



Workshop 3.3: Sustainable biofuel production in developing countries: "Green" energy as the key for development?

Convenors: **Harry Hoffmann** and **Götz Uckert**

From biomass to biomass: Influential factors of biogas projects in rural areas of Burkina Faso

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The energy situation in Burkina Faso is one of the most critical issues to be addressed in the country. Biogas is thought to be one of the most sustainable solutions for developing energy self-sufficiency in rural areas. Although biogas has a long history in the country, no significant breakthroughs have occurred yet. The study analyzes the partial success and failures of the attempts to install biogas plants. The result is a table of influential factors for biogas projects which were grouped into eight main categories and will serve as planning framework.

Bioenergy value chains in Namibia: Institutional challenges for rural development and food security

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This paper elaborates on the impacts of bioenergy production in Namibia on rural development and food security and the institutions shaping these. The two presently most promising bioenergy feedstocks are analysed along different value chains: *Jatropha curcas* into straight vegetable oil and biodiesel, and invasive woody shrubs into charcoal, pellets, and woodgas. While land is relatively abundant, several other factors constrain agricultural development, especially in the poorer communal areas. The study finds that bioenergy investments can (practically) overcome these problems though need to be accompanied by strong government regulations and institutions, not yet sufficiently developed in the country.

Development and adjustment of sustainability indicators for evaluation of outgrower schemes in bioenergy production: The case of Tanzania

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The project Better-iS will contribute to the increasing global demand for sustainable produced bioenergy by developing a Sustainability Impact Assessment Tool for decision makers with special emphasis on contract farming in Tanzania. Therefore, a set of related indicators was developed in workshops with local bioenergy experts, based upon promising sustainability certification approaches. In the second research step, the derived set was translated into quantifiable parameters. Their applicability on the ground was tested in a field survey between March and June 2010. This article will present the preliminary results and discuss the challenges and opportunities of sustainability related indicator development.

New Zealand: sustainable biofuel production using new crop cultivars and legumes in a closed-loop nitrogen supply cropping system for use on marginal land

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New non-woody plants with high nitrogen-use efficiency in combination with N-fixing legumes are being screened to produce biomass not requiring external nitrogen input on marginal land. A key element of this closed-loop nitrogen supply system is conversion of biomass into biogas using anaerobic digestion, with the biogas digestate returned to the energy crops (with a potential of a surplus being used for food/feed crops). This integrated system to displace fossil fuels will facilitate self-sustaining rural communities via distributed biofuel made from crops such as subtropical C4 grasses and perennials lucerne and topinamber able to grow on previously underutilised lands.



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The national program for production and use of biodiesel and its social components – Findings from Brazil

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This paper presents empirical findings based on expert interviews from a field study in Ceará, Northeast Brazil. It analyses the implementation of the National Program for Production and Use of Biodiesel. With its focus on social inclusion the newly developed Social Biodiesel Label encourages the collaboration between biodiesel producers and farmers in delivering the feedstock. Several problems were analysed during the first phase of implementation, such as the participation of farmers in the program, farmers' delivery of castor oil as feedstock, and the control process of the Social Biodiesel Label. Furthermore federal public supportive policies for small scale farmers and prospective developments will be discussed.

Biomasses for energy: Application of some synthetic-quantitative index

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Looking at biomass as source for energy production we apply two widely used quantitative indexes (LCA and EROEI) to three cases-studies. The cases are different for the used biomasses and for environmental context. The results show the relevance of the boundaries definition to obtain an objective evaluation of the possible choices, and consequently the usefulness of the concept of microsystem in analysing the convenience of any "energy production chain". The use of a decision supporting system (ELECTRE®) is also shown to be a crucial tool to obtain a reliable ranking among different alternatives subjected to mixed criteria.

Success factors for standards and certification schemes for biofuels: "Sustainable Palm Oil" from a small-scale farmer and development perspective

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The global demand for bioenergy is triggering a booming market for biomass with far-reaching global consequences and sustainability concerns. Palm oil and its global production and consumption are used to illustrate these concerns. The sustainability of biomass value chains shall be ensured by standards and certification. Their effectiveness is investigated using a conceptual framework for identifying success factors and evaluating a standard setting initiative for palm oil. Key findings are the importance of power balance in standard setting processes, the coverage of the whole value chain and the need for coherent policy frameworks to address weaknesses of market-driven governance models.

Biofuels for rural development: Lessons learnt and approaches in development cooperation

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The question of how biofuels contribute (or not) to rural development is still debated: How can we avoid resource conflicts and depletion while making use of additional income opportunities from renewable energy markets? One key answer is that smallholders and the local population should be able to participate equally in biofuel value chains. Experiences from development cooperation highlight the importance of adequate training and organization of farmers. The approach of partnership farming offers new ideas on how to improve the relationship between farmers, labourers and buyers while building up knowledge on sustainable agriculture and market access.

Development perspectives of the biobased economy: The need for a systems approach

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In this presentation the discussion of agricultural futures in a biobased economy is framed by commitments underpinning the MDGs. An outline of the biobased economy, its perspectives for agriculture and for development will be presented as well as possibilities of the development of bioproducts and advanced biofuels. Biobased products that offer most development perspectives will be discussed with special focus on products like fine chemicals. Identified research challenges include the development of production chains and of biosolar cells as well as the selection of model crops that offer perspectives for less favoured producers and underdeveloped rural areas.