

Bioenergy and Rural Development: Carefully Planting the Seeds of Poverty Alleviation

How can bioenergy contribute to rural development and poverty alleviation? GNESD's ongoing thematic study examines this complex question by reviewing 20 developing countries in the context of their current bioenergy status. Ten GNESD Centres of Excellence, under the coordination of Brazilian Centers (Cenbio/USP and CentroClima/UFRJ), are involved in the study, which was launched in December 2008. While bioenergy has been examined before, this study is a departure from previous analyses undertaken by UN and other multilateral agencies, which mostly addressed trade issues and focused primarily on liquid biofuels. GNESD's report considers all forms of bioenergy—solid, gas, and liquid—to see what role each can play in enhancing the lives of poor people in rural areas and fulfilling their development goals.

Bioenergy has always been part of the energy mix in developing countries. Ever since the discovery of fire, bioenergy—the use of organic materials to provide heating, lighting and motive power—has been one of the most dominant sources of energy worldwide. Today, bioenergy provides about 14% of the world's primary energy supply, and in some developing countries where it is heavily used for cooking and heating, the share can be as high as 90%.

Today, we make the distinction between two types of biomass (the materials used to produce bioenergy): "traditional" biomass, mainly unsustainably harvested wood and charcoal used inefficiently for household heating and cooking; and modern biomass, sustainably-produced biofuels made from energy crops and rural, urban, and animal residues, used to create renewable energy for transportation and electricity production.

The study is covering a wide range of bioenergy use issues. After the initial inception phase, which included a detailed analysis of the potentials within all three types of bioenergy, the centres are looking at the data in the context of sustainability, financing, job creation, food security and whether large plantations are compatible with small farmer programs, among other issues, and identifying the biggest barriers to implementing sustainable bioenergy in each country.

The study's preliminary findings show that though most countries still rely heavily on traditional biomass, there is both high potential and interest in modern forms of bioenergy, both as a sustainable alternative to fossil fuel for transport, as well as a means of decentralized energy production. Many countries already have national programs in place to promote the production and use of bioenergy, and most of these are geared towards rural development goals and reducing poverty. However, a lack of regulatory and policy frameworks is keeping many of these programs from realizing their potential. The report also points out that in order to make these programmes both sustainable and affordable, developing local energy production activities is essential.



Jatropha plants need a framework to grow on in Ghana

In West Africa, there is intense interest in the jatropha plant, which requires little water and can grow on low-quality land, for producing biodiesel. While governments may encourage plantations on idle and degraded lands, private companies do not always follow suit. Since a national initiative was introduced in Ghana in 2006, some 20 private companies (mostly foreign owned) have started large-scale projects, and today 19% of all agricultural land is either planted with jatropha or earmarked for future cultivation. At present there are no specific bioenergy policies or regulatory frameworks to monitor these companies' actions, and a potential threat to food security looms as subsistence farmers are displaced to create large plantations.

The centres stressed the importance of ensuring that biomass is cultivated in areas that do not jeopardize water, land, or food security. In many countries, available land and water is limited, and unregulated biomass cultivation can pose a serious threat. In these



areas, adequate environmental zoning can play an important role. In some cases, the most practical form of bioenergy farming involves no additional planting. In regions where agricultural practices are very inefficient, such as Africa, there is substantial bioenergy production potential to be tapped simply through increased productivity on existing lands.

Putting agricultural waste to work in Kenya

One of the most promising bioenergy options in Kenya is the use of agricultural waste to produce biofuels, which requires no new plantations nor disrupts existing farming practices and food production. The study recommends encouraging existing Kenyan agro-industries to adopt high-efficiency bioenergy technologies, such as cogeneration power plants, that can efficiently utilize existing solid biomass wastes to generate electricity for its own consumption and for sale to the national grid.

Though the potential for bioenergy in developing countries is considerable, there are significant barriers to be overcome. Most strikingly, lack of policy and regulatory frameworks, infrastructure and trained local workforce are slowing down the implementation and efficiency of bioenergy projects. The first step, according to the centres, is establishing frameworks so that a bioenergy industry can take root and create instruments to promote new energy options. Brazil, Malawi, and Columbia, for example, established a mandatory biofuel blend that created a captive market. In Thailand and China, the creation of renewable portfolio standards, feed-in tariff incentives, RE purchase obligations, and competitive biddings helped

All technical reports will be available on the GNESD website soon. A Summary for Policy Makers will be launched in April 2010.

For more information on the bio energy study and other GNESD Studies, please visit the GNESD website on www.GNESD.org

Less may be more in China

While the government strategy currently encourages large-scale biomass-burning power generation, this approach may not be the most cost-effective in terms of investment, resource use and development. The study found that village-based gasification and biogas heating and power projects produce far more economic, social and environmental benefits.

Biogas for clean cooking in India

An NGO based in southern India has successfully used surplus cow dung in rural areas to generate biogas: after five years of operation, 95% of the 60,000 biogas plants installed are still providing clean cooking gas to rural populations. The Indian programme has also created employment for local youths, thereby eliminating their need to migrate to the cities to seek work.

Among other benefits, R&D for biofuel technology and electricity production presents an excellent opportunity for South-South co-operation, as is the case in Latin American countries with bioethanol and biodiesel, and in India with small-scale gasifiers. In this regard, the study notes that international foster agencies can play an important role by helping countries build infrastructure, enhance capacity, and facilitate technology transfer through South-South cooperation.



GNESD

Secretariat:

The GNESD Secretariat is located at Risø National Laboratory (RNL) at DTU, Denmark, which is also the host of the UNEP RISØ Centre (URC).

GNESD Secretariat
 Risø National Laboratory - DTU
 Technical University of Denmark
 Frederiksborgvej 399, P.O. Box 49
 DK 4000 Roskilde, Denmark
gnesd@risoe.dk
 Tel: +45 4677 5131 Fax: +45 4632 1999

A dedicated web site for the GNESD is located at www.gnesd.org. This newsletter provides information on the activities of GNESD and the views expressed do not necessarily represent those of UNEP or Risø National Laboratory. For additional information or comments please contact the editor, Mette Annelie Rasmussen (meta@risoe.dtu.dk). GNESD is printed on 100% recycled, chlorine-free paper. Layout by Finn Hagen Madsen, finn@studio8.dk.