WOOD ENERGY NEWS

July 1994

Vol.9 No.1

Issued by the Regional Wood Energy Development Programme in Asia (GCP/RAS/154/NET)

Contents

Project Address

Regional Wood Energy Development Programme in Asia (GCP/RAS/154/NET)
FAO Regional Office for Asia and the Pacific
Maliwan Mansion, Phra Atit Road
Bangkok 10200, Thailand

Fax: (66-2) 280-0760
Phone: (66-2) 281-7844 Ext. 114.
(66-2) 280 0760 (DL)
E-mail: fao-rapa@cgnet.com

Harry Oosterveen	APO/Information Systems
Conrado Heruela	Consultant
Auke Koopmans	Consultant

Project Focal Points and Country Correspondents

Bangladesh	Chief Conservator of Forests, Forest Department, Ministry of Environment and Forest; Member (S+T), Bangladesh Council for Scientific and Industrial Research
Bhutan:	Director General, Forest Department; Director, Department of Power, Ministry of Energy
China:	
India:	Inspector General of Forests, Ministry of Environment and Forests; Secretary, Ministry of Non-Conventional Energy Sources
Indonesia:	Director General of Electric Power and New Energy Sources; Director, Bureau of Planning, Ministry of Forestry
Laos:	
Malaysia:	
Maldives:	
Myanmar:	Director General, Forest Department; Director General, Energy Planning Department, Ministry of Energy
Nepal:	Director General, Department of Forests, Ministry of Forest and Soil Conservation; Executive Secretary, Water and Energy Commission Secretariat
Pakistan:	Inspector General of Forests, Ministry of Food, Agriculture and Cooperatives; Chairman, Pakistan Council of Appropriate Technology
Philippines:	Chief, Non-Conventional Resources Division, Department of Energy; Director, Forest Management Bureau, DENR
Sri Lanka:	Conservator of Forests, Forest Department; Secretary, Ministry of Energy Conservation
Thailand:	Director General, Royal Forest Department; Director General, Department of Energy Development and Promotion
Vietnam:	Director, Vietnam Forest Institute; Deputy Director, Institute of Energy

Editorial

After a period of little activity, this new issue of Wood Energy News is a sign that RWEDP will be active again. A new, five-year phase of the project has been approved as per 1 July 1994. During the coming months, it is expected that new staff will join the project, alongside the existing staff which was recently augmented by two consultants, both of whom have worked with RWEDP in the past: Auke Koopmans in the field of Energy Conversion and Conrado Heruela in the field of Energy Planning.

The new Chief Technical Adviser, Prof.Dr. Wim Hulscher from the Netherlands, will take up his duties in Bangkok in early October. Recently, he has been working with the Technology and Development Group of the University of Twente as Course Director of the international courses on Rural Energy Planning and on Energy Management, and with ITC, the International Institute for Aerospace Survey and Earth Sciences, as a professor in the field of Rural Energy.

Since the last Wood Energy News, Mr. Egbert Pelinck has completed his assignment as Chief Technical Adviser of the project, and has taken up a new challenge as Director-General of ICIMOD, the International Centre for Integrated Mountain Development, in Kathmandu. Mr. Pelinck was largely involved in the formulation of the new phase of RWEDP, and the final approvement is a reward for his dedication.

Philip Hulsebosch has returned to the Netherlands and received his Master's degree at the Agricultural University of Wageningen. Congratulations! We wish him success in his future career.

After the review of RWEDP publications in the last issue of Wood Energy News, we look to the future again. In this WEN we look at some topics that will (continue to) receive much attention in future project activities: woodfuel flows, the woodfuel market and data assessment. Data assesment is the first step in studying woodfuel flows and woodfuel markets, of which a good understanding is required in order to develop appropriate wood energy plans, policies, and strategies.

As RWEDP wants to promote technical cooperation among development countries, we invite the reader to share his experiences with the other readers and write an article for Wood Energy News.

Front page: Woman sorting fuelwood in Vietnam

Woodfuel Flows

by Auke Koopmans

Biomass fuels are an important source of energy in the RWEDP member countries, which is illustrated in figure 1. They consist of woodfuels, such as fuelwood and charcoal, as well as other biomass like agricultural residues (rice husk, rice straw, bagasse, etc.), leaves, grasses, ferns and dung. Studies carried out over the last decade have shown that, unlike what was earlier assumed, a major part of the woodfuels is not derived from forests but obtained from non–forest sources. The latter consist of trees growing on agricultural land, along roads and canals, on home and farm yards, village and other common lands, as well as scrap and waste wood from saw milling, construction sites, demolition of old buildings, packing crates, wood found along roads, drift wood and so on.

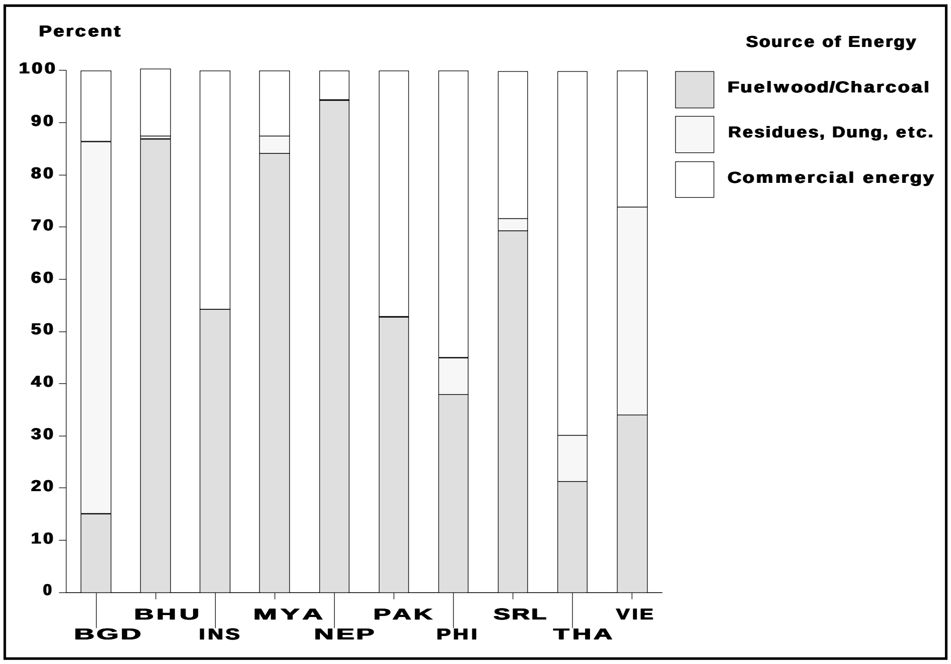

Figure 1: Sources of energy

However, even though it is clear that woodfuels are an important source of energy, this statement says little about how woodfuels are obtained, e.g. how the woodfuels find their way from the source to the end-users. In order to get a better understanding RWEDP has supported or commissioned several studies (see FAO–RWEDP Field Documents in reference list) to get a better understanding of woodfuel flows.

The studies show that of the total amount of woodfuels used, only part is traded, as many people gather their woodfuels from their own land, land owned by their neighbours, common land or other places nearby as shown in figure 2. This is true in particular for rural areas, but gathering woodfuels is also quite common in urban areas, as is shown in the Cebu study. This phenomenon, woodfuel collection in urban areas, is also supported by other studies, for instance in Indonesia where 53% of the households who used woodfuels collected all of it, 31% of the woodfuel using households exclusively bought their woodfuel supplies, while the remaining 16% of the households used a mixture of gathered and bought woodfuels (World Bank, 1990). In rural areas most of the woodfuels are collected by the users themselves, but even here some of the woodfuels involve commercial transactions. Leach reports that in 1978-79 about 12 million tons out of close to 79 million tons of woodfuels consumed in rural India involved a commercial transaction. In contrast, in urban areas in India, close to 14 million tons out of close to 16 million tons of fuelwood involved a commercial transaction (Leach, 1987).

Figure 2: Sources of woodfuel collection

Most, if not all the studies on woodfuel flows deal with traded woodfuel flows from rural to urban areas and shed very little light on trade and flows for rural woodfuel supplies. This is not surprising as the major part of rural woodfuel supplies is freely gathered and as such woodfuel remains by and large a non–monetized commodity.

Structure of woodfuel flows

The four FAO–RWEDP woodfuel flows studies, as well as other studies, indicate that the general structure of woodfuel flows consist of acquisition of woodfuels, conversions (cutting and/or sizing, carbonization, etc.), transport and sale to the end–users. However, within this relatively simple flow mechanism an enormous amount of variation is found. This can range from a simple system where an urban trader is buying woodfuels, transporting it himself to town and selling it to users, to complex woodfuel flow systems involving local traders using middlemen to buy trees from farmers, hiring people to cut the trees, transporting cut wood to intermediate collection points, sorting by species and qualities and bundling, arranging transport to wholesalers in urban areas who may re-size and/or re-bundle the supplies and sell them directly to larger users or retail shops who then sell the supplies onward to households. In between these two extremes many variations are found. To name just a few: households may ask a knowledgeable person to buy woodfuels for them and pay this person a small commission (Paudyal, 1986); charcoal makers may collectively appoint a commission agent who sells their charcoal supplies when the price is right (FD 36); commission agents may buy charcoal for large users (FD 36); charcoal makers may sell their supplies to village people who then, together with the charcoal maker, go to urban areas to sell the charcoal (FD 26), etc. These flows of woodfuels are illustrated in figure 3.

By comparing the woodfuel flows discussed in the studies it is clear that different trading systems co-exist in the same area, the use of a particular system does not preclude the use and existence of other systems. In fact there appears to be a considerable amount of flexibility in the systems which makes them more difficult to study, let alone control the flow of woodfuels.

Regulations

In most countries rules and regulations exist with regard to the control of woodfuel cutting and/or transport. Such regulations appear to be equally valid for forest based woodfuels and for non–forest based wood, and this may form an impediment for growing trees for fuelwood. In practice, however, a considerable amount of woodfuels circumvent the controls. For instance, it is reported that in Thailand a large charcoal maker often sells his charcoal for a low(er) price to local villagers. He brings them (for which he charges them transport costs) with his charcoal to the market. The main reason for this practice is that a license is required to possess and/or transport charcoal unless it involves small amounts for own use (less than 0.5 m^3, equal to about 3 bags). Another reason cited is that the charcoal maker wants to support the local

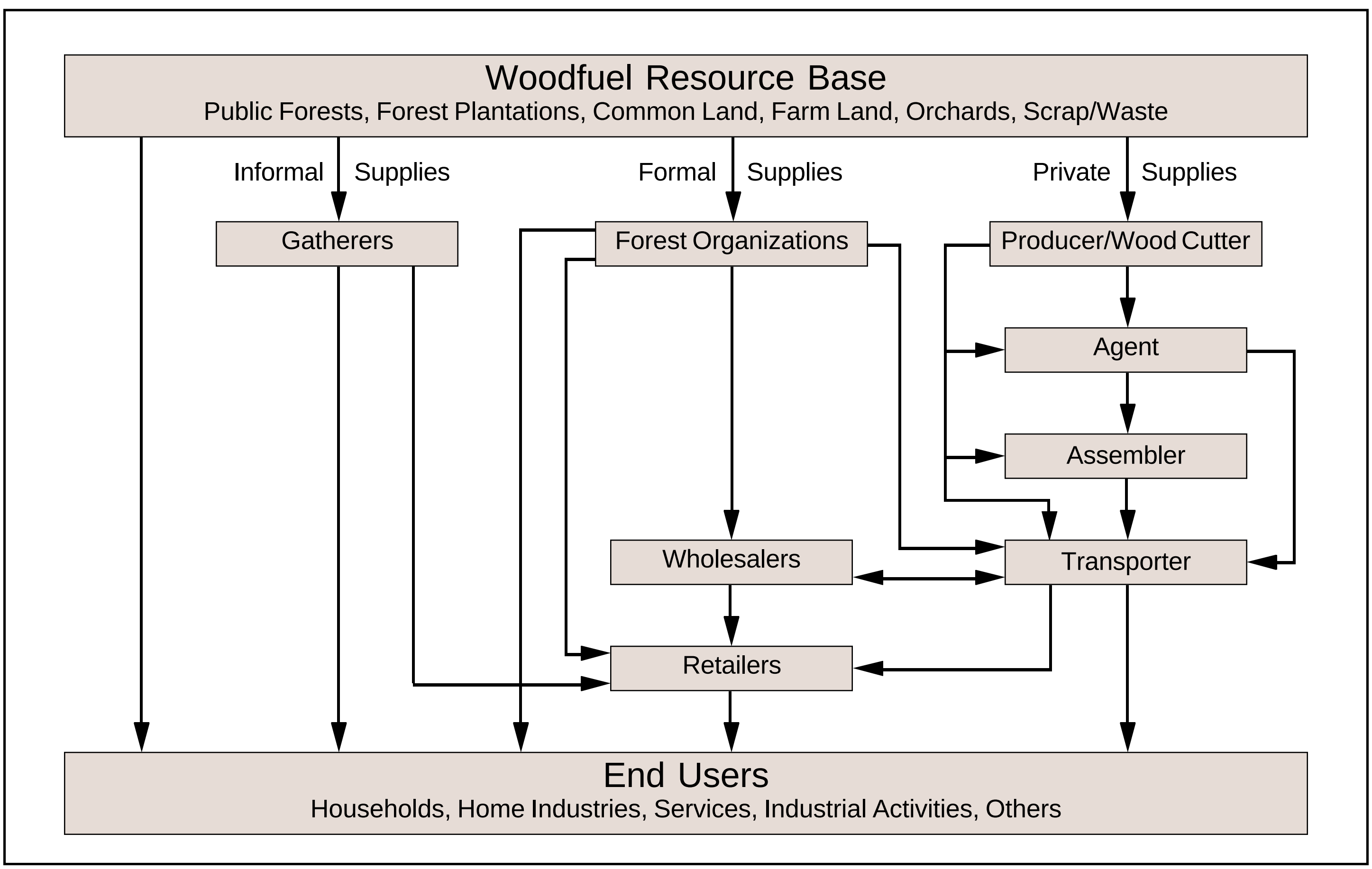

Figure 3: Schematic view of woodfuel flows

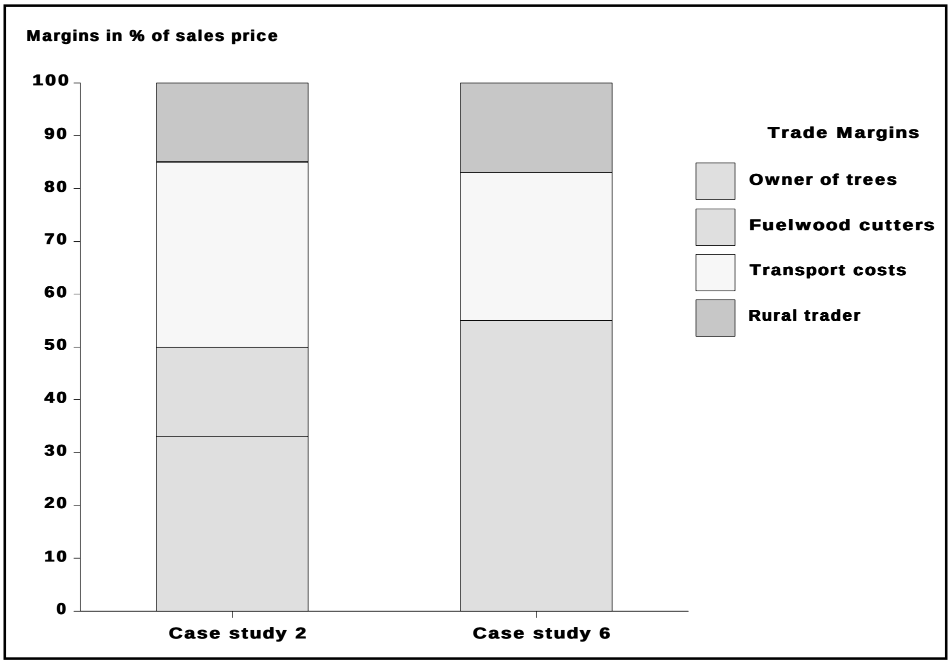

Figure 4: Fuelwood trade margins

people in earning some income. In other countries, people frequently transport woodfuels in small quantities using public transport, which is less often checked. In Nepal (Shaikh, 1989) and in the Philippines (FD 42), recycling of transport permits is reported where, in case a permit is not checked while transporting woodfuels, the same permit is used to transport a second or even more loads of woodfuels. However, this is only possible for the larger traders as they have sufficient stocks to be able to transport truckloads of woodfuel within the period of 1-5 days that the transport permit is valid. In India transport permits for charcoal are only valid for a specific amount to be transported to a specific destination within the expected arrival time and date stated on the permit.

Often, the trade in woodfuels is based on volume. However, in most cases the trade in charcoal is based on weight, and sometimes the retail trade in fuelwood as well. Prices of woodfuels vary widely but it appears that mark-ups in the woodfuel trading system are not excessive, and farmers appear to receive a fair price for their wood. However, large variations in the price at the source are common, depending on quantities involved. In the case that a farmer has a large amount of wood at his disposal, prices generally are higher, as a number of intermediate steps may be cut out, for instance by transporting it directly to the end-user (such as industries).

Many farmers sell wood at stump: they sell the standing trees to traders who then arrange labour for cutting and transport. Evidence shows that farmers in most cases would be able to get a better price for their wood if they cut the trees themselves and transported it to the markets. Figure 4 shows a comparison between mark-ups in a system in the Philippines, where the landowner sells the tree on stump (case study 2) and where the landowner himself takes care of the cutting of the trees (case study 6). Due to various reasons, e.g. shortage of own labour, the need to organize transport as well as permits, contacts in the woodfuel markets, etc. most landowners continue the practice of selling at stump.

Economic impact

In quite a few countries the woodfuel trade is considered as having a low status but in fact many of the traders are quite well off and are often looked upon as being able to support the local people, as is also evident from the case in Thailand cited earlier. The same phenomenon appears to be quite common in other countries too (FD 42, FD 38). The woodfuel trade is thought to be quite important at the national level. Many people derive part of their income from it. It has been estimated that in the Philippines close to 700,000 households are involved with woodfuel production (gathering, cutting, charcoal making, etc.) complemented by another 140,000 households who are traders. As such, close to 10% of the rural population is involved with woodfuels. They receive an average 40% of their cash income from the trade. Many of these rural households have few alternative sources of off-farm income and the woodfuel trade is for them a vital component of their household economy (WB, 1992). In Pakistan, it was estimated that close to 100,000 persons are involved in the trade alone while the total value of the traded woodfuels was estimated to be about 13,000 million rupees, equal to about 10% of all monetary assets in circulation in the country (WB, 1993). A rough estimate for India indicates that at least 3-4 million people were involved in the woodfuel trade, making it the largest source of employment in the Indian energy sector (Agarwal, 1987).

Conclusion

In many countries the demand for woodfuels will remain strong and may even increase in absolute terms due to an increase in population. While the available information has provided a good insight into woodfuel flows and their governing factors, a lot still has to be learned. A few subjects which warrant further investigation are:

- How does a tree grower decide whether the stumpage fee offered is fair in relation to the amount of wood available (size and age of trees) and his inputs;
- The role of transport and regulatory expenses in woodfuel pricing;
- The regulatory system itself—to what extent do regulations impede woodfuel growing and woodfuel flows, in particular from non-forest lands; the influence of land tenure on the growing of trees for fuel, etc.

It is expected that in the new phase of RWEDP the woodfuel flows and marketing will receive more attention in order to get a better understanding of how and under what conditions woodfuels are moved from the source to the end-user. This is considered important as it may help in identifying policy gaps with regard to the supply side of woodfuels from both forest and non-forest resources.

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Factors Influencing Fuelwood Markets

by Philip Hulsebosch

Many reasons for fuelwood problems can be traced back to policies that distort prices and markets. Incomplete markets fail to provide signals that, in a well functioning market, would promote the increased conservation, substitution, innovation and efficiency necessary to bring fuelwood supply and demand into balance.

In general, the three major policy instruments of a government are taxes, regulations and subsidies. They are used to carry out a policy that is framed in terms of simultaneous and sometimes contrary objectives. Usually, several instruments are required to reach these objectives. The functioning of the fuelwood market too is influenced by national and governmental policies, not only in the energy or forestry sector, but in other sectors, like agriculture and transport , as well. The effects of policies on fuelwood markets are not always predictable or desired—sometimes they can not even be ascribed to any single policy.

In this article, some major policy-instruments influencing fuelwood markets are reviewed. The instruments presented are not exhaustive and applicable to every fuelwood market. They merely express the diversity and magnitude of influences. The effects of taxes are investigated by looking at; the effects of regulations are reviewed by looking at the factors that are creating monopoly/oligopoly situations and the effects of subsidies are discussed by focusing on the impact of replacing or stimulating fuelwood use.

Stumpage fees

A stumpage fee is the value of standing wood resources in financial terms. It is the price that the owner receives in exchange for surrendering ownership and the rights of harvest. In the case of government forests, the term stumpage fee or royalty is generally understood as a tax that is levied by the government on wood that is sold, as it adds to the cost of the harvester of the wood.

The effects of stumpage fees (royalties) on the fuelwood market are a subject of debate. Some experts argue that stumpage fees for harvesting fuelwood on government land should be raised at least to its replacement cost. On the other hand, a royalty or stumpage fee increases the selling price of fuelwood, and the poor, who rely on fuelwood, are disadvantaged by this measure. A "subsidy" of uncollected stumpage fees may better reach these poor than any government subsidy, financed by increased revenues, could do. Others argue that this price subsidy would not reach the final consumers because the middlemen would take up the share as an extra to their income (Openshaw and Feinstein, 1989). An important issue is the correct setting of the stumpage fee, because an improper setting may result in under- or over-pricing of the wood.

Philip C.J. Hulsebosch has worked with RWEDP and studied the marketing of fuelwood.

This can result in market inefficiency and undesired effects on the fuelwood market.

In *de facto* or *de jure* open-access forest resources (i.e. government forests in remote areas without control), which have no exclusive owner to demand a price and control access, there are no markets and no prices for these resources. The implicit price of the forest itself is taken to be zero, regardless of the scarcity and social opportunity cost. When fuelwood from open-access forests accounts for a significant part of the market share, the price will only reflect the opportunity cost of labour and capital used in collection, handling and transport. The price does not include the opportunity cost of the scarce natural resource and thus does not reflect its true social value.

A producer of fuelwood, however, faces additional costs that have to be compensated by a higher marketprice. Therefore, when costs are not correctly accounted and the fuelwood price that consumers face does not reflect the growing overconsumption or underinvestment in supply, this could lead to the loss of future resources and the loss of existing growing stock (Soussan et al. 1992).

Other effects of under- or unpriced fuelwood are:

- *Overconsumption*: the cheaper a good (relative to others), the more of it will be consumed.
- *Wastage*: the cheaper a good the less care is taken to reduce wastage, for example inefficient charcoal making, transport losses, harvest losses, etc.
- *Transfer of benefits*: the (urban) traders and consumers are getting a cheaper product at the cost of the (rural) producers.
- *Disincentive to tree growing*: the price (stumpage fee) the farmer gets for his fuelwood is to low for any production initiative.
- *Drain of government revenue*: the price does not reflect the real cost and loss of revenues, while replacement costs stay at market prices. (Openshaw and Feinstein 1989).

Regulations

Governments are making and enforcing certain regulations for every sector in order to guide the development process to their objectives.

Regulations are often based on a permit-card system to control quantities and distribution of production, harvest or trade. Examples are transport permits, fuelwood collection cards or cutting-permits. The permit-cards are mostly issued by government institutions to individuals on the basis of cer-

Figure 1: Weighing out fuelwood on a local market in bangladesh

tain criteria. To be effective, the number of permits issued should be small or difficult to obtain and the demand for the permits should exceed the supply.

The person who grants the permit and the person who is holder of a permit are in a special powerful situation in comparison to those who do not have a permit. The step towards a monopoly or oligopoly situation is small with the conditions that there should be barriers to entry for new suppliers/buyers and no close substitutes for the product. If these two conditions are not met, monopoly will be a short lived phenomenon.

A monopolist/oligopolist will maximize profit and this results either in less production or a price set by the monopolist/ oligopolist (higher/lower than the marketprice). This reduces efficiency and possibly a black market will be established.

In Myanmar woodfuel gatherers need a special and genuine identification card issued by the forestry department for a certain area. Traders are expected only to buy fuelwood from registered woodfuel gatherers. This results in the situation that the traders in Myanmar prefer bamboo above other fuelwood species because bamboo is excepted from an extraction permit. This indicates the problematic nature of using permits.

Another monopoly/oligopoly situation could establish when the distance between households and resources is large and a high capital investment (e.g. a truck) is needed to come into business. Because of an imperfect financial market, only a few people are able to enter through this barrier and when a close substitute is not available, the market could be influenced negatively by the creation of a monopoly situation.

Subsidies

Subsidies as a policy tool are used to guide development with a carrot rather than a stick. Behaviour according to policy objectives is initiated and rewarded with a subsidy. One objective often found in policy documents is rural development. When people switch from fuelwood to a modern fuel (like kerosene or LPG), this is seen as progress and development.

To initiate such development, some countries place heavy subsidies on the use of other fuels like LPG by subsidizing the initial investment (eg. stove) or a structural fuel-price reduction (eg. import subsidy). This makes fuel switching easier, especially for households that have mainly economical reasons for using a specific fuel.

The subsidy on the modern fuels changes the price relation between competing fuels and thus also the fuelwood market. The fuel-switching will be away from fuelwood and, assuming the fuelwood was traded at marginal cost, a structural reduction of price per unit can not be expected. A large number of new fuelwood consumers is therefore not to be expected. A decrease of consumers and the quantity of fuelwood traded will have impact on the number of jobs in this subsector.

The fuelwood production by farmers will decline because at the same marketprice as before, the market can not absorb as much fuelwood any more, and selling below the marginal cost is not economically sound. Fewer farmers will be able to sell fuelwood and the total cash flow will decline. Initiatives to produce fuelwood will decline and the value of standing resources will be less than before the subsidy was given on the modern fuel.

Fuelwood will still be used by those who appreciate a special property of the fuelwood, by those for whom fuelwood is still cheaper than the modern fuel or who still can not afford to switch fuel.

Conclusion

When there is inefficiency in the fuelwood market caused by any policy instrument, the end-user suffers most from the effects. In the developing countries of Asia these are mostly the poorest segments of society. A subsidy, like the reduction of stumpage fees, superficially seems to help people but there are always losers where a policy is concerned. Governments and other institutions should monitor the functioning of the fuelwood markets as well as the influences of policies on the efficiency of the market.

Care should be taken to ensure that the losers of any policy are not the poorest segment of the population.

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Wood Energy, the Environment, and Economic Development in Cebu Province, Philippines

By Terry Bensel

The extraction and use of woodfuels in developing countries is often pointed to as a significant cause of tropical deforestation, especially in cases where a large urban demand for commercialized woodfuels is also a factor. Urban woodfuel demand is believed to lead to a commodification of biomass resources in rural areas, resulting in rates of extraction that are unsustainable and an ever-widening ring of forest destruction leading out from the city. The environmental impacts of this process are clear and can include, among others, rapid loss of topsoil, increased flooding, micro-climatic changes which lead to water shortages, sedimentation of rivers, irrigation canals, and reservoirs, and a switch to agricultural residues for fuel which further aggravates the degradation process by limiting the use of these for soil enhancement purposes.

While such a scenario is certainly plausible, it should also be acknowledged that there are many instances in which woodfuel extraction and use takes place on a far more sustainable basis, and where commercial markets for woodfuels and other wood products can provide the appropriate incentives for landowners and smallholder farmers to undertake more intensive tree-planting and management practices. Such is the case for the island province of Cebu, in the central Philippines. Cebu has the dubious distinction of being the most densely populated and deforested island in the Philippines, and is considered by many to be a classic example of deforestation-induced environmental degradation in the tropics. Woodfuel use by the island's 2.65 million inhabitants is often cited as one of the major factors leading to this situation, and national and local government policy towards the woodfuel trade is formulated and enforced on this assumption.

Terrence G. Bensel works with the Complex Systems Research Center, University of New Hamshire, Durham, U.S.A

In order to better determine the actual impact of woodfuel use on the environment and economy of Cebu Province, a collaborative research effort was undertaken by researchers from the University of San Carlos (Cebu) and the University of New Hampshire, with financial support from the FAO Regional Wood Energy Development Programme and the Winrock International F/FRED Project. The goals of the research were to quantify the level of woodfuel consumption in Cebu, explore the effectiveness of the marketing and distribution network that moves woodfuels from rural to urban areas, and investigate the ways in which woodfuel producing trees are grown, managed and harvested in rural areas of the province. The most significant findings of the research were that woodfuels still account for a significant portion of urban energy demand, the distribution network handling these fuels is highly organized and efficient, and the supply systems for these fuels are far more sustainable and beneficial to the environment than previously assumed.

Forest resources

To begin with, deforestation on Cebu is not a recent phenomenon. Historical records indicate that the island was already 90 to 95% deforested at the turn of the century, with clearance for agricultural purposes probably the single most important factor behind this trend. Second, even in this deforested state there has been a substantial commercial trade in woodfuels on Cebu for a number of decades, with the value of the trade in urban Cebu City alone (population 0.55 million) estimated at $5 million in 1992. It seems difficult to reconcile the long history of deforestation in Cebu with a continual (in fact, growing) trade in commercial woodfuels. The explanation for this paradox lies in the ways in which rural Cebuanos have responded to urban woodfuel demand by planting and managing shrub and tree species perfectly suited to woodfuel production and other purposes such as soil enhancement and protection, as well as for animal fodder production.

The bulk of commercially traded woodfuels on the island comes from fast-growing exotics such as *Leucaena leucocephala* and *Gliricidia sepium*. These trees are planted in woodlots, tree plantations, or as part of a variety of agroforestry systems, and can also be found growing spontaneously in tree fallows and shrub/secondary forest regrowth areas. A number of fruit tree species are also used for woodfuel purposes. These trees are not actually cut for woodfuel, rather old trees no longer bearing fruit, or trees uprooted or damaged by storms are used for this purpose. While Cebu appears to have lost all of its primary dipterocarp forests, there are still scattered areas covered with fairly dense stands of (secondary growth) native shrub and tree species. These areas are regularly exploited for woodfuel purposes, but tighter restrictions on the transport of native species (as opposed to fast-growing exotics) has led to a reduction in their importance in the commercial woodfuel trade. Finally, non-woody biomass fuels in the

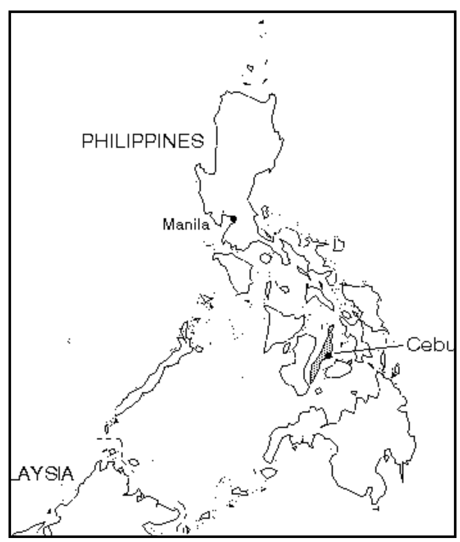

Figure 1: Map of the Philippines

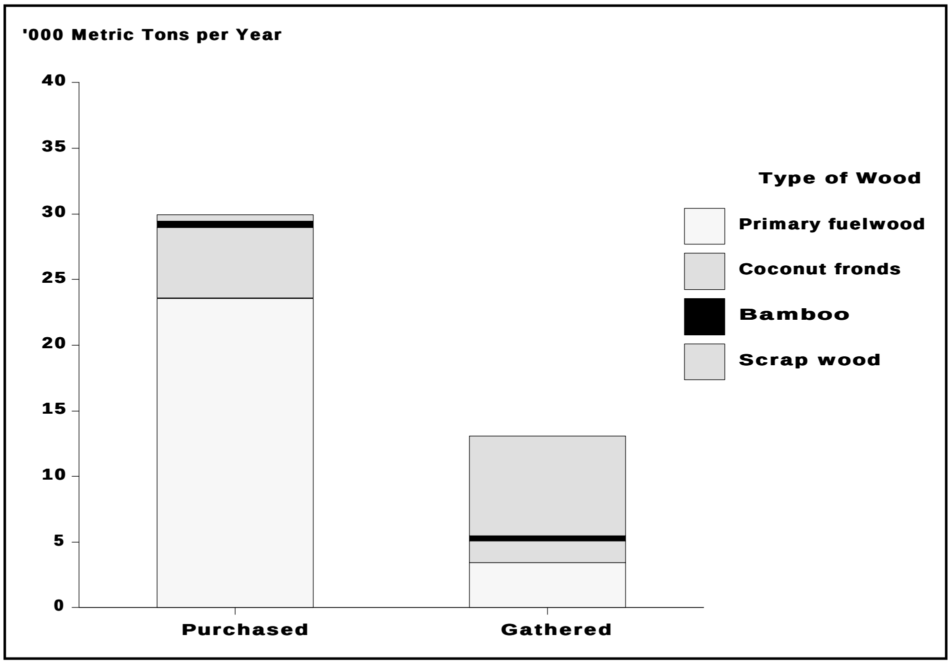

Figure 3: Fuelwood consumption in Cebu City

form of bamboo trunks and coconut fronds, husks and shells meet as much as 50% of rural biomass energy needs and 25% of urban demand.

The harvesting of trees from woodlots, plantations and agroforested areas is usually done on a two-year rotation, with the trees being coppiced and left to regenerate from the stump. Smallholders will generally do their own harvesting, splitting of the wood and, if necessary, conversion to charcoal. Larger landowners will hire wood-cutters or tenants to do the harvesting and conversion on either a daily wage or sharing basis. Overall, the commercial woodfuel trade is estimated to provide at least supplemental employment and income to over 35,000 families in the province, close to 10% of the population. A well-established network of rural and urban traders works to bring woodfuels to consumers. These traders were found to be operating in a highly competitive environment, and the margins they earned appeared appropriate to the effort and risks they undertook in their occupation.

Energy consumption

In the Metro Cebu area, around 40% of the residential sector was found to be relying on fuelwood and charcoal as their primary cooking fuels. Another 30% were using these fuels on a supplemental or back-up basis. Fuel-switching trends support the notion of a move away from woodfuels and towards fuels like kerosene and LPG. However, price instability for modern fuels, taste preferences, and population growth have all combined to keep absolute levels of woodfuel demand at constant (or even increasing) levels. In addition to households, fuelwood and charcoal are also widely utilized by a significant number of commercial, industrial and institutional establishments, ranging in size from sidewalk barbecue vendors up to rattan furniture and carrageenan manufacturers. In all, the residential sector accounts for around 65% of the fuelwood and 55% of the charcoal consumed in the city, with the commercial, industrial and institutional sectors accounting for the rest.

Overall, the existence of a substantial commercial trade in woodfuels in Cebu Province appears to be resulting in a number of positive developments for the local environment and economy. While some woodfuel harvesting in Cebu is destructive and should be discouraged (such as poaching of trees in watershed protection areas and private reforestation sites), the bulk of the commercial woodfuel trade consists of fast-growing species that have been established and managed on a relatively sustainable and ecologically sound basis. For many decades, urban woodfuel demand has provided clear economic incentives for rural residents to plant and manage trees and shrubs. These practices provide a critical source of income to people in these areas, and purchases of locally-produced woodfuels provide clear economic advantages for the province over those of imported fuels.

National and local government policy towards the woodfuel trade appears not to consider the above points, having been created with the wider problem of tropical forest destruction in the Philippines in mind. The fairly unique circumstances encountered in Cebu, including the history of land use and lack of forests, needs to be considered and used as the basis for a more rational woodfuel policy on the island. Instead of viewing the commercial demand for woodfuels and other wood products as a problem to be controlled or eliminated, policy-makers and forestry officials in Cebu should see it as an opportunity to promote more widespread tree-planting and management activities. This will in turn provide residents in the rural areas of the province with increased income and employment opportunities, while simultaneously helping to meet local energy needs in a way that is renewable and beneficial to the regional economy.

Copies of the final report on the Cebu woodfuel study, Field Document 42, entitled: *Patterns of Commercial Woodfuel Supply, Distribution and Use in the City and Province of Cebu, Philippines*, prepared by Terrence Bensel and Elizabeth Remedio, can be requested from the RWEDP secretariat.

Planning and Methods for Data Assessment

by Harry Oosterveen

In comparison to other sectors, one of the things that complicate wood energy planning is the relative lack of data. There are various reasons why data is lacking: often woodfuels are not traded in a formal system, hence there is no need for registration; the collection and use are widely scattered over the country, and there are no centralized bodies that regulate woodfuel flows. Obviously, one needs data in wood energy planning: to identify problem areas and areas for potential intervention, to analyze the situation in an area in which you want to intervene, as well as to get a better understanding of the woodfuel flows, the patterns of production, distribution and utilization. Hence, one of the main objectives of RWEDP is to contribute to an improved database on wood energy and to improve the capacity to generate, manage and assess such data.

Funds for collecting the required data are not unlimited, therefore the available funds should be spent in an efficient way. This implies a commitment to thinking deeply about exactly what data is needed and how to obtain it. Clearly, this depends on the purpose of your data: data needed for a first reconnaissance can be less detailed than for a final preparation of an intervention. This should be reflected in the way you collect data as well: for more detailed data you need different methods for data collection. A strategy could be to acquire data in the following order, with the appropriate methods: first, determine the picture of a large area (nation/state), from which problem areas can be identified. For the problem areas, more data is needed to identify bottlenecks and constraints, as well as opportunities for improvement. In the preparation of interventions, again more data is needed. Here, more data not only refers to the level of detail, but also to the scope of the data: for a first impression, woodfuel supply and demand may be sufficient, but in later stages you will need data on many more topics, for example on the social and economic status of the various user groups.

Sources of data

It is important to note that acquisition of data means more than doing surveys. Considering the cost and time involved in an extensive survey, other methods should be looked at first. Other methods include the use of secondary data, remote sensing, field observations, key informants, etc., while a mixture of these methods is to be used to accomplish the best results.

Secondary data should be a *primary* source of data: it is a fast and cheap way to get your data, provided the available data is accessible:

- It should be possible to see, copy and use the data, which may involve a fee payable to the owner of the data;
- It should be easy to find and retrieve the data, which requires good documentation of what is available and where.

All available data will probably not be available at the institutes that deals with wood energy planning. This stresses the need for inter-institutional cooperation, in this case in the field of exchange of data, in order to work more efficiently and hence reduce cost, and especially to avoid duplicating the same survey. However, data from other institutions, which is collected for a different purpose, will often not be ideally suited for wood energy planning. So secondary data from several sources has to be collected, and still this often has to be supplemented by other data.

Acquiring additional data often necessitates a field survey. Even then, there is a large variety of options, with respect to the composition of the team (single interviewers–multidisciplinary team), number of people interviewed (house to house survey, sampling, key persons, observation only) and depth of interview (structured questionnaire, semi-structured interviews, open discussion). Which one to choose, depends on the level of detail and scope of the required data, hence on the particular purpose of the survey. This has to be a trade-off between data requirements and available resources.

The easy way is to play it on the safe side, and collect the most detailed and most reliable data possible. However, with limited resources, one has to compromise and deal with less detailed, less reliable and often incomplete data. This is a fact of life, and one has to realize that data will always be limited in detail, reliability, representativeness, etc., unless you do a nationwide, house to house survey, and even then it may be outdated when the results are available. The questions therefore are first, how to find the optimum trade-off between the required data and the available resources, and second, how to

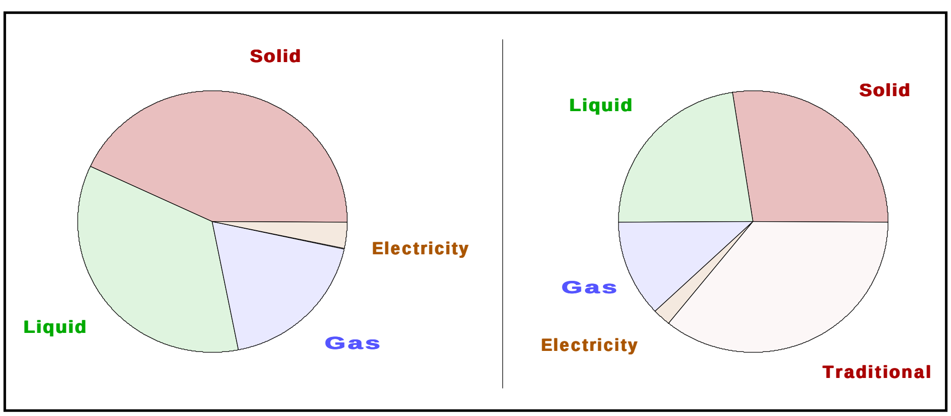

Figure 1: The use of different data sets on energy use

work with less than optimum data to come to valid conclusions. Certainly, one should not ignore data that is of lower quality, as is illustrated in figure 1.

The figure on the left hand side indicates the share of several commercial fuels in a number of Asian countries together. The source of this information (WRI, 1994) gave only figures for commercial fuels, as data on traditional fuels (which here includes woodfuels, even though they may be traded) was not readily available, or not consistently collected in these countries. However, the figure completely ignores a large part of the energy consumed, being the energy used by the majority of the people. On the right hand side the same figure is shown, but now some estimates for the consumption of traditional energy have been added; from this figure it is immediately clear what is the single most used category of fuels. The point here is that if data is ignored at some stage (whatever the reason), the danger exists that it may be ignored in the rest of the planning process.

A framework for data collection

As data is often scattered, pieces coming from different documents and offices, the job of bringing it all together to give a comprehensive picture is not an easy one. A structured approach is essential at this stage. This means that a framework is prepared in advance, in which is indicated what data is needed and how it links together. The purpose of such a framework is to make sure that all relevant data is included, and to be able to plan data collection.

An example of such a framework is used in the LEAP (Long-range Energy Alternatives Planning System). The part dealing with energy demand is shown in figure 2. Here energy consumers are divided into sectors, subsectors, end-uses and devices. This way, the problem of finding data for all energy consumers is systematically divided into the smaller problems of finding data on smaller groups of consumers/end-uses/devices. Now the smaller problems can be submitted to specialists in that particular field or the relevant institutions.

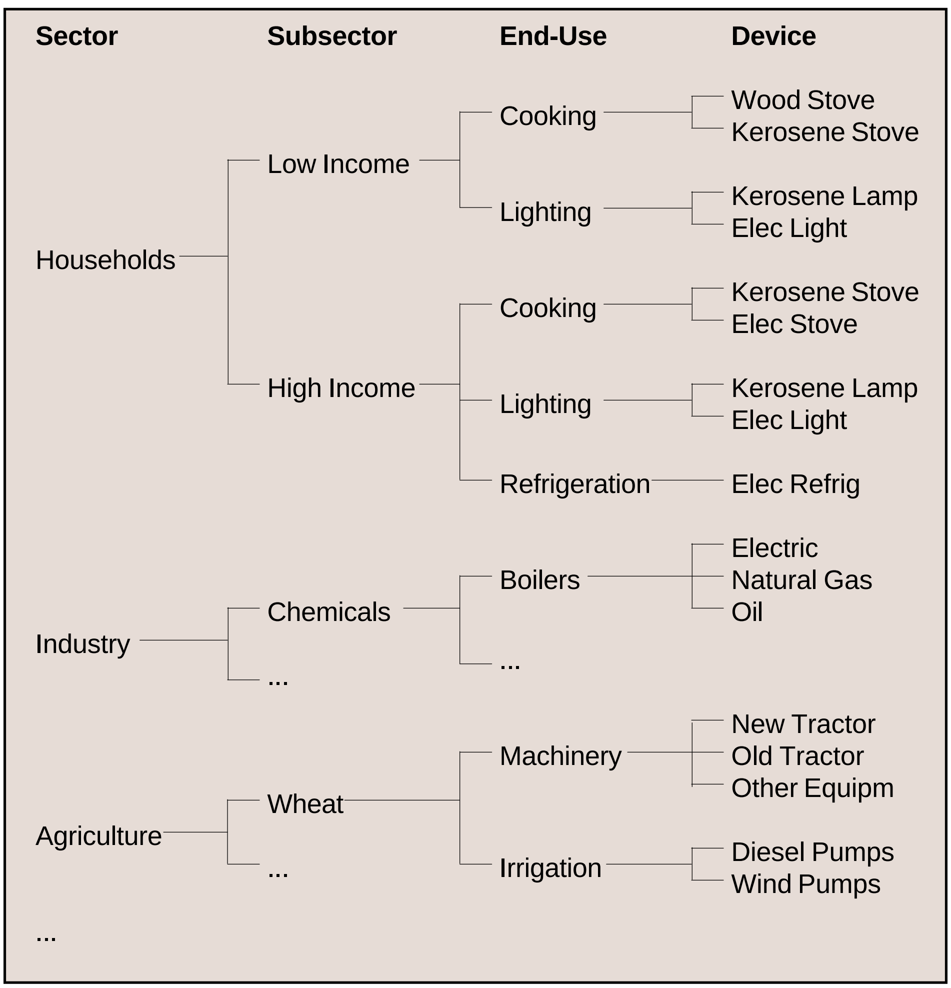

Figure 2: Example of framework for demand data

Note that this framework is particularly flexible: for example, the division into subsectors can be different for each sector. Also, a framework should be flexible in the way that data can be entered, either as a total, relative share, or whatever, and if possible in any unit (kWh, MJ, TOE, etc). This way the framework can be adapted to suit the way in which data is available and collected.

New techniques

The problem of inadequate data on biomass energy has been mentioned already. There are basically two causes for this: firstly, in most cases there is no formal trade involved in biomass energy collection and use, so no records are being kept and available, and secondly, the use of biomass for energy is scattered, which makes surveying very expensive.

New techniques may be helpful in gathering this data. In particular the use of geographic information systems (GIS) and data from remote sensing (aerial photographs and satellite images) seems to be promising. A study in Pakistan (Archer, 1993) showed that, using satellite imagery, an inventory of woody vegetation and crop residues can be carried out quickly and efficiently. However, it should be noted that this is not a straightforward method: it involves comparing a series of satellite images, showing the vegetation in different seasons, combined with ground verifications. Remote sensing (RS) can greatly help in resource assessment, but actual field data will remain necessary to supplement the RS data.

In many countries some kind of energy planning programs are used (LEAP, MEDEE-S, etc.). If biomass resource data is used in these programs, it often has to be entered as figures in a table. However, using a GIS this data may be available in the form of a map. It would be a useful option if data between GIS and energy planning programs could easily be exchanged.

Combining RS data with other GIS data, for example settlement locations and population data, can give an indication of possibly problematic areas with respect to wood energy, as shown in two studies (Van Heist and Kooiman, 1992, and RWEDP, 1993). For these purposes, it is necessary to design a map indicating wood fuel demand. Clearly, this can not be derived directly from population data, as not all people use the same amount of wood fuel. The demand for wood fuel depends on many other factors too, like social and economic position, availability of other sources of energy, way of using the fuel (as fuelwood or as charcoal), whether it is traded and transported to other areas as well, or only used locally, etc. Modelling techniques could be used to derive such a wood fuel demand map, but again data from different sources has to be combined, and little experience is available.

Conclusion

In this paper, some problems in and options for data collection, management and processing have been mentioned. More data is needed for effective wood energy planning, and new techniques and methodologies have to be further developed and explored in order to collect and manage the data more efficiently. RWEDP has already paid attention to this field in the past, for example the "Workshop on Methodologies for Local Non-Conventional Energy Planning" was held in 1991, and this will continue to receive attention. Therefore, we would much appreciate your experience in this field, in particular with energy planning programs such as LEAP and MEDEE-S, and with the use of RS and GIS.

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The marked () documents are available from the RWEDP secretariat.

News & Notes

Regional Rural Energy Workshop in Vietnam

Organized by the World Bank and the Energy Institute of Vietnam, a Regional Rural Energy Workshop was held in Hanoi, Vietnam, from 22-24 June 1994. The workshop was attended by participants from China, India, Indonesia, the Philippines, and Vietnam, as well as several experts from the World Bank and relevant NGOs. It became clear that there were two major topics in rural energy planning, namely rural electrification and sustainable biomass use, which have less in common than would be expected, because they target different needs. Rural electrification may contribute to rural development, but is not likely to be a significant substitute for cooking fuels, which is the main need for energy in rural areas. Although the share of biomass fuels in the total energy demand is decreasing, the absolute amount is increasing due to expanding population.Still, the role of biomass fuels is often undervalued, and it was recommended that biomass fuels should be included in official statistics. With respect to rural electrification (and commercial energy in general), it was stressed that attention should be paid to institutional issues and to rational pricing policies.

A country study on each of the countries was presented. Some of the conclusions of these presentations are:

- The largest use of energy in all countries is in the rural households, mainly in the form of biomass.
- In most countries, it is presumed that there is an upcoming energy shortage, hence the need to increase the energy supply, in particular by means of introducing new forms of renewable energy and by rural electrification.
- To a varying extent in different countries, there is lack of data and insufficient understanding of the rural energy situation.

In the discussions, it was stressed that the ultimate goal in rural energy planning is not to deliver energy, but to improve rural living conditions, so strategies should be formulated in the context of the bigger picture of overall development. Attention should be paid to the institutional issues: who will implement plans, how to involve the private sector, and how to overcome market barriers.

Integration of Wood Energy in National Energy Planning in Nepal

RWEDP, in cooperation with the Department of Forests of His Majesty's Government of Nepal organized a national workshop on the "Integration of Wood Energy in National Energy Planning" from 29 June to 1 July 1994 in Kathmandu.

The workshop drew participants from the forestry, energy, agriculture, industry, economic planning, academic and science sectors. Delegates came from both government and non-governmental organizations. During the three-day workshop, which used a methodology adapted from the "Objective-Oriented Project Planning Approach" (developed by the German Agency for Technical Assistance) the participants, came to a common understanding on the following:

- The country's current capability in wood energy programme planning and management,
- The extent of integration of wood energy planning in national planning exercises, particularly in national energy and forestry planning exercises,
- The specific areas where the country needs development or strengthening of wood energy planning capabilities and which of these should require external assistance, and
- The specific areas where the country has expertise and is capable of providing expert advice to other member countries under the framework of TCDC (Technical Cooperation among Developing Countries).

The end result of the workshop was the drafting of a workplan of activities towards realizing the overall objective of the workshop—to integrate wood energy in national energy strategies. The workplan involved four types of activities: policy actions, national capability building activities (institutional and organizational strengthening activities such as training), in–country case studies (to build up a wood energy data base and develop in–country capabilities in data management and assessment), and programme planning and management activities (to initiate and institutionalize a wood energy programme planning and management process in the country).

Regional Workshop on Palm Sugar Processing, Yogyakarta, Indonesia

A three day workshop was organized by the Asian Regional Cookstove Program (ARECOP) from 23-25 August. The workshop was attended by 18 representatives and resource persons from various government and international organizations as well as NGOs from India, Myanmar, Philippines, Sri Lanka, Thailand and Indonesia.

Palm sugar is obtained from various species of palms e.g. the palmyrah (*Borassus flabelliber*), coconut (*Cocos nucifera*), nypa (*Nypa fructicans*), kittul (*Caryota urens*), etc. The results of the studies carried out in India (Kerala), Myanmar (the dry zone), Sri Lanka (central highlands) and Indonesia (East Nusa Tenggara and Yogyakarta) provided evidence that palm sugar can and does play an important role in the rural economy. For instance, an estimated 800,000 persons are engaged in palm sugar processing in India with the value of the products being estimated at over 1,200 million Rupees (about US$ 40 million). In Myanmar these figures are respectively 100,000 households with a sales value of over 2,500 million Kyats (about US$ 23 million at an unofficial exchange rate of 110 Kyats/US$ - over 400 million US$ at the official rate of exchange). During group discussions, the participants identified 5 main common issues in the palm sugar production system:

- The use of traditional production technologies including the use of in-efficient stoves resulting a low quality product and high production costs;
- Labour and social issues;
- Environmental issues and land management;
- Marketing, and
- Policy and institutional support.

The participants noted that many of these constraints have a common cause: a lack of access to land, financing, information, markets, etc. Therefore possible solution should take this common denominator into account. Awareness building, both internal as well as external was identified as being important for the survival and/or well-being of the palm sugar industry.

Internally efforts should be made to combine forces e.g. more cooperation between individual palm sugar producers in order to make use of the advantages an increased scale of operations can offer, setting up of informal support organizations, etc.

Externally efforts should be made to introduce improved stoves and processing technologies such as those developed in southern Thailand which at the same time can increase the quality of the product, preserve fresh sap and processed sugar, introduce new products such as candy, soft drinks, R&D, etc. Although all sectors e.g. government-, non-government- and international organizations could be involved in providing these external inputs, it was thought that non-government organizations could be instrumental as a change agent while the government and international organizations could provide assistance with R&D, technical and financial assistance and providing channels for exchange of information etc.

The workshop provided a firm basis for follow-up action, both at the national as well as at the international level. The proceedings, including suggestions for follow-up actions, is being finalized. For further information please contact: ARECOP, P.O.Box 19, Bulaksumur, Yogyakarta, Indonesia.

Events

Event, Description (Info)	Date, Venue
Community Forestry Extension, short course Training in extension skills for middle management personnel in forestry departments and community forestry programs (RECOFTC)	7 Nov–12 Dec 1994 Bangkok, Thailand
Management of Minor Forest Products, international seminar Practical management solutions to problems of sustainable forest management, case studies, economic studies, innovations, new technologies, and institutional aspects (COMFORPTS)	13–15 Nov 1994 Dehra Dun, India
Conflict Resolution, short course Training for middle level officials and NGO personnel involved in forest management and conservation, conflict sources, opposing interests, negotiating strategy and communication ability (RECOFTC)	12–20 Dec 1994 Bangkok, Thailand
Rural Extension for Foresters, 12-week course Processes of technical and social change in rural communities, design extension programmes, management and supervision of field level staff, working with communities (AERDD)	16 Jan–7 Apr 1995 Reading, UK
Stand Establishment and Inter-Rotation Management, international conference Exchange of views on forest vegetation management and research, economic and environmental issues, plant competitive effects, inter-rotation management, regulatory, training and management support systems (NZFRI)	March 1995 Rotorua, New Zealand
Nitrogen Fixing Trees for Fodder, international workshop Research on utilization and management of NFT's in agroforestry systems for fodder production, practical information, research priorities, and collaborative networks (NFTA)	20–25 Mar 1995 Pune, India
Rural Projects - Design, Monitoring and Evaluation, short course Techniques for identification, design, appraisal, implementation, management, monitoring and evaluation of rural projects, integrated approach, role of computers in planning and management, case studies (ANUTECH)	24 Apr–19 May 1995 Canberra, Australia
Recent Advances in Tropical Tree Seed Technology and Planting Stock Production, international symposium Review of recent advances, discussion of constraints and priority research areas (AFTSC)	12–14 June 1995 Haad-Yai, Thailand
Geographic Information Systems & Environmental Modelling, short course Principles and potential of GIS's as a tool in resource management, hands-on skills in development and use of GIS for storing, retrieving and analysing complex sets of resource and environmental data (ANUTECH)	3–14 July 1995 Canberra, Australia
Environmental Assessment for Development Projects, short course Environmental screening of projects, identification and scoping of environmental impacts, and environmental appraisal in project design, monitoring and evaluation (ANUTECH)	4–29 Sep 1995 Canberra, Austalia

AERDD: Agricultural Extension and Rural Development Department, University of Reading, 3 Earley Gate, Whiteknights Road, Reading RG6 2AL, UK. ☎ (44-734) 318119, 🖹 261244

AFTSC: ASEAN Forest Tree Seed Centre Project, Muak Lek, Saraburi 18180, Thailand. ☎ (66-36) 341-305, 341-691, 🖹 341-859

ANUTECH: ANUTECH/Australian National University, GPO Box 4, Canberra, ACT, 2601, Australia. ☎ (616) 249 5671, 249 0617, 🖹 249 5875, 257 1433

COMFORPTS: Centre of Minor Forest Products, HIG-2/No.8, Indirapuram, Gen. Mahadev Singh Road, Dehra Dun - 248001, India. ☎ (91-135) 83503, 🖹 23539

NFTA/BAIF: Nitrogen Fixing Tree Association, c/o BAIF, Kamdhenu, Senapati Bapat Road, Pune 411 016, India. ☎ (91-212) 342621, 342466, 🖹 349806

NZFRI: NZ Forest Research Institute, Private Bag 3020, Rotorua, New Zealand. ☎ (64-7) 347 5899, 🖹 347 9380

RECOFTC: Regional Community Forestry Training Center, Kasetsart University, P.O. Box 1111, Bangkok 10903, Thailand. ☎ (66-2) 579-0108, 561-4881, 🖹 561-4880

Fuelwood transport in Myanmar

How much wood you use per day? Household survey by a student of ITC