



IFAD/U. Heer



China biogas project turns waste into energy

Animal manure is a source of methane, the main component of natural gas and a potent greenhouse gas when released to the atmosphere. But methane can also be captured and used as a source of clean, renewable and affordable energy. An IFAD-supported project in China provided about 30,000 poor households with nearly 23,000 ‘biodigester’ tanks for biogas production. As a result, methane emissions dropped, incomes rose and household sanitation and health improved.

Biogas is a fuel produced during the anaerobic digestion of agricultural and animal waste. With biogas technology, waste is stored in specially constructed containers, known as a biodigester or biogas plant. Besides producing fuel, biogas digesters have the added benefit of producing a high-nutrient fertilizer and encouraging better sanitation on farms.

Methane, which is released from animal manure, is a major greenhouse gas. It is second to carbon dioxide in the amount

generated but its global warming potential is 22 times more damaging. Burning bio-methane reduces methane’s more damaging global warming effect.

China has successfully promoted the use of biogas as a source of household energy since the 1980s. In the 1990s China’s biogas strategy was extended to remote communities in west Guangxi, where wood for fuel was in short supply and rural electricity was not available. In 2002 the strategy was a key component of a six-year IFAD-funded project to improve and sustain the livelihoods of poor rural people while rebuilding and conserving natural resources.

Improving health, saving money

Most of the farmers who live in Guangxi province do not earn enough to pay for fuel or electricity, and few are connected to the power grid. Women, who generally have the responsibility of collecting fuelwood, spent hours every day collecting wood and then spent more time cooking in their smoke-filled homes.

“We used to cook with wood,” says Liu Chun Xian, a farmer involved in the project. “The smoke made my eyes tear and burn and I

Photo: With help from an IFAD-supported project, 30,000 poor rural households in West Guangxi are now producing biogas and saving an estimated 7,500 hectares of trees each year as a result

always coughed. The children too were often sick and had to go to the clinic, which was expensive. Now that we're cooking with biogas, things are much better."

Each household involved in the project builds its own plant to channel waste from the domestic toilet and nearby shelters for animals, usually pigs, into a sealed tank. The waste ferments and is naturally converted into gas and compost. In addition to producing energy, the project has resulted in better sanitary conditions in the home.

The poorest households, which had only one pig, built small units that could produce enough gas to provide lighting in the evening. Households with two or more pigs built larger units that could produce gas for cooking as well as for lighting.

Huge payoffs lead to high adoption rate

The double bonus of energy and compost motivated poor people to adopt this technology in significant numbers. By 2006, the project had exceeded its target by providing more than 22,600 biogas tanks and helping almost 30,000 households in more than 3,100 villages. As a result, 56,600 tons of firewood can be saved in the project area every year, which is equivalent to the recovery of 7,470 hectares of forest.

"Farmers used to spend a lot of time collecting wood," says Lu Gui Hong, the mayor of Fada, a village included in the project area. "As you can imagine, it wasted a lot of time. Since we constructed the biogas digesters, farmers have a lot of time to find other ways of earning money. For example, in my village we now grow tobacco and organic tea."

In the last five years, with more time to spend improving crops, farmers in Fada have increased tea production from 400 kilograms to 2,500 kilograms a day. Average income in the village has quadrupled to just over US\$1 per day. This is significant in a country where the poverty line is 26 US cents per day.

Looking towards a more viable future

"We hope to continue to improve living conditions and to make the environment greener and people's lives richer," says Lu Gui Hong. "In 20 years from now, you won't see any wood smoke at all coming out of houses here."

Through the use of biogas, people's living conditions and the environment have improved, forests are protected and the labour force has more time for agricultural production. A large amount of straw, which was previously burned, is now put into biogas tanks to ferment. This further reduces air pollution from smoke and helps produce high-quality organic fertilizer.

The lives of women, in particular, have been transformed by the project. Since Liu Chun Xian's family began producing biogas on their farm, she no longer spends three hours a day collecting wood for cooking. Instead, she has taken training that has helped her improve the family's tea farm, which now generates more money. Thousands of poor farmers across the province have done the same, contributing to a drop in rural poverty.

The Guangxi project has become a catalyst for other initiatives in the region. To date, 2.73 million biogas tanks have been built in villages, benefiting about 34.2 per cent of the rural households in Guangxi. It is estimated that 7.65 million tons of standard coal and 13.40 million tons of firewood are saved annually in Guangxi because of the use of biogas.

KEY FACTS

West Guangxi Poverty-Alleviation Project

Partner: World Food Programme

Total cost: US\$107.3 million

IFAD loan: US\$30.4 million

Duration: 2002-2008

Geographical area: Guangxi Zhuang Autonomous Region

Directly benefiting: 240,000 households

Status: ongoing

CONTACT

Thomas Rath

Country Programme Manager IFAD

Via Paolo di Dono, 44

00142 Rome, Italy

Tel: +39 06 54592069

Fax: +39 06 54593069

t.rath@ifad.org

LINKS

IFAD in China

<http://www.ifad.org/english/operations/pi/chn/index.htm>

Rural poverty in China

<http://www.ifad.org/operations/projects/regions/PI/factsheets/cn.pdf>

U.S. Environmental Protection Agency methane information

www.epa.gov/methane

Stories from the field

<http://www.ifad.org/story/index.htm>

Building a poverty-free world

IFAD was created 30 years ago to tackle rural poverty, a key consequence of the droughts and famines of the early 1970s. Since 1978, IFAD has invested more than US\$10 billion in low-interest loans and grants that have helped over 300 million very poor rural women and men increase their incomes and provide for their families.

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International Fund for
Agricultural Development
Via Paolo di Dono, 44
00142 Rome, Italy
Tel.: +39 06 54591
Fax: +39 06 5043463
E-mail: ifad@ifad.org
www.ifad.org
www.ruralpovertyportal.org