

## EarthTrends: Featured Topic

Title: Undying Flame: The Continuing Demand for Wood as Fuel  
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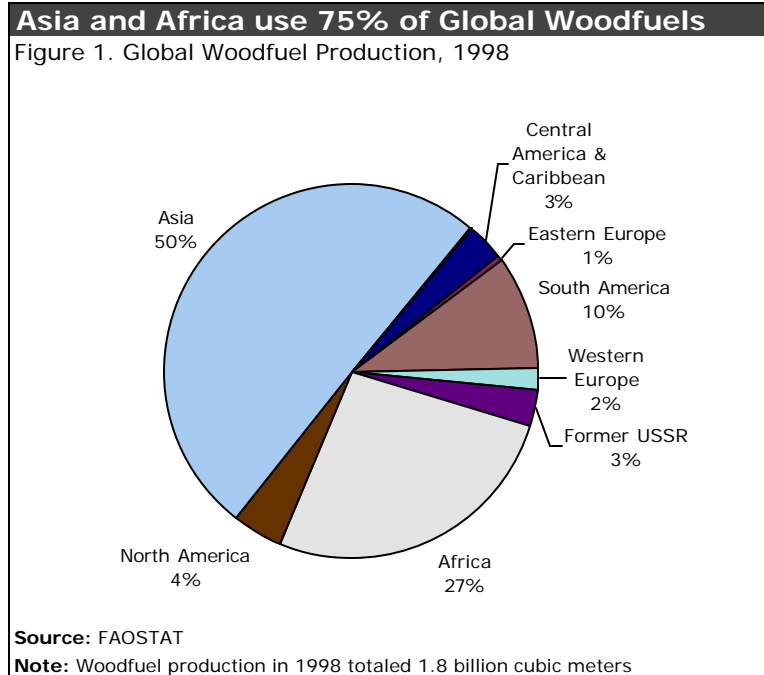
The chief use of the world's wood is not as building materials or paper, but as fuel. It is a pattern both ancient and modern, and one that is not likely to change in the next several decades. Today, hundreds of millions of people remain completely reliant upon wood for energy and can't anticipate any rapid transition to other energy sources. In fact, woodfuels are the world's most important form of nonfossil energy.

Of the 4.4 billion cubic meters (m<sup>3</sup>) of wood harvested in 1996, close to half—some 1.9 billion m<sup>3</sup>—are burned for cooking or to provide heat, or are used to make charcoal for later burning (FAO 1999:144). Other wood products also end up being burned for fuel. Commercial wood residues—chips, sawdust, and even the “black liquor” that is a by-product of pulp and paper making—are often fuel sources for commercial energy plants and individuals. Energy plants may also burn used packaging, discarded construction lumber, and paper wastes. Including all these sources, the UN Food and Agriculture Organization (FAO) estimates that about 63 percent of all wood harvested is burned as fuel (FAO, 1999:37).

### Wood Dependence in Developing Countries

Low-income nations depend most heavily on wood for fuel. (See Figure 1: Global Woodfuel Production, 1998.) Five countries—Brazil, China, India, Indonesia, and Nigeria—account for about half the firewood and charcoal produced and consumed each year.

Unfortunately, analyses of woodfuel consumption are com-



plicated by a dearth of current, comprehensive data. The FAO woodfuel data, for example, are based largely on estimates derived from scattered 1960s household consumption surveys, which are updated annually in line with population and income growth. These estimates substitute for information on actual woodfuel consumption in most developing countries.

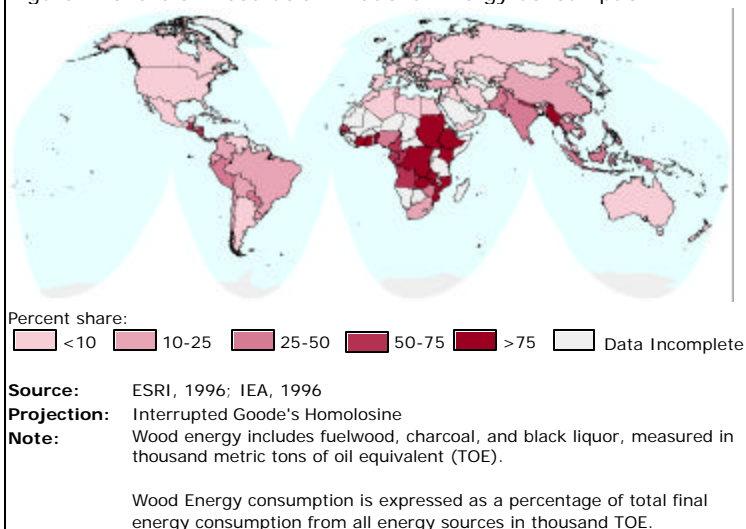
Although the picture we get from such data is hazy, it is clear enough to confirm the importance of wood in the national energy picture of developing nations. Wood is the most important of several biomass fuels that also include crop residues and animal dung. Biomass provides roughly 30 percent of the total energy supply in developing countries, and wood accounts for more than half of this—about 15 percent of

the energy supply in the developing world (IEA, 1996: II.289-308, III.31-187). However, in many individual nations, dependence on wood is much higher. In some countries, like Nepal in Asia, and Uganda, Rwanda, and Tanzania in Sub-Saharan Africa, woodfuels provide 80 percent or more of total energy requirements. (See Figure 2: Share of Woodfuels in National Energy Consumption.)

In most industrial countries, wood energy contributes only about 3 percent of total energy supply. There are exceptions: wood energy accounts for more than 16 percent of total energy supply in Sweden and Finland, and 12 to 18 percent in some Central and East European countries (FAO, 1997b:7, 11).

### Wood is a Primary Energy Source in Many Developing Countries

Figure 2: Share of Woodfuels in National Energy Consumption



### Trends in Woodfuel Consumption

The FAO estimates that woodfuel consumption rose by nearly 80 percent between 1961 and 1998, slightly trailing world population growth of 92 percent over the period. The largest increases in woodfuel consumption were reported in Asia and Africa.

Demand for fuelwood and charcoal is driven primarily by growing numbers of rural poor, who depend on wood for their cooking and heating needs. Charcoal, often consumed in the form of briquettes, is also an important fuel among the urban poor, whose numbers are expanding rapidly. Charcoal is also an industrial energy source in some Latin American countries. The steel industry in Brazil, for example, depends heavily on charcoal.

Economic growth might be expected to reduce demand for wood and other biomass in coming years. The conventional view is that, as incomes rise, countries shift toward the use of commercial fuels, such as kerosene, natural gas, and other fossil fuels, and reduce their dependence on biomass. Yet trends to date suggest otherwise: it appears that, even with economic development,

woodfuel use will not necessarily decline significantly.

In recent decades, economic growth in the developing world has indeed caused fossil fuel use to increase, and the relative share of energy consumption accounted for by biomass has declined. But the actual quantity of biomass consumed has continued to grow. Recent research shows that biomass consumption in Indonesia, Malaysia, Philippines, Thailand, and Vietnam grew by nearly 2 percent annually between 1985 and 1994, when these countries' economies were growing strongly (RWEDP, 1997b:20). In many developing countries, fossil fuels are simply added to the energy mix, not substituted for woodfuels.

### Is There a "Woodfuel Crisis"?

It is difficult to project future demand for woodfuels at the global level and projections vary widely. Some projections are simple extrapolations of FAO production trend data, in spite of the data's known shortcomings. Others are based on estimates of how much woodfuel will actually be available for consumption or how much woodfuel people *would* consume if all their needs were fully met. As a

result, projections of global woodfuel consumption in 2010 range from 1.5 billion m<sup>3</sup> (a decrease of 16 percent from 1998 levels) to 4.25 billion m<sup>3</sup> (an increase of 136 percent) (cited in Brooks et al., 1996:45-74).

It is clear, however, that local and regional shortages of woodfuel—and the hardship this creates—exist in many parts of Africa, Asia, and Latin America. Numerous studies document instances of villagers traversing ever-longer distances to gather daily wood supplies.

Woodfuel shortages are especially likely to occur near cities. Poor, urban populations gather fuelwood and rely heavily on charcoal, which burns more efficiently than wood, but is inefficient in terms of the conversion process from wood. Rising demand for fuelwood and charcoal is causing a halo of deforestation around many cities, towns, and roads. Anecdotal evidence exists of closed forests being affected, notably in India, Sri Lanka, and Thailand.

At the global level, forecasts of scarcity have probably been exaggerated. "Doom scenarios" under which wood-dependent countries would lose all their forests to firewood collection have not transpired. For example, a 1979 Nepalese forecast predicted that all accessible forest in the country would disappear by 1990. Actual forest loss has been about one half the predicted amount, and there is no suggestion that it results from firewood collection.

The error was caused by the mistaken assumption that forests were the sole source of firewood (RWEDP, 1997a:20). Actually, regional studies indicate that as much as two thirds of woodfuel worldwide probably comes from nonforest sources. Woodlands, roadside verges, and backyards are alternative sources for collecting fuelwood; residues from logging, wood industries, and tree planta-

tions; wood recovered from construction waste; and waste packaging supplement other nonforest sources (RWEDP, 1997a:21).

Closed canopy forests appear not to be a prime source of woodfuels and, at the global level, wood collection for fuel is not regarded by the FAO as an important cause of deforestation.

So, the assumption twenty years ago that woodfuel collection

was to blame for deforestation seems to be wrong. There is good evidence that woodfuel supply in developing countries can be sustainable even in densely populated areas, where government planting programs, community woodlots, and plantations are adequately managed. (Unfortunately, numerous plantations and community woodlots exist in India, China, South America and other parts of

the world that are too small in area to be included in national inventories, so their real extent is unknown.) Studies in Africa indicate that institutional factors, such as lack of property rights or ownership, not scarcity of trees, are often to blame for woodfuel shortages. That said, woodfuel collection does cause severe localized deforestation in some areas.

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