

# ENVIRONOMICS

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## Director's Note

The 2<sup>nd</sup> Annual EERH Workshop was held on 10<sup>th</sup> February in Cairns as one of the Australian Agricultural and Resource Economics Society pre-Conference Workshops. Holding the Hub workshop adjacent to the AARES Conference facilitated increased interaction between the Hub members and the wider community of Environmental Resource economists. Holding it in Cairns also assisted in fostering links with MTCERF researchers. With around 80 people attending, the Workshop proved to be a lively and productive event.

As well as hearing presentations from a number of EERH project leaders and students, the Workshop audience enjoyed a number of invited speakers. Prof. Stale Navrud from the Norwegian University of Life Sciences spoke on the prospects for benefit-transfer across national boundaries, Steve Hatfield-Dodds (OCC) gave a policy adviser's perspective on climate change and Alex Michaelowa from the Institute of Political Science at the University of Zurich discussed the future of the CDM.

The diversity of presentation at the Hub Workshop illustrates the breadth of application to which the principles of economics can be applied. The range of projects being carried out within the Hub is currently expanding with the

## Successful Hub Workshop held in conjunction with AARES



*The Annual Hub Workshop provided a great opportunity for Hub members and delegates to network and update each other on their projects.*

allocation of funds under the "Emerging Research Issues" category. These include projects on the management of waste, the value of built heritage protection and incentives for marine biodiversity protection.

These projects are currently being negotiated with DEWHA staff and formal announcements will follow in future editions of *Environomics*. Another exciting initiative is the development of a major Symposium to be held on 16-17 September that will focus on "Invasive Species and Biosecurity". Again stay tuned for more details.



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### Invited Speaker - Professor Stale Navrud



*Professor Stale Navrud travelled from Norway to be the first invited speaker at the Environmental Economics Research Hub 2009 Annual Workshop in Cairns in February held in conjunction with the AARES annual conference.*

## In Search of Farm Waste : Professor Tor Hundloe, Griffith University



*Amy White shows the produce of a banana plantation however there are many waste streams from banana production.*

We hope the title of this Environmental Economics Research Hub study does not mislead. In case it does, the reader can note that the word "waste" is used due to the fact that any discard on the farm is commonly referred to as waste. We prefer to call our waste a "residue" – in fact, we are hoping to convert residues to resources, with a resource being an input into the production of a product in demand. To jump ahead of the story, the product in demand we have in sight is fuel to provide the power to drive machinery or produce electricity. In this case, there is an issue of insufficient demand. In the long run, with world population growth and expansion of the middle-class in China, India and some other developing countries there will be increased demand for energy. Put "peak oil" into the equation and the very likely prospect that national and global greenhouse gas policies will – eventually, if not tomorrow – result in decreased use of fossil fuels and our residue/resource will become more valuable – in greater demand.

You might ask why farm residues? There are various parts to the answer. First, attention has been drawn to the conversion of traditional food crops, such as corn/maize and

sugar cane/beet, as the feedstock for ethanol production. Palm oil in particular is identified with biodiesel production. The substitution of fuel for food has been blamed by a variety of commentators for food shortages in parts of the world, particularly the poorer parts. While this assertion does not necessarily stand up to economic scrutiny, we don't need to enter into that debate here. Associated with the use of corn/maize in the US for ethanol production is the large subsidies given to American farmers. This grant to farmers is more about agri-politics than addressing climate change and peak oil. There are less expensive ways for the American motorist to obtain ethanol, such as imports from Brazil.

The most problematic issue with the growing of crops to provide feedstock for ethanol or biodiesel production is the real (total or life-cycle) cost of production. Given that significant quantities of fossil-fuel based fertilizer, irrigation and mechanical and electrical energy is involved in the production it is not obvious that the net energy benefits are significant or even positive. A range of studies suggest that the net energy is minimal. In the context of a wide choice of alternative power services, particularly for stationary energy (which can be stored in batteries for transport energy), there are more economic options than growing the food crops as feedstock.

It was issues like these that drew our attention to the farm sector – and what it produces – as a potential source of inexpensive feedstock for alternative, renewable, low CO<sub>2</sub> feedstocks. For sometime now, the final product of farmed-meats, tallow, has been used for biodiesel production. Tallow has a history of being a residue converted to a resource. The refined fat has been sold in Australia from the early days of European settlement as dripping, used either as substitute spread (when butter or margarine were expensive) or as a cooking oil. The joint-product of refining tallow, glycerine, also has a long history.

Another derivative of farmed-crops is cooking oils, traditionally called vegetable oils to distinguish them from animal fats. While the use of these oils in the home is in small amounts, some types of fast food outlets, in particular fish and chip shops, use relatively large amounts. "Vegie-oil" enthusiasts and backyard biodiesel producers have for many years sourced used cooking oil as the base for biodiesel production – and with success.

Our interest in "farm wastes" was helped along by our knowledge of the use of tallow and used cooking oil to produce biodiesel. What other sources, particularly on the farm, of biofuels existed? This is where our research commenced.

Our investigations have taken us to a variety of farming districts along the east coast of Australia, from Tasmanian poppy farms in the south, to the banana plantations in far north Queensland. Our attention has been drawn to the very productive fruit and vegetable growing areas of far north Queensland.

*Continued on Page 4*



*Lisa Lee is a postdoctoral research fellow working with Professor Kevin Fox at UNSW*

## EERH project 9, Profile: Lisa Lee

### Salinity, Uncertainty and Property Rights.

My interest in environmental issues led me to undertake a resource economics degree at the University of Sydney. In between studies I worked short-term positions at the State Forest of New South Wales silviculture division, and the Australian Bureau of Agricultural and Resource Economics trade policy section.

In 2003 I took up a two-month internship position with the Yokohama City Council Environmental Protection Bureau in Japan. This experience gave me an insight of how pollution problems varied in different settings, subject to land and resource constraints, and led to a growing interest in water management.

Upon return I began my honours year focusing on water economics, analysing water efficiency options in a case study cotton farm in the Gwydir valley in NSW. I continued onto a PhD after graduating from honours, in which I conducted a cost-effectiveness analysis of achieving environmental targets based on the Namoi catchment.

The objective was to develop a decision-making framework using bioeconomic modelling, utilising geographical information systems (GIS) data, to simulate patterns of efficient water use in the catchment, and the effect of environmental policies, such as increased environmental flows and salinity reduction, have on production.

After completing the PhD in 2007, I started part-time at the Institute for Sustainable Futures as a research consultant. My main role was to analyse urban water consumption data, to evaluate the effectiveness of government subsidised programs aimed at reducing household water demand.

On the other days I worked part-time at the Centre for Applied Economic Research at the University of New South Wales as a post-doctoral fellow under Professor Kevin Fox, who is a research project leader in the Environmental Economics Research Hub (EERH). From August 2008 I took on a full-time post-doctorate position at the University of New South Wales.

As part of the EERH project "Salinity, Uncertainty and Property Rights" the objective of my research project is to explore how salinity mitigation policies can be designed to effectively achieve salinity reduction in light of significant uncertainty arising from the diffuse nature of the externality and the lengthy time lag between cause and effect.

The key methodology involves economic modelling to simulate the variance in outcomes due to uncertainties in various hydrological parameters. The results will then be applied to the design of a framework for applied policy settings, such as setting incentives in areas with high salinity-risk.

It is expected that the use of conservation tenders and auctions will be of particular interest as recent experiments have demonstrated their potential in delivering beneficial land use changes in a cost effective fashion.

### HUB THEME LEADER CONTACTS

#### Theme A.

Establishing viable markets to achieve environmental goals  
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Advancing Australia's capability for social and economic analysis of environmental issues at the regional scale  
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#### Theme B.

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#### Theme D.

Valuing environmental goods and services  
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## Farm waste continued from Page 3

Here both rainfall and soils have allowed the successful cultivation of a vast range of crops.

Consultations with farmers, Queensland DPI officers and industry bodies helped us to identify the potato, mango and banana industries as having substantial waste streams, in particularly the banana industry. The other products investigated include peanuts, avocados, pawpaws, various exotic fruits (e.g. lychees), straw plus animal products, although these were deemed to be inappropriate for a variety of reasons.

### Our Research Perspectives

About the time we were formulating our ideas on the use of farm residues to make biofuels two other organisations were developing research programs in the general bio-energy field. They are CSIRO and the Clean Energy Council. We met with the key stakeholders in these bodies, mainly to ascertain that there was any duplication of effort.

The Clean Energy Council has as its task the documentation of "all forms of stationary energy derived from biomass". The end product, the "Australian Bioenergy Roadmap", was published in September 2008. The only 'farm wastes' (termed agricultural related wastes by the Clean Energy Council) identified by the Council were timber and wood-related wastes.

The CSIRO project is focusing on a variety of first and second generation feedstocks, including wastes from wood production and processing, cereal stubble, sugar bagasse and municipal solid waste.

### For further information please contact:

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*Tor presenting at the first  
EER Hub Workshop held  
in Canberra in May 2008*



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