

MODULE 1

**Version 2
Revised June 2005**

CONCEPTS IN GENDER AND ENERGY

Glossary

Biomass fuel: any organic material of plant or animal origin such as wood, agricultural residues and dung, used as a fuel.

Energy: includes fuels such as petroleum products (kerosene, petrol, diesel) and biomass (firewood, charcoal, agricultural wastes, dung), power (electricity) which can be from a number of sources (fossil fuel based or renewable) and animate forms of energy, particularly human metabolic energy.

Energy carrier: The form in which energy is delivered to the end user, for example, fuels (biomass and fossil fuels), batteries and electricity (grid). The end-user has to make an additional transformation of the energy into a useful form, for example, switching the radio on which converts electricity into sound.

Energy efficiency: The ratio of output energy to input energy gives a measure of the conversion efficiency of a particular piece of equipment. The ratio varies and can never be 100%.

Engineering design aims to maximise the conversion efficiency.

Energy poverty: Absence of sufficient choice in accessing adequate, affordable, reliable, clean, high-quality, safe and benign energy services to support economic and human development.

Energy services: The desired and useful products, processes or services that result from the use of energy; for example, illumination, comfortable indoor climate, refrigerated storage, transportation, appropriate heat for cooking.

Energy technologies: The hardware that converts an energy carrier into a form of energy useful for the end-user.

Productive work: Work done by both women and men for pay in cash or kind. It includes both market production with an exchange value, and subsistence/home production with actual use value and also potential exchange value.

Practical or Reproductive work: Childbearing and daily child-rearing responsibilities and tasks involving the care and maintenance of the household and its family members, in most societies primarily done by women. In some societies, men may have customary domestic activities (e.g. house building). Despite the important role this type of work contributes to the economy, for example, by ensuring that there is a fit and active workforce, it is rarely considered as the same value as productive work. It is normally unpaid.

Strategic interests: Things necessary to change the balance of power between women and men in society, based on the premise that women in society are subordinate to men. Examples of strategic interests include: the law, education and income. Strategic interests aim towards women's emancipation, equality and empowerment.

Women's Empowerment: Process of awareness- and capacity-building of women leading to a more equitable participation in decision-making and enabling them to exercise control over their own lives.

INTRODUCTION TO MODULE 1 CONCEPTS IN GENDER AND ENERGY

Module 1 sets out some key ideas and concepts about gender, and argues that a clear understanding of gender and the way it is reflected in social and economic roles is essential for effective rural energy planning. This module argues that gender sensitive energy planning is required to realise the project goals set and to meet the needs of the people identified as the intended beneficiaries of an intervention.

aim of the module To introduce participants to key ideas relating to gender and gender in energy. The module aims to familiarise the participants with the gender terminology related to energy projects.

key concepts and ideas introduced in this module:

- gender, gender roles, gender contracts
- gender relations
- triple roles in energy projects
- what gender and energy is about
- gender mainstreaming and ‘women only’ energy projects
- practical and productive gender needs and strategic interests in energy projects
- gender and energy for different gender goals: improving welfare, increasing, productivity, assisting in empowerment, and project efficiency

topics in this module:

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UNIT 1.1 WHAT IS GENDER? WHAT IS ENERGY?

Learning objectives:	<p>After completing the topic the participant should be able:</p> <ul style="list-style-type: none"> ▪ to define the difference between gender and sex; ▪ to recognise gender differences in his/her own society; ▪ to debate with others the nature and origin of gender differences; ▪ to classify tasks of men and women according to whether they are reproductive, productive, or community tasks; ▪ to identify which factors might influence gender roles and contracts; ▪ to classify energy sources; ▪ to explain the concept of the energy ladder; ▪ to explain why we focus on women when addressing gender in energy
Time schedule:	<ul style="list-style-type: none"> ▪ 4 hours

What is gender?

Men and women are different in some ways, and alike in others.

Men and women differ both socially and biologically but there are similarities.

Biologically, we all need to eat and to sleep and to breathe, we are all subject to malaria and flu and we all need exercise to keep healthy. But there are differences in body forms; and women bear children while men cannot.

In some ways men and women are similar in social terms. Both are sociable - they both like celebratory gatherings and festivities! - and both want to be valued as individuals, for example. There are however a lot of social differences between men and women in most societies. Girls are usually expected to grow up to be good wives and mothers; this sometimes implies that they are expected to be modest, and to be obedient, to be quiet when men are around. Boys in most societies are supposed to grow up to be the chief breadwinners, and the 'head of the family', and this may imply that they are expected to be brave, to take the lead, to speak up. Most of these behavioural differences are not innate (that is biological), but are learnt by a child at an early age, both directly by being taught by parents and by society in general, and through observation of the behaviour of adults in the world around the child.

Discussion Point 1.1.1

It is not always easy to say what differences are really biological and what are socially learned ones.

Is it a biological difference or a social one?

- Men are usually heavier than women
- Women are better at looking after children
- Girls are shyer
- Boys can run faster

All cultures have views on what men and women can and should do and what they are 'naturally' good at and what they are 'intrinsically' bad at. Some things, such as tasks around the household or types of employment, are just considered 'right' for women and 'wrong' for men, and vice versa. "Things" have always been done like this and mostly people accept these ideas without question.

Discussion Point 1.1.2

Do you agree or disagree with the following statements):

- "Men are more logical and rational, women are more emotional"
- "Women are unstable at certain times, for example during menstruation"
- "Women have more difficulty in working with numbers than men"
- "Women are quarrelsome among themselves and don't work well in a group, men get on with each other better"
- "Although it is true that women do some work on the farm, the farmer is really a man"
- "A family really consists of a man who is head of the household, a woman, and their children"
- "Women prefer to have a man to make the decisions for them"
- "Children suffer if their mother goes to work outside the home"
- "Men are much less sensitive than women: they don't notice how people are feeling"

Gender: a concept to explain socially determined differences between men and women.

There are different ways to describe what it means to be a woman or a man. Biologists use physical characteristics which they call sexual differences. While social scientists use social characteristics which they call *gender*. These characteristics include the tasks, roles, obligations and privileges in public and private life of women and men as well as the relationships between them. "Gender" is not the same as "sex" since the former is not determined by biology, but by society based on social, cultural, political and economic expectations. Since "gender" is shaped by society, it will have different forms from society to society.

>> Exercise 1.1.1: Gender Roles

Gender roles shape women and men's identities.

Gender roles are roles assigned to men and women by society. Gender roles shape our identity, determining how we are perceived, how we are expected to think and act as women and men.

>> Exercise 1.1.2: Gender Roles in Different Societies

Gender norms govern socially expected behaviour of women and men.

The manner in which women and men behave within their gender roles are shaped by *gender norms*, the accepted standards of behaviour shared by a particular society.

Linked to gender roles are certain rights and obligations based on cooperation and support. Within a household for example, men and women are able to negotiate to some extent what their rights, benefits and obligations are as regards carrying out certain duties or tasks that ensure the survival of the household. These negotiations are also about the use of household/family resources, such as land, labour and cash. This means that these negotiations are not always harmonious since there can be disagreements and competition for the resources. It is important to remember that these negotiations are not usually taking place between equals. In most societies, men have more power than women to make decisions about and exercise control over their own lives and resources, as well as other family members. This balance of power between men and women defines the relationship between the genders. The effects of differences in power operate at all levels in society: household, community, organisational, national and international.

>> Exercise 1.1.3: Gender Roles

Gender relations are shaped by the power of decision making at all levels in society.

Gender relations, like gender roles, are socially determined and are influenced by the same social, cultural, political and economic expectations. Gender relations are shaped by a range of institutions, such as the family and legal systems. Gender relations exist both within households (private sphere) as well as within the community and workplace (public sphere). An analysis of a given situation based on gender relations differs from one based on gender roles because it gives more focus to power relations and the connections between men and women's lives.

The gender contract is an invisible agreement which determines gender relations within the household.

Gender roles and relations are made on the basis of an informal arrangement, but if this were a legal matter, it might be called a 'contract'. Therefore the term *gender contracts* is used to describe how the relationship in households between men and women is shaped and enforced, and the term can also be applied in a wider context of the society in which they live. This 'contract' is an invisible agreement which determines how men and women should behave and the sort of sanctions society "imposes" on those who break the gender contract. As was pointed out above, a gender contract is not a negotiated settlement between equals but one in which one of the partners (usually the man) holds and can exercise more power than the other (usually the woman). In other words, gender contracts tend to favour men. The modern legal system usually gives men and women equal rights of ownership and inheritance. However, traditional systems often grant other types of rights, for example, women might not be able to inherit property. These two systems are often found operating in parallel in a community and this can lead to tensions and conflict, as women try to assert their right under the "modern" system.

Different societies have different gender contracts

Gender in societies

In the previous section we were introduced to concepts related to gender. In this section we will look at some of these concepts in practice. Case 1.1.1 describes gender roles in a rural area of Kenya.

Case 1.1.1: Gender roles in Kenya

In Kakamega area of Kenya a shortage in fuelwood meant that the women

The case demonstrates that acting against gender roles is uncomfortable and can trouble in energy projects if these roles are neglected

had to walk long distances to collect firewood. This situation inspired a project to encourage the women in the village to plant trees. The men in the village already planted trees in the surroundings, but these trees were meant to be sold as timber. Project planners visited the area and offered the women seedling if fast growing trees for firewood to plant on their fields. However, the women refused. They could not plant trees, because they felt that they did not own the land. Their husbands own the land and it would be disrespectful to plant trees on their land. Planting trees is a man’s task (Bradley, 1991).

The case from Kenya demonstrates that it is difficult both for men and for women to go against the gender roles in their community. Even though, in this case, it would relieve the women’s tasks, the women didn’t accept planting trees because they found it not appropriate within their community.

In each country and in different regions of a country ideas about gender roles differ. This observation supports the view that gender is not determined by biology but by society. It is not only different communities that define gender roles differently but also different people in the same community can see gender roles in different ways. Case 1.1.2 illustrates this point from a village in Tanzania.

Case 1.1.2: Men’s and women’s views on gender roles in a village in Tanzania

Even in the same community people have different views on gender roles

A gender relations study has been carried out in Korogwe Village in Tanzania by the Tanzania Gender Networking Programme, with the purpose of raising gender awareness. Female respondents considered cooking as the most unlikely non-traditional role that could be performed by men, followed by fetching water and lastly fetching firewood. Male respondents on the other hand viewed men fetching firewood as the most unlikely change in gender roles, followed by men drawing water (TGNP, 1996).

Discussion Point 1.1.3

Is there a term for ‘gender’ in your own language? Write it down and explain how it is used.

How you explain gender, depends partly on who you are trying to explain it to. Can you formulate an explanation of what gender is, for policy makers,

How would you explain it in a village meeting? Try to do this in a small group: one of you can play the gender planner, the rest can play ‘typical villagers’. Try to explain in ways that the ‘typical villagers’ will understand.

Note: in Appendix 2 to this Module, there is an exercise called ‘Whose Hands are These’. This may be a useful way of introducing the gender idea at village level in practice.

Changing gender roles, contracts and relations

Gender roles, contracts and relations can be altered.

Gender roles, contracts and relations are not static but change over time; do you remember your grandmother saying young men and women don’t behave today like they did when she was young? Gender roles and relations change in response to changes in social-economic circumstances, natural and man made disasters such as droughts and war, technological development, education and

so on. In other words, gender roles and relations are generally dynamic and gender contracts can be renegotiated in response to changed circumstances. Moreover they can actively be encouraged to change, and many groups are working to change them at local, national and international levels. Others do not wish these things to change, because they see them as part of the culture and tradition of the society in which they live. Societies which feel threatened by external forces or ideas can react by calling for a return to “traditional values”, which can include the subordination of women, in other words gender contracts remain constructed to favour men.

Discussion Point 1.1.4

- Do you think that gender roles in traditional communities in your country should be changed?
- Do you think it is possible to change these roles? How?
- What influence does gender have on the ability of women to take part in planning and implementing energy projects?

It is sometimes thought that modern, urban society is more open to changes in gender roles and relations than traditional, rural societies. However, education and contact with foreign cultures does not naturally imply more openness and tolerance to changing gender roles, as is illustrated by Case 1.1.3 from India. In the case study acceptance or rejection of non-traditional gender roles clearly has less to do with education and exposure (forest department officials are educated and relatively exposed to external cultures), but more to do with intrinsic dynamics within the local community. The second case from Ghana (1.1.4) describes a successful change of gender roles.

Case 1.1.3: Different views on changing gender roles in India

Education and experiencing other cultures does not necessarily imply more openness and tolerance

The Ministry of Environment and Forests noted that forests in India had suffered serious depletion and initiated a programme whereby village communities and NGOs would participate in regeneration, management and protection of degraded forests. The programme - Joint Forest Management (JFM) - had special features for providing access to, and control over, forest resources; and for attempting to involve women substantively in resource management. Community Organisations called VSS were formed, in which every household was represented by one man and one woman. A VSS had to have at least 30% representation by women.

In reality, it turned out that in the regions where JFM was operating, most women were unaware of the programme; most VSS committees had less than 30% women; participation in the labour force was equal between the men and the women, but women were paid less than men for the same work.

Following a study to explain the discrepancies, it was found that an overwhelming majority of the ‘grassroots’ male members of VSS had no objection to equal participation by women, equal wages for equal work, and even to accepting suggestions made by women. The men however expressed some concern about sending women away for training, because they were concerned about the women’s safety and because they felt that women needed to be around to take care of young children. Surprisingly, when asked similar questions, men among Forest Department officials, NGO staff and wealthier men in the village were of the general view that forest management

was men's work. (Suryakumari, 2001)

Case 1.1.4: Successful change of gender roles in Ghana

The project in the Volta region of Ghana has helped to transform an infertile region into productive farmlands through various sustainable agro-forestry practices. Most of the farms are communally owned, and worked by both men and women.. Some of the proceeds from the farms are ploughed back into community activities while the rest is divided equally among members, both men and women. . The gender division of labour on these farms follows the traditional pattern, it has not changed. However, with the money they have earned, many women have been able to start their own farms, as economically independent units. The era when it was men's exclusive responsibility to initiate or spearhead such activities passed. As a result there has been a huge change in attitudes as regards gender roles and contracts. While it is admitted that women have some traditional family roles, 'unjustifiable built-in gender roles' which relegate women to the background or the kitchen are strongly rejected.(Sigot et al, 1995)

Discussion Point 1.1.5

What is the basis for the gender relations that underlie typical gender roles in your society?

What groups are trying to change gender relations?

What are the positive and negative aspects of attempts to change gender relations?

>> Exercise 1.1.4: Changing gender roles

Complexity of Gender

Gender contracts differ within each country, class and social group

Women are not a homogeneous group.

Gender is not just a binary condition, but is graduated by affluence and poverty; age; marital status; caste systems and other cultures and traditions, as well as physical and mental health. In other words, gender issues cannot be addressed without reference to the other inequalities.

It is important to recognise that different groups of women may have very different needs in a given society. Not all women are poor, and not all poor are women. In communities where there is a strong social division (for example based on class, caste or ethnicity), the needs and capacity of poor women to meet those needs will be different from those of rich women. Not all women are disadvantaged (although they are generally subordinate to men of the same social group). One cannot assume that all women have the same problems. The needs and the capacity to meet those needs of poor women will be quite different from those of the rich. Nor should one assume that gender is the only basis for disadvantage. However, by taking gender into account, unexpected insights and solutions can emerge that would be missed by using standard planning approaches.

Discussion Point 1.1.6

Look at the material presented in Appendix 2 of this module. It consists of a set of drawings of hands, each pair of hands is doing a different task. The purpose of the drawings is to raise a discussion about gender roles, at village level, and to make people more aware of it.

What other methods could you use to raise discussion and awareness of gender roles at village level?

Analyzing gender roles and relations

Gender analysis helps us understand gender roles and relations.

To fully understand the gender side of energy, it is important to realise that gender contracts do exist, and that the underlying reason for gender differences in regard to energy may be found in the underlying gender relations that characterise the society in question. Gender experts use a number of different ways to analyse gender roles and relations. *Gender analysis* asks questions, in relation to men and women, about who is doing what, who owns what, who makes decisions about what and how, who gains and loses by a planned intervention. Gender analysis examines what is happening within the household and makes linkages with the different levels of the wider society.

Gender interests are not always obvious which can lead to incorrect assumptions as a basis for interventions which turn out to be inappropriate.

Gender analysis is not about looking at women alone, nor is it about complaining that women suffer more than men, but rather gender analysis is about reaching a better understanding of how communities work from the perspective of relationships between men and women. Gender interests are not always obvious, neither are potential impacts of energy interventions. Sometimes inappropriate interventions are made because they are made on the basis of assumptions. For example, the emphasis in energy planning for the benefit of women has long concentrated around cooking, with firewood collection being seen as the central problem to be tackled. However, is this narrow focus justified? Is cooking the only activity women do? Do men get involved in fuelwood collection and make decisions about stove purchases?

Gender analytical tools help in identifying existing gender situation and potential project impacts on gender relations.

Gender analysis is carried out using *gender analytic tools*. Gender analytic tools are a method of organising information in a systematic way (known as a *framework*) which helps in understanding the existing gender situation in a given community, or for assessing what the impact of an intervention, such as an energy project, is likely to be on men and on women. Gender analytical tools can be used in a number of ways. For example, to draw attention to gender inequalities in a given community, and to be an early warning system identifying gender problems that may arise if an energy initiative is started within the community. (Unit 2.1 in Module 2 introduces some gender analytical tools which have been specifically developed for use with energy interventions.)

Unfortunately there are no standard ways of analysing gender roles, contracts and relations. There are different frameworks which have different starting perspectives which then shape the questions asked and the types of solutions likely to be proposed to solve any identified problems. One of the first attempts at gender analysis was based on the gender division of labour and divides tasks for men and women into three main social-economic areas:

reproductive, productive and community. This framework is known as the *triple role*.

Triple Role

The triple role: reproductive, productive and community tasks.

- *Reproductive*
This refers to all tasks undertaken to reproduce the labour force (bringing up the next generation) and includes child bearing and rearing, feeding the family, caring for the sick, teaching acceptable behaviour and so on.
- *Productive*
This covers work done for payment in cash or in kind. It includes the production of goods and services for subsistence or market purposes.
- *Community tasks*
Community tasks are those done not for individual family gain but for the well-being of the community or society: charitable work, self-help communal construction of village facilities, sitting on village committees, involvement in religious activities, visiting friends who need help and so on. For women their community tasks are often seen as an extension of their reproductive roles.

The three task categories are not water tight

Of course these categories are not entirely water tight: there are fuzzy lines between them. For example, someone who runs in an election for a political position - is that community work or productive?

Men are mainly involved in productive and community tasks

Because women are involved in tasks in all the three main areas, they are often expected to do a full day's work raising crops or working outside the home, plus housework and child-raising, plus community obligations. Men are mainly involved in productive and community tasks.

Discussion Point 1.1.7

- In your society, do men or women take the greatest role in:
 - reproductive tasks ?
 - productive tasks ?
 - community tasks ?
- Is it different between social classes?
- Compare with others if it is different for different cultures.
- Which of the three gender roles (reproductive, productive or the community) is most often addressed in the energy projects you know?
- Are men and women's roles, and hence needs, seen differently in this project?
- Do you think that the needs of men and women are equally met in these projects?

What is Energy?

Everything we do involves energy.

Everything we do involves energy. Energy can make our life easier and more efficient. For example, a flour mill may be run on electricity, which may be produced from burning coal in a power station. In this example, electricity or *electrical energy* helps save the tedious and tiring work of pounding maize or hulling rice by hand which uses *metabolic energy* (human energy, derived from the food we eat). Kerosene (paraffin) lights are brighter than candles;

electric light is even better for seeing at night. Cooking on wood usually means collecting wood from long distances, and it produces a lot of smoke and soot which is not only bad for your health but also hard work cleaning dirty pans. LPG gas, is faster, the flame is easier to adjust and cleaner and healthier than wood. Walking, especially when you have to carry a heavy load, again using metabolic energy (human energy, derived from the food we eat). We would often prefer to take a bus (which uses diesel oil), or perhaps a bicycle, which is a conversion technology that uses our metabolic energy more efficiently.

Energy is a concept used by physical scientists just as social scientists use the concept of gender: concepts help explain certain processes.

Energy comes in different forms which can be converted from one to the other.

Energy conversion uses equipment some are more effective (or efficient) at the conversion than others.

Good energy efficiency is better for the environment and can be cheaper.

Fuels and batteries are energy stores.

The same quantity of different fuels store different quantities of energy.

What exactly is “energy”? Energy is a concept that physical scientists use to explain certain processes that have a number of common features. It is the same as social scientists and the concept of gender which they use to explain certain process. We cannot see or feel “gender” but only see or feel the consequences of gender in action. It is the same with energy. We cannot see it or feel it but we can see or feel the consequences of energy (such as: warmth, light, sound, motion). Energy enables us to do such diverse things as: cooking a meal, lighting a room, operating a grain mill. If we think about these three activities we can already begin to understand some important features of the concept of energy. To do the three activities we would use energy: heat to cook the food, electricity for lighting and a diesel engine turned the shaft of the mill (mechanical energy). So the first important feature about energy is that it comes in different forms. (There are more than the three forms given here. Some more are listed in Table 1.1.1.) The second important feature is that energy forms can be converted from one form to another. The electricity could have been made by burning natural gas in a power station (*chemical energy* converted into electrical energy). The electricity was converted into light (*electromagnetic radiation*). The conversions all required a piece of equipment or a device. In our example: a stove for cooking, a light bulb and a diesel engine.

Unfortunately when energy is converted from one form to another not all of the energy ends up where we would like it: a portion always ends up as heat (think of a light bulb). Scientists and engineers strive to make this portion appearing as heat as small as possible. They try to make a piece of equipment as efficient as possible. This makes good economic sense as well as being better for the environment. The efficiency of conversion equipment varies. An LPG stove converts around 60 to 70% of the chemical energy stored in the LPG into heat energy while a wood stove converts around 12 to 30 % of the chemical energy stored in the wood into heat energy. An LPG stove is generally regarded as having a good efficiency while a wood stove is generally regarded as having a low efficiency. However, this assumes that the equipment is well maintained. Poor maintenance can lead to lower efficiency as well as reducing the lifetime of the equipment.

If we look at the examples of activities, some of the conversion equipment uses fuels (such as wood, LPG, diesel, coal). Fuels are stored chemical energy which is released when the fuels are burnt. These fuels differ from each other in a number of ways: their physical form (gas, solid and liquid which has implications for their transport and the types of equipment where they are burnt) and the amount of energy they store. For example, a 1 cm³ piece of wood contains less energy than a 1 cm³ piece of coal. There are other ways to store energy: for example batteries (chemical energy) and water in dams.

All energy sources have their origins in the natural environment.

The energy chain shows the flow of energy from the natural environment, through its conversion stages to the end-use.

Classifying energy

Energy analysts are interested in energy from the perspective of a resource rather than an interesting scientific phenomenon (although of course they cannot totally ignore the scientific laws governing energy use). They have a number of ways to classify energy as a resource. All energy has its origin in the natural environment. Energy analysts classify the natural resources of energy as *primary energy* (see Box 1.1.1 for examples). We are able to use some of the natural sources of energy directly for example, biomass. However, primary energy is often located not where it is needed or in forms that can directly used (for example nuclear energy). Therefore primary energy often has to undergo a number of conversions so that it can delivered to the consumer. It can be transformed into *secondary energy* for transport or transmission. It might undergo another conversion to the form which the consumer buys or receives (*final energy* sometimes known as an *energy carrier*). The consumer then uses the energy carrier in an appliance to produce *useful energy*. Useful energy is almost invariably either in the form of heat or shaft power. However, for a few end uses (for example, communications equipment) electricity is the useful form. The conversion of energy from primary to secondary to final and useful forms is known as an energy chain. Energy analysts use energy chains to analyse energy losses.

An example of an energy chain is the use of water to run a saw mill. The water stored in a dam is a hydro resource which forms the primary energy. The water can be converted to electricity, which is the secondary energy, by the use of a hydro power station. The electricity is transmitted to the saw mill as the final form where it is converted to the useful form of shaft power. In this case the secondary and final forms are the same.

Box 1.1.1: Primary Sources of Energy

Biomass: any material of plant or animal origin such as woody biomass (stems, branches, twigs) non- woody biomass (stalks, leaves, grass), agricultural residues (rice husk, coconut shell), and animal and human faeces.

Solar radiation: energy from the sun.

Hydro: utilises potential energy from water stored behind dams or weirs and moving water in water falls, streams or rivers.

Wind: the kinetic energy from the movement of air.

Geothermal energy: heat flow from the earth's core to the surface by molten rock or hot water.

Animate (or metabolic) energy: energy delivered by humans and animals.

Ocean energy: includes three energy sources: wave and tidal, which both utilise the kinetic energy of moving water, and ocean thermal, which utilises the heat flow between the warm surface waters of low-latitude tropical oceans and the cool deep waters.

Fossil fuels: coal, oil and natural gas.

Nuclear energy: energy released when nuclei of uranium atoms break apart.

Discussion Point 1.1.8

Can you think of any other energy chains?

How can energy chains be used in gender analysis?

There are other ways of classifying energy sources. Most of the primary sources of energy are *renewable*: in other words will not be depleted in

Energy can be classified in terms of sustainability of the resource.

contrast to *fossil fuels (non-renewable)* which will at some stage in the future be depleted. Renewable energy sources include biomass (although unless this is managed properly it can become non-renewable), solar, water and wind. Some people do not consider nuclear energy as renewable since all the natural uranium will be used up at some time in the future. So to incorporate this view point the term *New and renewable* sources is used which includes all the renewable energies plus, nuclear, ocean and geothermal.

Energy can be classified in terms of familiarity of use.

Another way of classifying energy is related to familiarity of use. Energy sources we have used for a long time we can consider to be *traditional* or *conventional* as opposed to new sources (*non-traditional* or *non-conventional*). Many biomass users would be regarded as using a traditional source and would regard using fossil fuels as non-traditional. It can be the conversion technology rather than the resource which determines the classification. Animal dung can be regarded as a traditional energy resource if burnt directly but if it is used to produce biogas in a digester a non-traditional energy source results. The terminology is rather ambiguous since it depends very much on the context. For example, wind energy. It is clearly renewable but is it traditional? Windmills have been used for several centuries. Or is it non-conventional since wind energy has only been converted to electrical energy for less than 100 years?

Energy can be classified in terms of whether or not it is purchased.

Energy analysts also classify energy according to whether or not it is purchased (*commercial*). Commercial energy always includes the fossil fuels and some new and renewable sources. Biomass is usually classified as *non-commercial* - however again this depends on where you are in the world. In many urban areas and some rural areas biomass is a commercial energy source.

Discussion Point 1.1.9

In which energy categories would you classify fuelwood in your country?
Solar energy?
LPG?

In table 1.1.1, the main energy sources are listed, with their direct and indirect uses, the technologies that may be associated with them, and their end use.

Box 1.1.2 Energy and Power

In everyday English we use the words *energy* and *power* interchangeably (for example, wind energy/wind power). However, scientists use much stricter definitions for the two words. Power is the rate at which we use (eg burn wood in a stove) or transmit energy (eg electricity from a power station to the consumer).

Some more information about energy and power can be found in Appendix 3.

Table 1.2.1: Main fuel sources and their end uses

Energy source	Direct use	Can be transformed into (energy carrier)	Conversion Technology	End use Energy service
Traditional renewable energy sources				
Wood (P)	Heat	Charcoal Liquid fuel	Cook stoves Furnace	Household cooking and heating Small industries needing heat process
Agro-wastes (P) Crop residues Dung	Heat	Briquettes Biogas	Cook stoves Furnace	Household cooking and heating
Fossil fuels				
Oil (P) Diesel (S/F) Petrol (S/F) Kerosene (S/F) (paraffin)	Motive Power Transport Light and heat	Electricity	Generators Engines	Grain milling, water pumping
GasLPG (S/F)Natural Gas (P)	Heat	Electricity	Stove Turbine/generator	Cooking Baking, brick making
Metabolic fuels				
Food (S)	Metabolic energy		Human and animal bodies	Work
New, renewable energy sources				
Sunlight (P)	Heat	Electricity Hot water	Solar dryer Solar cooker PV panel and battery	Drying crops, fish Cooking Light, communications, TV, radio, computer
Flowing water (Hydro) (P)	Mechanical energy	Electricity	Water Electric cooker	Grain milling Cooking
Wind (P)	Mechanical power	Electricity	Wind turbines	Light, communications, TV, radio, computer
Modern biomass fuels				
Vegetable oils (S/F)	Mechanical energy	Electricity	Diesel engine	Transport
Ethanol (S/F)	Mechanical energy	Electricity	Petrol engine	Transport
Producer gas (S/F)	Heat Mechanical Energy	Electricity	Burner Generator	Bakery, Brick making Water pumping

P = primary energy; S= Secondary energy; F=Final energy (or energy carrier)

An energy source can be primary, secondary or final depending on the specific energy chain.

Discussion Point 1.1.10

Can you think of any types of energy or energy technologies, which are not in the table? Where would you add them?

Some energy forms are more attractive as fuels than others; some are more expensive than others.

The Energy ladder

Some forms of energy or fuels are less attractive and other much more attractive for doing particular tasks. It is possible to rank fuels based on specific criteria, for example, cleanliness of use. Energy analysts can display these fuels in the form of a ladder. The least attractive fuels are at the bottom of the ladder, and the most attractive fuels are at the top. The rungs of the ladder represent other, intermediate, fuels. Energy interventions can be targeted at trying to help users move up the energy ladder. The problem with the transition up the ladder is, of course, that the more attractive energy forms tend to be more expensive as well as the equipment required to use the energy. Cost influences the type of energy people use. As a consequence, poor people are at the bottom of the ladder using wood for cooking and even for lighting at night. But it is also true further up the ladder. For example, even rich people rarely cook using electricity, as gas is generally cheaper and more flexible.

The energy ladder is a simplified form of reality. Often people use more than one form of energy carrier for a particular task, depending on a number of factors such as availability and convenience. There does not appear to be a smooth progression as incomes increase of switching from biomass fuels to kerosene, to LPG to electricity. Even wealthy households are known to keep kerosene lamps in case there is a power cut. Low income households may be prepared to afford an electricity connection for lighting but will continue to cook on biomass or kerosene. Energy choice is not a simple matter of income.

Discussion Point 1.1.11

Why are women not making the transition up the energy ladder for cooking fuels?
Do you know of examples where women have gone down the energy ladder?
What caused this to happen?

Energy derived from biomass and human muscles are the most used energy sources in developing countries

Two neglected energy sources

What is clear is that most of the fuel used in developing countries is derived from the traditional forms of biomass, that is to say from trees, agricultural wastes and dung, and a large part of this is used in its original form, which is generally inconvenient and not attractive to use. However, for most rural people it is “free” in the sense that they do not pay cash for it. Also often they have no alternative. Indeed, two billion people in the world do not have access to ‘modern’ energy carriers (electricity, petroleum derived fuels or gas) at all. There are two main reasons. One these energy carriers are not available in rural areas. The other reason is that these are commercial fuels and the income levels of the poor are insufficient to access these fuels. Traditional biomass and metabolic energy are the main energy sources in the lives of poor people in both rural and urban areas.

Metabolic energy is an important energy source but is ignored in energy statistics.

Metabolic energy is rarely measured and few energy departments concern themselves with trying to include metabolic energy into official statistics. Nevertheless metabolic energy is a very important part of the energy balance in people's lives. Many of the tasks using metabolic energy are physically demanding and can be repetitive, boring and time consuming (drudgery). One of the aims of energy interventions can be to relieve drudgery and bring improvements to people's lives, for example, men's tasks (such as ploughing) and women's tasks (such as pounding grain). For a full picture of energy needs, it is important to include tasks which today use metabolic energy.

Discussion Point 1.1.12

Why do you think metabolic energy is not included in official energy statistics?
What would be the consequences of including such data?

Biomass and metabolic energy are often more or less ignored in national energy planning

Despite the importance of biomass and metabolic energy for most people, and particularly for poor women, a typical report on a national energy situation in most developing countries will devote most of its attention to commercial energy use and supply, only a few pages to biomass, and nothing at all to metabolic energy. It is usually recognised however that much of the biomass energy is gathered by women and both the drudgery of this task and the presumed environmental consequences are often referred to. Where solutions are sought, this is, as noted above, normally in projects for tree planting or for energy saving stoves. However, national energy policies only usually devote a small percentage of their budgets to biomass related projects. In the next unit we will look at why this is the case.

Discussion Point 1.1.13

Do you think that one of the reasons biomass energy has received so little attention in national energy planning is that it is 'women's fuel'? In other words, if men were the prime collectors of firewood, would something have been done about it long ago?

>> Exercise 1.1.5: Gender roles and energy

Biomass is the fuel of the poor.

Gender, energy and poverty

As we saw above low-income households use biomass as their main energy source. The fuel quality is low, burning with levels of smoke and particles that are recognised as having negative effects on health. Biomass collection can take several hours per day, time that cannot be used for other activities. Although nearly all households in rural areas use some biomass, poor households rely most on this source, and tend to spend more time searching than higher income households. Wealthier households also purchase other, higher quality, fuels which will be used for a greater variety of end-uses than in poor households. In urban areas, poor people have to purchase cooking

<p>Low-income households generally suffer from energy poverty which condemns them to using poor quality fuels.</p>	<p>fuels, and they spend a higher proportion of their income on fuels than higher income households. Typically, a poor urban family may spend 20% of its income on fuels. In rural areas, poor households will generally restrict fuel purchases to lighting uses (candles and kerosene – with their associated fire hazards). Low-income households use less energy per household than wealthier ones in absolute terms. These observations about energy use by poor people have led to the development of the concept of <i>energy poverty</i>. Energy poverty has been defined as “the absence of sufficient choice in accessing adequate, affordable, reliable, high quality, safe and environmentally benign, energy services to support economic and human development”.</p>
<p>Energy for meeting household needs is women’s responsibility..... unless distance to the energy source is significant when men take over.</p>	<p>The gender dimension of energy arises from the fact that within households, where there are adult men and women, the gendered division of labour generally allocates to women the responsibility for household energy provision related to their spheres of influence in the household, in particular activities centred around the kitchen. This responsibility can be damaging for women’s health and can make them time poor. Women are often supported in this work by girls and sometimes boys, who can be kept out of school thereby damaging their own future livelihood choices. Men become involved in fuelwood collection in locations where large quantities and pieces of wood need to be transported over long distances.</p>
<p>Energy poverty has a gender dimension not only because around 70% of the poor are women but also because women have less access and control over resources.</p>	<p>The gender dimension of energy poverty arises because of the approximately 1.3 billion people living in poverty, it is estimated that 70% are women, many of whom live in woman-headed households in rural areas. Since women generally have less access to resources and decision-making than men, many poor woman-headed households can be expected to be living in extreme energy poverty. It is not only the supply of energy which will be constrained, but also the important services for the household which will be affected, such as clean water provision. Their lack of resources makes them vulnerable to changes outside of their control e.g. drought.</p>
<p>Men and women move into and out of poverty in different ways which affects energy strategies to assist them.</p>	<p>When designing energy strategies that are intended to assist people to move out of poverty the gender dimension of the routes into poverty must be taken into account, since these will influence not only what has to be done but the strategies that can be employed. Poor men and women do not necessarily become poor in the same ways. For example, a man might lose his job, and a woman, who has always depended on her husband for financial support, may become a widow, forcing her to start looking for a paying job later in her life, which she might be ill equipped to do. Men and women have different ways of adopting strategies for addressing their poverty. For example, men are more easily able to migrate while women stay put managing the household and creating informal sector business they can run from home.</p>
<p>Women have restricted influence over household and community resource allocation including about energy services.</p>	<p>Other gender issues which influence the form of energy intervention strategies include the fact that women’s influence over decision-making within the household and community is restricted. Women’s lack of influence limits their capacity to control processes and resource allocation on many issues including energy. As we saw above men even make decisions about purchasing cook stoves. The impact on poverty of improved energy services is determined not only by the choice of end-use to which energy is put but also who makes the decision.</p>

Case 1.1.5 Gender differences in perceptions about the benefits of energy

A research study on the gender related impact of micro-hydro in Sri Lanka, found that men in the area under study saw the benefits of electricity in terms of leisure, quality of life, and education for their children; while women saw electricity as providing the means for reducing their workload, improving health, and reducing expenditure.

Source: Dhanapala (1995) quoted in Barnet, 2000.

“Gender and energy” or “women and energy”?

In this unit we have introduced the concept of “gender” and we have begun to relate it to energy. However, much of the material focuses on women, rather than women and men. Is this not inconsistent? Well there are several reasons why we tend to focus on women more than men when dealing with energy issues, particularly when this is combined with poverty issues.

As we saw above women tend to have responsibility for the household’s energy provision which is demanding both in terms of their own metabolic energy and time. So while both men and women benefit from access to energy in terms of reducing poverty and hunger through increased food production, employment and clean water, women and girls are likely to show additional benefits due to time saving, particularly in terms of water and fuel collection, and improved health, particularly through the use of cleaner fuels. The disproportionate number of women living in poverty, and by extension energy poverty, indicates that energy policy should reflect this situation and ensure that women’s needs and circumstances (lack of ownership, access and control over resources) are taken into account.

However, what we find in practice is energy policy fails to recognise that needs of men and women are different. Energy policies are *gender-blind*. They tend to exclude women in terms of meeting their needs and do not change gender relations. Energy policy makers assume that a good energy policy, programme or project will benefit both male and female equally. Energy policies are considered to be *gender neutral*. No-one sets out to deliberately discriminate against women.

Therefore, to try to redress these inadvertent biases against women in energy policies and women’s role in low-income households for energy provision, we tend to focus on women and energy when talking about policy formulation and implementation. However, men are not completely excluded since they can also form part of the solution to energy provision and men with low-incomes can also experience energy poverty.

Where gender becomes particularly important is in the analysis of the energy needs of households and communities. Gender analysis would pose key questions such as: who chooses which energy carrier?; how is it used?; and who benefits from this use?

In the next unit we will look at how energy planning can be made to be more sensitive to women’s needs.

1.1 EXERCISES

Exercise 1.1.1: Gender Roles

List two things you like to do, which are considered typical for your gender in your culture:

List two things you hate to do, but which are considered normal for your gender in your culture:

List two things you like to do, which are considered non-traditional or even unsuitable for your gender:

List two things you really wish you could do but which would be frowned upon by society if you did them, because they are 'of the other gender'.

List one thing, concerning energy, you like to do and which is considered typical for your gender in your culture.

List one thing, concerning energy, you don't like to do but which is considered typical for your gender in your culture.

This exercise is suggested in the CICC handbook (see references)

Exercise 1.1.2: Gender Roles

Every culture has gender based norms about what is suitable behaviour and what are suitable activities. In some cultures, divergence from these norms is strongly disapproved of; in others it is tolerated but still considered 'odd'.

1. What are five unwritten 'gender-rules' that you consider determined in your culture? Where do they come from?
2. What are the 'gender-rules' and 'gender-roles' concerning energy in your culture? Where do they come from?
3. Who or what perpetuates these gender rules and gender roles?
4. How strongly is adherence to them valued?
5. How is an 'eccentric' (i.e. someone who goes against the norms) 'punished'?
6. In your opinion, should these norms be changed, and why (or why not)? How can they be changed?
7. In your opinion, should these norms concerning the energy roles and rules be changed, and why (or why not)?
8. Would you say that most people agree with you on this? Who agrees, who disagrees?

Exercise 1.1.3: Changing Gender Roles

Having considered or discussed all these points, make a judgement on a ten point scale on the following issues:

How important are gender norms in determining the behaviour of an individual in your culture?

Extremely important										Not at all important
1	2	3	4	5	6	7	8	9	10	

How important are gender norms in determining the behaviour of an individual in energy in your culture?

Extremely important										Not at all important
1	2	3	4	5	6	7	8	9	10	

To what extent do you think it is desirable to change these norms concerning energy roles and rules?

Extremely important										Not at all important
1	2	3	4	5	6	7	8	9	10	

To what extent do you think it possible to change these norms?

Very easy										Impossible
1	2	3	4	5	6	7	8	9	10	

To what extent do the norms affect the kind of energy work you do and the way you do it?

Completely										Not at all
1	2	3	4	5	6	7	8	9	10	

Exercise 1.1.4: Gender Roles in Different Societies

Describe in your own community the gender roles and responsibilities for men and women, concerning the following five issues:

- raising children
- cooking and household work
- work
- leisure time
- education

Now repeat the assignment for what you know about a Northern /Western culture such as the United States or a Western-European country. Compare the differences. In which society are the gender roles distributed more equal between men and women?

Exercise 1.1.5: Gender Roles and Energy

Choose a society with which you are familiar (e.g. typical village in southern Malawi, or upper middle class society in Bangladesh). Say what proportion of the tasks is carried out by men and women:

	Men	Women	Total
Reproductive			100%
Productive			100%
Community			100%

Which energy carriers do they use for each task? Is this renewable/non-renewable? Traditional or non-traditional? Commercial or non-commercial

1.1 FOLLOW UP

- How do the gender roles of men affect their attitude to energy?

- How does the triple role of women affect your daily energy practice? Do you deal with some, or all of these roles?

- Are you able to change any gender roles and contracts through energy interventions? Which? How?

UNIT 1.2 WHY IS GENDER IMPORTANT IN ENERGY PLANNING AND HOW CAN ENERGY HELP WOMEN?

Learning objectives:	<p>After completing the topic the participant should be able:</p> <ul style="list-style-type: none"> ▪ to explain the importance of different types of energy in women's lives (including metabolic energy); ▪ to account for the lack of attention to women's need in energy planning generally; ▪ to identify weaknesses in actual project plans as regards lack of gender content.
Time schedule:	<ul style="list-style-type: none"> ▪ 4 hours or half a day

Energy planning and the energy services approach

Energy projects generally aim at increasing accessibility and reducing the costs of more convenient types of energy....

...and energy projects could aim at a diverse range of other goals

Energy policies are generally concerned with increasing the availability and reducing the cost of energy carriers. They may aim at increasing the supply of the original fuel – as in the case of woodfuel plantations, and in improved charcoal production. They may aim at utilizing a source that has up to now not been tapped – for example, sunlight, or wind, or flowing water. They may make a source available – for example, by introducing diesel-based electricity generators to a rural area far from the grid, or extending the grid to those areas. They may aim at transforming an energy source into a more convenient form, for example, making briquettes out of agricultural wastes, or turning sunlight or wind into electricity, or turning dung into biogas. They may aim at increasing the efficiency with which a certain type of fuel is used, for example in improved woodstoves, or produced, for example higher efficiency charcoal kilns. They may introduce new types of technology, which replace existing ones that use less attractive forms of energy: flour mills to replace hand pounding, electric pumps for raising water from the well, tractors to replace hand ploughing or oxen, lorries to carry the crops to market to save people carrying the sack on their heads. These interventions are often carried out in the form of projects.

Discussion Point 1.2.1

Give some examples of women's tasks that involve drudgery in your examples, what sort of energy interventions could help relieve women's drudgery?

An energy services approach is a new approach to planning

Energy planning, as described in the last paragraph, is often viewed as simply the provision of an energy source and the appropriate conversion technologies. (This approach is known as *supply side planning*.) However, people do not express their needs in terms of a solar home system, rather that they need lights. They do not need a micro-hydro plant, rather they need to grind grain. They do not need a biogas digester, they need to cook. People want *services* which energy provides such as lighting, cooking, space heating, a mill, TV or

...which is more aware of the target group and easily adapts to taking gender into account.

radio, drinking water, or a telephone. Increasingly energy planning is coming to realise that by identifying what energy services people require and matching those needs with an appropriate energy technology then there is a much greater chance that there will be a sustainable use of the technology. Also the intended beneficiaries will have a greater sense of satisfaction that their needs are being met. The *energy services* approach means planners have to be much more aware of the social and economic circumstances of the target group which should easily link to taking gender into account. For example, an assessment in rural Sudan found that women wanted telephones to call their husbands working in the city to remind them to send cash for buying essential household items and paying school fees. The men in the village wanted electricity for irrigation.

Energy makes important contributions to other sectorsbut it needs other inputs to be fully successful.

Energy planning cannot be divorced from other aspects of rural development, such as agriculture, small and informal sector industries, health and education. Again, these sectors do not think in terms of diesel generators or PV systems but in terms of services energy can provide such as, water pumps, lighting, and refrigeration. Supplying a sector, such as health, with an energy technology to meet a particular service gives the opportunity to supply not on the need identified in the initiative, for example, a vaccine refrigerator, but to extend it to meet other needs, for example, lights to enable women to deliver their babies with a greater feeling of safety. Likewise energy services alone will not bring dramatic changes to rural areas, other inputs are needed at the same time. For example, solar driers for a women's fruit drying enterprise might produce higher quality dried fruits than drying the fruit in the open air, but if there is no transport system to get the product to market, the women's work will not succeed.

The energy services approach looks at technical and non-technical issues.....

The energy services approach means that it is not only the technology which is important but also other non-technical aspects such as affordability which can be a key issue for women whose assets are usually less than men's. Innovative ways are needed to enable women's access to the energy services they require. Training in the use of the technologies is also important to ensure equipment continues to function well and women should not be overlooked from these opportunities. Experiences in the water sector, have shown that women are more effective at hand pump maintenance than men, because it is women's role to provide household water. Men do not see the necessity for them to mend drinking water pumps (irrigation pumps are a different matter!)

...but its starting point is not with a specific technology but with people's needs.

Above all, an energy services approach means that you do not start with the *technology* but rather with an analysis of what the *needs* of people are, in their own estimation and with regard to their own priorities. Dozens of energy projects have failed because well meaning planners have arrived in a community with a plan already in their heads: for example, to provide a windmill with a pump for the water supply. This is planning from the supply side: "we have the technology, we want you to have it". Far better and more successful is the demand driven approach: what do people actually want?

In this manual and especially in Module 2, the demand driven, energy services model is used.

>> Exercise 1.2.1: Adopting Energy Interventions in a Village

Why should gender be taken into account in energy planning and projects?

Diverse reasons contribute to the
By involving women, participation in project planning is increased

By no means all energy projects succeed. Many have failed, leaving the energy technology that was introduced rusting and unused. There may be various reasons for this, but one of them is undoubtedly that many energy projects were planned far away from the area where they were implemented, and with little or no consultation with the people who would be the eventual users and intended beneficiaries. One important aspect of this is that women are often not consulted at all in the planning process. It may seem obvious that one should talk to the 'customer' before trying to 'sell' them a particular energy technology, but time after time planners have failed to do this, and above all, failed to talk to women. So taking a gender approach is a logical approach towards increasing the level of participation in the planning process.

Men and women have different energy usages and needs

A second reason for taking gender into account in energy projects is that men and women use energy for different things. Therefore their needs, and their appreciation of any particular energy intervention, may be different. It is important to understand these different needs well to be able to serve everyone well.

Interventions in energy technology have different effects on men and women

A third reason is that interventions in energy technology have different effects on women and on men. Women and men have different roles within the family and community in most societies and different customs and possibilities as regards activities which use energy, and as regards access to sources of energy (See Unit 1.1). Any change such as the introduction of a new technology is likely to be experienced differently by men and by women. Some technologies may help women; others may on the contrary have negative effects on them. For instance community-managed forestry programmes might promote good forestry management, but as a side-effect increase (instead of decrease) women's work, which is illustrated in the case 1.2.1 from India. Therefore it is important to understand and anticipate such effects, aiming to try to build on positive outcomes and certainly mitigate or prevent any negative ones.

Women are an important target group in developing policies

Finally, many development agencies have a policy of active support to women, because of the generally lower position of women in most societies. Most agencies recognize this and consciously attempt to improve women's position vis-à-vis men (*change gender relations*). To do this, it is important to understand what the situation of women is, relative to men, in a particular community, what their hopes and ambitions are, and to consider how energy interventions might assist in fulfilling these aspirations.

Case 1.2.1: Increasing women's work caused by a community-managed forestry programme

In Gujarat (India) a community-managed forestry programme was initiated around 1985, when consecutive poor monsoons over 5 years resulted in a sharp drop in the water table and soil productivity, combined with a scarcity of timber for house construction and agricultural implements. Village leaders wanted to regenerate the forest before even the rootstock would disappear. Therefore the forest path was "closed" for 5 years and they installed protected areas. Entry was prohibited. Today, a number of villages have regenerated

Well-intended energy projects, might increase women's drudgery, because their circumstances are insufficiently taken into consideration

their forests in an impressive way. However, despite the good intentions of forest protection, the community forest management sidelined women, burdening them with added responsibilities and hardships. Now the women could only collect one headload of fuelwood (instead of two) and they needed to walk for 5 km to an area where the forest protection was not in force. Only the strong women are able to walk the 5 hour distance. Additionally, the women become more vulnerable to humiliation from male family members and outsiders when they are travelling beyond their village boundaries because they are not "conforming to the rules" [In other words they are transgressing gender contracts – see Unit 1.1] (Ministry of Non-Conventional Energy Sources, 2001).

>> Exercise 1.2.2: Energy projects and gender roles

Why has gender not been considered in energy planning and projects in the past?

Energy influences the quality of life of users

Energy is a prime ingredient in all productive, subsistence and leisure activity. The quantity and quality of available energy determines the efficiency and effectiveness of activities, as well as the quality of life of the users. As such, both women and men are stakeholders in energy development and use. Women's problems are often under-addressed or neglected in energy planning. Although the intentions might be good, sometimes projects worsen the situation for the women involved.

Discussion Point 1.2.2

- In your experience have the energy needs of women have been neglected in energy planning?
- If so, what, in your opinion, causes this neglect?

Women's energy needs are neglected...

...especially their non-household energy needs

If women's needs are taken into consideration at all, it is almost always an energy project that focuses on the cooking energy needs of women. Even less attention has been paid to women's *non-cooking* energy needs, both in the literature and in practice. There is very little written about women and renewable energy technologies and almost none on women's metabolic (human physical) energy use and substitutions for this. The only new and renewable energy technologies which have been targeted at women have been solar cookers, which have not been very successful in general, and biogas plants, also for cooking, which have been successful only in a few places. There is also very little literature on energy use by women for non-household production and less still on energy for women's transport. Not only improvements in supply and combustion of traditional biomass fuels for cooking, but also improved technology for its use for process heat, as well as electrification and the availability of mechanical power of various kinds, which could make enormous changes in women's lives possible, are neglected. Much greater emphasis could be placed not only on the impacts of energy investment on women, but also on understanding the impacts that

improved energy can have on women's lives and on gender relations.

Discussion Point 1.2.3

Non-cooking energy needs are insufficiently taken into consideration in energy planning.

A micro-hydro scheme is used for a few hours per day to generate electricity for irrigation pumps. Could this project be diversified to enable electricity to improve women's lives? In what ways could the electricity be used and what improvements would it bring? (Think of the "Triple Role" from Unit 1.1)

Few women are involved in energy planning

There are many reasons why gender has been a neglected factor in energy planning. Many planners do not fully understand that energy impacts differently on men and women. One explanation of why there is a lack of understanding is that energy professionals are nearly all men, so women are not able to bring issues that affect them to the fore. Women have recognised the gender blindness of energy policies and there are examples of women taking action to redress the balance. Case 1.2.2 from South Africa illustrates a group of women taking action to increase their influence on ensuring women's needs are incorporated into energy policy.

Women's acting together to influence energy policies to be gender aware

Case 1.2.2: Women influencing energy policy in South Africa

In 1993 a small group of women activists in South Africa attended a National Energy forum and were struck by the lack of women at the meeting. These activists requested that more women be able to attend the Forum, and initiated a support group for women participants. The women eventually formed a network- Women's Energy Group (WEG).

WEG's activities after 1993 included developing alliances in order to be heard, linking energy professionals and political organisations, pressuring political bodies to place women and energy issues on their agendas. WEG participated in drafting the Energy 'Green Paper', a preliminary policy paper. The Green paper was explicit on the gender issues that need to be addressed in the final policy document. A team of 6 men and 2 women was then appointed to produce the final energy policy document in 1998.

As a result of WEG activities, greater attention is paid to women's needs and to addressing gender imbalances in the energy sector. In 1994 a female Deputy Minister for Energy, Minerals and Mines was appointed. In 1999 a woman who had long been a champion of gender issues was appointed Minister in the same ministry. In 1994, in spite of huge resource potential, only 44% of households were electrified- including only 12 % in rural areas. At the time, energy policies were driven more by a desire for security and self-sufficiency as a country, than by concerns about meeting the energy needs of the majority of the population. The final energy policy document published in 1998 demonstrated a paradigm shift towards equity, efficiency and environmental sustainability.

However, the final document- 'the energy white paper'- gave little specific attention to women, despite an explicit acknowledgement of women's subordinate position and gender imbalances in the sector: that women comprise only 11% of the total workforce and 5% of management in the

energy sector. Women’s issues were assumed to be covered under ‘the poor’ and ‘low-income households’.

Data on biomass energy are hardly available....

..... the training of energy professionals neglects this important source.

While biomass fuels dominate the energy budget of most women, biomass does not dominate the activities of Ministries of Energy or research institutes. Data on biomass energy is hardly collected. A reason for this is that energy professionals may not know how to collect the data. They are mostly engineers or economists and very few (if any) learn about biomass during their professional training. It is much more difficult to tabulate reliable statistics on biomass, because the fuel is dispersed over the whole landscape and collected by many individuals – unlike electricity or fossil fuels, which are sold by a limited number of dealers and quantities can be measured with meters. Measuring metabolic energy is even more professionally challenging than biomass.

Taking a broader view of energy, to include metabolic energy

Gender analysis of men’s and women’s tasks as part of energy planning leads to more sustainable and equitable outcomes

The importance of analysing how energy is used by men and by women during the initial stages of project planning cannot be over-estimated. Gender interests are not always obvious, neither are potential impacts of project interventions. Emphasis in energy planning for the benefit of women has long concentrated around cooking, with firewood collection being seen as the central problem to be tackled. However, a proper analysis of women’s and men’s workloads may reveal quite different priorities. This point is illustrated in case 1.2.3, which focuses on metabolic energy.

Case 1.2.3: Gender contracts in energy in eastern Zimbabwe

Metabolic energy is an important energy source which should be part of gender analyses

A study by Mehretu and Mutambira (1992) measured the time and energy used by different family members in transport connected with regular household activities. Chiduku Communal Area in eastern Zimbabwe is a resource deficient area with high population density. There is no electricity. Kerosene, which is used only for lighting, is very expensive.

Seven routine trip related to household activities were analysed:

- Fetching water for domestic consumption ("water" in the table below)
- Doing the family laundry ("laundry" in the table)
- Collecting firewood ("firewood" in the table)
- Grazing livestock ("Livestock, G" in the table)
- Watering livestock (" Livestock, W" in the table)
- Visits to local markets ("Markets, L" in the table)
- Visits to regional markets (" Markets, R" in the table)

Activity	Female Contribution %	Total weeks household time (hours)	Female Share of time (hours)	Energy cost (Calories)
Water	91	10.3	9.3	2,495
Laundry	89	1.3	1.1	304
Firewood	91	4.5	4.1	1,068
Livestock G	39	7.7	3.0	1,672
Livestock W	39	6.9	2.3	1,484
Markets L	63	15.0	9.5	3,585
Markets R	61	0.3	0.2	76

Source: Mehretu & Mutambira (1992)

A gender analysis helps in the identification of the most significant energy intervention

According to the analysis in Case 1.2.3, the most significant energy intervention may be for water collection and market trips, because the metabolic energy costs are highest for these activities. So, from this analysis it could be concluded that interventions for these activities could be more effective in improving the energy aspects of women's lives than interventions for collecting firewood and cooking.

Discussion Point 1.2.4

In the case study, metabolic energy is seen as an important energy source. Many of the tasks could be done by machinery powered by energy.

- Do you consider the design or promotion of such machinery to be part of the work of your Energy Department? If not, which Ministry should be responsible?
- Why do governments and other development agencies not appear to recognise the use of metabolic energy?

Case 1.2.3 focused on metabolic energy in transport, but there are many other tasks which consume large amounts of metabolic energy. One of these is food preparation, and particularly the preparation of grain (shelling and pounding maize and millet, de-husking rice). These tasks may use much more time and more human energy than fetching firewood, and yet they are often totally ignored in energy planning. Why is it that:

....an electric pump that transports water uses energy, but a woman carrying water does not. A water mill grinding grain falls within the energy sector, but a woman doing the same task with mortar and pestle, does not. Trucks transporting crops are consuming fossil fuels, but women head loading crops walk outside the energy balance.

. Cecelski, 1995)

Let women define their own energy needs

What is evident is that tasks of this kind are highly differentiated by gender. Therefore it is very important to start with an analysis of the kinds of tasks that men and women do, and which tasks they themselves consider to be heavy work which could be lightened by the use of energy. To start with the assumption that cooking is a woman's greatest energy problem may be to do her a great injustice. Is it not better to let the women state their own priorities in this regard?

>> Exercise 1.2.3: The Importance of Addressing Metabolic Energy

Taking into account not just gender roles, but also gender relations

In Unit 1.1, we saw that the tasks which men and women do in most societies are different. Their gender roles are different, hence their energy needs will in most cases be different and their priorities for energy interventions will vary.

Not only gender roles but also gender relations influence energy use.

It is less easy to see that gender *relations* play an important part in energy use too. The relations between the genders will influence who makes decisions about, for example, who decides whether the household will pay to join an electricity scheme, who will pay the bills for this, whether kerosene or charcoal is used as the main fuel, and many other such decisions. Who is responsible for energy decision making within a household is tied very closely to the question of who has control of the major resources – money, but also time, and for example access to equipment such as means of transport. In many societies gender relations are such that the women in the household have less right to make decisions and less means of accessing resources, and so their choices as regards energy may be very limited. In planning energy in a gender sensitive way, it is important to understand these constraints and to recognise them, even if it is not possible to change them – although, if one is aiming for empowerment of women, then changing these ‘social rules’ about decision making power and rights to resources may indeed be a long term aim.

Asking the right questions in energy planning is important for meeting women and men’s needs.

What it may come down to in many cases is asking the right questions – not just “what type of energy is being used here” but “why is this particular type of energy being used here and why not another, more convenient/less polluting type?”. “Who is it that is controlling the choices in energy in this setting?” “Which decisions about energy are made by men and which by women?”. Such questions can be useful at the household level, but they can also be very revealing when asked at the community level.

>> Exercise 1.2.4: Meeting women’s needs in energy projects

1.2 EXERCISES

Exercise 1.2.1: Adopting Energy Interventions in a Village

Read the case study through. The case study looks at the different reactions of men and women to a new energy technology introduced into a village. It represents a not untypical energy planning situation.

Community biogas plant, India

In Fateh Singh ka Purwa (India) a Community Biogas Plant has been installed. This plant provides cooking energy. Technologically this plant was a success, but socially a failure. Male community leaders pointed out that they were not interested in energy for cooking – they would rather have energy to power irrigation pumps, chaff cutters and milling machines. Women were extremely critical on the plant. The organising committee, which was composed entirely of men, decided that the gas supply would be limited to 2 hours (8m-10am) in the morning when the women were already in the fields. This fact was completely ignored by the plant organizers. The gas therefore did not provide even 25% of the day's cooking and the women had to look for wood as substitute for the dung cakes which went to the biogas plant. (Ministry of Non-Conventional Energy Sources, 2001).

- What are in general the advantages of using community biogas plants? In which situations are community biogas plants useful?
- What could be the possibilities of the biogas plant for the women in this village?
- What could be the possibilities of the biogas plant for the men in this village?
- What are the disadvantages of using the biogas plant? Who will have to perform most of the work for the biogas plant?

Both the men and women in this case are critical about the community biogas plant. The men decided to limit the gas supply to 2 hours. As an energy planner you want to promote the use of the biogas plant and you decide to visit the village.

- Who would you talk to? Why? Would you address the men and women separately or at the same time? Why?
- What arguments would you use to promote the use of the biogas plant in the village? Would you use the same arguments for both the men and women?

Exercise 1.2.2: Energy Projects and Gender Roles

Read the case study through. We will look at the possible impacts of the project on women and men.

Cotton Stalk Carbonisation and Briquetting, Sudan

Cotton stalk, which is an agricultural waste product, is a potential energy source for the domestic sector in Sudan and other developing countries. In Sudan it could replace up to 10% of charcoal consumption and thus save considerable tree resources. For agricultural reasons (destruction of crop pests) the stalk must be destroyed or sterilised within a short period of harvesting. At present they are usually burned in the fields. Previous prefeasibility studies indicated that small scale on-site carbonisation is an alternative. The disadvantage is that cotton coal produced like this involves high transport costs and possesses burning characteristics which make it unsuitable for domestic use (density is low), so it is not a marketable alternative. Briquetting is needed for improvement both in fuel characteristics and in economics.

Prototype briquetting machines were developed to fit the requirements (small investment, small production capacity, etc). These appeared to be promising both from a financial and a technical point of view. After identifying feasible production scales and organisational options, a report was made which concluded that a pilot plant is needed to demonstrate the financial feasibility of the technology to potential investors.

The long terms aims of the project are thus:

- to develop cotton stalks as an alternative to wood as a source of charcoal fuel thus relieving pressure on forests
- to implement a technology for this
- to develop four small scale rural industries involved in i) the fabrication of charcoal kilns, ii) the maintenance and assembly of briquetting equipment, iii) production of charcoal from cotton stalks and iv) production of charcoal briquettes from the resulting charcoal.
- to generate employment opportunities; although there is expected to be only a small increase in income for the cotton growing farmers, the related industries should generate considerable numbers of jobs.
- to develop experience in this sort of technology and the organisational setting required which may be of value in other countries.

The strategy taken involved field testing of the cotton coal briquetting production, study of the marketing possibilities for briquettes, and a review and recommendations for production organisation. Several production scales were considered, and test briquetting plants were set up and run by project staff to test these.

A more realistic operating briquette production facility was then built under local ownership and management; project input here was only training and technical assistance. This was a village level unit with a production capacity of 800,000 briquettes per year. Briquette production and marketing was monitored.

At this point the project proposes a third phase for dissemination. It is considered essential that the plants are operated in the private sector, but project activities are necessary to stimulate this. Since the technology is new, there is a lot of training required, and there are possibilities to explore such as obtaining tax and royalty exemptions. Equally important is the identification and development of private producers (village cooperatives, individual tenant cotton farmers, agricultural schemes, outside entrepreneurs).

Expected results include scope for more rural employment opportunities for men and women alike. The individual rural families would benefit directly from such a development and this in turn will contribute to decreasing rural to urban migration.

Also there will be value added by upgrading of products that were formerly purely waste products. There is the possibility that in addition to cotton stalk waste, other agricultural residues could be treated in this way.

The project will be environmentally beneficial since cotton stalk briquettes substitute wood charcoal. About 300,000 tonnes of (wood)charcoal enter the borders of Khartoum annually for consumption in the city and in the (dry) northern areas. It is estimated that Central Province, the primary cotton production area, could potentially produce 200,000 tonnes per year of charcoal briquettes. The extent of the regional benefits could be even greater if the technology spreads to other countries.

The immediate results are that an attractive product has been created as well as a technology that works and which has commercial applications. This technology is mature for the case of Sudan, including the local manufacture of equipment, maintenance, and operation of tools and machines and management of all operations involved.

Source of data:

Biomass Technology Group: 'Cotton Stalk Carbonisation and Briquetting Project', prepared for Directorate General for International Cooperation, The Hague, Netherlands.

It will be apparent that there is hardly any reference to women in the report. This is a very common characteristic of energy documents!

1. In what ways might women be affected by this sort of project? List them as systematically as possible (think of the triple roles of women).
2. In what ways might men be affected by this sort of project?
3. What sort of information might you want, in order to assess what the impact of this project would be upon women? List the types of information you think might be important to have.

Exercise 1.2.3: The Importance of Addressing Metabolic Energy

1. What do you consider to be the three priority uses of women's metabolic energy for replacement by an energy end-use equipment/machine?
2. Which energy carriers do you consider most appropriate to operate the equipment/machine? (There may be more than one option for each.)
3. What financial mechanisms could be used to enable poor women acquire such equipment/machine and the energy carrier?
4. What policy tools could be used to ensure that financial institutions support access by women with low incomes to such equipment/machine and the energy carrier?
5. Are there other barriers to women having access to such equipment/machine and the energy carrier?

Exercise 1.2.4: Meeting Women's Needs in Energy Projects

Read the case study through. In this exercise we will analyse a project that consciously aimed to help women.

Blantyre Urban Fuelwood Project

This project was an initiative to supply firewood to Blantyre and Zomba in Malawi. It was a pilot energy project funded by NORAD. The first phase commenced 1986 and the second in 1992. Phase one focused on establishment of fuelwood plantations, rural extension and infrastructure development, managing and protecting indigenous forests, and research. Phase 2 consisted more of firewood harvesting, transportation and marketing.

4,700 ha. had been planted by the time of the report (1992), of the 10,000 planned. These are expected to meet about 5% of the energy needs of Blantyre and Zomba. In addition 10,000 ha. of indigenous forests have been managed for several purposes including firewood harvesting. The project has provided employment for about 2,800 people, it has constructed 175 km of roads, 100 buildings (offices, dwelling units, storage) and a social infrastructure including dispensary, maternity clinic and primary school). The project has provided for training courses in nursery and woodlot establishment; it has established a maize mill and a turkey rearing enterprise as a women's income generation activity; it has installed water and electricity to project headquarters and forest stations, and it has built a women's dormitory at the Malawi College of Forestry in Dedza.

Table 1 shows employment data by gender. Women formed 13% of technical staff, and 33% of professional staff (2 out of 6), but none of the professional foresters were female. This was because there were hardly any female foresters to recruit. Enrolment of women at Malawi College of Forestry was zero in many academic years for some courses. There were only two female professional foresters registered in Malawi in fact, and one of them was studying abroad at the time of the study.

The idea of providing a dormitory was to encourage women to enrol at the College but in fact the most important constraint to enrolment was that Ministry of Forestry and Natural Resources controlled student selection and decided the gender breakdown. NORAD tried to promote women in the project by setting an arbitrary employment target of 35% for women, but no distinction was made by level (see table 1), and no provision was made for dealing with problems such as the fact that there are virtually no female foresters in Malawi.

The maize mill and turkey rearing enterprise were set up to involve women more in the project, but both have been dogged by problems. The mill was to save women the burden of walking 17km to the nearest one; but it operated on diesel and the cost to the customer was up to four times as much as at the other, so women generally walked to the original electric mill despite the distance. The mill was given as a 'gift' to the women but they did not own and operated it themselves. The turkey business was doing badly because there was no technical training given to the woman caring for the turkeys. Both projects were discussed with the women, but they were not their choice.

Infrastructure improvements (roads, school, clinic) were expected to benefit all local residents, including women. However, although employment was created, there were also costs. The land used was customary land, and a negotiation process was going on for the project to secure ownership. A lot of residents, including women, were displaced without compensation. This may be a permanent displacement if the area is gazetted as forest. Moreover, the actual costs of the project meant that the urban woodlot would never be a commercially sustainable venture but would always depend on government or donor support. Thus it can be questioned whether it was economically justifiable to turn people out from their economically sustainable farms and replace them with economically unsustainable tree plantations for fuel.

Table 1 Blantyre City Fuelwood Project Employment Levels (by category and gender)

Category of Work	Female	Male
<i>Professional</i>		
Project Managers	0	2
Senior Accountants	1	1
Assistant Accountants	1	1
<i>Technical</i>		
Forestry Technicians	0	3
Forest Assistants	3	11
Forest Guards	1	14
<i>Support Staff</i>		
Surveying and Mapping Assistants	0	11
Clerks/Typists Account Assistants	8	18
Drivers	1	15
Security Guards	0	9
<i>Labourers</i>		
Nursery Workers	545	0
General Labourers	0	2155
TOTAL	560	2240

Source of data

Reid, Collins and Associates and the Forestry Sector Technical Co-ordination Unit, Malawi: *'Women in Forestry in the SADCC Forestry Sector programme of Action'*, 1992

In this project, considerable effort was made to "help women", yet it appears that these efforts were not very successful.

1. What are the underlying reasons for this lack of success in helping women?
2. Can you suggest some alternative ways in which women's needs could be met more effectively in such a project?

1.2 FOLLOW UP

Consider an energy project in which you have been involved recently.

- Has there been sufficient attention for women's needs in your organisation in the energy planning process?
- What were key factors in ensuring women's needs were addressed?

If there was not sufficient attention to women's needs:

- What aspects were overlooked?
- Why did this happen?
- What have been the consequences of not including those needs?
- If you could do it again, what changes would you suggest?

UNIT 1.3 GENDER MAINSTREAMING VERSUS THE 'WOMEN-ONLY' APPROACH

Learning objective:	<p>After completing the topic the participant should be able:</p> <ul style="list-style-type: none"> ▪ To classify projects as gender blind, gender neutral, gender biased or gender aware. ▪ to explain the difference between the mainstreaming and the 'women only' approach to energy project planning. ▪ To argue the advantages and disadvantages of mainstreaming and the 'women-only' approach
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Time schedule:	2 hours
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Energy policies and projects assume men and women benefit equallythey are gender neutralbut in reality they are gender blind they fail to recognise men and women have different needs.

To have their needs fully met women need gender aware projects.

The traditional approach to energy policy and planning has assumed *gender neutrality*. It has assumed that energy policy, programme or project benefit both men and women equally. It has assumed that any differences in the needs and capacities of men and women do not affect the extent to which they benefit from and contribute to energy development and use. What we find in reality is that energy planning is *gender-blind*, that it fails to recognise that needs of men and women are different. The consequences of gender-blind policies are that they tend to exclude women and do not change gender relations. However, if we aim to ensure that women, as well as men, benefit from energy policies and programmes we aim to ensure that the policies are *gender aware*. Gender-aware policies and projects recognise that women have different interests, needs and priorities which may sometimes conflict with those of men. For example, a solar water-pumping project would ensure that there was tapped water for drinking (women's practical need) and for irrigation (men's practical need).

Another category is when a policy or project is said to be *gender biased*. That is when it favours either men or women and it leads to an unequal outcome or access to benefits for either gender.

Discussion point 1.3.1

- Do you have experience with a gender blind energy project? What was the result?
- Do you have experience with a gender aware energy project? How were the diverse needs for men and women met? What influenced the organisation to be gender aware?

Gender mainstreamed projects focus on the needs of both men and women, but look at them separately.

There is a debate still going on what is the best approach to ensure that policies and programmes are gender aware. The debate is about whether programmes aiming at helping women should be an integral and integrated part of an organisations work, in other words, the programmes are

'Women- only' projects focus on women alone

mainstreamed, or whether separate, special programmes should be set up for women ('*women-only*' projects). (In energy planning, this is very close to the difference between promoting 'women and energy' programmes or using a gender approach.)

The two approaches differ because they were developed to address different issues related to women's position in society. The "women only" approach has its origins in trying to gain recognition for women's productive activities, mainly in the informal sector, in official statistics. By gaining the recognition of women's contribution to economic development, it was considered that more resources and benefits would be allocated to women. Gender mainstreaming of projects has its origins in efforts to secure equality between women and men and gained in prominence after the 4th International Conference on Women held in 1995 in Beijing. One of the outputs of this conference was an international agreed strategy (known as the Platform for Action) for governments and development organisations to promote gender equality. A major tool for achieving gender equality is through gender mainstreaming. Gender mainstreaming aims at shifting gender relations in a direction more favourable to women.

'Women only' projects

Supporters of 'Women-only' project believe that only in such projects there is any certainty that women will benefit

The idea of 'women only' projects gained support in the 1970s from a growing understanding that many interventions have done, unintentionally, harm to women while benefiting men. An example is mechanisation projects in which tractors and other equipment have increased the field area which a farmer can cultivate in a given period of time. Since weeding and harvesting are not mechanised, but are primarily women's tasks, it follows that they have to do more manual work than before. Another example is land registration, in which plots of land which have been cultivated for generations by a family are made 'official' (the family receives papers of ownership, giving them more security). In practice it is not the family, but the (male) head of household that receives such land titles. The consequence is that women, who do much of the farm work, have no legal hold over the land and so are not able to use the land titles as collateral should they want to raise credit at a bank. Supporters of 'women only' projects believe that it is only by targeting projects specifically at women that there is any certainty that the benefits will actually flow to women. They also argue that women will learn skills such as management and decision making if they are made responsible for these (in most projects, the majority of the managers are men).

'Women-only' project mostly focus on the women's roles as cooks, gatherers of fuel wood and income generators

Many energy projects recognise women's role as chief cooks and household energy managers, and a number of special programmes have been set up for women, mostly to introduce more efficient or less smoky stoves, or to encourage a switch over to solar power or biogas for cooking. Other programmes have tried to involve women in the growing of trees to increase the level of firewood supply. Many women only projects focus on women's productive role, as we can read in the next two cases from Vietnam (Case 1.3.1) and Bangladesh (Case 1.3.2).

Case 1.3.1: A successful ‘women only’ energy project. PV systems in Vietnam

From some women’s only projects not only women benefit, but also the rest of the village

In February 1994, SELF, the Solar Electric Light Fund, launched a household solar PV project in Vietnam in association with the Vietnam Women's Union (VWU). The VWU is a nation-wide social service organisation with eleven million members. The programme has directly benefited over 1,500 people through the installation of solar home systems (SHS), and indirectly benefited hundreds more through solar systems in village community centres and village markets.

During the first stage of the project, 130 SHS were installed in rural communities in the provinces of Tien Giang and Tra Vinh in the Mekong Delta and in Hoa Binh Province near Hanoi. In the second stage, completed in February 1997, SELF and the VWU installed another 110 SHS.

Solarlab, a PV technology group based in Ho Chi Minh City, was contracted by SELF to provide technical assistance directly to the Women's Union, and to oversee the after-sales maintenance program.

SELF also installed larger PV systems to provide electricity to community centres and village markets. The systems were cost-shared with the local communities, who were responsible for providing AC television sets and VCRs for communal video viewing. In addition, two village markets were illuminated through the installation solar street lights.

25 local technicians, many of them women, have been trained on behalf of the Women's Union. In addition, the VWU trained 20 “motivators” to sign up families and collect their down-payments.

240 rural families can now enjoy solar light in their houses. Many of the families have purchased black-and-white TV's and can now access educational and entertainment programmes.

In the project women have been trained in PV technology, and are successfully promoting, selling, installing, maintaining and using photovoltaic SHS. Not only is the project completely implemented by women, it is also implemented on a commercial basis with full cost recovery. Although initial funds were made available by American donors, the users pay back the costs of the systems over a period of four years, thereby renewing the fund and enabling more households to purchase a SHS. The solar energy systems do seem to improve some of the women's living conditions. The project is also addressing women's energy needs by making available sustainable energy systems. This could very well benefit women and possibly strengthen their position. (Everts & Schulte, 1997).

Discussion point 1.3.2

- In your opinion, is the Vietnam PV project a gender and energy project or just a successful project implemented by women?
- Why do you think so?

. ‘Women- only’ projects focus on women alone, taking no account of men’s roles or needs. They involve women fully in the implementation phase

Case 1.3.2: A successful ‘women only’ energy project. Producing and selling battery-operated lamps

In 1999 the project “Opportunities for Women in Renewable Energy Technology Utilization” in Bangladesh started. Through consultations with community members and non-governmental organizations about energy needs in an area of remote islands outside the reach of the grid, electric lightning was identified as a high priority. Modern battery-operated electric

lamps replace kerosene lamps. The project trained rural women to produce the lamps in a micro-enterprise manufacturing facility and distribute them to local markets. At this point 33 rural women are engaged in constructing and selling efficient fluorescent lamps that use direct current batteries of 12 or 8 volts. More than 600 lamps are being used.

The women gained full employment in a sector where access to jobs and tasks normally is reserved for men. The women acquired technical skills and the lamp production provided a new opportunity for women to earn a living, one in which their labour is highly valued. Additionally, living conditions have been improved through better lightening and the status of the women has been increased (Khan, 2001).

There is always a risk, with women-only projects, that they may fail, if the men in the community are strongly opposed and don't accept the intervention. Various strategies may be used to sabotage such projects, either physically (uprooting trees planted by women, burning down the workshop etc) or more often by coercion (denigrating the women involved, putting pressure on their own womenfolk at home not to participate etc).

Women only projects have also been criticised for treating women as a homogeneous group and not taking into account the other socio-economic factors which shape women's lives. In addition, the approach has also been criticised for focusing on practical and productive issues while not addressing changing gender relations.

Discussion Point 1.3.3

- The two cases of 'women-only' energy projects given above, were both rather successful in terms of income generation for women. Do you know of any other cases? Were they successful or did they fail? In what way(s) did women benefit?
- What do you think were the factors behind the success of the two cases given? Could these be replicated easily elsewhere? What guidelines could be drawn from these cases?

>> Exercise 1.3.1: Women only projects

Mainstreamed projects

Women's problems should not always be tackled in isolation from the main development activities.

In response to women only projects the view was expressed that women should not be deliberately "segregated" or "separated" from the mainstream activities of development. Those who argued against women-only projects considered that women's as well as men's concerns and experiences are integral to the design, implementation, monitoring and evaluation of all legislation, policies and programmes so that men and women benefit equally and inequality is not perpetuated. Experience had shown that in order to reach objectives that aimed for women to be the beneficiaries it may be better not to try to deal with women's problems in isolation, but to see them in the context of the society in which they live. In other words women's problems had to be

seen in terms of their gender roles and relations. Solutions to meeting women's needs had to be formulated in the mainstream policy making and decision making forums of governments and other organisations active in development (such as international development agencies and NGOs) and not confined to "separate, special units". It was argued that it is not "women's issues" but "gender issues" which have to enter the mainstream and this could be done through a gender approach. A gender approach aims to ensure that men and women benefit equally from all legislation, policies and project and that any inequalities, such as in human value, opportunities and life chances, are not perpetuated.

Since 1995, governments have an international commitment to taking a gender perspective.

Gender mainstreaming has gained in prominence since the Platform for Action from the 4th International Conference on Women in 1995 called on governments to mainstream a gender perspective in all policies and programmes to ensure equalities of outcome. As a consequence, when we talk of gender mainstreaming we are aiming to re-organise, improve, develop and evaluate policy making processes in order to incorporate a gender perspective in all policies and programmes at all levels and at all stages in the process.

Sometimes women need additional help to ensure they can participate equally in projects.

At the project level, mainstreaming means that projects have to be designed to ensure that women as well as men are entitled to participate and benefit from a project. Sometimes this means that special provisions have to be made so that women can overcome the obstacles that have prevented them participating in the past. One approach to reducing inequalities in project participation is positive discrimination in favour of women enabling them to take up management and decision making positions.

However, even in gender mainstreamed projects success is not guaranteed. Two cases (1.3.3 and 1.3.4) from Nepal provide contradicting results when women are involved in decision making processes.

Case 1.3.3: A gender mainstreamed project in Nepal.

Involving both men and women in male and female community organisations can ensure that women have a distinct voice and that their self-confidence increases

In 1996 the Rural Energy Development Programme (REDP) in Nepal established male and female community organisations with equal responsibilities to work on the project. The REDP project aims at enhancing rural livelihoods and preserving the environment by supporting the installation of micro hydro power systems. Every participating household sends a male member to the male community and a female member to the female community. The segregation of women and men into separate community organisations encourages men and women to discuss and analyse specific problems they face. The community organisations meet every week. By the end of 2000, total membership was 20,258 women and 19,125 men in 1,021 female and 1,000 male community organisations. Additionally, the project facilitates capacity building through training in reading and writing, management and leadership.

The equal opportunities have had a very visible and positive impact in mobilising women and integrating them into mainstream activities. The women in community organisations have a distinct voice in local affairs and self-confidence has increased, as has their capability for independent and collective action (Rana-Deuba, 2001).

Women may not express their opinions in public if these go against the opinions of seniors

..... women find it difficult to transgress gender norms.

Case 1.3.4: Women's participation in the community forestry decision making process in Nepal.

Foreign project planners told villagers in Nepal that because women are the forest users they must also be members of the forest committee. According to the foreigners it should be compulsory for women to attend the meetings. The men agreed to this and women were allowed to become committee members. However, women were informed of a meeting only when a male committee member chanced to meet them. Even if women attend meetings they cannot voice their opinions: they cannot speak their opinions against the opinions of the seniors. When the men have finished speaking, that is the end of the meeting. Men do not tell actually women not to speak at the meetings, but the men do not want to be opposed by women (Hobley, 1996).

Discussion Point 1.3.4

The two projects in Nepal (Cases 1.3.3 and 1.3.4) describe a successful and less successful project in involving women in decision making. The community forest project is not really successful in giving women a voice in decision making.

- How could you give women a voice to express their opinion in the community forest case?

Discussion Point 1.3.5

Do you consider that the main objective of the two projects in Nepal (Cases 1.3.3 and 1.3.4) was (i) to improve the energy situation in the community (ii) to change gender relations or (iii) both?

Advantages and disadvantages of mainstreamed and women only projects

Women may not be able to participate successfully in mainstreamed projects

Men may be strongly opposed to 'women-only' projects

There are advantages and disadvantages to both approaches in meeting women's needs. Mainstreaming may not work, because women may not be in a position to participate on an equal basis with men (too heavy a workload already, no experience in making financial decisions, entrenched gender taboos for example, speaking up in front of men etc). On the other hand, women-only projects may be even more strongly opposed by the men in a society, who not infrequently feel emancipation of women as threatening and express this in terms of the need to maintain social or religious traditions. There are cases in which men in a village have sabotaged women's small industry projects or woodlots because they see them as 'immodest' and leading to 'trouble between men and women at home'. Men do worry about how women will use their extra "free time" when new technologies are introduced which result in considerable time saving for women.

Discussion point 1.3.6

These days mainstreaming is considered very important for improving gender balance in project planning, even though, as noted in the text, it sometimes does not work as intended.

Why is mainstreaming so important?

How can it be made to work more effectively?

How can policy makers be persuaded that this is a better approach to project planning?

>> Exercise 1.3.2: Mainstreaming versus 'women-only' discussion

or

>> Exercise 1.3.3: When to use Mainstreaming or Women-Only Approach**Taking Mainstreaming a step further**

Mainstreaming aims to transform gender relations. We have so far concentrated on women as consumers of energy and trying to transform energy planning so that it is more gender sensitive. However, another sort of transformation is in the way that energy is delivered to women. The liberalisation of energy markets is opening up new opportunities for the provision of energy services. Energy Service Companies (ESCOs) are springing up, many focusing on rural areas, offering the potential of good incomes. Women should not be excluded from these opportunities – particularly when based on prejudices that women are not interested in technical matters. The water sector long ago began to train women in the operation and maintenance of hand pumps. Here women have proved to be more effective in regular and preventative maintenance than men.

Discussion point 1.3.7

An energy entrepreneur is one who supports the energy economy by doing any one or more of the following: producing, processing, distributing and selling energy or energy resources.

Some people have claimed that women are good candidates to be energy entrepreneurs. Do you agree?

Experience tells us that women are under represented in the energy sector as employees in the public and private sector. However, the energy sector also offers good careers with potentially well paid jobs.

Discussion point 1.3.8

Why do you think women are under represented in the energy sector?

Does it matter?

1.3 EXERCISES

Exercise 1.3.1: Women only projects

Read the case study through

This is an example of a project planned and organised by women for women.

- Is there evidence that this is more successful than a 'traditional' project, i.e. one dominated by men as organisers?
- Consider the nature and strengths of women's organisations that you are familiar with . Are they capable of carrying out planning and/or implementation of energy projects, and if not, what are the problems they face in doing this?
- Do you think it is a good idea to transform this project it into a gender mainstreamed design? Why (not)?

Women's Organisations in Stove Building in Uganda

The household energy sector in Uganda, just as in many southern African countries, relies on biomass, firewood providing an estimated 95% of the total. It is mainly burned in an open fire or a traditional metal stove of low efficiency. Where firewood is in short supply, agricultural residues are becoming substitutes.

The YWCA was one of the first NGOs in Uganda to get involved in dissemination of household stoves. After assessing seven different models from various parts of the developing world, the YWCA developed the "Y" stove, specially designed to suit Ugandan cooking habits. Water boiling tests showed an efficiency of 13.9% and specific fuel consumption was 2.9, compared to an open fire which has an efficiency of about 10.2% and an specific fuel consumption of 2.5. The Y stove has a grate to improve fuel efficiency, and enhance combustion conditions that increase maximum power and steady state power output, ensuring better flame stability and symmetrical air flow. The grate also reduces carbon monoxide production from 1.8% to 0.5%. It is built by the user and can be built in different sizes to suit the user. It is clay stove made of termite soil and hay, with old tin cans for the chimney.

The Y stove project was funded out of the YMCA's Women's Development Fund, and later from income generating activities including training courses given by YMCA for women (training courses are a big income earner for the YMCA). The Appropriate Technology Unit of the YMCA is responsible for dissemination, which is does by providing free training (in this case) to club members and interested womens groups. Its great strength is the fact that it has 35 active branches. So far, it has reached 15 out of Uganda's 38 districts.

The standard approach to dissemination is:

- staff visit a specific club where members are taught how to make the Y stove.
- club members are encouraged to build similar stoves in their own homes
- where possible, staff visit the homes to assist and inspect the work
- club members are encouraged to disseminate the technology to other women in the area.

Since the message is passed by word of mouth, it is difficult to determine exactly how many Y stoves have been disseminated.

Source: P. Turyareeba 'Mobilising Local Financial Resources - The Case Of Uganda': In S.A. Karakezi And G.A. Mackenzie *Energy Options For Africa*, London: Zed Books, 1993

Exercise 1.3.2: Mainstreaming versus 'women-only' discussion

It has been suggested that there are two points of view regarding the way to conduct gender-sensitive project planning, gender mainstreamed projects and 'women only' projects.

On the one hand the mainstreaming point of view advocates project designs to ensure that women as well as men are entitled to participate and benefit from a project. Let us call this 'point of view A'.

On the other hand we have the 'women only' point of view which advocates that only in such projects there is any certainty that the benefits will actually flow to women needs and constraints. We will call this 'argument B'.

- Which point of view do you sympathise with more, and why?
- Write 'A' or 'B' as appropriate on a piece of card and attach it to your clothing.
- Walk around the room and join up with others of the same opinion. Share your reasons with them.
- Select one or two from your group to present your views in a debate.

Exercise 1.3.3: When to use Mainstreaming or Women-Only Approach

For each project it has to be decided which approach fits best, a 'women only' or a gender mainstreamed approach. What do you think is the most appropriate approach for the following cases? Why do you think so?

- Installation of an electricity grid in a village
- Production and selling of solar cookers
- Installation of 50 battery-operated lamps in a rural village of 25 huts
- Development of an improved stove
- Installation of a water pump
- Tree planting for fuelwood
- Producing and marketing biomass briquettes

Under which conditions would you use a gender mainstreaming approach in energy project planning?

Under which conditions would you use a women only approach in energy project planning?

1.3 FOLLOW UP

List all the projects and programmes which your organisation is involved in which are supposed to benefit women.

Which ones are mainstream projects and which are 'women-only'?

Which are more successful in achieving their objectives, on the whole? Why?

If you would have the possibilities to redesign some of the energy projects in your organisation, for which projects would you choose a 'women only' design and for which projects would you prefer a gender-mainstreamed approach? Why?

UNIT 1.4 RELATING ENERGY TO GENDER GOALS

Learning objective:	<p>After completing the topic the participant should be able:</p> <ul style="list-style-type: none"> ▪ to explain the importance of gender sensitive energy project planning; ▪ to explain and identify the difference between practical and productive gender needs and strategic interest in energy projects; ▪ to distinguish between four different goals as regards using a gender approach in energy project planning: (1) to improve women's level of welfare, (2) to increase women's productivity, (3) to help to empower women and increase their equality relative to men and (4) to improve project efficiency ▪ to explain the relation between gender needs and project planning goals ▪ to formulate consistent gender goals that meet the needs of the target group involved; ▪ to identify shortcomings in project planning approaches aimed at meeting needs and gender goals.
Time schedule:	6 hours

Gender goals should be formulated explicitly to ensure that projects do not fail

The importance of gender sensitive project planning

Why is it important to consider gender in designing policy or planning projects and programmes? Although the answer may at first sight seem obvious, there are in fact several different perspectives or motivations for involving or not involving women in projects and in what ways women should benefit and what the outcomes for women should be. You may not have the same perspective or motivation as I do. But the approach we take, the actions that we chose, will, consciously or unconsciously, have their roots in some underlying motivation. The consequence of this in energy projects is that different stakeholders in a project might have different motivations for their involvement (including some who may see no reason to specially benefit women). So it is important that before going ahead, we make sure that the motivation is clear, and agreed upon by all parties. Too often, the gender goals are left vague, with the result that it is difficult to assess whether the policy or project is having the desired effect, and some people may feel that it has failed to meet women's needs.

Leaving aside those who do not think gender issues are important at all, there are a number of positions with regard to incorporating gender that can be taken from a project planning perspective.

We will start by looking at the implications of energy projects in terms of how gender needs are met.

Gender needs and issues: practical needs, productive needs and strategic interests

Men and women are physically different, have different roles in society, do different work and thus have different needs. As we saw in Unit 1.1, these

needs can be classified into the tasks that men and women do as part of their daily lives. This classification leads to the development of the gender analytical framework known as the triple role. Another analytical approach considers that gender roles have different assigned tasks which have different needs, including energy, to be met. These needs are usually divided into *practical* and *strategic*; they always depend on local circumstances and are influenced also by variables such as a person's age and civil status. In the context of energy however it is more helpful to consider three sets of needs or interests: practical needs, productive needs and strategic interests. These are described below:

▪ *Practical needs:*

When practical needs are met, life becomes easier.

Addressing practical needs does not affect gender relations.

Practical needs are interventions needed to make women's life easier and more pleasant, but which do not challenge the accustomed tasks and role of women in the household or in society, or their gender relations. That is to say, they do not upset the traditional balance of power and authority between men and women. They are needs primarily related to the reproductive functions of women, activities that keep the household running and the families daily survival ensured. Examples of energy services to meet practical needs are household lights, improved cooking stoves for household use, improved supply of fuel wood for household use etc.

▪ *Productive needs:*

When productive needs are met, more and better products can be produced.

Addressing productive needs may affect gender relations by improving women's status in the family.

Productive needs are those that if resolved, allow women to produce more and better products (usually for income gain). Cleaner energy forms and new technologies might also make the work easier and reduce drudgery. However, does meeting productive needs change gender relations within the household and community? Some researchers do claim that a woman's status within the household improves when she contributes to the household income. There is no universal answer since the outcome depends on the context and the objectives of the project.

Examples of energy services to meet productive needs are power supplies which facilitate the use of food drying installations, sewing-machines etc; knowledge concerning manufacturing and selling of cooking stoves etc.

▪ *Strategic interests:*

Addressing strategic interests aims to transform gender relations to improve women's societal position.

Strategic interests are those which relate to women changing their position in society and which help them gain more equality with men, and help them towards empowerment in all its senses.

Examples of energy services which meet women's strategic interests are street lights which enable women to participate the village council, radio and T.V. increasing women's knowledge.

Women's strategic interests are generally to do with addressing issues related to laws and gender contracts which tend to be biased against women. For example, in many societies certain groups of women (widows, divorcees, and abandoned wives) suffer economic deprivation as a result of their civil status, based on traditional or modern legal codes: their property can be removed from them by male relatives. In this context, a strategic need is to improve the status of women, for example, through laws which give women and men equal rights, and enforcement of these laws, which establishes their rights to land and other property. Other strategic interests for women may include laws on inheritance so that daughters have equal rights with sons, for example, and prohibiting violence against women. In most countries there are such laws but they are not always enforced. Some see these institutional approaches to

addressing women's strategic interests as too long term and look for other solutions which will bring changes in women's societal status more quickly. For example, women earning an income through an enterprise have been found to increase their status, accompanied by greater influence in decision making and control over resources, within their family and community.

Discussion Point 1.4.1.

Do you think women's strategic interests can be met through energy projects?

Boundaries between the needs and issues are not fixed or clear

It is important to realize that the boundaries between these needs are not fixed. Case 1.4.1 describes a project in Mali which addresses not only the practical and productive needs of women, but also their strategic interests. Their daily tasks which used to take a lot of human energy, have been relieved (their practical needs). Additionally, they are able to produce new, better and more products to gain income (their productive needs). Finally, the creation of a decentralized energy enterprise owned and managed by women generates strong dynamics for structural transformation, in a setting where land and agricultural assets are traditionally owned by men and tasks are performed by women as unpaid obligations to men (part of the *gender contract*). The enterprises enable women to change their position in society (alters *gender relations*) and therefore also serve the strategic interests of the women.

One project can address several needs and issues

Case 1.4.1: Energy for women's practical and productive needs and strategic interests in Mali

In Mali the Multipurpose Platform Project provides decentralized energy to rural areas in response to requests from women's associations in the villages. The fundamental energy need for poor rural women in Mali is to find appropriate and affordable substitutes for their own energy, so that they can engage in activities that generate income, and that provides benefits for themselves and their families.

The platform consists of a small diesel engine mounted on a chassis, to which a variety of end use equipment can be attached, including grinding mills, battery chargers, vegetable or nut presses, welding machines etc. It can also support a mini grid for lighting and electric pumps for a small water distribution network or irrigation system. The goal of the project is to install 450 such platforms. Through these platforms it is expected that approximately 8,000 women in rural areas will have access to better opportunities for improved micro-enterprises. Increased income generating activities are anticipated as an outcome of the project (Burn & Coche, 2001).

A film about this project can be obtained from UNDP (see reference list)

Discussion Point 1.4.2

The multifunctional platforms in Mali (case 1.4.1) are designed serve women's energy needs. In what way does the multifunctional platform meet:

- Women's practical needs?
- Women's productive needs?
- Women's strategic interests?

Having classified women's needs into these categories we can see that women's energy needs extend beyond cooking. In table 1.4.1 some examples are given about how different forms of energy could serve women's different types of needs.

Energy provides many possibilities to address practical and productive needs and strategic interests. This table provides some examples

Table 1.4.1: Examples of women's needs and issues in energy projects

Energy Form	Women's needs and issues		
	Practical needs	Productive needs	Strategic interests
Electricity	<ul style="list-style-type: none"> ▪ Pumping water supplies - reducing need to haul and carry ▪ mills for grinding reduces drudgery ▪ lighting improves working conditions at home 	<ul style="list-style-type: none"> ▪ increase possibility of activities during evening hours ▪ provide refrigeration for food production and sale ▪ power for specialised enterprises such as hairdressing and internet cafes 	<ul style="list-style-type: none"> ▪ make streets safer allowing participation in other activities (e.g. evening classes and women's group meetings) ▪ opening horizons through radio, TV and internet
Improved biomass (supply and conversion technology)	<ul style="list-style-type: none"> ▪ improved health through better stoves ▪ less time and effort in gathering and carrying firewood 	<ul style="list-style-type: none"> ▪ more time for productive activities ▪ lower cost for process heat for income generating activities 	<ul style="list-style-type: none"> ▪ control of natural forests in community forestry management frameworks.
Mechanical	<ul style="list-style-type: none"> ▪ milling and grinding reduces drudgery ▪ transport and portering of water and crops 	<ul style="list-style-type: none"> ▪ increases variety of enterprises 	<ul style="list-style-type: none"> ▪ transport allowing access to commercial and social/political opportunities

>> Exercise 1.4.1: Gender Needs and Issues

>> Exercise 1.4.2: Gender Needs and Issues Role Play

Gender goals in energy project planning

Understanding that women have practical and productive needs, and strategic interests, that can be addressed by energy projects, leads to the question of what, exactly, are the gender goals of any given project. In other words, what is the reason for taking a gender approach in planning the project? What do

we hope to achieve by it? Some general reasons were given above, but in energy project planning, clear choices have to be made.

The gender goals will differ from one project to another, from one community to another, from one situation to another, but it is important that both the planners and the community involved in the project are clear about what the gender goals are in the particular case, and agree on this. Often projects are said to be aimed at 'empowering women' when in reality they are not able to do this – or local people may not be in agreement that this is the aim. It is better to be clear and realistic about what gender goals have been set, so that the target is visible and evaluation of the project can be made on the basis of an agreed and accepted aim. Also participants in the project need to be clear about the aims. This can help overcome resistance to projects and avoid disappointments.

Being clear about gender goals at the beginning of a project helps overcome resistance and avoids disappointment

There can be four different goals when it comes to using a gender approach in energy project planning. Careful thought is needed to decide *which* of these should be the guiding goal for any given project.

1. To improve women's welfare through energy technologies

This first goal is in some way rather old fashioned one, but still important and relevant today. It notes that women's lives involve a lot of drudgery, recognizing that they work longer hours than men, when their household tasks are considered as well as their other work in the family fields or in the family business, or as wage labourers. Many of the household tasks require considerable physical effort and negative effects; fetching water, fetching firewood and cooking over smoky, open fires, for example. Sympathy for the unpleasantness of these conditions has rightly given rise to the idea that such tasks should be lightened for women.

Projects aiming to improve women's welfare acknowledge women's drudgery.

Cooking stoves can damage the health of women and children

Poor women in the developing world use cooking energy systems that are unsafe and polluting and food-processing technologies that are rudimentary and laborious. With limited access to appropriate energy, household sanitation and hygiene is at best inadequate, exposing women and children to a host of pathogens that lead to debilitation, morbidity and mortality. Children tagging along with their mothers are exposed to burns and scalds from cookstoves and inhalation of noxious productions of combustion.

Energy projects aiming to improve women's welfare can be in other sectors than energy, such as health.

Health and safety are major concerns of women in their use of biomass fuels. Smoke reduction and improved safety for children are often the two most important reasons cited by women for adopting improved stoves and fuels. The largest energy-related health impact on women and children on a global basis is their high exposure to indoor air pollution in the more than half of the world's households that cook daily with wood, crop residues and untreated coal. Typical indoor concentrations of important pollutants, such as respirable particulates, carbon dioxide, benzene and formaldehyde, are excessive by comparison to the World Health Organisation's (WHO) guidelines on acceptable limits for exposure. Thus it is obvious that improved stoves that are safer and produce less smoke, relate to *welfare* goals for women. But energy projects aiming to improve women's welfare may also focus on issues like drinking water, as the case shows

Discussion Point 1.4.3

- What examples can you think of how energy is able to influence women's well-being?
- What other programmes do you know that are designed to improve women's welfare?

Projects aiming to improve women's welfare can also focus on issues like drinking water

Case 1.4.2: Solar water disinfection in Latin America

Solar water disinfection in Latin America is a possibility for thousands of people who, due to their precarious conditions, have no other option for obtaining clean drinking water. It especially benefits women and children since they traditionally have the responsibility within the family for water collection and its treatment. Previously chlorine and boiling have been used as strategies to clean the water. However, the problem with the use of chlorine is the bad taste it gives the water and additionally obtaining the supply of the chlorine. High costs for fuel make water boiling problematic and in many areas there is a scarcity of fuelwood.

SODIS provides a simple and effective alternative. SODIS is a simple technology that utilizes the energy from the sun to inactivate and destroy pathogenic micro-organisms present in water. Basically it amounts to filling transparent bottles with water and exposing them to the sun for a minimum of six hours. Disinfection takes place through the combined action of ultraviolet (UV) radiation and the increased temperatures generated by the sun. Research has demonstrated that SODIS results in reductions of up to 99.9% in faecal coliforms, a good indicator of the faecal contamination of water. The same has been shown for *Vibrio Cholerae* bacteria.

The benefits for women are clear, it reduces their workload and it improves health (Del Torres & Salas, 2001).

When the project goal is to aim at improving women's welfare in most cases this relates very closely to satisfying women's practical needs.

2. To increase women's productivity through energy technologies

Some energy projects have the potential to help women produce more efficiently and to produce more in a quantitative sense and better quality products, leading to higher incomes for the women and their families and to development in an economic sense. Examples include: electric sewing machines to replace hand machines, solar driers which give a better quality product (dried fish or fruits); improved small scale bakery ovens for women's enterprises, electric light allowing work in the evenings, refrigerators allowing the sale of cool drinks; and computers supporting business enterprise. There are in fact a huge variety of interventions possible, most of which have an important energy component.

Case 1.4.3: Energy project to increase productivity. Ugandan women and solar dryers

In Uganda, an FAO/UNDP post-harvest programme recommended small-scale solar dryers for long-term storage and household consumption of fruit and vegetables. However rural women's groups were more interested in solar dryers for income generation than for food security. Subsequently, the 'Fruits

Energy technology projects for women's enterprises can improve women's income by producing higher quality products

of the Nile' company was formed in 1992 to link rural producers with the market for dried fruit in Europe. Within three years more than 50 women groups had taken up the solar drier technology, and in 1995 the company exported more than 50 tonnes of dried fruit. The original food security concerns are also being addressed: When they are not drying for profit, the women use the solar dryers to preserve vegetables and fruits for home storage and consumption (Okalebo & Hankins, 1997).

In case 1.4.3 above the solar dryers enabled women to increase their productivity.

When the project goal is to aim at improving women's productivity in most cases this relates very closely to satisfying women's productive needs

Many projects aim at reducing differences between men and women

3. To promote women's equity, equality and empowerment through energy technologies

These terms are often used interchangeably, although they mean different things. Equity means a 'fair' distribution, but what is fair, has to be decided. To you, it might mean that women and men get paid the same daily wage for the same work in transporting bags of grain. To someone else it might mean that women get paid less, because they are less strong and cannot carry so many sacks. What is meant by 'equity' has to be decided.

Equity means a fair distribution: what is fair has to be decided

Discussion Point 1.4.4

You support a community in establishing a stove producing enterprise. Both men and women are involved in manufacturing new stoves. Men have more time available per day and manufacture more stoves than women; as a result they have become more skilled and faster (more stoves per hour worked). The project planners have an equity goal with this project in mind.

What is in your opinion a fair distribution of wages between men and women?
If you would be the responsible project planner how would you establish what is a fair distribution of wages?

Equality means an equal distribution

On the other hand 'equality' means equal distribution. The women's movement worldwide is striving not for equity but for equality between men and women: that they should have equal rights in all sectors, even within the household. An obvious example is that girl children should get just as much education as boys, but also that decisions over household expenditures should be shared. There is, of course, a lot of opposition to this in some quarters, because – particularly at the level of the household – this is a very threatening idea to many people (not just to men: many women find the idea unpleasant). Outside the household, equality relates to whether women are treated equally in the workplace (pay, promotion, conditions etc) and in public arenas where collective decision making is made, such as politics – for example, how many women representatives are present at different levels of government, but also in organizations in the civil sector. However, it does not mean that women and men become the same. Nor that there should be equal numbers of men and women.

It is evident that goals related to equity, equality and empowerment all relate to *changes in gender relations*, in other words, to a redistribution of power between the genders.

Cases 1.3.3 and 1.3.4 from Nepal (see unit 1.3) have tried to increase women's involvement with an equality goal in mind. A project that offered a micro hydro system took both men's and women's needs taken into consideration by separating them into two distinct groups with equal responsibilities. The project has an equality goal, whereby men and women have equal rights and responsibilities. In this project the women have also felt empowered by their successes. In contrast, another project tried to involve women in the community forest decision-making process. This project has been less successful in involving the women. The women did not dare express their opinion if it was contradicting the men's opinions. Challenging gender norms can take time, and often longer than the time scale of a project.

Empowerment refers to women taking charge of their own lives

Empowerment is an extension of the equality idea; it refers to enabling people – in this case, women – to take charge of their own lives, where formerly they were under the authority of other people (fathers, husbands, brothers, male bosses), and had to obey or agree, whether they liked it or not (*gender contract*). Women's empowerment implies that they should have more autonomy and be able to make decisions on issues that shape their lives, both at household level but also in society in general. This autonomy can be financial; if women as individuals have means of making money and can spend it as they chose. But it can also mean more social freedom. Empowerment of women might mean for example that in cases of divorce, they have equal rights over the children and inheritance; that they can claim protection in cases of household and sexual violence, not just in theory but in practice; that they have the right to control their own sexuality and reproductive functions; and generally that educational and career opportunities are open to them where these were formerly restricted.

Energy provides opportunities for women to become energy entrepreneurs, a mean to empower women

The term empowerment is much used and probably misunderstood. In addition, to the definition in the last paragraph, there are other definitions. Some take it to be a goal, others see empowerment as a process which leads to certain outcomes – for example the UN HDR sees empowerment as participation to contribute to economic goals while Oxfam sees it as challenging oppression and equality. The consequence is the same as we saw with gender goals, people in the same project will be using their own, sometimes conflicting, definitions that are implicit rather than explicit.

How can energy help “empower” women? This is an interesting and indeed intriguing question. An example is the creation of new career opportunities for women in the energy sector, for example energy entrepreneurs in any one or more of the following: producing, processing, distributing and selling energy resources (eg electricity) or technologies (solar cookers). Several projects have succeeded in educating women as energy entrepreneurs. The case study from Kenya, below, shows a situation where women became energy entrepreneurs and felt empowered. The women have taken control of the business and their lives into their own hands.

Case 1.4.4: Energy project for empowerment. Kenyan women producing stoves

Thirteen women's groups (200 people) have been trained in making stoves in the Rural Stoves West Kenya project, and many have also benefited from business management training. Annual production is estimated at 11,000 stoves annually; the profit generated by the stoves is comparable to wages in rural areas. As a result, the women potters have gained in status, self-confidence and financial independence (ITDG, 1998).

For most energy projects it is difficult to really bring empowerment to women

Although 'empowerment' is a major issue in development, it may be difficult for most energy projects on their own to really bring empowerment to women. The reasons that women are not empowered today are complex and many sided; energy is only one of many resources to which women have little access that might contribute to their lack of empowerment. In general we can say that it is not a particular energy technology that has the potential to really empower women, but the *process* by which the energy technology is introduced or as a consequence of having the technology (saving time to do other things or increases status from increased income). A project can be planned in such a way that women get new types of opportunities, such as management positions, or technical training in maintenance, which are non-traditional. Projects can be carried out in such a way that women are properly represented in decision making, and given scope to take on decision making where they were previously ignored. This will depend not on the technology, but on the attitude and working practice of the implementing organization, which will have to be very sensitive to gender issues and to really involve women. However, there are examples where women have had access to T.V. and radio as a result of rural electrification projects that have enabled women to learn about their fundamental rights although this was not an aim of the project. We can say that women are empowered as a planned or unplanned outcome of an energy intervention.

Empowerment, equity and equality all relate to the strategic interests of women.

Discussion Point 1.4.5

Imagine a project which offers solar cookers for women with a credit programme to assist in purchasing them. Would you say that this is:

- A welfare approach?
- An empowerment/equity/equality approach?

Imagine now a programme which sets out to train women to assemble solar cookers and sell these in the district. What category would fall this under?

In your opinion, which category do most rural energy projects for women fall under? Why do you think this is the case?

4. To improve the likelihood that the energy project is successful and efficient in itself

The previous three approaches to gender planning reason from the perspective of benefits to women. Another approach focuses on the benefits for the *project*.

The project efficiency goal begins with the idea that projects often fail because the planners fail to understand the people's needs properly. Hence the idea of

Including both women and men in project planning promotes the success chances and efficiency of a project

participation was developed, as a means of listening more to the people and finding out what it is that is needed. An extension of this is that men and women may have different needs, thus it is necessary to encourage women to participate to understand better what their needs are. It is acknowledged that unless special care is taken, men's voices will always be heard more than women's, for example at public meetings, or when a survey interviewer goes to a household, since generally it is the male head of household (if there is one) who is expected to be the respondent. Many such surveys ask questions about 'the household' as if it were an undifferentiated unity. In this way, women's needs are not noticed. By finding out what women need as well as what men say is needed, more economic efficiency can be drawn out of the project.

When energy projects do not take into consideration the needs of both men and women, efficiency will suffer (as shown in case 1.4.6 from Northern Thailand, where the gender contracts of women were not taken into account sufficiently and the whole forestry planting project failed).

Setting up collaborative structures between men and women may also facilitate the successful implementation of energy projects, as the case of biogas cooperatives in India shows.

Case 1.4.5: Improving efficiency. Involving women and men in management

Men recognised key role women in ensuring project success

In India, cases where community biogas plants have been successful, largely due to local management through the formation of co-operative societies of the biogas producers and users. From village to village, the bio-gas co-operatives have, over a period of time, evolved their own unique methodologies for managing their plants. While some purchase the dung and sell the gas and slurry, others give a discount on charges for gas to those who contribute the most dung. Still others return the amount of slurry to members according to the quantity of dung contributed without payment. For instance, Motipura Village purchased a biogas plant in the form of deductions in the milk payments from the village Dairy Cooperative. A management committee was elected. At first, there were no women on the committee. After one year of operation, the crunch for dung arose – people were not supplying enough dung to the biogas plant. The men thought that only through active involvement of women could this problem be overcome. The simple logic was that it is the women who tend the cattle and they are the ones who benefit the most from the gas supply. The cooperative then inducted 5 women members on the Management Committee. The decision-making was left entirely with the chairperson and the group of women who were trained to run the biogas plant. (Ministry of Non-Conventional Energy Sources, 2001).

An interesting aspect of case 1.4.5 is that the men saw for themselves that it was necessary to involve women in running the project if the project was to succeed.

When gender differences are not taken into account the efficiency of projects suffers. The FAO film "Gender Analysis for Community Forestry" illustrates the efficiency problems caused by an insufficient performed gender analysis (the story is told in the next case).

Case 1.4.6: Problems caused by lack of gender analysis. Gender analysis for community forestry in Northern Thailand.

A gender analysis helps you anticipate gender roles, plan accordingly and avoid efficiency problems

A tree planting project in northern Thailand was motivated partly for environmental reasons, and partly to reduce women's drudgery in fetching firewood. Households were interviewed, and it appeared that both men and women supported the idea that a tree plantation should be started. So the project management delivered the tree seedlings at the beginning of the rainy season – but they never got planted. Why not? Because planting, as an activity, is a women's task in that community, and in the rainy season they were 100% occupied with planting the staple food crop, which had of course a greater priority in their minds. Through lack of sensitivity to traditional gender roles, project management had assumed that men planted crops and therefore that women would have had time to plant trees. Had the planners talked to women in more detail beforehand, this kind of fact might have been discovered and a more efficient plan could have been made: possibly a deal could even have been made by which the men planted the trees! But as it was, the resources were wasted, because the men did not see it as their work – the benefit was, after all, to be for the women (Wilde & Vainio-Mattila, 1995).

>> Exercise 1.4.3: Gender Goals Discussion

Gender goals and needs

From the above discussion, it is clear that there is a relationship between peoples' expressed energy needs (for practical, productive and strategic purposes) and gender goals (welfare, productivity, empowerment).

Moreover it is clear that energy cannot always produce empowerment for women; it is more likely to have an efficiency or a welfare effect, but this does not mean that it cannot ever have empowerment effects. It is really important to succeed in a careful tuning of project goals, project planning and the needs of people involved, before the project starts.

Table 1.4.2: Overview of the meaning of gender goals

Gender Goal	Meaning	Implies
Welfare of women	Drudgery of women's work and the related ill health reduced, but gender roles and relations are not changed	Practical needs to be met Relates mainly to so-called reproductive activities
Productivity of women	Women able to participate in economic activities or increase their productivity / efficiency	Productive needs to be met, but gender roles not necessarily changed
Empowerment, equality, equity for women	Opening up of new roles and opportunities for women outside traditional ones, in economic, social, and political sphere Women able to participate on equal basis with men in the economic sphere; earn and control income for themselves, if this was not the case before	Strategic interests need to be addressed Relates to new types of activities and new roles and freedom for women. Gender relations are altered to be more favourable to women. More emphasis on strengthening women's productive activities or opening new opportunities for women's production
Project efficiency	Gender roles properly understood; the household no longer seen as the unit in planning.	Project should be more carefully targeted.

Table 1.4.3: Examples of energy interventions to match different gender goals

Gender goal	Types of needs/issues addressed	Could be met by energy intervention:
<u>Welfare</u> Reduce drudgery associated with cooking on woodfuel	<u>Practical need</u> Reduce the time taken and the load that has to be carried	Improved wood stoves Bottled gas
<u>Productivity</u> Women to increase their output in their tailoring businesses Women should be able to devote more time to productive activities	<u>Productive need</u> More efficient sewing machine Speed up housekeeping tasks	Electric sewing machine Water supply pumped and grain milling automated rather than by hand Electric light for work in evenings
<u>Empowerment:</u> Women should participate on an equal basis with men in decision making regarding communal activities Girl children should have as much education as boys	<u>Strategic interests:</u> Women need confidence to enter into discussion with men and time in the evenings to participate in meetings Girls need time to attend school and do homework	No direct energy solution, but the management of the energy project could (a) work with women's groups to help them develop their public speaking skills, and (b) project committees should have minimum 50% female members. Street lighting may encourage attendance at meetings Reduce girl's housekeeping tasks through modern energy: electric pump to bring water closer to houses, powered mill to grind grain. Lightning in the household allowing for school work in evenings.

As is demonstrated in table 1.4.3, a welfare gender goal strongly relates with the practical needs of women. A project goal to increase women's productivity strongly relates to the productive needs of the women. Thirdly the goal to empowerment women strongly relates to strategic interests.

A gender approach to increase the project efficiency of an energy project can not be linked directly with the needs of the women, because it reasons from the point of view of the project instead of from the point of view of the women.

Discussion Point 1.4.6

What other examples can you think of to expand this table? Formulate

- an energy intervention that serves a strategic interest and an empowerment goal (formulate the goal and interest as well)
- an energy intervention that serves a productive need and an efficiency goal (formulate the goal and need as well)
- an energy intervention that serves a practical need and an welfare goal (formulate the goal and need as well)

Gender project goals and individual needs and interests should be matched. Project planning should be accordingly

Table 1.4.2 describes some examples of energy technologies which match different gender goals. Naturally, one should aim at matching the goals of the project and the needs and issues as expressed by the individuals concerned. Additionally, the project planning (of activities, kinds of intervention, technology) should match the project goals. This is not as self-evident as it seems. Much donor policy is written in terms of women's empowerment. However, in contrast, most energy projects are planned in welfare or efficiency terms. Often a gap between gender policies or goals and actual practice occurs. A case from the Tumkur district in India describes an example of inconsistent project planning from the government.

Inconsistencies between gender goals, project planning and individual needs can cause projects to fail...

... which causes poor project efficiency

Case 1.4.7: Inconsistent energy project planning, failure to match needs and goals

In India improved stoves have been disseminated by government departments. A small NGO, TIDE (Technology Informatics Design Endeavour) evaluated the use of these improved stoves in rural households. TIDE observed a large-scale rejection of the stoves, and identified several reasons for the rejection, one of them being the inconsistency between the government's goals and the needs of the women. The government aimed at improved stoves to save fuel. Women's needs however were primarily to improve their welfare by reducing the smoke. Unfortunately the stoves did not meet this requirement, causing the non-acceptance of the stoves by the women.

A new strategy for dissemination of household stoves was needed and TIDE engaged rural women in dialogue about their needs/expectations of an improved woodstove. Finally the project evolved towards a stove design catering for women's expressed needs and a stove dissemination strategy for rapid penetration of improved stoves without subsidy or government intervention, but completely conceived and executed by women. (Bhogle, 2003)

Case 1.4.7 above illustrates that at the start of the project the needs of the user were not taken into account sufficiently. Hence, at the start this caused a poor project efficiency. When the needs and goals were properly matched project efficiency increased.

>> Exercise 1.4.4: Matching Gender Needs and Goals: A Case from Yemen

Ensuring consistency of goals

It has been noted that it is difficult for energy interventions to deal with strategic gender interests, to really empower women. Yet most donors have strong policies supporting gender empowerment and equality, for example the OECD / DAC gender policy (OECD, 1998).

Many energy projects state that they are following empowerment goals, while in reality they aim at welfare or productive goals

This means that many projects, including energy projects, *state* that they are following “empowerment” goals when, in reality, they are aiming at welfare or productive goals for women. It would be better if the planners concerned were honest and admitted that they are unlikely to really empower women through energy technology if this is the case. If they are able to create a better life for women is this not a sufficient reason for going ahead with the project? On the other hand it is clear that there is a challenge to planners to design energy interventions that *are* empowering, and to justify them as such.

Case 1.4.8: An example of inconsistent goals

A Western development organization called “Empowerment 4 All” says in its mission statement that it works “to bring equality between all people, regardless of race, religion or gender”. “Our aim is empower women and give them the same opportunities as men”, says its website. It also states that its policy is to work with a high level of participation of local people.

“Empowerment 4 All” is working in Kenya with a partner organization, “Safi Sana”. Safi Sana is a local NGO which has been promoting the use of latrines in remote villages, but which has recently decided to include smokeless stoves in its work, because of the high incidence of respiratory diseases which women and children suffer as a result of cooking indoors using biomass fuels. A stove made of bricks, with a chimney, has been designed and one is built in the house of the village head, in one of the project villages.

After some time it is evident that the stove is not popular; only one family has asked to have one built in their house. A senior planner from Empowerment for All comes from Europe on a visit, and complains that Safi Sana has taken the wrong strategy. “The problem is not the stoves” says she, “the problem is that the women do all the cooking. You should be educating the men to do the cooking too, not introducing new stoves!”

The women at the meeting laugh at this. Cooking is their job, they do not want the men to take this over. They do not like the stove because it gets too hot and takes too much space in the house. What they really want is better transport so that they could get their vegetables to the town more easily and sell them.

Empowerment 4 All has strong empowerment goals and expects the project to work towards this. Safi Sana has essentially welfare goals; it is concerned with health, of both men and women in fact. The women want more economic opportunities.

Clearly, it will not be easy to find an energy intervention that satisfies everybody!

Many donors and international development agencies work with the so-called

Millennium Goals. It is therefore worthwhile to examine the extent to which they address gender and energy issues. There is only one related to gender, and that is expressed in terms of education:

Goal: Promote gender equality and empower women

Target: Eliminate gender disparities in primary and secondary education preferably by 2005, and at all levels by 2015.

There are no Millennium Goals directly for energy. However, a number of attempts have been made to draw out from the general Millennium Goals their energy implications. Table 1.4.4 taken from the journal *Energy for Sustainable Development* demonstrates how energy intervention can be directed to meeting the Goals and in particular to bringing benefits to women and girl children (Havet, 2003).

Table 1.4.4: Millennium Development Goals - Goals and targets related to energy and gender

<i>Goal</i>	<i>Target</i>	<i>How energy contributes to achieving goals and targetsⁱ</i>	<i>Gender perspective</i>
Goal 1: Eradicate extreme poverty and hunger	Target 1: Reduce by half the proportion of people living on less than a dollar a day	<ul style="list-style-type: none"> ▪ More efficient fuels and fuel-efficient technologies reduce the time and share of household income spent on domestic energy needs for cooking, lighting and keeping warm (poor people pay proportionately more for energy) [Reddy, 2000] ▪ Reliability and efficient energy can improve enterprise development ▪ Lighting permits income generating activities beyond daylight hours ▪ Energy can be used to power labour-saving machinery and increase productivity of enterprises 	<ul style="list-style-type: none"> ▪ Women and girls are generally responsible for the provision of energy for household use, including gathering fuel or paying for energy for cooking, lighting and heating ▪ When women's time and income is freed up from these activities, they can reallocate their time toward (1) tending to agricultural tasks and improving agricultural productivity (2) developing micro-enterprises to build assets, increase income and improve family well-being
	Target 2: Reduce by half the proportion of people who suffer from hunger	<ul style="list-style-type: none"> ▪ Improved access to cooking fuels and energy-efficient technologies increases the availability of cooked foods (the majority (95%) of staple foods need to be cooked before they can be eaten) ▪ Pumped water for drinking, cooking needs and irrigation systems that deliver more water than what can be carried ▪ Mechanical energy can be used to power labour-saving machinery and increase productivity along the food chain (for example, to process agricultural outputs, such as milling, husking) ▪ Improved access to efficient fuel and technologies reduces post harvest losses and water needs through better preservation (for 	<ul style="list-style-type: none"> ▪ Women are generally responsible for cooking and feeding their families and often for subsistence agriculture and food processing ▪ A well-developed agricultural sector helps to promote economic opportunities for women, allowing them to build assets, increase income and improving family well-being

		example, drying and smoking)	
Goal 2: Achieve universal primary education	Target 3: Ensure that all boys and girls complete a full course of primary schooling	<ul style="list-style-type: none"> ▪ Access to efficient fuels and technologies frees up children's time, who are often pulled out of school to help with survival activities (fetching wood, collecting water, cooking inefficiently, crop processing by hand, manual farming work) ▪ Energy can create a child-friendly environment (access to clean water, sanitation, lighting and space heating/cooling) ▪ Lighting in schools allows night classes 	<ul style="list-style-type: none"> ▪ Girls are more likely to be taken out of school to help with domestic and agricultural chores than boys ▪ Spending on schooling, especially for girls, increases with higher incomes for women ▪ Girls are more likely than boys to be affected by a lack of access to clean water and sanitation facilities reducing school attendance
Goal 3: Promote gender equality and empower women	Target 4: Eliminate gender disparity in education	<ul style="list-style-type: none"> ▪ Electricity enables access to educational information and information communications ▪ Street lighting improves the safety of women and girls at night allowing them to attend night schools and participate in community activities 	<ul style="list-style-type: none"> ▪ Women are more likely than men to be illiterate ▪ Women are less likely than men to have access to information and be included in political and community life
Goal 4: Reduce child mortality	Target 5: Reduce by two thirds the mortality rate among children under five	<ul style="list-style-type: none"> ▪ Cleaner fuels and technologies help reduce indoor air pollution which contributes to respiratory infections that account for up to 20% of the 11 million deaths in children each year ▪ Traditional stoves can be unsafe (for example, burns and household fires) ▪ Cooked food, boiled water and space heating contributes to improved nutrition and health 	<ul style="list-style-type: none"> ▪ Women have primary care for the health of children ▪ Women and young children spend the most time indoor ▪ Women and girls are generally responsible for cooking, often with unventilated open fires
Goal 5: Improve maternal health	Target 6: Reduce by three quarters the maternal mortality ratio	<ul style="list-style-type: none"> ▪ Energy services are needed to provide access to better medical facilities, including medicine refrigeration, equipment sterilization and operating theatres ▪ Energy can be used to produce and distribute information on sex education and contraceptives 	<ul style="list-style-type: none"> ▪ Excessive workload and heavy manual labour (for example, carrying heavy loads of fuel wood and water; arduous and repetitive agricultural and food processing tasks) may affect pregnant women's health and well-being
Goal 7: Ensure environmental sustainability	Target 9: Reverse loss of environmental resources Target 10: Reduce by half the proportion of people without sustainable access to safe drinking water	<ul style="list-style-type: none"> ▪ Over harvesting, land clearing or environmental degradation can make fuel wood more scarce forcing the poor to travel farther and spend more time and physical energy in search for fuel ▪ Availability of cleaner fuels and energy-efficient equipment reduces demand for fuel wood and charcoal, increases availability of dung and agricultural wastes for fertiliser, and reduces air pollution and greenhouse gas emissions ▪ Motorised pumps help provide more clean water for drinking and sanitation than amounts that can be carried by people or animals 	<ul style="list-style-type: none"> ▪ Women and girls are generally responsible for gathering fuel wood and collecting water ▪ The chances of sexual assault and other risks (for example, of snake bites) increases the further women and girls must travel

Discussion Point 1.4.7

Most of the Millennium Development Goals refer to sectors outside the energy sector.

- How can you introduce the energy component in these other sectors?
- What kind of actions does the energy department have to take to satisfy the energy needs of these other sectors?

>> Exercise 1.4.5: How can energy interventions meet gender goals?

1.4 EXERCISES

Exercise 1.4.1: Gender Needs and Issues

- Read the three cases thoroughly (two of them have been presented earlier), and try to identify any practical or productive needs or strategic interests.

Upesi stove project in Kenya

The Upesi project was initiated in 1995 to promote the adoption of more efficient stoves in rural areas of Western Kenya. Its goal was to improve living and working conditions of women in rural households by enabling a significant and increasing number of women and families to benefit from fuel-saving wood-burning stoves. The project has cooperated with women's groups and involved them in design and field-testing of the stove. The women have been trained in producing, distributing and installing the stoves. Additionally, their marketing skills have been improved as well. Therefore their ability to earn their own income from stove-related activities has increased. Over 16,000 stoves have been installed, providing significant poverty alleviation. The benefits to men and women in the project areas include improved health and time savings for users of the energy efficient stoves, as well as relief from pressures caused by wood fuel shortage (Khatami-Njenga, 2001).

Battery-operated lamps in Bangladesh

In 1999 the project "Opportunity for Women in Renewable Energy Technology Utilization in Bangladesh" started. Through consultations with community member and non-governmental organizations about energy needs in an area of remote islands outside the reach of the grid, electric lighting was identified as a high priority. Modern battery-operated lamps replace kerosene lamps. The project trained rural women to produce the lamps in a micro-enterprise manufacturing facility and distribute them to local markets. At this point 33 rural women are engaged in constructing and selling of efficient fluorescent lamps that use direct current batteries of 12 or 8 volts. More than 600 lamps are being used (Khan, 2001).

Solar Water Disinfection (SODIS) in Latin America

Solar water disinfection in Latin America is a possibility for thousands of people who, due to their precarious conditions, have no other option for obtaining clean drinking water. It especially benefits women and children since they traditionally have the responsibility within the family for water collection and its treatment (see also the table below). Previously chlorine and boiling have been used as strategies to clean the water. However, the problem with the use of chlorine is the bad taste of water treated with chlorine and additionally the supply of the chlorine. High costs for fuel make water boiling problematic and in many areas there is a scarcity of fuelwood.

SODIS provides a simple and effective alternative. SODIS is a simple technology that utilizes the energy from the sun to inactivate and destroy pathogenic microorganisms present in water. Basically it amounts to filling transparent bottles with water and exposing them to the sun for a minimum of six hours. Disinfection takes place through the combined action of ultraviolet (UV) radiation and the increased temperatures generated by the sun. Research has demonstrated that SODIS results in reductions of up to 99.9% in faecal coliforms, a good indicator of the faecal contamination of water. The same has been shown for *Vibrio Cholerae* bacteria. The benefits for women are clear, it reduces their workload and it improves health (Del Torres & Salas, 2001).

Exercise 1.4.2. Gender Needs and Issues Role Play

A role-play.

Two project planners visit the village of Anakapalatanam in Andhra Pradesh, India, to study what kind of energy intervention will help the people from the village.

In this role-play several parts should be played.

- Two trainees will perform the role of project planner (one man and one woman).
- Divide the rest of the group in two groups the male trainees and the female trainees. Half of the male trainees will perform as the men of the village and the other half as the women in the village. Repeat this for the female trainees. Now equally large male and female groups have been formed. Make sure that in the male and female groups some act as Scheduled Tribes, some as Scheduled Castes as well as Caste population.

Men and women in the village: Preparation about 30 minutes

Read the Anakapalatanam case thoroughly.

The men and women identify (in their separate groups) their energy needs (allow 20-30 minutes).

One spokesperson from each group summarises the identified needs to the other group (5-10 minutes).

Project planners: Preparation 30 minutes

Separate yourself from the men and women in the village (preferably use another room). You are not provided with the case description, but you have to plan how you are going to do a needs analysis when you 'arrive in the village'

Who are you going to address? Identify questions you need to ask. You want to ask them about their practical and productive needs (but not in these terminologies, because these people won't understand, so how are you going to explain what you are interested in?). How are you going to address them? Are you going to separate the men and women and address each group individually? Or all at the same time? Or individually? Or per social group?). In what way will you get the best response?

The role-play (45 minutes)

The villagers should all be sitting in a room, probably in the social groupings. The project planners 'come in to the village', introduce themselves, explain their mission, and then start to carry out their 'needs analysis survey'.

Discussion (45 minutes)

- The project planners present their findings concerning the needs in the village. The project planners divide the needs in practical and productive needs and strategic interests. They should use flipcharts or overhead sheets for this (15 minutes)
- Subsequently a discussion is held, to see whether the village men and women agree with this needs analysis (15 minutes).
- The project planners and the other trainees reflect on what happened in the needs analysis. Did they get the responses they expected? Will it be like this in reality? (15 minutes)
-

Total time needed: 2 hours

The village Anakapalatrnam

Anakapalatrnam is a large village of about 7000 inhabitants in the north of Andhra Pradesh, India. It is in the hills above the coastal plain, an area once heavily forested and now partly cleared. Its population is mixed. About 40% of the village is from the Scheduled Tribes, which is to say, descendents of people who traditionally were forest dependent. Although many now do some farming (a few have their own small fields in the valley to grow cereals, some have illegally cleared cultivation plots within the forest), most continue to gain some income from the forest by gathering Non-Timber Forest Products such as beedi leaves, berries, flowers, and medicines. About 15% are Scheduled Caste, which is to say people traditionally considered (like the Tribal people) to be outside the caste system and who had the lowest position in society, and who traditionally carried out tasks not permitted for Caste Indians such as removing dead carcasses from the fields. Most of them are today agricultural or industrial labourers or servants. The people of the Scheduled Tribes and Castes are generally poorer than the rest of the population and most are illiterate. The remaining part of the population is divided between various different castes, and primarily engaged in farming (irrigated rice, cereals, cotton) although some are also in trade, owning and running village shops, a small ceramics factory, a bus company etc. One or two of these families are quite wealthy

There are about 15 shops selling food, cold drinks cloth and kerosene, and these shops and the large houses in the centre of the village are connected to the electricity grid. Poorer households cannot afford this and there are a lot of farms in small hamlets (both larger and smaller farmers) which still rely on traditional lighting systems. The *Panchyat* or village council is elected, and there is one member of the Scheduled Tribe and one woman on this council. The *Sarpanch* (leader of the council) is a wealthy man with a large farm and a large herd of dairy cattle.

Women in Anakapalatrnam

The position of the women differs according to their social group. The tribal women in many ways have more freedom than women in the caste community, although they are less well educated. Traditionally there was no property, so unlike the caste community in which sons inherited the family wealth, in this group girls were treated more equally with boys. Until recently there was no dowry although some tribal families are also accepting this practice. They are known to be more outspoken than most of the caste women, and especially when there is a big group of them together, they are not afraid of standing up in a village meeting and making their opinions known quite loudly. The women of wealthy families generally have at least some primary school education, but very few have jobs outside their homes. Their time is spent managing the household, not least organizing meals for the many labourers who are employed (a hot meal is part of the wage). They also take care of the milk cattle and milk the cows themselves, or supervise the milking and the cooking of milk to thicken it. It is rare that they attend village meetings, and it is not their custom to make their opinions known, because this is considered the proper role of the men folk. Women of poorer caste families work on the family farms during most seasons of the year and are often engaged as labourers on the larger farms too. They tend to be even more shy.

Cooking in most households is done using dried cow dung cakes, firewood, and agricultural wastes such as rice husks and stalks, and pigeon pea stalks. The richest households use bottled gas, but not when they are cooking large quantities eg to feed the labourers or to prepare food for the calves. The richer families eat rice twice or even three times per day, the poorer people each *rotis*, a kind of thick pancake made from coarse grains and baked.

Exercise 1.4.3. Gender Goals Discussion

It has been suggested that there are four points of view regarding why a gender-sensitive approach is necessary in planning and implementing development projects.

On the one hand we have the equity, equality and empowerment point of view that women have been systematically underprivileged in the past and that they want and need to be emancipated. Let us call this 'argument A'.

Secondly we have the productivity point of view, in which the main aim is to ensure that women become more productive and economically active as a result of the project. We will call this 'argument B'.

Thirdly, we have the welfare approach in which is striving to improving the welfare of women without changing their roles at all - we may call this 'argument C'

Fourthly, we have the project efficiency point of view, that is that projects will not be effective unless they are constructed on a proper understanding of both men's and women's needs and constraints (D).

- Which point of view do you sympathise with more, and why?
- Write 'A', 'B' 'C' or 'D' as appropriate on a piece of card and attach it to your clothing.
- Walk around the room and join up with others of the same opinion. Share your reasons with them.
- Select one or two from your group to present your views in a debate.

Exercise 1.4.4. Matching Gender Needs and Goals: A Case from Yemen

Read the case thoroughly.

This case describes a project in which the needs of the villagers are taken into consideration. These needs are matched with the project goals.

- What are the needs of
 - Female villagers (in terms of practical needs, productive needs and strategic interests)
 - Male villagers (in terms of practical needs, productive needs and strategic interests)
- What are the project goals (in terms of welfare, productivity and equity/equality/empowerment)?
- Do you think that the goals and needs match each other? Do you have some additional suggestions for improvement? What are they?
- Do you think that this is going to be a successful project?
- Do you think the careful project planning contributes to its success?

Diffusion of Biogas Technology: Development of Women in Al-Habeel Village**The village**

Mansourit Al-Habeel is a typical village in southern Yemen. The village consists of scattered groups of houses, near which are located open animal sheds. It has 270 households totalling about 1500 persons, of which 70 households are located in Mansourit Al-Habeel. The area of land owned ranges between zero and 3.5 acres per family. The number of landless families totals 57. The animal holding in the village is about 0.2 animal units per person compared to 0.23 animal units per person for the overall rural sector in southern Yemen. About 16% of the families own more than 50% of the animals with the density of 2 animal units or more per family. An appreciable part of the village water is obtained from underground sources. Latrines of the village are connected to deep pits which pollute the underground water, thus constituting dangerous sanitary problems. The village had been recently supplied by electricity which is used only for lighting.

Waste water in the village is drained around the houses, forming small ponds of stagnant waste water thus causing an additional source of pollution. The main source of pollution in the village is in fact organic waste, which consists of animal dung, human excreta and waste water from the households.

Women in the village

Women have to walk distances of more than three or more kilometres for fuelwood and they are exposed to snake and scorpion bites. This fuelwood is burned directly in open stoves without grit or chimney for cooking, baking, and other domestic uses. The combustion in these stoves is incomplete, thus producing harmful smoke containing a considerable amount of toxic carbon monoxide, which accumulates near the stove and in the kitchen. Al-Habeel women also indicated that they dislike baking because it involves a high risk of burning their hands.

Women are also responsible for cleaning the animal sheds where the fodder is placed on the ground and eventually is mixed with animal manure. Since animals do not eat this mixture, a substantial part of the fodder is wasted. Also this mixture makes the cleaning of the sheds more difficult. The women are also responsible for collecting the dung which is not used as fertiliser because it usually contains large amount of seeds that grow unwanted grass. The women pile the animal manure outside the houses waiting for the annual rainfall to sweep it away. With the all-year round hot weather, these piles become a source of health hazard to all the community. Both the manual handling of the manure and the presence of the piles increase the health hazards affecting women and children in particular. Al-Habeel women are also responsible for milking the cows.

Biogas technology in the village

Organic waste can be properly handled by introducing an integrated biogas system which includes a biogas digester, properly designed shed, simplified waste water treatment plant, and latrine, as demonstrated in the block diagram shown in the figure. A product of this waste management is a clean energy source to replace direct burning of biomass, seedless germ-free fertiliser which does not attract insects and flies and which can be used for increasing the fertility of the land and the green area in the village, more efficient use of fodder, and improved sanitary disposal facilities. The treated water, supplemented by the fertiliser, can be utilised to irrigate the newly formed home gardens. The local people can participate in the design, construction, operation and maintenance of the biogas system, which is constructed of locally available materials.

The project

The project went through many phases which consisted of both surveys as well as actual field operations. The first phase consisted of a case study on the techno-economic and social aspects of the introduction of biogas technology in Southern Yemen. Three different designs were constructed in a test in order to select the most appropriate design for the local conditions. The cost effectiveness of each system in terms of the investment in the construction, returns from the gas and fertiliser outputs as compared to the conventionally used fuels and fertilisers was considered. A social assessment demonstrated the values and practices of the villagers especially women, regarding their acceptance of using an unfamiliar technology and using the biogas produced from animal manure and human excreta

as a fuel for cooking and baking. It also indicated the social values related to the acquisition of skills by women once they are liberated from fuelwood collection and other hardship responsibilities.

The three biogas systems used, were Egyptian-Chinese, Borda and Indian designs. The Egyptian-Chinese design proved to be the most appropriate for the village conditions. Successful operation of the three models, and the enthusiasm of the villagers, moved the government to request ESCWA to pursue this activity further by implementing a pilot project in Mansourit Al-Habeel.

The participation of the local people in planning, monitoring, and assessing the activities of the project was considered a primary factor in adopting the technology and introducing social change especially to the conditions of women. This was translated operationally by the formation of a village committee composed of the local peoples' organisations, including the General Federation of Yemeni Women, and representatives of the beneficiaries. This village committee undertook the promotion of objectives and activities of the project in the community, participation and formulation of detailed work plan, selection of beneficiaries, site selection for biogas plants, selection of labour force, determining the financial responsibilities of the beneficiaries, solving the problems arising from sharing the output of the multi-family digesters, monitoring the implementation of the extension programmes for women, and ensuring the provision of the necessary requirements from the village for the construction of biogas systems.

In order to assess the impact of the technology on the community at large, and women in particular, a base-line data survey of the village was undertaken. It addressed the families, heads of households, and women. The survey confirmed the conditions of rural as described above. In addition, it revealed that women were ready to acquire new skills and knowledge that would improve their lives and that of their families. It also indicated that the male heads of households welcomed the release of women from their difficult tasks, within and outside the home, and the utilisation of the time for education and improvement of family conditions.

Twenty one biogas digesters of the fixed dome Egyptian-Chinese type were constructed in Mansourit Al-Habeel serving 28 families out of 70 families of the village; they represent 40% of the villagers. Five digesters were community units serving more than one family and the remaining ones were family units. These twenty one units are in addition to the four constructed in Al-Habeel village in the test phase.

The digesters were constructed within an integrated biogas system consisting of: the digester, feeding chamber, outlet chamber, animal shed, wastewater treatment plant, simplified drip water irrigation system for the house gardens, simplified gas transportation network, modified stoves and ovens. In addition the kitchens and latrines were modified to fit the biogas system. The beneficiaries participated either in cash or in-kind in many aspects of the project. They contributed in cash about one third of the cost of the system or in-kind through work days equivalent to the same amount.

The female beneficiaries participated with commitment in the extension programme provided by the project. Initially the centre of the Local Defence Committee was provided for the extension activities in Al-Habeel village and later the programme was conducted in one of the homes of the villagers in Mansourit Al-Habeel itself. About 50 women from the village were introduced for the first time to basic life skills as literacy, health education, home economics, sewing, child care, poultry raising, vegetable gardening and the operation and simple maintenance of the biogas equipment inside the house.

The participation of the local people in planning, monitoring, and assessing the activities of the project was considered a primary factor in adopting the technology and introducing social change especially to the conditions of women.

Local impacts

In terms of the environmental conditions in the village, the piles of animal waste and the stagnant wastewater around the houses of the beneficiaries disappeared completely. Connecting the latrines directly to the digesters solved the sanitary disposal problem in the houses of the beneficiaries. The green areas around the houses have become more prominently visible in the village. These improved environmental conditions had direct impact on the quality of life of the villagers. The children have cleaner and safer areas to play. Improvement in the general health conditions of the community was witnessed.

Financially speaking, the villagers who used to buy kerosene or firewood to supplement their energy

needs now save money by the use of the biogas. Part of the fertiliser is used in the home gardens, while the major part is transported to the fields after drying and have replaced the purchase of chemical fertilisers, and increased the productivity of the land and safeguarded the farmers and the land itself from the adverse effects of chemicals. In addition, the home gardens irrigated by the treated wastewater and enriched by the fertiliser started producing fodder for the animals, vegetables and fruits for household use, thus bringing further savings to the budgets of the beneficiaries. By eating clean, green and abundantly available fodder, the animals in the newly constructed sheds appear healthier and fatter thus producing more milk.

Besides the saving of family income, the economic benefits of the project also included creating employment opportunities during construction for the local labour in the village and creating working opportunities for the female extension workers from the village. The project also assisted the beneficiaries in generating income from selling excess fertilisers, animals and animal products such as milk.

Women are the real beneficiaries from this project simply because they are responsible for many of the difficult tasks that are alleviated by the technology. They are relieved from collecting and carrying fuelwood, thus saving them the long and arduous transportation of the fuelwood along with minimising their exposure to poisonous bites. Also the time spent in baking and cooking decreased thus allowing more time for them to take care of their families and to acquire new skills. During the cooking and baking process, women are not exposed anymore to the smoke from woodstoves and ovens, thus minimising susceptibilities to respiratory and eye diseases and burning their hands. By not handling the manure and milking the cows in a cleaner environment, the women and children are spared intestinal diseases. Also their children are drinking cleaner and healthier milk.

Through the extension programme, the women began to read and write, acquire new values and skills regarding cleanliness, home management, nutrition, child care, personal care, in addition to productive skills of poultry raising and home gardening.

The financial analysis of the biogas system revealed that the simple rate of return on the investment can reach 17.2% based on the international prices and 8.4% based on the local prices (which include high taxation) of the building materials. In southern Yemen, a project is included in the national plan, once its components are exempted from taxation. Here lies the importance of the awareness of the decision-makers of the real benefits of this technology and their decision to include such a project in the national plan.

Wider impacts

The benefits are however not confined to the one village where the pilot project took place. The project had a direct impact nationally through its clearly identified outputs. The awareness among decision makers at the national level regarding this renewable energy technology grew to such an extent that the introduction of this technology was included in the national plan for the socio-economic development of the country. A trained team of engineers, technicians and skilled labour was formed as the nucleus for the diffusion of this technology in other parts of the country. Another team of field data collectors was trained to conduct surveys and a third team of extension workers was trained to implement extension programmes in other villages. This is very significant for the future spread of biogas technology in Yemen.

Source of data

Obaid, T.A. & Saleh, M.A. (1997). Diffusion of Biogas Technology: Development of Women in Al-Habeel Village. *Energia News*, 1(3), pp 8-11

Exercise 1.4.5: How can energy interventions meet gender goals?

Consider a poor, slum area of a city that you know. Several families live in one house usually, if they are lucky there is a space at the back where the cooking is done. There is no electricity – partly because people are too poor to pay for it, but also because the houses are of such poor quality that the electricity company says it is not safe for them to get wiring.

Some of the houses closest to the main road, where there is an electricity line, have illegal connections, but from time to time the police come and cut them off. Most people use charcoal for cooking, and they buy it in small quantities, usually daily, which means that they pay much more per kilo than if they were to buy a sack once every two weeks or so. If they have lighting at all, they use small wick lamps with kerosene. The community is made up of some families (parents and children), but also a large number of single young men, who have come from villages in hope of a better job in the city, and women on their own (sometimes two sisters together), with their children but without an adult male. The men get jobs when they can as labourers carrying goods in the nearby city market, the women try to earn money by petty trading and other means, because there are few labouring jobs available for them. The men in particular have a tendency to get drunk in the evenings, women are frequently molested, and especially young girls are afraid to go out at night.

The buying power of the people is obviously very low, and their use of energy is also low.

What types of energy might help women to support themselves and give them income earning opportunities? What sort of opportunities might these be?

What types of energy might improve the welfare of women and reduce the drudgery of their daily lives? Would this also improve their health?

Can you think of any energy interventions that might make a long term difference to women's position in this community?

1.4 FOLLOW UP

In your last projects were the goals, planning and needs consistent?

On what issues has it been inconsistent?

What causes the inconsistency?

What would you change if would have improve the consistency, the goals or the project planning?
Why?

References and supporting materials for Module 1

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Audio visual materials

Two videos are recommended for use with this module:

FAO's Community Forestry Programme has a video describing its gender approach which illustrates the project efficiency approach or goal: It is called **Gender analysis for forestry development planning why? & how?**. To order it, consult the webpage <http://www.fao.org/forestry/fon/fonp/cfu/pub/en/av/abav03-e.stm>

UNDP Mali has a video illustrating the Mali Platform programme. It is called **Overcoming Rural Women's Poverty with the Multipurpose Platform** and it is available from

Projet National Plate-forme Multifonctionnelle
Cellule Regionale
C/o UNDP
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Appendix 3

ENERGY AND POWER

When converting energy from one form to another we are usually concerned about two aspects: the *quantities* of energy involved and the *rate* at which energy is converted from one form to another or (particularly in the field of electricity) transmitted from one place to another. The rate per second at which energy is converted or transmitted is called the **power**. There is a mathematical relation between the two concepts:

$$\text{power} = \frac{\text{energy}}{\text{time}}$$

$$\text{energy} = \text{power} \times \text{time}$$

In qualitative terms this means if you have a given quantity of energy, for example, a pile of fuelwood, you can convert the stored chemical energy into heat. The more wood you put into the stove the more power the stove will produce. Another way to look at this is that the more fuel you put into the stove at one time the more quickly will you use up the fuel.

When describing energy conversions the resources undergoing transformation are usually characterised in terms of their quantities and the conversion equipment is usually described in terms of the amount of power they consume or produce.

There are a large number of ways of measuring energy and although most scientists internationally use the same unit, the **joule** (abbreviated as J), it is quite common to find other units in everyday use. Many engineers, particularly when talking about steam, and Americans use British Thermal Units (abbreviated as BTU's) and in India the calorie (abbreviated as cal) is still common. National energy statistics use tonnes of coal or barrels of oil.

Power is almost universally measured in watts (abbreviated as W). 1 watt is defined as the power produced when converting 1 joule of energy per sec, which can be written as 1 J/s (or 1 J s⁻¹). (See Box 2 for worked example.) 1 joule and 1 watt are very small quantities compared to the amounts converted in many pieces of equipment, so it is quite common, for everyday practical applications, to talk in terms of multiples of ten for both quantities (for example, 10³ J; 10⁶ W) or to abbreviate the powers of 10 with prefixes, for example, kilowatt (1 kW = 10³ W), megawatt (1 MW = 10⁶ W), kilojoule (1 kJ = 10³ J) and gigajoule (1 GJ = 10⁹ J).

Many electrical appliances are sold in terms of their power rating, for example, a 60 W light bulb or 1 kW hot plate. It is therefore very common to measure electrical energy consumption (ie conversion) in terms of power and time. For example, a one kilowatt device running for one hour uses 1 kilowatt-hour (kWh) of energy, which is equivalent to 3.6 MJ.

BOX 1 ENERGY MAGNITUDES

100 kJ of energy is equivalent to:

- radiation from the sun falling on the roof of a house (of about 40 m²) in 2.5 s
- heat released on burning 3.5 g coal or 2.9 g petrol
- potential energy of object (1000 kg) at a height of 10 m
- energy captured by a windmill of 3m diameter in 20 mins in a wind blowing at 5 m/s
- energy stored in a car (1000 kg) moving at 50 km/h
- heat emitted when 3 cups of coffee (0.4 kg) cools from 80°C to 20°C
- energy needed to melt 0.3 kg of ice
- electrical energy consumed by 100 W light bulb in 17 minutes
- rotation energy of flywheel 0.6 m diameter, 70 mm thick rotating at 1500 revolutions per second

BOX 2 ORDERS OF MAGNITUDE OF ENERGY AND POWER

1 kWh	Roughly energy consumed by electric hot plate in one hour
1 MWh	Roughly energy needed to drive a car 1000 kilometres
12.2 TWh	Approximate commercial energy use in Tanzania in 1994
1 kW	Power Rating of an air conditioner
10 kW	Power rating of small tractor/power tiller
1 MW	Rated output of power station serving a small town of around 20,000 people.