

Rather than scouring the forests for biomass suitable for household use, residents in the developing world's rural communities can meet many of their energy needs from their own homegardens.

By David Landes



A woman extracting biomass for domestic energy use from a rural forest near Lawachara National Park in Bangladesh. Photo: Sharif A. Mukul

Homegardens can help save forests

AT TIMES IT can seem like the debates about bioenergy are focused on developing the latest technology or finding the optimal incentives for expanding the supply and markets for different biomass-based solutions.

Thus it can be easy to forget that for nearly 50 percent of the world's population bioenergy is one of, if not the only, source of fuel and energy.

"Although economic development in many developing countries has progressed rapidly, alternatives to biomass fuels are still scarce in many rural areas," says Sharif Mukul from the Shahjalal University of Science and Technology in Bangladesh.

While people living in rural areas of the world's less developed countries may utilize bioenergy out of economic necessity, that doesn't mean that their bioenergy consumption patterns can't offer useful insights for others, as well as highlight some of the common challenges in effectively managing bioenergy resources.

Forests are vital resources

Since much of the biomass used by small rural communities comes from neighbouring forests, increased biomass utilization can lead to deforestation.

"Forests are still among the most vital sources [of biomass fuels] and provide the majority of the biomass fuel required in most developing countries. Extraction of

these fuels is also one of the major causes of forest depletion in certain regions," says Mukul.

But as Mukul discovered during a 2006 field study in Lalpur, a small village in the Sadar upazila, a sub division of the Noakhali district in southern Bangladesh, some local communities have found ways to feed their biomass habits without stripping nearby forests – in part because most of the neighbouring forests are no longer productive.

Characterized by a primarily agrarian economy and a sizeable population with a low per capita income, Bangladesh exhibits many characteristics typical of the world's less developed countries. Natural forests cover about 17 percent of Bangladesh's land area, but the country also has one of the highest deforestation rates in Asia. As a result, forests aren't evenly distributed and are under threat in many parts of the country.

"In the northern and south-central regions, the country has no productive public forest from which people can meet their fuel requirements," according to Mukul.

"In those areas, it has been found that homegardens play a vital role in meeting households' demand for biomass energy."

Biomass for food and fuel

Homegardens consist of a collection of different plants, including trees, shrubs, vines, and herbaceous plants growing around a

family's dwelling. A long-established way to provide families with biomass for food and fuel, homegardens play an important role in the livelihoods and economies of rural communities, says Mukul.

"They also play a potential role in forest conservation by providing for subsistence needs of local populations, which they may otherwise have derived from the forest," he adds.

In Bangladesh, about 80 percent of the rural population maintains homegardens which can meet many of their domestic fuel needs.

"In the context of the rapid loss of forest vegetation in the developing world, homegardens will have to play an important role as a substitute source of natural forest products, including biomass fuel. In fact, in some areas where forests have become scarce, homegardens already play an important role in meeting households' domestic fuel requirements for processing food."

Mukul spent his time in southern Bangladesh examining households' domestic fuel consumption patterns in the hopes of learning more about the potential contribution homegardens can make as an alternative energy source.

"It's helpful to understand the probable value of homegardens as an alternative energy source and to promote this productive system in areas where there has been a

shortfall in fuel for domestic use, or where deforestation is taking place due to the collection of biomass fuel from forests," he says.

A diverse assortment of plants

Mukul discovered that homegardens in Lalpur featured an incredibly diverse assortment of plants, including 37 species of trees, in addition to various types of grasses and shrubs.

Firewood was the most common form of biomass derived from homegardens, representing just over half of villagers' biomass consumption. Both dried leaves and dung cakes were used in significant quantities as well.

In addition, Mukul learned that more than half of households total energy needs were satisfied by biomass derived from homegardens, with biomass collected from neighbours or from public land accounting for about 30 percent combined.

The situation in Lalpur is indicative of Bangladesh as a whole, where 88 percent of wood products are drawn from homegardens.

"It's a very productive system, and suggests that trees outside of the forest can provide a significant proportion of wood and other kinds of biomass fuels," says Mukul.

Government has a role to play

He believes governments can do more to help nourish the homegarden model by helping poorer residents who have no land of their own and by filling government lands with plantations of fast-growing and high-caloric value species.

In many cases, there may be no alternative if governments are serious about preserving their forest lands.

"In developing countries with high population density, gathering of biomass fuel may cause serious deforestation because a majority of the forests are still communal and unregulated... as the supplies of firewood from public forests diminish, rural households are now required actively growing more of their own biomass fuel," says Mukul.

"Policy makers could make the country's vacant lands, such as river banks, or areas near roads and railways, available for marginalized people to plant trees under long term sharing agreements. Governments could also provide financial assistance and technical support," he added.

Opportunities for business

There are also opportunities for business to help make the utilization of biomass more efficient.

"Bioenergy companies could work on designing and promoting improved kilns that are more environmentally friendly as well as economically feasible. They could also pro-

mote new homegarden plant species that have high calorific values, with substantial growth and branching," says Mukul.

While not wanting to oversell the benefits that homegardens have for fighting deforestation, Mukul is confident they can be part of an overall strategy.

"Certainly homegardens are not a long-term solution to fight deforestation and they have little effect in areas where illegal extraction of valuable wood is the main reason of

deforestation. They are more of an incentive for a very early stage. [But] promoting homegardens could be a useful strategy for saving forests in areas where they are declining due to large-scale biomass extraction," he said.

Mukul concludes by pointing out that improving socio-economic conditions in rural villages near threatened forests, as well as raising awareness about conservation, are equally, if not more important, for helping to stop deforestation.



"In the context of the rapid loss of forest vegetation in the developing world, homegardens will have to play an important role as a substitute source of natural forest products, including biomass fuel!"

Biomass collection from forests is one of the main causes of deforestation in developing countries. Photo: Sharif A. Mukul



Vertical stratification of a rural homegarden near Noakhali, Bangladesh. Photo: Sharif A. Mukul