



# Bioenergy and food security

Bioenergy presents both opportunities and risks for food security. It could revitalise the agriculture sector, foster rural development and alleviate poverty, not least by improving rural access to sustainable energy. But if not managed sustainably, it could seriously threaten food security, hindering access to food for some of the most vulnerable.

## The current situation

Bioenergy can help mitigate climate change, but not if forests and peatlands are cleared to cultivate energy feedstocks. Producing biofuels from agriculture and forest residues may offer an alternative, but the technology is not yet commercially viable. Policy makers face the challenge of calculating how to exploit bioenergy opportunities while ensuring that people can continue to grow or buy adequate supplies of food.

For millennia, households have used bioenergy in the form of biomass from wood and organic wastes. This “traditional” bioenergy provides up to 95 percent of energy needs in developing countries (*see Biomass: energy source for 2.4 billion people overleaf*). Interest in developing modern bioenergy forms, such as liquid biofuels, emerged in the 1970s. Today, desire for more diverse energy supplies, concerns about climate change, and record-high crude-oil prices are driving its growth. Bioenergy can contribute to climate change mitigation, but the potential varies greatly between different feedstocks, locations and methods.

Bioenergy production can benefit rural development and reduce poverty by increasing employment and creating new market opportunities. Modern bioenergy sources are also a promising source of cleaner and more efficient energy for rural areas. However, harnessing these benefits requires mechanisms that promote participation by small-scale farmers and poor people.

Recently, liquid biofuels for transport have experienced the most growth. Developing countries in tropical zones have a comparative advantage in growing feedstocks for biofuels, but current demand growth is strongest in industrialized countries. Feedstock for current biofuels comes from food crops, including

sugarcane, maize, oil palm and canola, affecting food supply. Biofuel production also competes for natural resources such as land and water and causes land use change. Competition can be reduced with improved technologies, such as by converting cellulose into energy, and production of new energy crops on land unsuitable for growing food.

The production and consumption of liquid biofuels is highly concentrated. Approximately 90 percent of ethanol is produced in the United States and Brazil, while biodiesel is mostly produced in Germany and France. Today’s biofuel market, particularly in OECD countries, is driven by measures – mandates, subsidies, tax incentives, and tariffs – that favour domestic production and hinder international trade.

## How food security will be affected

Risks to food security through higher prices are greatest where bioenergy is based on food crops or uses land and water that would otherwise go for food production. This competition is more acute in producing liquid biofuels than in biomass for heat and power. Based on current technology, the rapid expansion of liquid biofuels is contributing significantly to rising food prices. This benefits rural farmers with surplus to sell but hurts urban consumers and the rural poor who must buy food. Pressures on food supply can be reduced through technologies that make use of degraded or marginal lands, sustainably intensifying production, integrating food and energy production systems and appropriate farming practices.

Food security may improve locally where the demand for feedstocks drives investment in agriculture, creates new employment and market opportunities for small

## Key facts

- Bioenergy meets approximately 10 percent of global energy demand, around 80 percent of it as solid biomass for heating and cooking.
- Liquid biofuels account for less than 2 percent of road transport fuels worldwide; this is projected to rise to nearly 5 percent by 2030.
- Brazil’s biofuel sector accounted for about 1 million jobs in 2001, mostly for unskilled workers in rural areas.
- In 2007/08, in the United States around 27 percent of the maize crop is projected to be used for ethanol.

producers, and revitalizes the rural economy. To what extent households can benefit from this will vary according to population and income, location, age and gender, and with the production system – large plantations or individual farms. Large-scale plantations could provide jobs for labourers but might displace small-scale farmers. Support for outgrower schemes and cooperatives and pro-poor bioenergy policies that ensure land tenure security for marginalized farmers could help mitigate the negative effects.

### What is to be done?

Policy-makers have a major role in ensuring that bioenergy is developed sustainably, safeguarding food security and ensuring that benefits reach the poor and vulnerable. Policy priorities include market and technology promotion, participatory processes and social protection:

- Safety nets: to mitigate impacts of higher food prices, the poor and food-insecure will need support such as food vouchers or other targeted subsidies.
- Policies: especially in promoting liquid biofuel, policies should be market-oriented, eliminating distortions that

create artificially high growth rates and hamper international trade for developing countries. Bioenergy policies should also promote environmental sustainability and foster market opportunities for smallholders and other vulnerable groups.

- Price transmission: if farmers receive higher commodity prices, they will be more motivated to expand production and raise productivity. This requires investing in market institutions and physical infrastructure and preventing export restrictions.
- Better farming practices: practices that increase productivity, mitigate environmental impacts and/or integrate better food and energy production are needed. This requires financial support, more inputs and access to appropriate technologies.
- Technologies: improved technologies should be developed and promoted to reduce competition for food and natural resources.
- Stakeholder participation: including small-scale farmers and rural communities in decision making on bioenergy development will enhance rural development benefits.
- Extension services: upgraded extension services and stronger institutions will be needed.

### Biomass: energy source for 2.4 billion people

The majority of poor rural people already rely on traditional bioenergy for their energy needs. Traditional used for heating and cooking, it is not very efficient and has been linked to indoor air pollution, accelerated deforestation, land degradation and soil erosion. The challenge is to develop energy systems that generate jobs without displacing people or hampering food security and improve local access and use of cleaner and more efficient energy sources. For example:

- Producing bioenergy from crop residues unsuitable for use as fertilizers could provide energy for rural areas
- Feedstock could be produced on individual farms, but this will require appropriate systems to collect, transport, store, handle and process the fuel. Large-scale systems can include poor farmers by adopting plantation-outgrower schemes under fair price contracts.

Efficient industry-based systems can supply energy for both industries and communities. Cogeneration plants using waste from sugarcane production provide close to 40 percent of the energy in Mauritius.

### Brazil: linking small farms and big biofuel producers

Brazil's poor farmers benefit from biofuel production through the Social Fuel Seal (*Selo Combustível Social*) programme. Biodiesel producers who buy feedstocks from small family farms in poor regions pay less federal income tax and can access finance from the Brazilian Development Bank. By the end of 2007, 400 000 small farmers had joined the scheme. The farmers are organized into cooperatives and receive training from extension workers. During the national petroleum agency's biodiesel auction in December 2007, 99 percent of the fuel sold came from companies with the Social Fuel Seal.

## Contacts

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