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# Woodfuels and Their Importance to Development – Particularly Rural Development

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The following outline is from remarks made by K. Openshaw and P. Hassrick during a panel discussion at the Rural Development Technology Center on September 16, 1983. This discussion concerned woodfuels and their importance to rural development as well as indigenous technology transfer. Mr. Openshaw talked about woodfuels in general, their importance for developing countries, and how technology transfer can be brought about. Mr. Hassrick presented a specific example of how the transfer of technology was used in stove improvement.

### Woodfuels

Woodfuels (fuelwood, charcoal sawdust, offcuts, etc.) are the most important energy source in the Southern African Development Coordination Conference (SADCC) countries. They account for between 80% to 90% of total energy consumption (excluding human and domestic animal power). In rural areas, the consumption is as high as 95% of all energy. For the most part, this fuelwood is collected rather than purchased. In urban areas, where it is mostly purchased rather than collected, fuelwood accounts for about 50% of energy consumption. Woodfuels also account for between 80% to 90% of all wood consumed. However, up to the present, forest services have focused on the remaining 10% to 20%, namely, sawn wood, poles, panel products, and paper.

### What Is the End Use Pattern?

About 85% of woodfuels are used for domestic and 15% for nonhousehold purposes. The chart on the following page shows the various uses of wood. Cooking is the most important use overall, and the introduction of improved stoves could lead to a significant saving of energy. However, improved kilns, barns, and boilers can save fuel in several of the industries mentioned in the chart. Already in the SADCC countries, research and development is going on in these fields, and technological transfer is gradually being implemented.

## HOUSEHOLD AND NONHOUSEHOLD USE OF WOOD

Household (%)		Service Sector	Cottage Industry	Industry
Cooking	85%	Restaurants	Brick/Pottery	Brick/Pottery
Heating	10%	Canteens/Food Shops	Brewing	Tea Drying
Other (Ironing, Lighting, & Protection)	5%	Schools	Tobacco Curing	Tobacco Curing
		Hospitals	Fish Smoking	Fish Smoking
		Army Camps	Blacksmiths	Salt Evaporation
				Copper Refining
				Cement Manufacture
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### The Supply Demand Situation of Woodfuels

Wood is a bulky low energy, low cost product. Therefore, it has to be as close to the consumer as possible, particularly for the rural population where it is collected by hand and transported by foot. Thus, there may be a surplus in one part of the country and a shortage in the other. Overall, SADCC countries may be more or less in balance as far as annual tree growth and annual removals are concerned, but many areas show severe shortages of woodfuel because it is uneconomic to transport wood from surplus to deficit areas. However, because of population increases which will increase the demand for wood and the demand for forestland to be cleared for agriculture, the wood imbalance will become a national problem and the tree capital will be reduced at an increasing rate to the detriment of the soil and the consumer.

## Solutions to Meet Future Energy Demands

There are three possible ways to meet future energy demands:

(1) Substitute other energy forms for woodfuels. Electricity, paraffin, and liquified petroleum gas require large foreign exchange inputs and shift the employment opportunities from rural to urban areas. On the other hand, biogas, wind, and solar energy are indigenous resources that could be used, although they still would require a large foreign exchange input in order to fill a substantial part of the market now occupied by wood. In addition, because the technology is quite sophisticated, technology transfer will be relatively slow.

(2) Increase efficiency both in production and consumption of woodfuels. On the production side, this can come about by managing trees better; improving the varieties of trees used; increasing the efficiency of charcoal production; and using wastes, such as sawdust, slabs, and crop residues. This can occur on the consumption side by improving efficiency for stoves, tobacco barns, fish curing kilns, tea drying sheds, boilers, etc., and by managing curing/drying techniques better.

(3) Increase the supply of wood by planting more trees. The big push has to come from the farmers themselves planting farm trees. Certain tree species planted at wide spacing (up to 300 trees per hectare on short rotation) will not interfere with agricultural crops. Rather, the farmers may actually enhance production through an improved microclimate, soil stabilization, and (if trees are nitrogen fixers) improved nitrogen and humus in the soil. For population concentrations and industry, the best solution may be to grow trees in woodlots and plantations.

In practice, although some substitution will take place because of foreign exchange constraints and in order to enhance rural employment opportunities, emphasis must first be placed on increasing the supply of wood by planting more trees and then on increasing the efficiency of

producing and consuming woodfuels. For these solutions technological transfer is also relatively simple.

### Future Uses of Woodfuels

Wood is sometimes looked on as a second-class fuel, but it can be marketed and packaged just like any other product. Also, stationary and mobile engines can be adapted to burn wood, either by using producer gas (a combustion product of wood) or using wood-fired steam boilers. Therefore, woodfuels are very versatile and can serve a nation indefinitely on a renewable basis if properly managed.