



Welcome to a new issue of the Development News published by Forest & Landscape Denmark (FLD), Faculty of Life Sciences, University of Copenhagen.

We report on our projects, education programmes and publications. Among the various subjects in this issue I would like to point out the following:

- Extraction of oil from *Jatropha curcas* has created interest world-wide, as it is seen as a potentially suitable source for sustainable, local production of bio-diesel in developing countries. Together with institutions in West Africa, we are testing the validity of this assumption.
- The National Forest Programme of Cambodia, in their aims to establish sustainable management of the forest for the next 20 years, has received assistance and knowledge in the fields of organization, planning and capacity building from FLD researchers.
- The emission of nitrogen to the atmosphere is increasing globally, and the possible consequences of elevated nitrogen input in tropical and subtropical forests have only been addressed in a few studies.

Yours sincerely  
Dr. Niels Elers Koch, Director General



## National Forest Programme Development

Forest & Landscape Denmark has assisted the Royal Government of Cambodia in the development of their National Forest Programme since 2007. Now, in early 2010, the final adjustments and approval by the Council of Ministers is taking place.

The Government of Cambodia has embarked on an intensive process of developing and implementing a National Forest Programme aimed to place good forest governance and partnerships at the centre of sustainable forest management.

The purpose of the National Forest Programme is to establish a policy

framework for the sustainable management of the forests for the next 20 years.

The programme consists of:

- 1: A process guided by principles of good governance, stakeholder participation, inter-sectoral co-operation and consultations between government institutions, communities, the private sector, knowledge institutions, civil society organisations and NGOs.
- 2: A reference for forestry stating shared vision, objectives, challenges, priorities and approaches for the future.
- 3: Documentation through:  
A Strategic Framework;  
A Background and Analytical Document;



An Implementation Framework comprising six programmes and associated sub-programmes.

The process of developing the National Forest Programme has been highly transparent and effective in attracting considerable participation through six cross-sectoral working groups, task forces, workshops and five 2-day public consultations resulting in significant contributions; and in raising the profile of important development issues.

It is evident that bringing stakeholders together for such an undertaking is a significant achievement. Moreover, a foundation has been built based on confidence, working relationships and capacity development.

The National Forest Programme is an essential and important strategic move and accomplishment for Cambodia - a country with more than 80% of the population dependent on the sustainable management of natural resources.

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## Nitrogen in tropical forest - effects of increased emissions

The emission of nitrogen to the atmosphere is increasing globally. While the emissions have stagnated in Europe, the emission is increasing rapidly in Asia in regions with strong economic growth. The possible consequences of elevated nitrogen input in tropical and subtropical forests has only been addressed in a few studies.

The first large field scale nitrogen input manipulation study in the humid tropics was established in 2004 at the Dinghushan Biosphere Reserve, China in cooperation with Professor Per Gundersen, Forest & Landscape, University of Copenhagen. The impact of several levels of nitrogen deposition has been studied in a land use gradient from mature natural rainforest over an ecosystem in succession to a plantation forest. The experiment is run by a Chinese research group headed by Prof. Mo, South China Botanical Garden, the Chinese Academy of Sciences, and includes studies of the impact of nitrogen on tree growth and physiology, plant diversity, soil fauna, soil microbiology, N cycling, interaction with phosphorus, nitrate leaching, carbon sequestration and greenhouse gas exchange.

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## Domestication programme on *Jatropha curcas* in Mali

*Jatropha curcas* is a (sub-)tropical shrub that is unique because of the fruits, which have a high content of non-edible oil suitable for bio-diesel. The species originates from Central America but is also grown in Asia and Africa. The overall idea of the *Jatropha* project is to contribute to sustainable, local production of bio-diesel from *Jatropha curcas* in Mali. This is accomplished by dissemination of basic pre-breeding knowledge and by facilitating future access to tested and selected

plant material with a high oil production under dry growing conditions.

The project is carried out between partners from Institute d'Economie Rurale (IER) in Mali, the World Agroforestry Centre (ICRAF), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Mali Folkecenter (MFC) and Mali Biocarburant SA, and FLD. Two Ph.D. projects will be initiated within the project.

Material has been collected from African landraces and from natural populations in Mexico to examine the breeding system of the species and population genetic structure of natural populations and landraces. The Mexican material was collected in collaboration with Centro de Investigación en Alimentación y Desarrollo (CIAD) and Centro de Desarrollo de Productos Bioticos (CEPROBI).

The genetic material will further be tested at four on-station field trials at sites with different climates. Along with these experiments a sub-set of the genetic material is tested by local farmers.

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*Please also read the abstract of the article "Towards domestication of *Jatropha curcas*" presented under New Publications.*



## Rural livelihood workshop and network

Numerous research fields are interested in the understanding and analysis of the livelihoods of poor rural households in the developing world: Their livelihood strategies, the choices made by poor households to cope with change and risk, the social, economic and environmental constraints under which they operate, the role of socio-cultural norms in forming options for development and improved welfare and many other questions. The answers to this kind of question are crucial to understanding what will bring about true and sustainable development for the rural poor and how they will react to different policy measures and incentives. One may take several approaches to address such questions, and indeed economics, political science, environmental science, sociology etc have all developed approaches of interest.

Among these approaches, quite a few rely on analysis of information that are often quantitative in nature, e.g. large scale household surveys, targeted field surveys of house-

holds and e.g. environmental conditions etc. Also Forest & Landscape, University of Copenhagen, has a large number of projects undertaking household level analyses, in particular in relation to the worldwide Poverty and Environment Network (PEN), which has collected household level information on social, economic and environmental aspects of rural livelihood for several years and in several countries.

In relation to these activities and to seek fruitful cooperation across the different disciplines and across partner institutions, Forest & Landscape, University of Copenhagen, hosted a workshop on rural livelihood analysis on March 24th 2010. The workshop and network were organized by Professor Nikolaj Malchow-Møller (University of Southern Denmark), Professor Henrik Hansen and Professor Bo Jellesmark Thorsen (both University of Copenhagen). Participants in the network include about 25 Ph.D-students, post docs and researchers from three universities and some five institutes within these - and represent several nationalities.

At the workshop, researchers gave brief presentations of their research questions, methodological approaches and not least their empirical data and their potentials. Several fields of future synergy gains were identified, including very concrete sharing of data and analytic competences and joint research efforts on risk and shock coping strategies of rural poor in Africa. In a broader perspective issues of impact evaluation, coping strategies and also the relation between institutions, development and environment, e.g. common pool resources, were identified as fruitful fields for cooperation.

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## News from TEAKNET

An international conference on teak will be held at Turrialba, Costa Rica during March 2011. The conference will be jointly organized by CATIE, FAO of the United Nations and TEAKNET. The First Announcement in this regard will be made in May 2010. See further at [www.teaknet.org](http://www.teaknet.org).

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## E-learning course in Tropical Forest Seed

A number of practical courses on tropical forest seed were launched through the former Danida Forest Seed Centre (DFSC). This type of training basically ceased when DFSC became part of FLD in 2004. However, acknowledging the continuous demand for capacity building in the area of tropical forest seed, yet acknowledging the technical field as a relatively narrow area in an educational context, i.e. with few potential students in any country, FLD, LIFE, University of Copenhagen has decided to revive the forest seed capacity building in a new set up. The Faculty of Life Sciences (LIFE) will offer a course in Tropical Forest Seed, as a formal university course under Agricultural Development. The course will be launched as a 100% e-learning (on-line) course, implying that it can be followed from any place in the world with access to internet. Students must, however, be registered at the University. Applicability of course fee depends on the student

status (see [http://www.life.ku.dk/English/education/Online\\_and\\_Summer\\_Courses/Online\\_courses.aspx](http://www.life.ku.dk/English/education/Online_and_Summer_Courses/Online_courses.aspx)). The e-learning platform makes communication between teacher-student, and student-student easy. Lectures, exercises and guidance will all be through the e-learning forum. Final exam will be based on an approved project, which students will carry out in their individual country. The course will be taught partly by Millennium Seed Bank, Kew. Tropical Forest Seed will be launched the first time as a 9 week course in April 2011. Formal announcement including further details at the faculty's homepage (above http address) available in July 2010.

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## MSc programme in Sustainable Tropical Forestry

SUTROFOR is a joint programme developed and implemented by five European universities in Denmark, France, Germany, Italy, and Wales. The programme provides SUTROFOR students with direct access to the best tropical forestry teaching in Europe. You can access the global research networks of the teaching staff when you decide on your thesis topic. During the programme students will spend one year at each of two of the partner universities (University of Copenhagen, AgroParisTech in Southern France, Dresden University of Technology, University of Padova in Northern Italy and Bangor University in Wales). Besides the many smaller field trips which are part of the individual modules there is a joint summer course where all SUTROFOR students carry out field work in a tropical country - getting to use in the field the knowledge and tools that have been acquired throughout the programme's first year. In the second year it is possible to specialise within areas such as ecology, management, agro-forestry, forest-people relations or ethics and trade – all in relation to tropical forestry. For more information contact the SUTROFOR Secretariat ([sutrofor@life.ku.dk](mailto:sutrofor@life.ku.dk)). Read about the programme and partner universities, find application forms etc. at [www.SUTROFOR.net](http://www.SUTROFOR.net)

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## New Ph.d thesis

On 23. February Mr. Øystein Juul Nielsen defended his Ph.D thesis Rural Livelihoods, Coping Strategies and Forests in Mozambique.

The Ph.D explores the role of forest in poverty reduction and shock-coping strategies among rural households in Mozambique. The project is based on income, consumption and asset data from 2142 household interviews. Findings show that households use a variety of incomes to sustain and improve



their living. Agriculture provides the most promising means for poverty escape, while income opportunities such as wage work and commercial forest and environmental use have intermediate roles in poverty reduction. The extent to which households are forest-dependent depends on forest availability and market access. In areas with good market access and commercial forest products, forest use may have a poverty reducing role for a smaller subset of households. In areas where forest products are mainly used for subsistence, forest dependency is mainly conditioned by forest availability; households with less access to forest use other environmental resources to accommodate their needs. This happens without negative welfare implications. Poor households generally lack the means to cope with shocks, mainly because of limited assets and an uncertain income environment. Those able to overcome misfortune, as measured by their ability to maintain consumption, have access to work, agricultural stocks or money transfers. The few misfortune-exposed households that use forest as a fallback are unsuccessful in maintaining their wellbeing. Household wellbeing is also affected by seasonal income fluctuations. Households are in particular vulnerable to agricultural income shortfalls, and access to other income sources, such as wage work, money transfers, and forest and environmental income, becomes critical in filling income gaps. These findings suggest that poverty interventions should aim at inducing agricultural growth, or at least mitigate the risks to agricultural productivity, through policies that support investments and property rights. It is equally important that access to the few income generating opportunities available are maintained or improved. This may include access to forest resources.

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Note: All publications published by FLD, e.g. Development and Environment, Seed Leaflets, Working Papers and most 'Other Publications' can be downloaded free of charge from our homepage, where you can also read more about distribution of hard copies.

<http://en.sl.life.ku.dk> > Forskning > DevelopmentEnvironment > PUblications.aspx

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## New publications

**Wouter MJ Achten, Lene R Nielsen, Raf Aerts, Ard G Lengkeek, Erik D Kjær, Antonio Trabucco, Jon K Hansen, Wouter H Maes, Lars Graudal, Festus K Akinnifesi & Bart Muys, 2010. Biofuels (2010) 1(1), 91–107.**

### **Towards domestication of *Jatropha curcas***

*Jatropha curcas* L. attracts a lot of interest as a biofuel crop, triggering large investments and rapid expansion of cultivation areas, and yet, it should still be considered as a (semi-) wild, undomesticated plant. To use the full potential of *Jatropha* and to support further expansion and systematic selection, breeding and domestication are a prerequisite. This review reveals and identifies gaps in knowledge that still impede domestication of *Jatropha*. Prebreeding knowledge is limited. In particular, the regeneration ecology and the degree of genetic diversity among and within natural populations in and outside the center of origin are poorly studied. There is only a limited understanding of the *Jatropha* breeding system and the effect of inbreeding and outbreeding. This review presents all currently available and relevant information on the species distribution, site requirements, regeneration ecology, genetic diversity, advances in selection, development of varieties and hybridization. It also describes possible routes to a better *Jatropha* germplasm, gives recommendations for tackling current problems and provides guidance for future research. We also discuss the participatory domestication strategy of *Jatropha* integration in agroforestry.

**Carsten Laugesen, Ole Fryd, Thammarat Koottatep and Hans Brix, 2010, Reston, VA: ASCE Press, 978-0-7844-0999-2, 2010, 252 pp.**

### **Sustainable Wastewater Management in Developing Countries: New Paradigms and Case Studies from the Field**

<http://www.asce.org/Product.aspx?id=2147485653#Description>:

Wastewater management in developing countries throughout the world is in a state of crisis. It is estimated that 2.6 billion people worldwide live without adequate sanitation. Resources are scarce, previous management systems have failed, and traditional techniques and solutions are not immediate enough, too expensive, or simply inefficient. The book investigates the political, economic, and cultural reasons that so many developing nations lack the ability to provide proper and effective wastewater treatment for their citizens. The authors draw upon their experiences in Malaysia, Thailand, and other countries to inspire innovation and improvement in wastewater treatment and management. They examine the failures of traditional planning, design, and implementation, and offer localized solutions that will yield effective sustainable management systems. These solutions include reuse of treated wastewater, energy conservation, and proper financial and organizational set up. "Sustainable Wastewater Management in Developing Countries" will urge practitioners, decision makers, and researchers to approach these systems in new ways, that are practical, innovative and, best of all, sustainable.

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