local bodies to address biomass fuel supply through SHGs.
- *Jatropha* plantations on wasteland (land not used for agriculture) should be set up with the involvement of women's groups. Panchayat lands could be allocated to women for the promotion of *Jatropha* plantations and oil-bearing seeds.

Ministry of Women and Child Development

- Include gender and energy issues in the mandate alongside water, sanitation and health etc.

Through an improved convergence among the many ministries mentioned above, the gender aspects of poverty and energy link would be better understood which, in turn, would make it possible to achieve the MDGs through the development and distribution of energy. This will also help in better understanding the role of gender and energy in poverty reduction and creating sustainable livelihoods for women and men in rural India.

5.7 Operationalising the Goal of "Making Cooking Fuel Available within 1 km of Rural Habitants"

This goal was included in the IEP and subsequently included in the 11th five-year plan. The IEP clearly sees ensuring access to cleaner and affordable cooking energy as an important energy intervention that needs to be addressed in order to reduce women's drudgery in gathering fuelwood and the health impacts of its use. Providing affordable and cleaner energy within one kilometre of all rural households needs a concerted approach, as well as the coordination of various ministries.

In the rural scenario, operationalising the goal would amount to strengthening access to biomass energy since access to commercial energy is still a faraway solution. A first step towards energy accessibility is to carry out a feasibility study of creating energy access within one kilometre of rural habitants. Women could take part in the management of local electricity generation. This would create employment and enable women to have a say in energy resource management. The formation of cooperatives, run by women, for fuel wood and oil seed plantations would be a very important initiative in changing traditional gender roles and relations which confine women to cooking and low skill jobs.

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Annexure - I

Report

Workshop for Gender Audit of national energy policies
10 October 2007, New Delhi

Prepared by
Integrated Research and Action for Development (IRADe)
New Delhi

Report of the Workshop for Gender Audit of national energy policies 10 October 2007, New Delhi

Background

The workshop for Gender Audit of national energy policies held on 10 October 2007 at New Delhi. It was a part of the Gender Audit exercise, which IRADe is undertaking presently. The exercise is being carried out in collaboration with ENERGIA, an international network for gender and sustainable energy to promote awareness about the issues.

Gender audit is a process that reviews the budget, projects and activities and is aimed at identifying gender gaps in energy/poverty policies and making gender and energy issues visible to a wide audience. With this study IRADe aims to mainstream a gender approach in national energy policy in India through in-depth analysis of energy planning, policymaking and poverty reduction approaches including relevant civil society discourses.

The objective of the workshop was to bring together key stakeholders/decision makers in the energy and related fields at the national level to make aware of the tasks that will be undertaken in the gender audit exercise. It was well attended by people who are involved in energy and gender related sectors both from the government departments and civil societies. The workshop was successful in meeting its objectives with the kind of quality discussion and suggestions carried out by the participants, which will help in successful implementation of the gender audit study.

Dr. Jyoti Parikh, IRADe and Dr. Govind Kelkar, UNIFEM seen with Prof. Sudhakara Reddy, IGIDR, giving his presentation

Opening Session

Dr. Sudhir Varma, Social Policy Research Institute, Jaipur, chaired the session. The keynote and welcome address was given by Dr. Jyoti Parikh, Executive Director, IRADe, who explained the background of the gender audit exercise in brief. She talked about importance of gender mainstreaming in energy planning and elaborated on the high investment made in the energy sectors but very little for the renewable energy sector. The relevance of incorporating cooking fuel to rural population along with electricity, water and road (Bijli, Sadak and Pani) in the government agenda for development of the country was highlighted. She also explained the steps involved in the gender audit study.

Prof. Sudhakar Reddy, IGIDR, followed with his presentation on "Energy in the Development Strategy of the Indian Households – A Stakeholders Approach from a Gender Perspectives". He expressed that there are limited amount of energy resources available to us and it is not being utilized efficiently. The realization of resource base is dependent on two types of interests i.e. individual and societal and if the individual interests meet the societal interests, more can be achieved. The individual put emphasis on the quantity and price of energy, its supply, cost of technology used, lifestyle needs and has short term interests whereas at the societal level it has a long-term interest with quality of environment and resource effectiveness. He further elaborated the following points:

- In the pattern of household energy consumption, biofuel still dominates with no distinctive changes in other fuel sources. Also the there is a question of affordability that means with increase in income there is a shift in household energy use from low energy carrier to high-energy carrier. The same goes for accessibility i.e. location of household also has an implication on the types of cooking energy demand.
- Technological enhancement along with understanding the role of the actors in energy system can help in fuel use efficiency. The actors can be identified at three different levels i.e. macro level (governments, national energy agencies, regulatory commission and R & D organizations), meso level (utilities, energy development agencies, financial institutions, equipment manufacturers) and micro level (energy end-users and NGOs).
- The actors at all the three levels can be linked in a women centric framework where women have the facility for fuel choice with access to local supply agents, energy service companies, entrepreneurship, women self help groups, etc.
- It is also equally important to improve assumptions, theories and models and also the changing behaviours of the energy consumers. For e.g the initial cost of setting up of a biogas plant or use of any improved renewable energy source is huge taking into consideration the income level of the rural mass. It is important to convert this initial payment into stream of payments.
- Micro finance institutions (MFI) and NGOs can play an important role in making cheap finance available to needy households who cannot afford the initial investment costs.
    - Attitude/behavior of male also has bearing on gender dimension of energy needs. Men assume that clean cooking energy benefits only women and have nothing to do

with them, so are not interested. There are cases of men dissuading the use of biogas for household cooking as the burden of making slurry and management have to be borne by them.

- For improved, clean and efficient fuel the drivers are awareness, decrease in technology cost, technology appeal, focus on service, environmental regulations and finally involvement of women in decision-making.

Dr. Govind Kelkar, Technical Adviser, Gender Audit gave an insight of the gender factor in the energy services. She highlighted the following points:

- Women are included in the three excluded groups among dalit and indigenous (men and women) with no proper representation in political and economic decision-making. The reason could be attributed not only to attitudinal and cultural reason and also to material or economic reasons.
- Some critical concepts in gender and energy issues are gender division of labour, the opportunity cost of women's labour, increase in women's income earning activities, cultural systems and poverty reduction policies and gender analysis.
- When there is increase in women's income earning activities there is change in opportunity cost of women's labour which means that if the marginal income from woman's income-earning activities is much higher than that of man's, then there is division of labour with men taking up additional domestic responsibilities. There is also a change in control of income or earnings by women.
- Leisure is not meant for enjoyment but also for self-development, which is a critical part of human development and drudgery reduction.

Participants at the workshop

- Gender analysis implies recognizing that households and communities are not solitary units with undifferentiated labour resources, but in fact are made up of women, men and children who may share, complement, differ or to be in direct conflict in their need for or interest in improved technologies and social change.
- Some policy considerations for women were pointed out – greater stress on investing public money in providing energy base on fossil fuel or electricity to increase the productivity of women's labour.
- Rural, poor women are in dire need of policies that (i) enhance their individual capabilities (management, health care, education/knowledge, technological skills) (ii) unmediated (not through household or the head of the household) control/ownership of assets and productive resources (iii) address cultures or socio-economic systems that discriminate, marginalize and in many countries physically eliminate them.
- The new deal for women in the energy sector is the adequate representation of women in energy management along with the necessary inputs of capabilities and credit support.

Dr. Varma wrapped the session with the following points:

- Universally women suffer more than men due to unavailability of clean energy. Maximum investment is put in the development of commercial energy however, major portion of non-commercial energy is used in cooking and lighting.
- So the energy policy should address the needs of the rural poor women as the focal point of the energy polices. Role of women are instrumental in meeting the required energy gap.
- He also pointed out loopholes in different government initiatives to ensure clean energy for all. He cited the midway fall back of different initiatives like solar cooker scheme. He also questioned the efficiency and prudence of some new schemes recently started by the government. Giving the example of a wide spread programme by the major PSU's oil companies under which they are going to distribute improved kerosene lantern to the poor. He was of a view rather giving priorities to fossil fuel, use of renewable energy should be encouraged.

Participants at the Workshop

Technical Session

The next technical session was chaired by Dr. Ajit K. Gupta, Ministry of New and Renewable Energy (MNRE), Govt. of India. It started with brief background note of Gender Audits study including gender audit studies carried out in three countries in Africa by Ms. Soma Dutta, ENERGIA Asia Regional Network Coordinator. She briefed the participants about the objectives of the gender audit and its relevance.

The gender audit team led by Dr. K. Sangeeta made a presentation on the gender audit studies, its tools and methodology, the indicators to be used, expected outcomes, etc. The team elaborated on the energy-gender-poverty linkages and how it contributes to the Millennium Development Goals (MDGs). It also includes compilation of the preliminary reviews of literatures and data gathered.

The comments made by the participants on IRADe's Gender audit Team presentations were the highlights of the discussion with good inputs and useful suggestions. The points emerged in the discussion has been grouped to the relevant themes identified from the perspectives of the gender audit study. They are as follows:

Policy Issues for women's participation and empowerment

- The gender audit should able to come with very practical and doable programme and policies. The idea is to handle the issues in new perspectives of governance and societies with greater role of women in energy planning and decision-making.
- The gender audit should also address the urban energy issues where women are sometimes faced with lesser fuel choice compared to rural women.
- It is important to formulate a village level energy plan at the cluster level, village level and state level with defined role of women in the gamut of participation, perspectives and decision making.
- To make gender sensitive energy policies, it is required to create awareness to planners and policy makers on gender mainstreaming, more women need to be appointed in high-level decision making positions, collect sex disaggregated data and conduct gender budgeting.
- The indicators to be used in the study should be analyzed critically whether they are going to be effective in gathering the required information. For instance Government allocates 30 per cent of budgets for women, but this does not necessarily by translate as women's effective participation. The proportion of budget they received cannot measure women's empowerment.
- We need an energy policy, which focuses on men and women have different energy needs. It is wrong to presume conventional energy is for men and the non-conventional is for women. Why is the energy for agriculture given free, but not cooking energy?
- The gender audit should also take into account the gender, energy and environmental sustainability issues taking the examples of the Ministry of New and Renewable Energy progarmme to distribute 10 million kerosene lamps, why not try to better improve solar lanterns.

Energy services

- For women oriented energy services emphasize access to 'affordable' energy service and link with rural employment, as it is a prerequisite for their growth, development and reduction in poverty.

- Our programmes should be demand driven and not supply driven. We should concentrate on energy services on small scale and focus on energy services required by women. Access to non-polluting sources that does not damage women's health should have an important part in the programmes.
- The audit should also take into account the discontinuation of MNRE's programmes on improved wood stoves, biogas, etc.

Institutional issues

- We should focus on organic, village based Women's Groups, Mahila Mandals, etc. to find women needs in different situations to engage women in energy projects. We need to bring that into our analysis and suggest how one can build on this.
- There is a role of monitoring agencies, which should evaluate effectiveness of different plans started by the government and quasi government organizations. Coherency is needed among different plans initiated by government and private companies.
- The gender audit should include only renewable energy and Ministry of New and Renewable Energy. It is important to involve more bodies like the Planning Commission, Ministry of Power (for electrification), Ministry of Oil and Natural Gas (Kerosene), Ministry of Rural Development (Biofuels), Ministry of Finance; Ministry of Women and Child Affairs, etc. which will provide ample data regarding the issue.
- NGOs are of great help at the grassroots level and obtain information about the local population in a more affordable and quicker way than the central government. Examples are the District Advisory Committee (DAC) for Renewable energy covering 500 villages.
- The government audit on energy need to focus more closely on renewable energy as it can help reduce the poverty, empower women with options for livelihood activities.

Technology and Investment

- Rural people are not very much aware about the efficiency and role of these clean energy technology. Workshops and special programmes can help in creating awareness in rural areas. There should be gender budgeting class for Panchayats to create awareness.
- Women should be trained on the technology used so that they can handle independently. There should be option for soft loans, as women are always willing to pay for the services unlike men.
- There were suggestions on how each technology needs to be introduced differently from gender point of view: Biogas – A biogas plant that works in all temperature conditions throughout the year, which can use all kinds of household wastes, etc. catering to women needs in different situations. Improved stoves – An improved stove with multi-fuel facility with which both rural and urban women can use with ease. Solar energy -Conventional energy works in all circumstances. But reliability is a problem even in conventional energy sources, such as electricity, where there are occasional power cuts that could not be anticipated in advance. . So even the rural electrification does not ensure reliable energy supply. Despite the fact that SPV does not provide energy round the clock, the specific

time period during which energy will be available is known in advance and, hence, the users could arrange social and economic activities according to these hours.

- Wind energy -With the corporate sectors venturing to wind energy and its conjunctive use with farming, it is crucial to integrate gender issues where woman and women's groups should be given the rights to cultivate.
- Street Lighting is helpful against violence. It is an important target that needs to be taken into consideration. For ensuring women's safety at night, usage of lanterns and other lighting systems are very crucial.

Economic empowerment

- A distinction between increase in income and women's empowerment should be done. They are different things and this fact should be taken into consideration. Income and time are both important indicators, for that reason we should measure both Income and Time in our analysis. The number of hours spent by women in a day is an important indicator.
- Women are getting employment for producing seeds, nursery, irrigation, etc. from biofuel plantation. Briqueting can generate employment especially for women and also women can be involved in traditional water mill that is used for grinding wheat to generate electricity.
- Unavailability of clean and efficient energy source in sufficient quantity has its economic angle too. Thirty Billion hours of women are wasted in gathering biomass and fetching water, this time spent can be utilized efficiently in some other works, which could be more productive. Availability of clean energy sources will save their time which they can utilize in other economic activity and generate money for them. This is an important question need to address under gender budgeting.
- There is a need to empower the women to convert them from 'user' of energy to 'producer' of energy through Self-Help Groups, micro-enterprises making women entrepreneurs.

Some specific suggestions for the Gender Audit team proposed by the experts during the sessions:

- ***The indicators to be used in the study should be analyzed critically whether they are going to be effective in gathering the required information. For instance, Government allocates 30 % of the budgets for women, but this does not necessarily translate as women's effective participation. The question is whether it was implemented and whether women benefited?***
- ***A distinction between increase in income and women's empowerment should be taken into consideration. Income and time are both important indicators. The number of hours spent by women in a day is also an important indicator, even id she does not generate income from that activity.***

- ***The audit should also take into account the discontinuation of MNRE's programmes on improved wood stoves and the need to review the biogas approach.***
- ***We should focus on NGOs, village bases women's groups, Mahila Mandals, etc. to find women needs in different situations to engage women in energy projects. We need to bring that into our analysis and suggest how one can build on this.***
- ***The gender audit should include not only the renewable energy and MNRE. It is important to involve more bodies like the Planning Commission, Ministry of Power (for electrification), Ministry of Oil and Natural Gas (for kerosene), Ministry of Rural development (for biofuels), Ministry of Finance, Ministry of Women and Child development, etc. which will provide ample data and insights regarding the issue.***
- ***It was suggested by MNRE that the Gender Team could send suggestions/ points on improving the programmes and policies of MNRE's 11th Plan Documents. It has to be done urgently as it is going to be submitted to the government soon.***
- ***Suggestions on how to implement the proposed policy on cooking fuels availability within 1 km. distance from rural habitants includes working out with different ministries not only MNRE, do a pilot study at the block level, combination of fuel option suitable to specific areas, etc.***

Annexure:

1. Prof. Sudhakara Reddy's presentation
2. Dr. Sumita Misra's presentation
3. Gender Audit Team's presentation
4. List of participants

Annexure - II

Report of Proceedings

Stakeholders Consultation and Dissemination workshop
Gender Audit of National Energy Policies in India

17 January 2008, New Delhi

Prepared by
Integrated Research and Action for Development (IRADe)
New Delhi

Stakeholders Consultation and Dissemination workshop Gender Audit of National Energy Policies in India

17 January 2008, New Delhi

Background

The Stakeholders Consultation and Dissemination workshop for the Gender Audit of National Energy Policies in India was held on 17 January 2008, New Delhi. The objective of the workshop was to share and discus the process and findings of the gender audit and deliberate on the recommendations with various stakeholders ranging from Planning Commission to Ministry of New and Renewable Energy to ENERGIA International Secretariat to other civil society groups. The idea was to consolidate the various findings to be able to come up with workable plans. It was well attended by people who are involved in and have stake in energy and gender related sectors both from government departments and civil societies. The objective of the workshop was fulfilled given the kind of discussion and deliberation that underwent between stakeholders that results in recommendations that will strengthen the government role in providing access to energy sources to rural poor women in India.

From left to right: Ms. Sheila Oparaocha, ENERGIA, Dr. Kirit Parikh, Member, Planning Commission, GOI, Dr. Jyoti Parikh, IRADe and Dr. Ajit K. Gupta, Advisor, Ministry of New and Renewable Energy, GOI

Opening Session

The Opening session started with Dr. Jyoti Parikh welcoming the participants and brief explanation on the background of the gender audit study and the objective of the workshop. Dr. Parikh mentioned that despite economic and technical development in India, 600 million people still depend on non-commercial energy sources. Much of the brunt of procuring, transporting and processing traditional fuels falls on women. Women are the mainstream users, and often suppliers, of renewable energy. Without their involvement, renewable energy projects

risk being inappropriate, or failing, since women can influence family-purchasing decisions related to energy, and their experience in energy-related enterprise is valuable. Dr. Parikh hopes that today's deliberations will enrich the scope of gender-sensitive energy policies, programmes and schemes of Ministry of New and Renewable Energy.

Ms. S. Oparaocha, ENERGIA International Secretariat explained briefly on the background of ENERGIA and its networking structure. She further elaborated on the ENERGIA Phase 4 where major interventions would be on strengthening national partners and their actions through strategies: capacity building, engender energy projects, policy influencing and networking. Ms. Oparaocha then explained about experience of gender audits in Africa and how it is different in Asia.

From left to right: Dr. Jyoti Parikh, IRADe, Mr. V. Subramaniam, Secretary, and Dr. Ajit K. Gupta, Advisor, Ministry of New and Renewable Energy, GOI

Shri V. Subramaniam, Secretary, Ministry of New and Renewable Energy, Government of India followed Ms. Oparaocha with the keynote address. He mentioned that is laudable for such an exercise being taken up for the first time in India and hoped that the study would able to come up not only with what went right only but also what went wrong. He made the following points:

- Three years back the Government of India started gender budget in different ministries and it has become a routine exercise. The problem is that it is not a prerequisite for planning but a kind of post budget exercise.
- He has observed positive experiences in commercial energy from biomass projects, cow-dung, rice husk, food waste. These activities of women (collecting the cow dung) can become an economic activity. In this project it will be much less polluting, having all the dung together in this kind of balloon and going directly by tubes to kitchen instead of every woman individually picking dung for their kitchen.

- Women won't be freed of the burden of collecting of energy but we can help to do it in a more efficient and less polluting way.
- The gender audit should come with workable recommendations that will make impact solving on rural energy crisis in India. The gender audit should not end with recommendations but should be able to go beyond in formulating policy for futures.
- It is well known fact that one-third of the energy needs in India is met by women who are responsible for collecting and using these energy sources and further mentioned that the situation is not so different in Africa too.
- When biomass based power projects works on commercial scale, biomass disappears, so if the project does not consider biomass on sustainable basis, then the use of biomass should not be encouraged.
- Use of cow dung cake is pervasive in rural areas for cooking. Commercial values of this important energy source and biomass have not been realized and accounted for. This is a significant economic activities, suitable compensation scheme for those involved can be designed to encourage it and make the process more efficient and can be used as an important source to bridge demand and supply gap of energy (especially cooking) of the country.
- Village Energy Security Programme(VESP) of MNRE is not only for energy security, but also to involve women in economic activity.
- There is a wide gap in sanction and implemented projects. These gaps need to be bridged. Citing an example of MNRE itself he said there are 200 sanctioned projects out of which only 30 has reached to the implementations phase.
- To address the energy demand needs effectively policies, infrastructure and etc bottlenecks are need to be sort out.
- The emphasis is on usable, non-polluting energy, which will free women from drudgery. And what are the options to make energy efficient to gender?

The inaugural speech ended with discussion from the participants. One of the participants said the rural energy could not be handled by one ministry as it is a cross-cutting issue. Another suggested gender and social audit should be a part of the VESP and it is the best time to tried out as it has been implemented at the field level.

Technical Session

The session started with a brief presentation by Ms. Soma Dutta, Asia Regional Network Coordinator, ENERGIA on the ENERGIA activities for 2007-2010 giving details about strategies for activities.

The Gender Audit team led by Dr. K. Sangeeta, IRADe presented on the background and methodology of gender audit in India, with Ms. Aysecan Oztop, IRADe presented on the gender audit analysis of the Integrated Energy Policy in India followed by Mr. Chandrashekhar on analysis of Ministry on New and Renewable Energy budget for 11th Plan in the context of gender and energy. The copies of the presentation have been circulated to all participants for comments. Dr. Govind Kelkar, Technical Adviser for Gender Audit mentioned about three

inter-related challenges that energy policy should do to overcome. The first is to address the appalling health condition of rural women in India, the second is why policies are made but not being implemented (minimally) and lastly, what is important is to make women an able citizen not shroud with sympathy.

Dr. Indira Hirway, Member, Think Tank Group, Gender Audit gave the following comments:

- It is an excellent exercise in energy sector in gender-energy framework. Some of the issues are extremely important like impact on health, income generation, education, etc.
- Demand for such type of non-commercial energy is going to increase. This will have to come from non-conventional energy sources. Energy needs of women must be identified in decentralized way.
- How to use the alternative energy effectively. This is right time to come up with some plan; the use of Integrated Energy Policy framework is a very positive thing.
- 1 km fuel wood plantation can be linked to National Rural Employment Guarantee Act (NREGA)[1].
- R&D needs to be enhanced especially for the gender needs. Subsidies are required because it is not itself economically viable.
- There are no gender-disaggregated data; it is required in a detailed manner and need to specify gender-segregated data.
- There need to be coordinated approach pertaining to institutions, finance in a decentralized manner for effective implementation.
- It is also important to incorporate best NGOs' experience.

[1] NREGA-2005 under the Ministry of Rural Development, Government of India is "an Act to provide for the enhancement of livelihood security of the households in rural areas of the country by providing at least one hundred days of Guaranteed wage employment in every financial year to every households".

Dr. Ajit Gupta, Senior Adviser and Chairman of the session made the following comments:

- Energy sector in India is very complicated and complex in nature as there is no single umbrella. The gender audit exercise in this context is a challenge.
- Concerns of lack of gender issues in energy policies are appropriate and the Ministry of New and Renewable Energy is supposed to address gender needs in rural sector.
- Though it is appropriate to address renewable energy sources for cooking and lighting purposes in rural India, it is also important to look other sectors such as oil and gas especially for kerosene and LPG.
- There has to be concerted efforts from all sectors integrating relevant factors in their approach. For e.g. huge amount of money has been spent on kerosene lanterns by Ministry of Petroleum and Natural Gas without taken into account many issues and most importantly impacts of other ministries in addressing rural energy needs. Another e.g. is the single point connection is done by Ministry of Power without consultation with any other ministries.
- National Rural Employment Guarantee Act (NREGA) though it encompasses many sectors has no connectivity with other ministries. Many programmes are carried out in isolation, there need to be convergence.
- Good postulations in women's role and energy needs. What can be done in implementation?
- This issue of gender mainstreaming in policy and programmes should taken up in the 11th Plan. Plans are being finalized without taking into consideration the IEP recommendations i.e. disconnection in implementation and proposed plans in IEP. We need to bring them into implementation and make Action Plans.
- Success stories (of NGOs) need to be captured and build into programmes and bring into planning process.
- Gender reporting should be part of Annual report of MNRE reflecting gender aspects in programmes/schemes.
- Beneficiaries are do projected but at the end of the project, it is not really highlighted, so it important to do the Monitoring and Evaluation (M&E) of programmes/ schemes more seriously.
- It was suggested a round of inter-ministerial consideration is important to see the impact of particular ministry on gender audit. Some level of coordination is required among different sectors.
- The Department of Women and Child Development, Government of India is not sensitized enough on gender and energy issues, their focus is more on women violence rather their economic position.
- It was mentioned that it is difficult to validate or endorse NGO work by the government.

On the analysis of budgets of MNRE by IRADe on gender context, he said that weightages on each renewable energy technology has to be carefully made as it will give wrong impression. The differences in the outlay, expenditure and allocation have to be distinctly defined. Also

the Rs.6 crore … are not spent except for publishing small booklets on women component of the programmes/schemes. This budget is allotted for creating awareness and capacity building programs on gender issues of renewable energy, but is not spent.

Comments form the participants:

Ms. Sheila Oparaocha, ENERGIA International Secretariat made the following comments:

- The allocations of fund for women's welfare in India need to be considered. In Africa the Women Ministry have made a mandate to train people in other ministries on gender issues.
- The IEP is gender sensitive and the process of involving women groups and individuals in the working of the IEP is really enlightening.
- Consultation with gender involvement is itself a recommendation which we should take forward.

Dr. J. K. Mehta gave a brief background on World Energy Congress (WEC) activities on gender issues.

Dr. Veena Joshi, Swiss Agency for Development and Cooperation, India made the following comments:

- The outcome of the gender audit should able to bring the focus on energy for the poor at the national level.
- Inter-ministerial interface is important i.e. ministries who have stakes in energy and gender issues. Through this women's social status and empowerment should take to new dimension by converging with other ministries.
- The possibility of involving the corporate sectors should be explored, for example in the wind power and small hydropower sectors.
- Alignment model is proposed – to align the district, state and center on good practices to integrate at all levels.
- Macroeconomics statistics are important for the energy ladder in the context of poor and gender audit takes to it.

Svati Bhogle, TIDE Bangalore commented the following:

- To make fuel available within 1 km of rural habitant is a pioneering movement. What is important is to translate to implementation.
- It is important to sustain the involvement of women in the programme because many times it happened that men take over the programme when it is successful, e.g biomass wood gasifier.
- Rural women want their health and social position to be taken care first than others such as energy sources. So, it is important to make them understand the linkages of energy to health and social position.
- In the commercialization of household fuel, women are asked to do trivial role though the focus is on them.
- Research in rural energy should make way for good and women friendly products.

Participants at the Meeting

Mr. Nathan mentioned that

- 50 percent of the universities research should target to gender sensitive areas.
- More than design fault in the biogas plants it is the faulty operation.

Dr. P S Sodhi, SGP/GEF said the following

- It is important to institutionalized women's groups as it makes greater impact than individual woman.
- It has been proven that when it is in women's hand they don't fall apart but the problem is getting into their hand.
- Women entrepreneurship should be encouraged.

Mrs. Lalita Balakrishnan, AIWC commented on the termination of National Program on Improved Chulhas (NPIC) at the center and transferring to state level which affects the impact it had made.

Dr. Govind Kelkar, Technical Adviser, Gender Audit said that the 1 Km. fuel availability Mission should be linked to the revolving programme like NREGA maximizing the involvement of Self-Help Groups (SHGs) and Panchayati Raj Institutions (PRIs). The Planning Commission can play a role.

Dr Ajit Gupta wrapped the session with the following comments:

- Availability of fuel within 1 km of rural habitants which is recommended in the IEP should be taken forward to implement at the field level.
- It should be taken on a mission mode involving ministries which have stake on it.
- This will help monetise the energy from biomass sources.
- This can be implemented through NGOs involvement as in VESP, which shows greater success.
- A pilot study needs to be carried before going on mission.

Dr. Jyoti Parikh, IRADe said that this has to be supported by a solid data, people's perceptions, etc. A seed funding to test at the field level is really important trying out 5-6 types of systems in the ground and find out which ministries can be involved.

Dr. Kirit Parikh, Member, Planning Commission who chaired the session on recommendations and action plans made the following comments:

- The Planning Commission is sensitive to gender issues and a lot of consultation and inputs from women's groups has been done in the formulation of IEP.
- The first problem to solve is to reduce Indoor Air Pollution, which means health and economics of clean cooking fuel. The fastest way to solve this is to make entitlement for LPG, kerosene at subsidized rate to all level of people, then make the fuel accessibility within 1 km. Distance.
- Operationalization of 1km. fuel accessibility in rural habitants. This is a complex issue which needs involvement of many ministries to bring to a consensus.
- Smart card for kerosene entitlement- Ministry of Finance is keen to try out, as this is one way to stop pilferage of kerosene. A pilot study needs to be carried out to see the feasibility.
- A mission document on wood load scheme should be initiated with required ground work, feasibility mechanism, right kind of species, financial resources, etc.
- MNRE has made many progresses and their programme on cooking energy is directed to women's welfare.
- One way to ensure success in the programme is to involve private firms to bring to commercial scale, if this happened then women would be benefited through its numbers and networks.

Ms. Soma Dutta said that though the government has stopped the National Programme on Improved Chulhas (NPIC) but now many private firms have come up with improved stoves with better designs and its been quite popular.

On the rationality of subsidy, Dr. Kirit Parikh said that incentives should be given in place of subsidies for successful implementation, because subsidy take away the opportunity for making incentives. Dr. Ajit Gupta further added that if at all the subsidy is to be given, it should be for the energy saved not for construction.

Recommendations

The following are the main recommendations that have emerged from the discussion:

- To do a pilot study of fuel availability within 1km. distance from rural habitants before carrying out on a mission mode.
- The Gender Audit study should not end with recommendations but go beyond by formulating policy for futures.
- Convergence of inter-ministries, which have stake in providing energy to rural poor women.
- Link gender and energy to ongoing programmes of the government like NREGA through involvement of SHGs and Panchayati Raj Institutions.
- Incorporate NGOs experiences in programmes and planning processes of MNRE.
- There should be a mechanism to ensure the funds earmarked for women benefits under Women Component Plan of MNRE should be spent in each financial year.

Annexure-III

Summary Record of the meeting of "Gender Responsive Energy Policy"

7 April 2008, Yojana Bhavan, New Delhi

A meeting on "Gender Responsive Energy Policy" was convened by the Planning Commission on 7 April 2008 at Yojana Bhawan, New Delhi. Dr. Kirit Parikh, Member, Planning Commission, chaired the meeting. He informed that the Planning Commission has been insisting on taking special plans for certain specific groups like Scheduled Castes/Tribes, which deserve a special attention to come at par and join main stream of development. Special attention also needs to be given to women, the FM in his budget speech had for gender audit. Citing the gravity of the problem he stressed on the necessity to show how much of the budget (in proportion of total budget) is earmarked for gender specific programmes. To identify the problem and allocation of funds to address the specific needs he said that gender indicators needs to be well-identified and budgetary provision should be made in congruence with it. He also pointed out the need to improve the efficiency of different programmes and streamlining of budgetary allocation to realise the targeted objectives.

To start the discussion Dr. Jyoti Parikh, Executive Director, IRADe made a brief presentation describing the issues, emerging from IRADe-ENERGIA study on gender audit of the Ministry of New and Renewable Energy (MNRE). She mentioned that very little investment, management and technology go into non-commercial energy which provided 28% of energy gathered by women.

(i) Investment in non-commercial energy

In response to Dr. Jyoti Parikh's statement that very little investment, management and technology go into non-commercial energy which provided 23 % of energy gathered by women, it was pointed out that there is considerable amount of investment going into agriculture, fertilizer, livestock and irrigation and a small portion at this could be considered as that going to non-commercial energy. Dr. Parikh pointed out that this would be valid only if there are specific programmes for utilization of agriculture waste and animal waste. At present, women's unpaid labour is used to remove unwanted materials. In other words, value of labour for removals is seen to be equal to value of the waste material removed by both sides i.e. supply and demand. This is not seen as an activity that calls for investment. Agricultural investment cannot be considered as investment motivated to provide fuels to women.

Biogas uses animal dung; crop residues are also used for industrial purposes. However, crop residues and dung collection become high valued activities only when investments take place in biogas plants, wood gasifiers, etc.

These investments are already shown under other heads e.g. renewable energy or small-scale industries and cannot be again shown under non-commercial energy. Many districts let Prosopis julifera proliferate that could be used for fuel. While this is "allowed", no investment is put in for this. However, some investments by the Ministry of Environment and Forests and state government for their programmes for fuel wood plantations may be

allocated. These, if substantiated, could be shown under non-commercial energy investments.

(ii) Gender Audit Methodology

It was explained that gender audit is meant to serve as a compass for future. IRADe methodology was to assign weights to each programme by identifying its relevance to women as specifically relevant (100%), mostly relevant (40%), partially relevant (20%) and not relevant (0%) depending on the end use. Using these weights, it was shown that the overall rating of MNRE programmes is 12%. It was questioned by the participants that why the weights assigned to grid power is 40% only and not 50%. It was answered that women are not always able to claim equal right to grid power and if renewable provides grid power or home services how it could be used (for no fault of MNRE programme) but the prime criteria here is whether women lives are improved or not. However, some participants were of the view that even if weight is altered and put 50% so as to give equal weights, end result would not change much. This was done by IRADe earlier and when the weights for grid power was taken as 50% instead of 40% the overall rating of MNRE peogrammes improved to 14%.

(iii) Integrated Energy Policy (IEP) report recommendations

The IEP report stated that subsidies do not reach the intended beneficiaries due to poor targeting. The real issue is to improve targeting within the subsidy programme well and ensure that those meant to be outside the subsidy net pay the full cost of supply.

LPG subsidy

LPG and Kerosene are considered cleaner and most convenient cooking fuels and can be regarded as gender friendly to some extent. Their respective consumption by households are estimated to be around 13 million tons and 15 million tons. Government provides a huge subsidy to provide these fuels. Kerosene gets 75% subsidy while LPG is 60-70% subsidized. But 35 to 40% of kerosene in rural areas goes for adulteration of diesel. So the problem is that of delivery mechanism and adulteration. Even if Kerosene and LPG are supplied free of cost, this does not ensure their right use unless this leakage is sealed.

Gender is a matter of targeting. Large number of Below Poverty Line (BPL) persons especially women do not really benefit. Those who depend on firewood should be provided Kerosene or LPG, whereas those already using Kerosene should be moved to the next level (LPG). We have to come up with a comprehensive action plan. The Ministry of Petroleum and Natural gas does not have targets to reach certain number of households every year. Public Sector Units (PSUs) are responsible for the distribution of petroleum and natural gas. Targeted subsidy to BPL household and tax relief for Corporate Social Responsibility (CSR) programmes can motivate them to help deliver cleaner fuels to BPL households.

It was suggested by a participant that all BPL families should get LPG regardless of fiscal implications. It would require additional 25 mt LPG (however such calculations have been made in 1980, 1995 and 2000, without much impact. Free LPG stoves and some LPG

supply were provided by the Andhra Pradesh Government which were sold off to others). An effective programme needs to be structured. The IEP has suggested entitlements through smart cards. Even then the poor sell their entitlements and use gathered fuelwood.

1 km. distance fuel availability

To reduce their drudgery implement fuel accessibility within 1 km distance from rural habitants, for which various factors need to be assessed such as energy consumption at the local level, geographical area, etc. For instance, arid areas have more difficulty in acquiring cooking fuels, whereas for forest areas it is much easier. As regards fuelwood plantations, National Rural Employment Guarantee Act (NREGA) funds can be used more aggressively for engaging in fuelwood plantations. Again, there is the issue of coordination. Self-Help Groups (SHGs) can grow and manage fuelwood or oil seed plantation like Jatropha. Moreover, Jatropha plant generates lots of biomass. The seed cakes have 30% fuel efficiency combustion. Such groups can utilize these residues also.

(iv) Suggestions for MNRE

Gender inequity arises from structural features. What steps can MNRE take to address these issues? This is not just a budget issue but one of political commitment. It should be the government's obligation to provide clean cooking energy. The government has to make commitment to improve women's lives. Fiscal cost could be covered if the government channels the funds from disparate and inefficient programmes.

Specific examples for MNRE are given below.

Biogas programme

The time saved by women through use of improved energy services through biogas can be utilized for their empowerment and income generation. In biogas programme, there should be additional elements in capacity building for women. For e.g. mason training may be accompanied with training for safe operation of biogas plants, training women as trainers for user's training. Introduction of brother-sister/wife-husband teams (instead of a woman alone) can help in ensuring functioning of biogas and gender harmony. There are examples of women running biomass gasifiers in Tamil Nadu, given an enabling environment.

Improved Stoves

In the case of Improved Chulhas (IC), three different schemes could have been involved in its implementation viz., (i) Indira Awas: BPL and SC/ST families are given houses and such IC could be installed in these houses, (ii) HRD Programme: In the schools for midday meal preparation ICs should be used. (iii) In the Ministry of Women and Child Development, no mention of fuel is made in any programmes. For midday meals in schools where larger amount of non-commercial fuel is used everyday, opportunity exists to introduce fuel efficiency measures. There is a serious coordination failure. What can be done to reduce this failure?

Convergence of ministries

Engendering the 11th Plan and inclusion of gender is a good step. Convergence of ministries to address the issue of energy accessibility for women in rural areas is very relevant. More work is needed to work out the mechanism. Also it is a good sign that other ministries also showed interest. In gender budgeting under each ministry, women's priorities must be shown and evaluation must be done to see how women have been helped. However, it is important to understand whether the exercise is just for gender rating of the budget or for women's empowerment.

(v) Empowerment to address gender energy poverty

Some participants felt that empowerment and energy issues both can go in tandem. Energy access creates economic space for women for work and mobility. Broader objective is to give cleaner energy to women alongwith empowerment. Giving example, one of the participants said that while women want electricity at the village well or kitchen, men may want it in the market or entrance of the house. Thus empowerment gives a voice and right to exercise one's preferences. If security is not provided for women they cannot work and for security energy is an essential element. It was observed that a lot of street violence against women takes place in dark areas. Unless the gender perspective is seen as a part of the planning process, one has an energy system by the men, of the men and for the men. Inclusion of women in the planning, execution and monitoring process could change the way energy system would evolve.

Integrated Energy Policy Committee recognizes that even if entitlements to energy are given there would still be problems. The two important issues are (i) Larger issue of women's empowerment ensuring that programmes contribute to women's empowerment and that all programmes of the government do so. (ii) It may help to focus attention on policy and expand the mandate to other ministries and take a broader view? Such approach may require mission mode-the way Rajiv Gandhi Drinking Water Mission was carried out. This may require a mix of several options depending on local situations and commitment from many ministries. For the time being, it was suggested to have a separate meeting at the Ministry of New and Renewable Energy to discuss the above recommendations pertaining to their budget lines and programmes.

LIST OF PARTICIPANTS

Sl. No.	Name	Designation	Organization
1	Dr. Kirit S. Parikh	Member (Energy)	Planning Commission
2	Mr. S. Narayanan	Deputy. Secretary	Ministry of Micro, Medium & Small Industries
3	Mr. V L V S S Subba Rao	Joint Adviser (Finance)	Ministry of Petroleum & Natural Gas
4	Mr. L Haokip	Under Secretary	Ministry of Panchayati Raj
5	Dr. Ajit Gupta	Adviser	MNRE
6	Mr. Santosh Mehrotra	Senior Adviser	Planning Commission
7	Mr. K B Thampi	IG of Forests	Ministry of Environment & Forests
8	Mrs. Lalita Balakrishanan	Head, Rural Energy Department	All India Women Conference
9	Ms. Benita Sharma		IFES, New Delhi
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About IRADe
(Integrated Research and Action for Development)

A 'think tank' that works with 'action tanks'

Integrated Research and Action for Development is a fully autonomous advanced research institute, which aims to do research and policy analysis, impart training and serve as a hub of network among various stakeholders. The institute focuses on research for effective action through multi-disciplinary and multi-stakeholder groups for executable solutions leading to effective governance. The key focal areas are:

- Environment and Climate Change
- Energy and Power System
- Impact of Policy Reforms
- Poverty Alleviation and Gender
- Action Projects with Communities
- Training and Capacity Building
- Policy Analysis and Knowledge Dissemination

Rural and urban development, technology assessment, etc. are some of the cross cutting issues that are not only embedded in research programmes but in Action, Training and Dissemination.

IRADe's Journey

IRADe has completed six years of successful work since its establishment. In the six-year period, IRADe has gained considerable strength and carried out wide-ranging activities in its focal areas. IRADe has also started to work as an independent evaluator to assess the effectiveness of different programmes and policies sponsored by government and quasi-government organizations. Over these years IRADe has succeeded in engaging not only academic experts but also NGOs, government's ministries, the public and private sectors and international agencies such as MOEF, MNRE, MEA, Planning Commission, Department of Science and Technology, CSO, SEWA, WISION-Germany, Stanford University-USA, WINROCK International, SANEI, UNDO, UNEP-Geneva, British High Commission, ENERGIA International-Netherlands.

Gender Team

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The Gender Study was carried out by a multi-disciplinary team of experts from IRADe headed by Dr. Jyoti Parikh, and the group members included Dr. Konsam Sangeeta, Mr. Chandrashekhar and Ms. Aysecan Oztop. The gender team received technical guidance from Dr. Govind Kelkar, Programme Coordinator, Reducing Feminization of Poverty and Exclusion, UNIFEM South Asia Office India; and was supported by a Think Tank group, composed of Dr. Indira Hirway, Dr. Indira Rajaraman, Ms. Sumita Misra and Dr. A K Gupta and Ms. Lalita Balakrishnan, Ms. Swati Bhogle and Dr. Sudhakar Reddy as co-opted members of the Think Tank.