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## CONFERENCE SPONSORS

**Other Sponsors:**

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*PERTH CONVENTION BUREAU*
WELCOME

It is my pleasure, on behalf of the organising committee, to welcome fellow delegates to the 56th annual conference of the Australian Agricultural and Resource Economics Society. We have selected the Esplanade Hotel in Fremantle as the conference venue for its congenial atmosphere and excellent facilities. We are confident that you will find the services match the very high standards set by previous AARES conferences.

The AARES President-Elect, Mal Wegener, has assembled an outstanding list of invited speakers on the compelling themes of global food security, the impact of the energy and minerals sector on the economy and new funding mechanisms for rural research.

Combined with the three mini-symposia sessions covering themes in environmental policy, food systems, resources and energy issues, water policy, climatic impacts, structural adjustment in farming and world trade negotiations, I am sure that you will find the program challenging and interesting.

The program format mostly follows that of previous conferences, but there is an addition in the form of a poster session on Wednesday afternoon. This has provided an alternative to presenting contributed papers, as well as giving an opportunity to people who miss out on a contributed paper slot.

This year’s conference has continued to receive most welcome support from continuing sponsors as well as from this year’s platinum sponsor, the Department of Agriculture and Food Western Australia. Without such financial assistance the quality of the event would be significantly lower in respect of venue and audio-visual equipment. As well as our recognised sponsors who provided financial resources to support the travel and accommodation costs of some of our invited speakers, many of our invited speakers and participants in the workshops and mini-symposia were supported by their own or other organisations to attend without cost to the conference. The organisations which provided this substantial in-kind support are acknowledged in the program.

The social program has been compiled to offer delegates a variety of events in addition to the Welcome Reception and the Conference Dinner. We would particularly encourage all new members of AARES to attend the Trivial Tuesday Quiz at the Sail and Anchor Hotel, sponsored by the Local Branch. Also, don’t miss the Bowls and Pizza-Networking event on Thursday night at the Mosman Park Bowling Club.

Thank you for your participation in the conference. We are sure that you will find it both enjoyable and stimulating along with the rest of your visit to Fremantle and Western Australia.

David Feldman
Chair, Local Organising Committee
AARES, 2012
Local Organising Committee members
Secretary and handbook          Fiona Gibson, Caroline Mitchell
Contributed papers and mini-symposia   David Pannell, Maksym Polyakov
Invited speakers               Mal Wegener
Poster sessions               Ross Kingwell
Social programme             Jo Pluske, James Fogarty, Marit Kragt
Various                       Michael Burton
Sponsorship                   Bronwyn Crowe
Treasurer                     James Fogarty

AARES FEDERAL COUNCIL AND STAFF
Conference registration and website Annie Hurst, Terence Farrell

ALL OCCASIONS MANAGEMENT
Registration desk contacts:
Shanna Sheldrick – Manager, Conventions and Events
0437 377 107
Megan Watmuff – Coordinator, Conventions and Events
0439 339 067
GENERAL INFORMATION

ACCOMMODATION
Delegates need to have made their own accommodation arrangements for the Conference. The Esplanade Hotel is offering delegates a discounted rate of $218 per night. Please see hotel reception if you have any queries regarding your accommodation booking.

CAR PARKING
The Esplanade Hotel conveniently offers its guests secure valet parking for $28.00 per vehicle, per day. Rate is subject to change, please confirm rate at time of reservation. There are further parking structures on Marine Terrace and Collie Street which are a short walk to the Esplanade Hotel, as well as Fremantle Council monitored street parking nearby.
For delegates wishing to park for an entire day there is parking at the Collie St car park for which the Esplanade can provide a discount. When you park take a ticket, and then see the hotel registration desk for a discount ticket. Use both tickets to exit the car park. The cost should be $15 per day.

CATERING
Morning and afternoon teas will be served in the Southern Cross Lobby of the Hotel Esplanade. Lunches will be served in the Atrium Garden Restaurant.

CONFERENCE EVALUATION
An electronic evaluation will be distributed post-Conference. To assist with the planning of future AARES events, we hope that you will take the time to provide feedback on the Conference.

CONFERENCE PAPERS
Papers from the Conference will be made available on the AgEcon Search website after the Conference – http://ageconsearch.umn.edu/

DISCLAIMER
The information presented in this handbook is correct at the time of printing. In the event of unforeseen circumstances, the Local Organising Committee reserves the right to delete or alter items in the Conference Program.

DRESS STANDARDS
Conference Sessions – smart casual
Social Functions – smart casual

INTERNET
Wireless internet will be available free to delegates for the duration of the Conference.

LIABILITY/INSURANCE
In the event of industrial disruptions or natural disasters, Australian Agricultural and Resource Economics Society (AARES), the Local Organising Committee, or any professional Conference organiser engaged by the Society, cannot accept responsibility for any financial or other losses incurred by the delegates. The
Australian Agricultural and Resource Economics Society (AARES), the Local Organising Committee or any professional Conference organiser engaged by the Society take no responsibility for injury or damage to persons or property occurring during the Conference. All insurance, including medical cover, or expenses incurred in the event of the cancellation of the Conference are the individual delegate’s responsibility. Attendees are encouraged to choose a travel insurance policy that includes loss of fees/deposits through cancellation of your participation in the Conference, or through the cancellation of the Conference itself, loss of airfares for any reason, medical expenses, loss or damage to personal property, additional expenses and repatriation should travel arrangements have to be altered. The Conference organisers will take no responsibility for any participant failing to insure against these potential losses.

LOCAL TRANSPORT
Fremantle Train Station and Bus Port is located five minutes walking distance from the Esplanade Hotel Fremantle. Trains to and from Perth CBD operate from the Fremantle Train Station, with buses connecting to meet with the trains. There is a complimentary CAT bus that stops in front of the Hotel and runs 7 days a week. This bus takes you to all of the most popular Fremantle destinations. Please visit www.transperth.wa.gov.au for routes, timetables and fares.

Perth Airport is approximately 45 minutes from the Esplanade Hotel. The Fremantle Airport Shuttle bus is available from $30. For shuttle bookings please call (08) 9457 7150 or visit www.fremantleairportshuttle.com.au.

Taxi companies in Perth include:
Swan Taxis – 13 13 30
Black and White Cabs – 131 008

MESSAGES and NOTICES
Messages for delegates may be left with the staff at the registration desk. A noticeboard will be located near the registration desk; please check this board for messages and important information.

MOBILE TELEPHONES
As a courtesy to other delegates and speakers, please refrain from using your mobile phone within Conference sessions, and switch it off or to silent.

NAME BADGES AND TICKETS
Name badges will be issued at registration and should be worn at all times. Admission to the Conference and related activities is by name badge only. Tickets for social functions will be issued at registration, please ensure you have a ticket for each function you have booked for.

POSTERS
Posters will be available to view in the Southern Cross Ballroom Lobby for the duration of the Conference, and presenting authors should be by their posters during the allocated session and tea break immediately prior. All posters must be collected by 12.10pm on Friday 10th February.
REGISTRATION and INFORMATION DESK
All delegates must collect their registration pack upon arrival to the Conference. The registration desk will be located in the Southern Cross Ballroom Lobby at the Esplanade Hotel, and will be open during the following times:

**Tuesday 7 February:**
8:00am-9:00am and 4:00pm-6:00pm

**Wednesday 8 February:**
7:30am-4:30pm

**Thursday 9 February:**
7:30am-4:30pm

**Friday 10 February:**
7:30am-4:00pm

TIME ZONE
Perth operates on Western Standard Time, which is GMT plus 8 hours. Perth does not observe daylight savings time.

TOURIST INFORMATION
A map of Fremantle and information booklet will be provided in your conference satchel. Please visit the registration desk if you would like further information.

TRADE EXHIBITION
Delegates are encouraged to visit the Trade Exhibition, located in the Southern Cross Ballroom Lobby, during catering breaks.

SECURITY
Please ensure that you take all items of value with you at all times when leaving a room. Do not leave bags or laptop computers unattended.

SPECIAL REQUIREMENTS
If you have advised the Conference organisers of any special dietary requirements, please identify yourself to the waiting staff for assistance.
PRE-CONFERENCE WORKSHOPS

PRE-CONFERENCE WORKSHOP 1

TRANSACTION COSTS IN ENVIRONMENTAL AND NATURAL RESOURCE POLICY

Convenors:    David Pannell, University of Western Australia  
               Laura McCann, University of Missouri  
               Dustin Garrick, University of Oxford

Speakers:     Laura McCann, Evy Mettepenningen, Graham Marshall, Keely Harris-Adams,  
               Albert Ofei-Mensah, Dustin Garrick, James Skurray, Lin Crase, David Pannell, Martin van  
               Bueren, Adam Loch, Anthea Coggan

Sponsors:     In kind support for this workshop was provided by the Centre for Environmental  
               Economics and Policy, University of Western Australia

The field of transaction costs research has advanced in agricultural and resource economics in the fifty years since Coase’s seminal article on externalities in natural resource allocation. A key shift occurred in the 1980s with the rise of new institutional economics and a departure from assumptions of zero transaction costs. In addition to Coase, Douglass North and Oliver Williamson have won Nobel Prizes in Economics, in part for their work on transaction costs. While the area of transaction costs in general has thus received widespread attention, much of the work has focused on market transactions and governance of private firms. However, transaction costs are particularly relevant in the case of natural resource and environmental policy. Transaction costs helped to explain impediments to policy changes and reallocation because property rights in complex resources are difficult and costly to define and manage. This workshop takes stock of the state of transaction costs research in environmental economics and policy analysis by reviewing theoretical traditions, methodological innovations, empirical results, policy implications and new research directions. It further considers opportunities to incorporate transaction costs into applied policy and benefit-cost analyses.

There will be three themes in the day:
(a) Theory and methods
   - Review of theoretical traditions and core concepts in transaction costs and natural resources
   - Purposes of transaction cost measurement and analysis
   - Measurement and modelling techniques
   - Transaction costs and benefit-cost analysis
(b) Empirical results
   - Case studies of empirical research
   - Synthesis and gaps by sector (e.g. water, conservation, environmental quality)
(c) Implications for policy
   - Determinants of transaction costs
   - Policy design
   - Benchmarking and policy evaluation
   - Applications and administrator needs
**PRE-CONFERENCE WORKSHOP 2**

**GLOBAL FOOD SECURITY: GETTING POLICIES AND INSTITUTIONS RIGHT**

Convenors: Kym Anderson, University of Adelaide and CEPR
Phil Pardey, University of Minnesota and InSTePP

Speakers: Phil Pardey, Kym Anderson, John Freebairn, Brian Wright, Julian Alston, Signe Nelgen, Will Martin, John Freebairn, Per Pinstrup-Andersen, Anna Strutt,

Sponsors: In kind support for this workshop was provided by ACIAR, Bill and Melinda Gates Foundation, IFPRI, RIRDC and World Bank

There are many dimensions to food security concerns. This workshop focuses on two fundamental ones: the trend level of food prices, and the variance around that level.

National governments, groups such as the G-20, and the major international economic organizations have worried over food price variability over the past four years. Certainly some groups are harmed by fluctuating prices, but others may benefit. Understanding the causes and effects of those fluctuations – and of the likely effects of policy responses to price spikes on markets, aggregate national welfare and its distribution – is essential for better policy making in this area.

Of perhaps far more significance to sustainable global poverty reduction, however, is the trend level of food prices. During the 20th century real food prices in international markets traced a downward path, to the point that by the late 1980s many felt that Malthus fears were a thing of history. As a result, growth in funding for agricultural development in general and R&D in particular slowed as development assistance resources were directed elsewhere. Two decades later it is evident that productivity growth has slumped – both in advanced and many developing economies. Meanwhile, rapid industrial growth in emerging economies in Asia and elsewhere is raising the demand for imports of primary products, while biofuel subsidies and mandates in numerous countries are reducing available supplies of food. How will these forces play out in the decades ahead? Will historians see the past few years as an aberration on a continuing long-run downward trajectory for food prices, or will they be seen as the beginning of a long period of high and even rising prices for farm products?

Following an overview of the spectrum of issues that contribute to concerns about food security in various parts of the world, the presentations will cover both of those areas:

a. Price volatility concerns
   - What are the economics behind price volatility?
   - How much do variable trade barriers exacerbate the problem?
   - How would the SSM as proposed by some WTO members help/hinder?
   - How does food price volatility affect poor households?

b. Long-run price trends
   - Will real food prices remain high in coming decades, in contrast to their downward trend in the 20th century?
   - If so, what would be the consequences for global poverty?
   - How quickly could an acceleration in agricultural R and D investment reverse the past two decades’ slowdown in farm productivity growth?
## CONFERENCE PROGRAM

**Disclaimer**
The speakers, topics and times are correct at the time of printing. In the event of unforeseen circumstances, the Local Organising Committee reserves the right to delete or alter items in the Conference Program.

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<td>SESSION C: The WTO's Doha proposals: template or tombstone?</td>
<td>Sirius Room</td>
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<td>SESSION D: Urban water planning with a risky climate</td>
<td>Orion Room</td>
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<td>12.10-13.10</td>
<td>LUNCH</td>
<td>Atrium</td>
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<td>13.10-14.40</td>
<td>CONTRIBUTED PAPER SESSION 6</td>
<td>See separate program</td>
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<td>14.40-15.30</td>
<td>DISTINGUISHED FELLOWS ADDRESS</td>
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<td>Climate change policy and the science of design</td>
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<td>Presenter: Professor Robert King, University of Minnesota, President of</td>
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<td>AAEA</td>
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<td>Chair: Dr Malcolm Wegener, University of Queensland</td>
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<tr>
<td>15.30-15.45</td>
<td>CONFERENCE CLOSE</td>
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<td>15.45-16.15</td>
<td>AFTERNOON TEA</td>
<td>Southern Cross lobby</td>
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<td>16.00-17.30</td>
<td>INCOMING COUNCIL MEETING</td>
<td>Terrace</td>
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Posters will be displayed for the duration of the Conference.
SOCIAL PROGRAM

The Local Organising Committee has developed an exciting social program to complement the Conference day sessions.

Delegates are encouraged to participate in the social aspects of the Conference. Please see the staff at the registration desk if you have not pre-booked for any of these functions and wish to attend.

WELCOME RECEPTION
Tuesday, 7 February 2012
6.00 –8.00pm
Resort Pool, The Esplanade Hotel

Renew old acquaintances and meet new contacts at tonight’s official Conference Welcome Reception. This event will open the Conference and get delegates ready for the Conference sessions the next day.

AARES YOUNG MEMBERS’ EVENT
Tuesday, 7 February 2012
7.30 –9.30pm
The Sail and Anchor, 64 South Terrace, Fremantle

Join fellow Young Members at ‘Trivial Tuesday’; an evening of multimedia pub trivia at the iconic Sail and Anchor in downtown Fremantle. This will be an excellent opportunity to get to know your colleagues in a relaxed environment. Higher degree students, recent graduates, early career professionals and young members new to AARES are all encouraged to attend this event. A light meal and drinks will be provided.

CONFERENCE DINNER
Wednesday, 8 February 2012
6.30 –10.30pm
Island Suite, The Esplanade Hotel

Enjoy a relaxing night of fabulous food, wine and good company. Recognise the achievements of your peers during the awards presentations, and enjoy the after dinner speech from Professor Alan Robson, recently retired Vice Chancellor of the University of Western Australia.

NETWORKING EVENT
Thursday, 9 February 2012
6.30-10.00pm
Mosman Park Lawn Bowling Club, Bayview Terrace, Mosman Park

The Networking Event will be a great opportunity to relax and catch up with colleagues and peers. A bus will be provided to transport guests to and from the venue. It will depart from outside the Esplanade hotel at 6pm. Guests will have a choice of return times to the Esplanade Hotel: 9pm or 10pm.
INVITED SPEAKER BIOGRAPHIES

Professor Julian Alston, University of California, Davis

Julian M. Alston is a professor in the Department of Agricultural and Resource Economics of the University of California, Davis, where he teaches graduate and undergraduate classes in microeconomic theory and the analysis of agricultural markets and policies, and serves as a member of the Giannini Foundation of Agricultural Economics, director of the Robert Mondavi Institute Center for Wine Economics, and associate director for science and technology policy at the University of California Agricultural Issues Center. At UC Davis, Julian leads a wide-ranging research program on the economics of public policies related to food and agriculture and related issues. He has published many journal articles and books related to these subjects, including most recently, Persistence Pays: U.S. Agricultural Productivity Growth and the Benefits from Public R&D Spending (Springer 2010), and Demand for Food in the United States: A Review of Literature, Evaluation of Previous Estimates and Presentation of New Estimates of Demand (Giannini Foundation 2011). He is a Fellow of the American Agricultural Economics Association, a Distinguished Fellow of the Australian Agricultural and Resource Economics Society, and a Distinguished Scholar of the Western Agricultural Economics Association.

Professor Per Pinstrup-Andersen, Cornell University

Per Pinstrup-Andersen is the H. E. Babcock Professor of Food, Nutrition and Public Policy, the J. Thomas Clark Professor of Entrepreneurship, and Professor of Applied Economics at Cornell University and Professor of Agricultural Economics at Copenhagen University. He is past Chairman of the Science Council of the Consultative Group on International Agricultural Research (CGIAR) and Past President of the American Agricultural Economics Association (AAEA). He served 10 years as the International Food Policy Research Institute’s Director General and the previous 7 years as department head. He also spent 7 years as an economist at the International Center for Tropical Agriculture, Colombia. He is the 2001 World Food Prize Laureate and the recipient of several awards for his research and communication of research results. He teaches and advises graduate and undergraduate students on globalization and poverty and a social entrepreneurship approach to government policy for the global food system. His research includes economic analyses of food and nutrition policy, globalization and poverty, agricultural development and research and technology policy.
**Professor John Freebairn**, University of Melbourne

After graduating with a PhD from the University of California (Davis) in 1972, John Freebairn worked at the NSW Department of Agriculture until 1974 where he was senior economist. John became a Research Fellow at the Research School of Social Sciences at ANU in 1974 before moving as a Professor of Agricultural Economics at La Trobe University from 1977 until 1984. From 1984 until 1986 John took over the responsibilities of Research Director at the Business Council of Australia. John joined Monash University in 1986 as Deputy Director in the Centre of Policy Studies. In 1991 he moved to the Department of Economics at Monash and at various times was Chairman of the Department and Deputy Dean and Dean of the Faculty. John joined The University of Melbourne in 1996. He was Head of Department from 1997 – 2002 and Director of the Melbourne Institute from April 2005 to April 2007. In 2008 Professor John Freebairn has been appointed as the Ritchie Chair.

**Professor Richard Gray**, University of Saskatchewan

Richard S. Gray is a Professor and Head of the Department of Bioresource Policy, Business and Economics at University of Saskatchewan. Richard received his Ph. D. in Agricultural and Resource Economics at the University of California, Berkeley and has a broad range of research interests covering many aspects of agricultural policy. In addition to five years experience with the Saskatchewan Agriculture as a Grain Market Analyst, Richard operated the family grain farm in Saskatchewan for ten years from 1977 to 1986. He has been involved in his son’s grain farming operation since 2008. He has published in the areas of agricultural trade, agricultural marketing, environmental economics, and more recently, research and innovation policy. Last year, Richard was on sabbatical leave and studied a number of crop research systems with particular interest in the role of the public, producer and private organisations, in research funding, governance and intellectual property management. Richard currently leads the Canadian Agricultural Innovation and Regulation Network. He regularly provides advice to farm organisations and government regarding innovation policy and is a Fellow of the Canadian Agricultural Economics Society.

**Dr David Gruen**, Executive Director, Macroeconomic Group, Australian Treasury

David Gruen is Executive Director, Macroeconomic Group, Australian Treasury. He joined the Treasury in Jan 2003. Before that, he was Head of Economic Research Department at the Reserve Bank of Australia, May 1998 to Dec 2002. He worked at the Reserve Bank for thirteen years, in the Economic Analysis and Economic Research Departments. With financial support from a Fulbright Postdoctoral Fellowship, he was visiting lecturer in the Economics Department and the Woodrow Wilson School at Princeton University from August 1991 to June 1993. Before joining the Reserve Bank, he worked as a research scientist in the Research School of Physical Sciences at the Australian National University. He holds PhD degrees in physiology from Cambridge University, England and in economics from the Australian National University.
Professor Robert King, University of Minnesota

Robert King is a professor in the Department of Applied Economics at the University of Minnesota. He joined the faculty at the University of Minnesota in 1983 and held the E. Fred Koller Chair in Agricultural Management Information Systems from 1983 to 2004. He served as head of the Department of Applied Economics from July 2004 through June 2008.

His research focuses on local food systems, on organic agriculture, and management issues facing food retailers, farmer cooperatives, and farmers. He teaches courses on managerial economics and cooperatives and helps advise the University’s Student Organic Farm. He is also active internationally, having lectured in Brazil, Hungary, Italy, the Netherlands, and Poland.

Hon Terry Redman MLA, Minister for Agriculture and Food; Forestry and Corrective Services, Western Australia

Minister Redman has been a member of the Western Australian Parliament since February 2005. He represents the electorate of Blackwood-Stirling which encompasses much of the southern region of the State. This region is renowned for its high quality and abundant agricultural produce from wine and dairy products to fruit and truffles. Prior to entering parliament Minister Redman graduated with a Bachelor of Science (Agriculture) from the University of Western Australia. Following this, he taught at a number of agricultural colleges in Western Australia, imparting his passion for agriculture to his students. He spent 9 years as Principal of Denmark Agricultural College – the youngest principal ever appointed to such an institution in WA. Minister Redman and his wife Marie were small business owners in the southern region for seven years and prior to that were partners in a family farming operation at the Porongurups for fourteen years.

Since entering Parliament in 2005, Minister Redman has built a solid reputation as a staunch defender of regional and agricultural interests. He believes strongly in making decisions that will lead to progressive and profitable agriculture, food and forestry sectors - which remain the unsung heroes of the West Australian economy. Effectively managing Western Australia’s natural resources, building the agriculture and food industry’s capacity to adapt and grow, improving market access for WA produce and promoting a positive profile of the WA food and agriculture sectors are the key areas of focus for Minister Redman.

Professor John Quiggin, University of Queensland

John Quiggin is a Federation Fellow in the Schools of Economics and Political Science, University of Queensland. Professor Quiggin’s research interests include risk analysis, production economics, and the theory of economic growth. He has also written on policy topics including unemployment policy, micro-economic reform, privatisation, competitive tendering and the economics of education.
INVITED SPEAKER ABSTRACTS

Professor Per Pinstrup-Andersen, Cornell University

Contemporary food policy challenges and opportunities: a political economy perspective

The global food system and related government policies are in disarray. In response to increasing food prices and amplified food price volatility, national governments are pursuing a variety of policies to protect population groups of greatest importance for maintaining legitimacy. Some of these policies are further amplifying price fluctuations while others are attempting to remove price signals from the market. A sense of uncertainty and heightened political risks resulting from extreme weather events, irrational expectations by speculators, sensationalisation by the news media, oil price fluctuations and the pursuit of self-interests by international organizations, NGOs and the private sector, are putting pressure on governments to prioritize short-term political interventions and bandage solutions to deal with increasing and volatile food prices. This paper will discuss these interventions and suggest a set of policy challenges of a longer-term nature as well as related policies to achieve sustainable food security for all in the foreseeable future. The paper will argue that food price volatility will continue to be with us but that real food prices need not increase. It will further show that the main bottlenecks to expand food production in most low-income developing countries are found outside the farm and that government intervention in the food system should focus on improvements in rural infrastructure, domestic markets and policies to facilitate efficiency and effectiveness in post-harvest value chains and input sectors. Full costing of environmental damage caused by the food system is suggested to be implemented to help assure sustainability and the author suggests that a multi-disciplinary, multi-sectorial approach to research and policy for the food system, which integrates environmental, health, nutrition and food security goals, be pursued.

Professor John Quiggin, University of Queensland

Is there still time to stabilise the global climate?

National governments have made commitments to stabilise the atmospheric concentration of greenhouse gases at the equivalent of 450 parts per million of carbon dioxide. However, policies sufficient to realise that commitment have not been implemented. In this paper, I consider whether this commitment is still feasible and, if so, how the cost of implementing it changes as a result of delay and inaction.

Professor Julian M. Alston, University of California Davis and Murray E. Fulton, University of Saskatchewan

Sources of institutional failure and underinvestment in levy funded agricultural research

In Australia most agricultural R&D is conducted within a complex public-private partnership. Commodity levies, matched by the Commonwealth one-for-one up to 0.5% of the gross value of production, are used to finance agricultural R&D administered by 15 rural Research and Development Corporations (RDCs). Australia’s research providers are mainly agencies within the Commonwealth or State governments, and these agencies themselves contribute resources in kind to projects funded by the RDCs, adding a further dimension to the public-private partnership. The RDCs spend about $0.5 billion per year but, through their role in providing project funding, they also have substantial influence over the other two-thirds of
Australia's total rural R&D investment of about $1.5 billion per year. Given its involvement as both a purchaser and provider of the research funded through RDCs, the Commonwealth takes an appropriate interest in the funding arrangements, and regulates and scrutinizes the activities of the RDCs. In 2011, concluding an inquiry dedicated to rural RDCs, the Productivity Commission recommended changes to the funding arrangements based on its assertion that the establishment of the levy alone, without matching support, is sufficient to lead to adequate funding for research that takes the form of an industry (or commodity) collective good, without any spillover effects to other parts of the economy. This position was taken in spite of the compelling evidence of persistent systematic underinvestment in agricultural R&D under the existing arrangements, which itself contradicts claims that a levy-based funding system without matching support would eliminate incentive problems in research funding. The PC recommendation was not embraced by the government for what appear to be political reasons rather than any disagreement with its economic basis, which has not been formally challenged in the academic literature. In this paper we consider the relevant evidence and arguments. First, we review agricultural R&D funding in Australia over the past 25 years, during which the RDC model has been in effect, and summarize the available evidence that suggests that the arrangement has increased the total investment in agricultural R&D but has been insufficient to eliminate the incentive problems that lead to underinvestment from the point of view of producers as well as the nation. Next we develop theoretical models and examine the determinants of producer choices of rates of levy for financing agricultural research, to identify aspects that may lead to collective underinvestment. We evaluate the roles of characteristics of markets, the nature of the research-induced technological change, the characteristics of the collective action program, and the characteristics of the participants in it, as determinants of the choice of the levy rate and the total research investment. Our analysis suggests that government matching would encourage higher rather than lower levy rates (a crowding-in effect). Finally, we consider the predictions from the theoretical analysis in light of what we know about levy-funded agricultural research in Australia, California, Canada, and Uruguay.

**Professor Richard Gray** and Katarzyna Bolek, University of Saskatchewan

**Grain research funding in Australia: lessons from international experience**

The Australian grain research system has undergone a profound transformation over the past 25 years. This began with the creation of Grains Research Development Corporation, which gave producers a voice within a national system of research funding. In the second phase of development, the GRDC tendered for the development of three for profit public corporations (HRZ, AGT and InterGrain) that would invest revenues from endpoint royalties (EPRs) to fund wheat breeding. This new funding for breeding allowed the GRDC to move upstream to focus on pre-breeding research efforts. As of 2012, these breeding firms had each acquired a multinational private partner and had collectively reached the point where end point royalties were sufficient to cover breeding costs. While this transformation has been successful at increasing private research investment, it has also created a toll good industry with inherent risk, economies of size, and barriers to entry with incentives for market concentration and monopoly pricing. The North American experience in hybrid crop sectors suggests that producers are likely to continue to pay far more for varieties, perhaps with only a small portion of end point royalties being reinvested in breeding activities. Policy options are discussed, including the French EPR system.
David Gruen, Australian Treasury

The mining boom and structural change in the Australian economy

The increase in mineral and energy prices associated with the current mining boom has seen the terms of trade rise to their highest level in Australian history. The size and duration of the boom has led to a large sustained rise in the Australian real exchange rate, which is putting profound pressure on those parts of the traded sector not associated in some way with the booming sector. In many ways, this appreciation is accelerating trends in Australia’s economic structure that have been apparent for some time. The talk will examine these trends in detail, and reflect on how the boom may play out over the longer term.

Professor John Freebairn, University of Melbourne

Mining booms and government budgets

Mining booms provide revenue windfalls for the commonwealth government (principal higher corporate income tax) and some state governments (principal royalties). This paper explores the arguments pro and con placing some of the revenue windfall gains in a sovereign wealth fund (SWF). Arguments pro a SWF include: to ensure intergenerational equity; to modify the magnitude of appreciation of the exchange rate and industry restructuring; and, to reduce the risks of wasteful expenditures and the “resource curse”. In the Australian context, contrary arguments for a SWF include: a diverse set of mineral resources, many with extensive known reserves; a large number of available domestic investment options to raise future productivity and incomes; a flexible and adaptive economy facing many forces for structural changes; and, longer term credible budget strategies.

Professor Robert P. King, University of Minnesota

Climate change policy and the science of design

Design and implementation of effective climate change policy on a global scale is one of the most important and difficult challenges we face. Economic analysis, which focuses on the prediction of economic performance under alternative climate change scenarios and on the assessment of costs and benefits associated with alternative polices, is playing a critical role in this process. Economic design, which focuses on devising new markets, contracts, organizations, and policies to address climate change, is equally important. While economists have a clear shared understanding of “good science” in economic analysis, we often view the process of economic design as a black box. This presentation focuses on the general questions of how we do economic design and what constitutes good economic design scholarship, with illustration and examples related to climate change policy.
MINI-SYMPOSIUM SESSION 1 DESCRIPTIONS

**TITLE:**  
FOOD ISSUES IN THE ERA OF SUPERMARKET DOMINANCE

Convenor:  
Malcolm Wegener, University of Queensland

Sponsor:  
University of Queensland

<table>
<thead>
<tr>
<th>Speaker 1:</th>
<th>Robert King, University of Minnesota</th>
<th>Supply chains for local food products</th>
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<tr>
<td>Speaker 2:</td>
<td>Lisa Jack, University of Portsmouth</td>
<td>Target cost management: An effective way for producers to match the supermarket’s buying power?</td>
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<td>Speaker 3:</td>
<td>Wendy Umberger, University of Adelaide</td>
<td>Understanding consumer demands for food attributes: What do consumers really value?</td>
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Farmers lost a lot of their market power when co-operatives and marketing boards disappeared. Now the structure of the food sector is being shaken again by the supermarket oligopsony with the Australian food sector heavily concentrated in the hands of two major supermarket chains. Three speakers in this session will address issues that are relevant to this scenario. Demand for locally produced food has increased sharply in the US in recent years and Professor King will describe how local food products are being introduced or reintroduced into the broader food system and the potential barriers preventing expansion of markets for local foods. Professor Jack has worked with farmers in the UK who are involved in contracting arrangements with corporate customers in the food supply chain. She believes there is scope to develop a collaborative form of target cost management that will satisfy all parties in the food supply chain. Dr Umberger has done quantitative and qualitative consumer studies for the past 10 years including a substantial study of beef consumers in Australia last year. Seven segmented groups of consumers, with significantly different socio-demographic and psychographic characteristics, indicated their preferences and willingness-to-pay for beef attributes.

**TITLE:**  
CHALLENGES IN VALUING ECOSYSTEM SERVICES

Convenors:  
Rosalind Bark and Neville Crossman, CSIRO

Sponsor:  
CSIRO Water for a Healthy Country Flagship

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<tr>
<th>Speaker 1:</th>
<th>Rosalind Bark &amp; Neville Crossman, CSIRO</th>
<th>Introduction and major findings of first Ecosystem Service Valuation workshop</th>
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<tbody>
<tr>
<td>Speaker 2:</td>
<td>Robert Johnston, Clark University, Massachusetts, USA</td>
<td>What to value and how? Ecological indicator choices with stated preference valuation of aquatic ecosystem services</td>
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<td>Speaker 3:</td>
<td>Rosalind Bark, CSIRO</td>
<td>Valuing the multi-benefits of the Murray-Darling Basin Plan using an ecosystem system framework</td>
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<td>Speaker 4:</td>
<td>Neville Crossman, CSIRO</td>
<td>Perverse outcomes from multiple markets for ecosystem services</td>
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<td>Speaker 5:</td>
<td>Stuart Whitten, CSIRO</td>
<td>Designing and implementing auctions to deliver ecosystem services requiring coordinated landscape scale activities</td>
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The UK government recently completed a national assessment of Ecosystem Services. This national assessment learned lessons from two global assessments of ecosystem services: The Millennium Ecosystem Service Assessment and The Economics of Ecosystems and Biodiversity. Australia does not yet have a national ecosystem services research program but the Murray-Darling Basin Authority...
commissioned CSIRO to value the ecosystem services benefits of the Murray-Darling Basin Plan in 2011. This session will be the first opportunity to report on this research. It will also be the second in a series of workshops on Ecosystem Services Valuation. The first was hosted by Prof. Morrison (CSU) and Drs Crossman and Hatton MacDonald (CSIRO) and held in Canberra, August 24-25, 2011. A book proposal is one of the outcomes anticipated from the previous workshop and this session.

**TITLE:** EMERGING STRUCTURAL ISSUES IN AUSTRALIAN FARMING - THE DEBT AND PROFIT CHALLENGE

**Convenor:** Ross Kingwell, Department of Agriculture and Food Western Australia and University of Western Australia

**Sponsor:** Department of Agriculture and Food, Western Australia

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<th>Speaker 1</th>
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<tr>
<td>Mick Keogh, Australian Farm Institute</td>
<td>Including risk in enterprise decisions in Australia’s riskiest businesses</td>
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<td>Speaker 2</td>
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<td>Peter Rowe, Bankwest</td>
<td>Western Australia’s farm debt trends: Are we at the tipping point?</td>
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<td>Speaker 3</td>
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<td>Bill Malcolm, University of Melbourne/Victorian Department of Primary Industries</td>
<td>Farm finance and size, performance and growth of farm businesses</td>
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The average return on capital (excluding capital appreciation) to Australian broadacre farms since 2001/2 has been less than 1 percent, even negative in some years. The impacts of higher or volatile input prices, prolonged or dramatic drought, a rising Aussie dollar and volatile commodity prices in concert have challenged many broadacre farm businesses. The capital at risk is now much greater than a decade ago. What are the current structural challenges facing Australia’s broadacre industries? Is there a way forward? This mini-symposium presents an array of eminent speakers to discuss these and related questions.

**TITLE:** POLICY, ECONOMICS AND HYDROLOGY OF ENVIRONMENTAL WATER MANAGEMENT IN THE MURRAY DARLING BASIN

**Convenor:** Jeff Connor, CSIRO

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<tr>
<td>Mac Kirby, CSIRO</td>
<td>System management opportunities and hydrologic limits: A Murray Darling Basin integrated hydrology and economics optimisation view</td>
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<td>Speaker 2</td>
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<tr>
<td>John Tisdell and Sayed Iftekhar, University of Tasmania</td>
<td>Water buyback, auction design, public cost and irrigator profits: Agent based assessment</td>
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<td>Speaker 3</td>
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<tr>
<td>Dustin Garrick, Oxford University</td>
<td>Institutional design for effective environmental water management: An institutional perspective</td>
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<td>Speaker 4</td>
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<tr>
<td>Tiho Ancev, University of Sydney</td>
<td>Can the advantages of a trading environmental water holder be realised in the Northern MDB</td>
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Recent policy reforms make the environment the largest single water holder in the MDB. Those managing the water will hold water entitlements bought from irrigators with a time profile of relatively even releases each year suited to irrigation needs. To meet environmental needs of period floods and drying, environmental water holders will likely carryover, buy and sell water. This mini-symposium will involve four thematically related presentations: An assessment of hydrologic opportunities to meet environmental goals given system inflows, flow dynamics with historic and climate change (Kirby); An evaluation of how the structure of buyback tenders and carryover provisions influence environmental water holder and irrigator rent seeking opportunity (Iftekhar); An evaluation of how institutional and
governance arrangements and their nesting at local, state, and basin level can facilitate or impede effective MDB environmental water management (Garrick). A presentation on potential gains, and institutional challenges to a trading environmental water holder in the northern MDB where highly variable flows and few current institutions currently support water trade and carryover.
MINI-SYMPOSIUM SESSION 2 DESCRIPTIONS

TITLE: FOOD SECURITY IN THE SOUTH PACIFIC, PAPUA NEW GUINEA AND EAST TIMOR
Convenor: Debbie Templeton, ACIAR
Discussant: David Shearer, ACIAR
Sponsor: ACIAR

| Speaker 1: | Satya Nandlal, Queensland University of Technology | Expanding freshwater aquaculture production in the Pacific region: increasing regional food security and sustainability |
| Speaker 2: | Modesto Lopes, Ministry of Agriculture, East Timor | Improving food security in East Timor with higher yielding crop varieties |
| Speaker 3: | Norah Manape Omot, National Agricultural Research Institute, PNG | Food security in Papua New Guinea |

Despite recent gains in agricultural productivity, roughly one in seven people in the world suffer chronic hunger. This problem will be compounded as the world’s population grows by an additional 2 billion people over the next 40 years. It is not surprising then that delivering food security has become a major topic at Conferences and meetings world-wide - including the Commonwealth Heads of Government Meeting in Perth in October 2011, and at the 56th AARES Conference in Fremantle in February 2012.

The purpose of this mini-symposia is to complement presentations on global food security by focussing on food security issues in three of Australia’s nearest neighbours - the Pacific region, East Timor and Papua New Guinea. The three papers will provide relevant background information on the status of food security in terms of national and local food availability and affordability. They will also provide comment on the effectiveness, or otherwise, of donor engagement aimed at increasing agricultural productivity as a way of improving the livelihoods of the poor through an increased supply of affordable food.

TITLE: THE USE OF NON-MARKET VALUATION IN GUIDING ENVIRONMENTAL POLICY DECISIONS
Convenor: Marit Kragt, University of Western Australia
Sponsor: Centre for Environmental Economics and Policy, University of Western Australia

| Speaker 1: | Nick Hanley, University of Stirling | Experiences with non-market valuation in UK policy making |
| Speaker 2: | Rob Gillespie, Gillespie Economics Consulting | Influencing Australian policy decisions through nonmarket valuation |
| Speaker 3: | Chris Toyne, Office of Best Practice Regulation, Department of Finance and Deregulation | Incorporating environmental values into Regulatory Impact Statements |

Non-market valuation (NMV) provides methods that allow estimation of the intangible cost-benefit impacts of environmental projects. It has been claimed that results from environmental valuation studies are increasingly used in policy development. However, there is limited substantiated evidence to show whether policy makers use NMV estimates in their decision making processes and, if so, how value estimates are used. The aim of this symposium is to enable an interactive discussion between panel members and audience about the use and non-use of NMV in environmental policy decisions. Experienced panel members from an academic, consultancy and decision maker background, will critically assess the impact that NMV has (or doesn’t have) on policy making. The discussion will focus in particular
on the factors that enable uptake of NMV in decision making versus barriers (e.g. acceptance of NMV, organisational characteristics, ...) that may prevent uptake.

**TITLE:** RESOURCES AND ENERGY: UNDERSTANDING AND MAXIMISING THE BENEFITS TO AUSTRALIA

**Convenor:** Quentin Grafton, Bureau of Resources and Energy Economics

**Sponsor:** Bureau of Resources and Energy Economics

| Speaker 1: | Nhu Che, Bureau of Resources and Energy Economics | Economic value chain analysis of the Australian gas industry |
| Speaker 2: | Arif Syed, Bureau of Resources and Energy Economics | Productivity in the Australian mining sector |
| Speaker 3: | Nicky Cusworth, Department of State Development, WA | Maximising the benefits of mining and energy sectors to the WA economy |

The resources and energy sectors are transforming the Australian economy. As a result, their relative importance in terms of contributions to value added in the economy, investment, exports, incomes, government revenues and employment has increased. The rapid growth in the resources and energy sectors in Australia occurred over less than a decade and represents a structural shift as important as the economic reforms of the 1980s and 1990s. This session provides presentations of some of the changes in the resources and energy sector over the past decade including an up-to-date analyses of value chain modelling the gas sector, productivity in Australian mining, and maximising the benefits of the resources and energy sector for Western Australia.

**AAEA-Organised Symposium:**

**TITLE:** INTERACTIONS BETWEEN WATER AND CLIMATE POLICY IN NEW ZEALAND

**Convenor:** Adam Daigneault, Landcare Research, New Zealand

| Speaker 1: | Suzi Kerr and Simon Anastasiadis, Motu Economic and Public Policy Research, New Zealand | Synergies between nitrogen and GHG regulation on agriculture on Lake Rotorua, New Zealand |
| Speaker 2: | Adam Daigneault and Suzie Greenhalgh, Landcare Research, New Zealand | Economic impacts of GHG and nutrient reduction policies in New Zealand: A tale of two catchments |
| Speaker 3: | Suzi Kerr, Motu Economic and Public Policy Research and Suzie Greenhalgh, Landcare Research | Farmer perception of overlapping NZ water and climate policies: Revelations from AgDialogue |

This symposium focuses on greenhouse gas (GHG) mitigation and water quality improvement policies in New Zealand. Papers 1 and 2 will present estimated economic and environmental impacts of simultaneously implementing water and climate policies at the catchment level. The third paper presents an overview of an agricultural multi-stakeholder dialogue process on controlling agricultural GHG emissions where participants are expressing the need to concurrently address GHG emissions and water issues. There will also be a discussion panel, including the speakers and other participants to be names later.
MINI-SYMPOSIUM SESSION 3 DESCRIPTIONS

TITLE: MARKET VOLATILITY AND FOOD SECURITY
Convenor: Malcolm Wegener, University of Queensland
Walt Armbruster Pacific Economic Cooperation Committee (formerly Farm Foundation), Chicago, USA
Moderator: Walt Armbruster Pacific Economic Cooperation Committee (formerly Farm Foundation), Chicago, USA
Sponsor: University of Queensland

| Speaker 1: Terry Sheales, ABARES, Canberra | Outlook for grain markets in Asia-Pacific region |
| Speaker 2: William Coyle, Pacific Food System Outlook, PECC, Washington | Global biofuel production and food: Implications for Asia Pacific region |
| Speaker 3: Funing Zhong, College of Economics and Trade, Nanjing University, China | Role of grain reserve stocks in long-term food security |
| Speaker 4: Ching-Cheng Chang, APEC Research Centre for Typhoon and Society, Taipei, Taiwan | Climate risk management and adaptation in Asia-Pacific: Implications for food security |

Food security is a multi-faceted issue and this symposium will address some of the pertinent factors relevant to countries around the Pacific Rim. Both supply and demand side forces will be examined. On the supply side, achieving food security depends on raising productivity of the agricultural resources available to supply food commodities since land availability and other input factors are expected to be constrained. The demand side involves maximising access to a steady supply of safe, affordable food for an increasing, and increasingly wealthy, population. Few countries in the Pacific Rim appear to have the resources to expand food production at the rate required to meet the demands of the expanding population. Most countries resort to the international market place in times of food shortage, thus creating considerably volatility in the market price for grains and other food items. The development of biofuels in some developed countries has placed added demands on commodity production and prices. Countries such as China, with its huge population and growing demand for grains and other commodities, has both operated in the international grains market and sought to establish reserve grain stocks as a mechanism to safeguard against food shortages.

TITLE: ENVIRONMENTAL POLICY FOR THE MINERAL SECTOR IN AUSTRALIA
Convenor: Fiona Gibson and Ben White, University of Western Australia
Chair: Graeme Doole, University of Western Australia
Sponsor: School of Agricultural and Resource Economics, University of Western Australia

| Speaker 1: Ben White, University of Western Australia and Bronwyn Crowe | Overview of incentive and risk management effects from using bonds to promote corporate responsibility |
| Speaker 2: Alex Gardner, University of Western Australia | Legal aspects of using bonds to facilitate mine site rehabilitation |
| Speaker 3: Phil Gorey, Executive Director Environment, Department of Mines and Petroleum, WA | Current status of environmental policy to ensure mine site rehabilitation in Western Australia |
| Speaker 4: Kane Moyle, Chamber of Minerals and Energy, WA | Environmental policy issues as they apply to small, medium and large sized minerals companies |

In situ environmental degradation arising from mining activity in Australia is primarily regulated using bond instruments. There are advantages to using bonds to regulate restoration of disused mine sites, such as reduced transaction costs to regulators and accounting for negative environmental impacts.
However there are apparent disadvantages, and varying opinions between mining companies and policy makers in relation to using bonds to regulate mine site restoration. This session provides an opportunity to discuss the issues surrounding the use of various environmental policies, including bonds, to regulate mine site restoration in the Australian mining sector.

**TITLE:** THE WTO’S DOHA PROPOSALS: TEMPLATE OR TOMBSTONE  
**Convenor:** Will Martin, World Bank

| Speaker 1 | Will Martin, World Bank | Unfinished business: The WTO’s Doha agenda based on the forthcoming book by Will Martin and Aaditya Mattoo |
| Speaker 2 | Kym Anderson, University of Adelaide | What’s the appropriate counterfactual against which to assess a Doha agreement? |
| Speaker 3 | David Laborde, IFPRI | Quantifying the implications of the WTO’s Doha proposals |

This session will launch a book on the WTO’s Doha agenda published by the World Bank and CEPR in November 2011. The book provides relevant information for the key decisions that will need to be made on the Doha Agenda—to accept it; to modify it; or to reject it and start again. Primary emphasis in this session will be given to the agricultural aspects of the proposals, which are perhaps the most important in terms of potential welfare gains and of sources of political obstacles to agreement. Analytically, the session will contribute by focussing on the rapid shifts in agricultural protection occurring in developing countries; and by presenting theoretically-well-grounded approaches to dealing with flexibilities in trade negotiations and to aggregating agricultural trade distortions. The session will also highlight some important lessons drawn from the Doha experience for potential future trade negotiations.

**TITLE:** URBAN WATER PLANNING WITH A RISKY CLIMATE  
**Convenor:** Harry Clarke, La Trobe University  
**Sponsor:** Victorian Centre for Climate Change Adaptation

| Speaker 1 | Harry Clarke, La Trobe University | Risk and uncertainty in urban water planning: overview |
| Speaker 2 | John Freebairn, University of Melbourne | Portfolio models |
| Speaker 3 | Anke Leroux, Monash University | Option pricing models |
| Speaker 4 | Jayanath Anandã, La Trobe University | Institutional issues |

Urban water supply augmentation in the face of climate change is an instance of the type of large-scale infrastructure investment that is undertaken with incomplete knowledge of the effects of climate change on the environment. Rainfall-dependent water supply technologies have uncertain effectiveness and this, in turn, affects the viability of expensive rainfall-independent ‘insurance options’ such as desalination. A recent Productivity Commission report suggests that State Governments have paid too much to guarantee water supply security. This seminar discusses recent approaches to analysing such investment decision problems using ‘option pricing’, dynamic programming and portfolio management methodologies. Institutional issues that impact on political decision-making processes are also analysed and policy conclusions drawn.
Abatania, Luke; Hailu, Atakelty; Mugera, Amin
**ANALYSIS OF TECHNICAL EFFICIENCY OF FARMS IN NORTHERN GHANA USING BOOTSTRAP DEA**
Carnac. Wednesday 10:30 am - 12:10 pm
Crop production is the main source of livelihood for households in Northern Ghana. Government policy is committed to improving crop production. Knowledge about the technical efficiency of crop production is essential in guiding policy decisions, yet little is known about the technical efficiency of farms in Northern Ghana. This paper examined the technical efficiency of crop farms in Northern Ghana. We used Data Envelopment Analysis (DEA) with bootstrapping to estimate technical efficiency of 189 farms. Using a linear regression model, we found that hired labour, geographical location of farms, gender and age of head of household significantly affect technical efficiency.

Abougamos, Hoda; White, Ben
**CONTRACTS FOR GRAIN BIOSECURITY AND GRAIN QUALITY**
Garden. Friday 1:10 pm - 2:50 pm
This paper uses a principal-agent approach to analyse the design of grain supply contracts between a grain handler (the principal) and a farmer (the agent). The grain handler is not able to observe directly the efforts made by the farmer to ensure that grain is insect-free and of good quality. However, the principal is able to sample grain before amalgamating the grain with other grain batches. The principal’s profit is determined by grain prices in world markets and prices paid to the farmer. Price premia are paid on observed grain quality and this provides an incentive for the farmer to engage in an optimal level of grain management effort. A case study is used for wheat supply in Western Australia.

Adamson, David
**THE MURRAY DARLING BASIN PLAN & A CHANGING CLIMATE: BUYING PAPER AND GIVING GOLD**
Orion. Friday 1:10 pm - 2:50 pm
The 2007 Water Act was meant to be the saviour of Australia’s iconic Murray Darling Basin. This included a development of a sustainable extraction limit and the purchase of water for the environment. Water property rights can be classified into three groups (high, general and supplementary) depending on their ability to deliver water in a given year. However, the plan negates any real changes to net irrigation supplies. As surface entitlements reductions are offset by increased supplies of ground water. Under a changing climate, this approach has significant benefits for irrigation with gold plated entitlements, but transfers significant risk to the environment with paper entitlements. As the Basin Plan did not undertake any economic impacts from a changing climate, the aim of this paper is to overcome that limitation and provide discussions on risk transfer.

Addai, Donkor; Pannell, David; Kingwell, Ross; Ewing, Mike; Finlayson, John
**THE ECONOMICS OF TECHNOLOGICAL INNOVATION FOR ADAPTATION TO CLIMATE CHANGE BY BROADACRE FARMERS IN WESTERN AUSTRALIA.**
Pleiades. Thursday 3:00 pm - 4:40 pm
Scientists have pointed out that climate change is unavoidable, to some extent. It is also acknowledged that agriculture is among the most vulnerable sectors to the risks and impacts of climate change. Farmers, therefore, need flexible and resilient agricultural systems to cope with a range of possible changes to climate. This research adapts an existing whole-farm bioeconomic model named MIDAS. The study examines possible impacts of different climate change scenarios, quantifies the impact of adaptation options that are available or could become available to farmers, and quantifies the impacts of climate policy on farmers’ incomes and optimal farm management strategies.
Aderinoye-Abdulwahab, Sidiqat

PASTORAL COMMUNITIES IN NIGERIA: ANOTHER CASE OF MARGINALISED CULTURES

Orio. Wednesday 10:30 am - 12:10 pm

The study which was conducted in Kwara State, Nigeria set to uncover how pastoralists’ families cope with their livelihoods when the cattle have gone grazing. It examined the social and financial coping strategies of their families through Focus group discussions and interviews with pastoralists, their wives and some extension agents. The findings revealed that the pastoralists live in marginalised conditions and they lack access to social services needed to boost their living conditions. The study recommended increased social networks by government and agricultural bodies to improve the livelihoods of these people.

Ahmed, Sharmina

ENDOGENOUS MATCHING AND AGRICULTURAL CONTRACTUAL CHOICE AMONG RICE FARMERS IN RURAL BANGLADESH

Abrohdos. Friday 8:30 am - 10:10 am

This paper study the presence of potential bias arising from multiple sources of endogenous matching among the landlords, the tenants and the activities while choosing between crop share contact and fixed rent contract in agricultural farming system. The study addresses this endogenous matching problem using data from rice farmers in rural Bangladesh. Although risk sharing explanation consistent with the naive estimation, after controlling for possible sources of matching, it is found not to has significant influence on choosing a particular tenancy contract.

Antony, George

THE LONELINESS OF ECONOMICS IN BIOSECURITY DECISIONMAKING

Admiralty. Wednesday 10:30 am - 12:10 pm

Biosecurity decisions can be represented by relatively straightforward applications of welfare economics. However, rational economics is often unheard over the cacophony of other decision paradigms: pure science, political economy, pure politics and environmentalism. A case is presented with examples that these alternative paradigms have skewed biosecurity decisions, and outlines how biosecurity economics can do better to influence decision-makers.

Axalan, Jerick; Concepcion, Sylvia; Montiflor, Marilou; Lamban, Ruby Jane; Batt, Peter; Murray Prior, Roy; Rola-Rubzen, Fay; Israel, Floro

RELATIONSHIPS WITH MARKET INTERMEDIARIES: THE CASE OF VEGETABLE CLUSTER MARKETING IN SOUTHERN PHILIPPINES

Rottnest. Friday 8:30 am - 10:10 am

Effective relationship among partners is a key in strengthening collaborative marketing efforts. This study examined the level of relationship of vegetable cluster farmers with their cluster and the downstream buyers. A total of 67 vegetables farmers in Southern Philippines were surveyed to determine their relationship level on trust, power-dependence, relationship-specific investments and satisfaction. Comparison between clusters and downstream buyers were made. The study found that farmers have high level of trust and satisfaction with their clusters compared to their downstream buyers. The high level of trust is attributed to the leadership, openness in sharing, and social cohesion of the group.

Aye, Goodness

THE LONG AND SHORT RUN IMPACTS OF FOOD AND ENERGY PRICE SHOCKS: EVIDENCE FROM NIGERIA

Pleiades. Wednesday 3:30 pm - 4:20 pm

The current global food crisis presents a puzzle, thus raising concerns among researchers and policymakers. A number of causes have been identified. However, the relative importance of each factor is still uncertain. In this study, the link between food prices and the various interconnected factors are modelled. The study also quantifies the current and future poverty impacts of rising food and energy prices under a number of scenarios. In general, it was observed that rising food and energy prices have adverse effects on the Nigerian economy and household welfare. Thus, the need for appropriate policy
responses cannot be overstressed.

Balagtas, Joseph; Bhandari, Humnath; Hossain, Mahabub; Mohanty, Samarendu

**IMPACT OF A PRICE SPIKE ON POVERTY DYNAMICS: EVIDENCE FROM A PANEL OF RURAL HOUSEHOLDS IN BANGLADESH**

Abrohdos. Thursday 3:00 pm - 4:40 pm

How did the rice market crisis of 2007-2008 affect income and poverty among rural households in Asia? Analysis of a panel of rural households in Bangladesh showed that between 1988 and 2004 structural transformation and accumulation of human capital contributed to improved incomes and a reduction in the incidence and depth of poverty. In this paper we analyze a subsequent round of the survey, collected in 2008. The timing of the latest round allows us to evaluate the effects of the rice market crisis on income and poverty dynamics, and to document coping mechanisms employed by households during the crisis.

Bashir, Khalid; Schilizzi, Steven

**MEASURING FOOD SECURITY: DEFINATIONAL SENSITIVITY AND IMPLICATIONS**

Abrohdos. Thursday 3:00 pm - 4:40 pm

Six methods for measuring food security are identified from the literature. The dietary intake method (DIM) and the food insecurity experienced-based measurement scales (FIEMS), the two most commonly used, were empirically tested using 1152 rural households in the Punjab province of Pakistan. Results show significant differences in the measurement of food insecure households: 22.9% with DIM vs. 4.7% with FIEMS. A slight change in the food security definition resulted in significant differences. With slight definitional changes, 6.5% of the sample households appeared food insecure using DIM and only 1.1% using FIEMS. Given its high definitional sensitivity, food security must be carefully defined according to country specific conditions and should reflect local diversity.

Beare, Stephen; Chambers, Ray

**FIDUCIAL COST-BENEFIT ANALYSIS: AN APPLICATION TO PURE RESEARCH FUNDING**

Abrohdos. Wednesday 10:30 am - 12:10 pm

Environmental intervention can be high risk and high return. Scientific hypothesis testing provides limited guidance to policy makers unless there is a high level of certainty in the supporting scientific evidence. Traditional cost-benefit analysis has limitations due to the subjective choice of how to discount uncertainty outcomes. A fiducial cost-benefit methodology is developed which integrates hypothesis testing and traditional cost-benefit analysis. Fiducial inference allows a value to be placed on changes in the level of uncertainty about a critical decision parameter that does not depend on a discount rate. There is a level of uncertainty at which we would reject an investment with a positive expected net rate of return. A net value may be placed on a program of pure research which reduces the uncertainty about a decision.

Bell, Brian; Sinner, Jim; Yap, Michael; Phillips, Yvonne; Scarpa, Riccardo; Batstone, Chris; Marsh, Dan

**MIXED SIGNALS: STATED PREFERENCES FOR FUTURE STATES OF THREE NEW ZEALAND RIVERS**

Sirius. Friday 1:10 pm - 2:50 pm

We conducted an online choice survey to inform advice to the Tasman District Council on setting management objectives for multiple uses and values across several catchments. One sub-sample was recruited via a survey company and a second via a public call with prize draw. From a survey with unlabelled choice sets for three rivers, we estimated a separate model for each river. Coefficients for natural character, fish & fishing, local jobs and cost were generally significant and had expected signs. Coefficients on swimming and boating attributes were weak even though 68% and 31%, respectively, of the panel sample reported engaging in these activities. Levels of attributes varied for the three rivers and, together with within-sample variation, made cross-river comparisons challenging. Latent class analysis was used to assess non-attendance with interesting results. The panel, public and combined sample results highlighted the effect of random versus non-random sampling.
Beltran, Jesusa; Pannell, David; Doole, Graeme; White, Benedict

**ECONOMIC ANALYSIS OF WEED MANAGEMENT OPTIONS IN PHILIPPINE RICE FARMING SYSTEMS**

*Garden. Friday 1:10 pm - 2:50 pm*

This paper describes a complex, dynamic simulation model that has been developed to provide a comprehensive assessment of integrated weed management programmes for the control of annual barnyardgrass (*Echinochloa crus-galli* complex) in Philippine rice farming systems. The main outputs of the model include weed seed and plant densities and seasonal and annualised profit over the simulated planning horizon. Model output emphasises the substantial economic benefits associated with effective long-term weed management strategies. In addition, a mixture of chemical and non-chemical treatments provides good weed control in rice crops, and maximises long-term profit for systems where the main weed is annual barnyardgrass. However, the performance of this strategy is influenced by crop establishment method and weed density level. These results illustrate the value of the model for guiding the efficient control of annual barnyardgrass in rice crops in the Philippines.

Bloch, Harry; Sapsford, David

**THE MALTHUSIAN PARADOX: DECLINING FOOD PRICES IN THE VERY LONG RUN**

*Abrohdos. Thursday 3:00 pm - 4:40 pm*

In the *Essay on the Principle of Population*, Thomas Malthus famously issued the dire prediction that mankind was doomed to survival at a subsistence level. We examine data on real food prices going back to 1650 for some commodities. We interpret these data using the framework of Joseph Schumpeter, which allows for endogenous technical change and cyclical behaviour. We find that among prices for nine food commodities; bananas, beef, cocoa, coffee, lamb, rice, sugar, tea and wheat, and up to six cycles lasting more than fifty years each negative trends dominate, especially for tea and sugar.

Boniface, Bonaventure; Umberger, Wendy

**FACTORS INFLUENCING MALAYSIAN CONSUMERS’ CONSUMPTION OF DAIRY PRODUCTS**

*Abrohdos. Thursday 8:30 am - 10:10 am*

Increasing demand for dairy products in Malaysia is driving government initiatives and structural change in the domestic dairy industry in order to increase competitiveness and self-sufficiency. This study investigates the drivers of increasing dairy demand by examining the factors influencing Malaysian consumers’ consumption and perceptions of various types of dairy products. A survey of 435 respondents was conducted and the data were analysed using logit models. The results indicate that demographic variables such as age and ethnicity as well as other attitudinal variables significantly influence consumers’ increasing consumption of dairy products. Managerial recommendations are suggested and policy implications are discussed.

Boxall, Peter

**AN EXPERIMENTAL EXAMINATION OF TARGET BASED CONSERVATION AUCTIONS**

*Orion. Thursday 3:00 pm - 4:40 pm*

Conservation auctions (CS) are typically employed to increase the provision of Ecological Goods and Services (EG&S) for achieving environmental goals. This paper examines the ability of a CS to meet an environmental target. Previous research on this topic used the number of contracts as a target rather than some environmental goal. We used experimental economic methods benchmarked to a wetlands restoration case study to examine a target constraint that must be met by bidders rather than a budget constraint. However, since no budget constraint is employed, agencies with limited resources might have to use other auction design procedures to ensure that financial outlays to pay winning bidders are not too high while meeting the target. Accordingly we utilize a reserve price experimental treatment to address this question. The research compares the various levels of budget and target approaches focusing on efficiency, environmental improvements, and rent seeking metrics.
Brindal, Mark
CAN AUSTRALIAN WATER TRADING ARRANGEMENTS NURTURE EFFICIENT MARKETS?: AN EXAMINATION OF THE EVOLUTION OF WATER MARKETS IN THE MURRAY DARLING BASIN
Garden. Thursday 8:30 am - 10:10 am
Faced with increasing scarcity, Australian legislatures have taken the economic gamble that, by creating “property rights” in water, they are enabling the resource to achieve greater efficiency through market tradability. Through the resultant trading regime, governments are also seeking to address such problems as externalities, over-allocation and environmental degradation. With specific reference to the Murray Darling basin, this paper explores the hypothesis that historic socio/cultural legacies and institutional arrangements fabricated from pre-existing structures might effectively be creating a Gordian knot, a tragedy of the anti commons ……and that efficient solutions will remain unobtainable without radical restructuring of the institutional settings.

Brown, Phil; Daigneault, Adam; Greenhalgh, Suzie
INTEGRATING ECONOMICS INTO AN ECOSYSTEM SERVICE DECISION-MAKING FRAMEWORK
Sirius. Friday 1:10 pm - 2:50 pm
Since the release of the Millennium Ecosystem Service Assessment (MEA) in 2005, the concept of ecosystem services as a framework for decision-making has been gaining traction amongst academics, non-governmental organisations, business and governments. Key components of the MEA such as the standard classification system for ecosystem services and an assessment of the state of these ecosystem services globally have spurred several initiatives to put the concept of ecosystem services into operation. Many have focused on the economic valuation of ecosystem services or the creation of ecosystem service markets. One benefit of this concept often overlooked, however, is the push for decision-makers to consider the ecosystem service dependencies and the impacts of their decisions. This paper uses a decision-making framework developed for government and business to explore the use of ecosystem service valuation and economic modelling to guide decisions within this rapidly evolving framework.

Browne, Natalie; Kingwell, Ross; Behrendt, Ralph; Eckard, Richard
COMPARING THE PROFITABILITY OF SHEEP, BEEF, DAIRY AND GRAIN FARMS IN SOUTHWEST VICTORIA UNDER DIFFERENT RAINFALL SCENARIOS
Carnac. Thursday 8:30 am - 10:10 am
Dryland farming is commonplace in Australia so the profitability of dryland farms often depends on the amount and timing of rainfall. With drier weather conditions featuring in climate change projections for southern Australia, it is important to understand the relationships between rainfall, commodity prices and farm profitability for different types of dryland farm enterprises. Using correlated farm commodity and input prices from the past 10 years, farm profitability was calculated for a range of farm types in Western Victoria under low, average and high rainfall scenarios. Fourteen representative farms were examined that included production of Merino fine wool, prime lamb, beef cattle, milk, wheat and canola. This paper compares and contrasts the spread of profitability of these farms against the backdrop of price variability and rainfall scenarios. Inferences about the resilience to climate and price volatility of the different farm types are made.

Burton, Michael; Fogarty, James; Kingwell, Ross; Zhang, Lei
ARE CONSUMERS PREPARED TO PAY FOR CARBON REDUCTION? A CASE STUDY OF CARBON NEUTRAL LAMB
Pleiades. Friday 8:30 am - 10:10 am
Given the significance of livestock’s contribution to carbon equivalent emissions in Australia, and the cost of changing farming practices to reduce these, it is of interest whether consumers are prepared to pay for a product that has a reduced carbon footprint. This paper investigates whether Australian consumers are prepared to pay more for lamb that has reduced emissions, and whether the method used to reduce those emissions matter. A national survey using choice experiment finds that there are substantial stated WTP among some segments of the sample, and that this depends on views about the causes of climate change.
Cacho, Oscar; Moss, Jonathan
THE ROLE OF ABATEMENT AND TRANSACTION COSTS FOR CARBON PROJECTS IN THE LAND-USE CHANGE AND FORESTY SECTOR
Pleades. Friday 1:10 pm - 2:50 pm
The agriculture and forestry sectors can be cost-effective contributors to climate mitigation by providing carbon offsets through carbon sequestration in biomass and soils and by producing biofuels. However, most carbon trades to date have occurred in the energy sector. Most obstacles to carbon trades from land-use systems are related to the transaction costs involved in converting a carbon offset into a tradable commodity. This paper presents an overview of the Australian situation, with focus on the Carbon Farming Initiative (CFI). It presents a review of abatement costs involved in creating carbon offsets and the transaction costs that may be incurred to allow market participation. A model is presented that allows project feasibility to be measured based on a contract between a project developer and a group of landholders. The model is used to identify possible strategies that may reduce transaction costs and increase the competitiveness of carbon offset projects.

Chalak, Morteza; Robertson, Michael; Pannell, David
WHOLE-FARM MODELS: A REVIEW OF RECENT APPROACHES
Carnac. Thursday 8:30 am - 10:10 am
This paper reviews whole farm models research with plot and field level details that aims to estimate the impact of management interventions on a farm business. We document current approaches and develop a typology, using a review of recent papers published on whole-farm models WFMs, and describe strengths and weaknesses of various approaches. The reviewed studies were being used to address whole-farm production, environmental and economic issues. Models with a more economic emphasises accounted for constrained resources, while those with a biophysical orientation focussed on dynamics of processes. The further development of approaches to couple of dynamic biophysical and static optimisation models with provides opportunities to address issues of uncertainty in farming systems under conditions of realistic resource constraints. We showed that more studies are needed to explore effective means to engage with decision makers using WFMs.

Che, Nhu; Feldman, David; Cook, David
SPATIAL ECONOMIC ANALYSIS OF PRODUCTIVITY AND EFFICIENCY FOR THE WESTERN AUSTRALIAN GRAIN INDUSTRY
Carnac. Thursday 8:30 am - 10:10 am
Over the past 30 years the average values of key inputs of WA grain have increased significantly. There has also been an increasing trend in the average value of output, revenue and costs and profit per farm. Both profit and Total Factor Productivity (TFP) and adjusted profit and adjusted TFP (i.e. with rainfall effect adjustment) have shown an increasing trend over the study period. Efficiency in high and medium rainfall zones is generally greater than efficiencies in low rainfall zones. The key factors influencing the economic performance are: climate condition; productivity growth and wheat prices. The impacts of climate variation on has increased over time. The average price of grain has increased substantially over last 6 years. As a consequence, average income and profit per farm has increased and compensated for the effects of less favourable rainfall conditions. Together with improved productivity, high grain prices have sustained WA through a period of adverse climate.

Choe, Chongwoo; Raschky, Paul
MEDIA, INSITUTIONS, AND GOVERNMENT ACTION: PREVENTION VS. PALLIATION IN THE TIME OF CHOLERA
Sirius. Wednesday 3:30 pm - 4:20 pm
This paper studies how media and the quality of institutions affect government action taken before and after a natural disaster. The key elements in this relationship are the media’s role as the provider of information to voters about government action, the quality of democracy that pertains to how relevant election results are, and corruption that reduces the efficacy of government action. Provided that more media activity is focused on post-disaster government action, we show that more media activity and more
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democratic institutions both contribute positively to the government’s palliative effort after the disaster, although corruption has a negative effect that decreases as media activity increases. On the preventive effort before the disaster, however, media and democracy both have a negative effect, as does corruption. We provide empirical evidence based on major cholera epidemics around the world, which lends some support to these hypotheses.

Clark, Nicholas; Santos, Paulo

ASSET TRANSFERS AND CHILD LABOUR. AN EMPIRICAL ANALYSIS OF LIVESTOCK BANKS IN LAOS

Rottnest. Wednesday 10:30 am - 12:10 pm

This paper empirically estimates the impact of asset transfer on child labour. In particular, it investigates whether asset transfers reduce child labour (as expected if poverty is the main determinant of this decision) or whether the hypothesis of a wealth paradox (where increased wealth leads to higher demand for labour, including from children) finds support in this data. Using non-experimental data from four villages in Northern Laos, we evaluate the effects of participating in a livestock bank, using propensity score matching. We find that livestock transfers reduce the demand for child labour for children from households who are considered "poor" (and especially among the poorest ones) but has no effect on children from households considered better-off, in support of the traditional explanation for child labour. These findings also suggest that asset transfers are an effective method to reduce the need for child labour among the poorest households.

Connor, Jeffrey; King, Darran; Ahmad, Mobin; Gao, Lei

ECONOMETRIC EVALUATION OF MDB IRRIGATION ECONOMIC ADAPTATION TO DROUGHT

Sirius. Thursday 3:00 pm - 4:40 pm

The study estimates land area, water use per hectare and gross value of irrigated agricultural production as functions of observed price rainfall, ET and water allocation using data from ABS surveys. The results show water allocation was the most significant determinant of land area change with small land area change for perennial crops and moderate to large for annual crops. Crop prices and hotter and drier weather were also significant determinants of land area change for some crops. Water application rate, as expected were positive in allocations net ET and crop prices. Gross value regressions had high R squares with predicted area the most significant determinant, followed by price and net ET. In conclusion we discuss how the analysis provides a more nuanced basis for simulating future scenarios with alternate states of three factors determining MDB irrigation sector economic outcome: hotter and drier weather, reduced irrigation water availability, and changing commodities.

Cook, David

A BENEFIT COST ANALYSIS OF BANANA BUNCHY TOP ERADICATION IN AUSTRALIA

Garden. Friday 8:30 am - 10:10 am

Comprehensive bioeconomic decision support frameworks are increasingly needed to assist policy makers in managing biosecurity risks. Benefit cost analysis is a tried and tested analytical framework that can clearly communicate the likelihood of net benefits or costs resulting from investment decisions to diverse stakeholder audiences. In a biosecurity context, it can condense highly complex economic and biological information into metrics that are easily absorbed by decision makers when making resource allocation decisions. In this paper, we demonstrate this important property using the example of a plant pathogen targeted for eradication from banana growing regions of Australia, banana bunchy top.

Cooper, Bethany; Burton, Michael; Crase, Lin

URBAN WATER RESTRICTIONS: WHAT DRIVES INTENTIONS?

Garden. Wednesday 10:30 am - 12:10 pm

Water restrictions have been the dominant demand management response to water shortages in Australian cities. This has resulted in a burden on many householders that all-too-often is downplayed by the public entities that manage urban water affairs. Limited consideration has been given to individual behaviour in the development of urban water policy and regulatory responses to drought. This study uses structural equation modelling to investigate factors that significantly influence individuals’ intention to
CONTRIBUTED PAPER ABSTRACTS

comply with urban water restrictions. The sample is drawn from six Australian cities with differing jurisdictions. This study will contribute to better stipulating compliance policy and institutional design.

Cramb, Rob; Sujang, Patrick
PATHWAYS THROUGH THE PLANTATION: OIL PALM SMALLHOLDERS IN MALAYSIAN BORNEO
Rottnest. Thursday 3:00 pm - 4:40 pm
The dominant view among policy-makers in Sarawak, Malaysia, is that to involve smallholders in the oil palm boom requires consolidating their land into larger, centrally managed production entities. We argue, however, that smallholders are exploiting existing plantation infrastructure (roads and mills) to pursue oil palm as a viable “pathway out of poverty”, with little government support. We explore the characteristics of oil palm smallholders and the processes by which they have inserted themselves into the plantation landscape. We demonstrate the economic viability of smallholders and identify modest means of support that could raise incomes and spread benefits more widely.

Cuevas-Cubria, Clara
THE IMPACT OF AUSTRALIAN ETHANOL POLICY ON AGRICULTURE – EXAMINING LIMITS TO GRAIN PRICE RISES
Carnac. Friday 1:10 pm - 2:50 pm
Government subsidies have fuelled expansions to Australia’s ethanol production capacity that uses grains as a feedstock. Additional ethanol production will intensify competition for grain in the Australian market, particularly during drought periods. Past empirical work has found that expansions to ethanol production will cause grain prices to increase. However, this study identifies three factors likely to moderate such increases in the price of grain: starch imports for ethanol production, starch imports for animal feed and ethanol imports. Overall, this study finds that additional demand for grain for ethanol production is not likely to result in an increase in grain prices, despite biosecurity restrictions on grain imports and regional grain supply constraints. These findings are particularly relevant to Australia’s largest grain user, the livestock industry.

Cullen, Ross
AN OVERVIEW OF PRIORITISATION AND EVALUATION APPROACHES FOR BIODIVERSITY PROJECTS
Sirius. Friday 1:10 pm - 2:50 pm
There are limited funds available for biodiversity projects. Choices must therefore be made on how to use limited resources most effectively, and such decisions should be based on clear and measurable objectives for achievement. Project selection and evaluation methods are used patchily by biodiversity project providers and researchers. We provide an introduction to project selection and evaluation; point to the range of selection and evaluation methods available; ask where they are best applied; and focus attention on the need to overcome the hurdles to adoption and continuation of project selection and evaluation methods.

Daigneault, Adam; Sohngen, Brent
ROLE OF GLOBAL FORESTS IN CLIMATE CHANGE MITIGATION: A FOCUS ON THE AUSTRALIA AND NEW ZEALAND FOREST SECTOR
Pleiades. Thursday 8:30 am - 10:10 am
This paper uses a dynamically optimal global timber model (GTM) to estimate changes in regional forest area, carbon sequestration, timber supply, and roundwood price from a global climate change mitigation policy imposed on the forest sector. The partial equilibrium model maximizes total welfare in timber markets over time across more than 250 world timber supply regions by managing forest stand ages, compositions, and acreage, given production and land rental costs. There are a variety of policies that could influence specific changes in the management of existing forests, such as payments for avoided deforestation and schemes that encourage afforestation, which we simulate by introducing a range of possible carbon price scenarios on forests in all regions of the world through 2100. Results are presented at the regional level, with additional focus on the potential impacts on the forest sector in Australia and New Zealand.
Davis, Katrina; Pannell, David; Kragt, Marit

**DETERMINING THE COST-EFFECTIVENESS OF PHYTOPHTHORA CINNAMOMI MANAGEMENT IN THE FITZGERALD RIVER NATIONAL PARK**

*Orion. Thursday 8:30 am - 10:10 am*

The Fitzgerald River National Park is one of the world’s 25 biological hotspots, containing many endemic flora and fauna species. Its unique biodiversity is being threatened by the introduced root pathogen, *Phytophthora cinnamomi*. We evaluate the cost-effectiveness of strategies to manage *Phytophthora cinnamomi* in the park, using the Investment Framework for Environmental Resources (INFFER). Management strategies based on current and higher investment levels are shown to have high Benefit Cost Indices. These results support the use of public conservation funds to address the threat of *Phytophthora cinnamomi*, and show the need for improved understanding of adoption and impact of strategies.

Doelle, Sebastian

**TITLE: EVALUATION OF PREDATOR-PROOF FENCED BIODIVERSITY PROJECTS**

*Orion. Thursday 8:30 am - 10:10 am*

There has been recent debate over the role of predator-proof fences in the management of New Zealand’s biodiversity. The debate has arisen due to concern that investments in fenced sanctuaries are less productive than are alternative ways to manage biodiversity. Predator-proof fences are costly and budget constraints limit the area of habitat that can be fenced. The area of habitat enclosed within fences, and number of individuals of species supported, determines project’s ability to contribute to biodiversity goals. Many fenced sanctuary projects require substantial, continuing volunteer input to monitor fences and other tasks. These projects often pursue a number of goals including species protection, habitat restoration, education and community engagement. In this paper we examine methods to evaluate fenced biodiversity projects. While Cost Benefit analysis can potentially be used to evaluate these projects, cost-effectiveness measures and multi criteria analyses provide useful ways to inform decision-makers.

Doole, Graeme

**THREE AMIGOS AND A BIG IDEA: IDENTIFICATION OF PROFITABLE MANAGEMENT OPTIONS IN A NEW ZEALAND PASTURE-BASED DAIRY SYSTEM**

*Abrohdos. Thursday 8:30 am - 10:10 am*

New Zealand dairy farms are complex agricultural systems that produce this nation’s key export commodity. There is considerable debate surrounding the relative value of alternative management options within these systems given their complexity. A novel constrained optimisation model of a New Zealand dairy farm is described. This framework is notable for its rich description of pasture and cow biology that removes evident biases observed in existing models. Moreover, comprehensive validation highlights that this framework provides a meaningful description of real systems. A sample application demonstrates that this model is a powerful tool for evaluating alternative farm management strategies. Additionally, the framework provides an important example of the benefits of incorporating greater complexity in optimisation models of agricultural systems.

Dutta, Mrinal

**INSTITUTION OF GROUND WATER MARKET FOR MANAGEMENT OF GROUND WATER RESOURCE: A STUDY FROM ASSAM IN NORTHEAST INDIA**

*Abrohdos. Friday 1:10 pm - 2:50 pm*

In Assam, north eastern India, huge reserves of ground water, in addition to the enormous surface water availability, has the potential to ensure agricultural growth. Returns to both labor and capital in the state are considered high as potentials for exploiting the existing technology are yet largely untapped. However, insufficient irrigation infrastructure is identified as a major constraint to exploiting such potentials. To enhance the utilization efficiency and better management of these resources, a study of ground water markets in the districts of Nagaon and Barpeta was taken up. The study points out that apart from improving utilization efficiency of irrigation, reliability of water use has also increased.
considerably with emergence of ground water markets in the state.

Edwards, Geoff
THE DESALINATION PLANT, THE NORTH - SOUTH PIPELINE AND THE WELFARE OF VICTORIANS
Orion. Friday 8:30 am - 10:10 am
The Wonthaggi desalination plant and the North – South pipeline announced by the Bracks Labor government in June 2007 were intended to add more than 50 per cent of Melbourne’s (restricted) annual water use to the city’s water supplies. The Liberal/National Party government elected in November 2010 designated the completed pipeline for use only in the event of ‘critical human need’. The desalination plant will miss its scheduled end – 2011 completion date, due, ironically, to rain, and industrial relations troubles. With Melbourne’s dams 64 per cent full in late October 2011, the new water sources will not be needed for years. The paper addresses some issues and options in considering how to integrate the pipeline and the desalination plant into Melbourne’s water system.

Farr, Marina; Stoeckl, Natalie; Beg, Rabi
RELATIVE VALUES OF KEY MARINE SPECIES ON THE NORTHERN SECTION OF THE GREAT BARRIER REEF
Pleiades. Wednesday 10:30 am - 12:10 pm
Using data from a survey of 2180 domestic and international visitors to the Northern section of the Great Barrier Reef this research investigates the relative values of key marine species. The Kristrom (logit) spike model was used to analyse contingent valuation data collected using a payment card approach. There was clear evidence of interval bias with the mean estimates of WTP varying across questionnaire formats, although the ranking of species was robust across specifications. The most valued species were whales and dolphins, followed by sharks and rays. Variety figured next in the ranking then marine turtles and finally large fish.

Feil, Jan-Henning; Musshoff, Oliver
THE EFFECT OF DIFFERENT POLITICAL SCHEMES ON INVESTMENTS AND DISINVESTMENTS IN COMPETITIVE AGRICULTURAL MARKETS: A REAL OPTIONS APPROACH
Abrohdos. Friday 8:30 am - 10:10 am
In consequence of changes in general conditions, like e.g. the EU milk quota abolishment, a higher level of (dis)investments in agriculture can be expected. To date, however, there are only few policy impact analyses on both the investment and disinvestment behavior of firms in a dynamic-stochastic context. The objective of this paper is hence to develop a conceptual real options market model, which allows the impact assessment of different political schemes, like e.g. lower price limits or investment subsidies, on investment and disinvestment triggers, firm profitability and economic efficiency. The results show that it is important to consider also disinvestments besides investments when evaluating specific policies in competitive agricultural markets.

Finlayson, John; Real, Daniel; Nordblom, Thomas; Revell, Clinton; Ewing, Mike; Kingwell, Ross
A FARM LEVEL ASSESSMENT OF A NOVEL DROUGHT TOLERANT FORAGE: TEDERA (BITUMINARIA BITUMINOSA C.H.STIRT VAR. ALBOMARGINATA)
Carnac. Thursday 3:00 pm - 4:40 pm
Tedera is a drought tolerant perennial legume. Although widely naturally distributed in the Mediterranean region, tedera is yet to feature in managed farming systems in other Mediterranean climatic regions such as southern Australia. This study evaluates the potential value and potential role of tedera in dryland mixed crop and sheep production systems. The results indicate that tedera offers the potential to increase farm profits by between 8 to 26 percent in a low rainfall mixed enterprise farming environment and by 33 to 55 percent in a high rainfall mixed enterprise farming environment. The increase in profit is attributable to savings in supplementary feed and higher stocking rates.
Fleming, Christopher

PUBLIC GREENSPACE AND LIFE SATISFACTION IN URBAN AUSTRALIA

Sirius. Thursday 8:30 am - 10:10 am

Employing data from the Household, Income and Labour Dynamics in Australia (HILDA) survey and Geographic Information Systems (GIS), this paper examines the influence of public greenspace on the life satisfaction of residents of Australia's capital cities. On average, it is found that public greenspace provides positive welfare effects. However, individual, household and local area characteristics exhibit significant heterogeneity in the level of benefit derived from the provision of public greenspace. The findings reinforce the importance of considering the needs of the local residents in the provision of public greenspace in urban environments.

Florec, Veronique; White, Ben; Sadler, Rohan

AN ECONOMIC ANALYSIS OF THE DESIGN OF AREA WIDE PEST MANGEMENT FOR QUEENSLAND FRUIT FLY

Garden. Friday 8:30 am - 10:10 am

The profitability of horticultural exports in the Sunraysia Pest Free Area depends critically on pest surveillance, pest eradication, border protection and post market treatment. Using a simulation model this paper presents the economics of area wide management with an emphasis on the economics of information and the importance of trade rules in determining the returns from investment in pest surveillance.

Fraser, Robert

PRICE INSURANCE, MORAL HAZARD AND AGRI-ENVIRONMENTAL POLICY

Sirius. Wednesday 10:30 am - 12:10 pm

Motivated by recent EC proposals to "strengthen risk management tools" in the CAP in relation to farmers' increased exposure to market price risk, this paper draws attention to a potential negative consequence of such a change in the CAP - an associated increase in cheating behaviour by farmers in the context of environmental stewardship. A theoretical framework for this policy problem is developed and used not just to illustrate the problem, but also to propose a solution - specifically to combine the introduction of CAP-supported policy changes which reduce farmers' exposure to market-based risk with changes in environmental stewardship policies which increase the riskiness of cheating and thereby discourage such behaviour.

Gandhi, Vasant; Crase, Lin

DETERMINANTS OF INSTITUTIONAL PERFORMANCE IN WATERSHED MANAGEMENT: A STUDY OF THE NATURE AND PERFORMANCE OF WATERSHED INSTITUTIONS IN ANDHRA PRADESH, INDIA

Orion. Friday 8:30 am - 10:10 am

Improving productivity and incomes in rainfed areas is a major challenge in India. A huge initiative through which this is pursued is Watershed Development (WSD) programs funded by the Government of India, state governments as well as external donors. Combining scientific approaches with community participation and knowledge is a major problem and requires effective institutions. The study examines the nature and performance of watershed institutions in India, using new institutional economics, and management theory of governance. It analyzes data from a primary survey 18 watershed institutions and 542 beneficiary households in Andhra Pradesh. The results identify a number of rationalities and institutional features closely related to performance, and this can add to the theory as well as the better design of institutions.

Gao, Lei; Kirby, Mac; Mainuddin, Mohammed; Connor, Jeffrey

SUSTAINABLE DIVERSION LIMITS AND CLIMATE CHANGE: RESULTS FROM AN INTEGRATED ECONOMIC – HYDROLOGY MODEL OF THE MURRAY-DARLING BASIN

Pleiades. Thursday 8:30 am - 10:10 am

We examine the impact on flows and the returns to irrigation of potential reductions in irrigation diversions, and the interaction with projected climate change impacts. Our analysis is based on an
integrated hydrology – economics model of the Murray-Darling Basin. We compared a 2,800 GL reduction to diversions with and without climate change to a base case of no reductions. The broad result of this analysis is that:

- The reduction of water available to irrigation under the sustainable diversion limit results in a less than pro-rata reduction in returns to irrigation.
- A median climate change projection removes from the overall system, and thus from environmental flows, slightly more water than is gained for the environment under the sustainable diversion limit; a severe climate change removes much more.
- The returns to irrigation are not much affected by climate change.

Gibson, Fiona; Pannell, David; Doole, Graeme; Fogarty, James; Park, Geoff

LESSONS FROM APPLYING ECONOMIC DECISION TOOLS TO NEW LAND MANAGEMENT PROBLEMS: PRESCRIBED BURNING IN CENTRAL OTAGO, NEW ZEALAND

Abrohdos. Friday 1:10 pm - 2:50 pm

We present our experiences in using economic decision tools (specifically the Integrated Framework for Environmental Resources) to quantify trade-offs between economic, social and environmental outcomes from various prescribed burning strategies in the Central Otago region of New Zealand. In applying an economic decision model to a relative new land management issue in environmental economics, several barriers and constraints were observed. We discuss these with particular focus on accounting for information uncertainty in economic decision models.

Gobin, Vilas

TOWARDS SOCIALLY OPTIMAL LAND-USE DECISIONS: MAKING CARBON COUNT

Pleaides. Friday 1:10 pm - 2:50 pm

This study examines the issue of the market failure that occurs when forests are cut for timber or cleared for other land uses. Market failure ensues because the decision to deforest or degrade a forest often fails to account for the ecosystem services provided by this resource such as carbon sequestration. These decisions also fail to consider other economically beneficial products of forests such as non-timber forest products. A land use model was developed to better capture some of these services and benefits. The study site was Guyana, which lies above the Amazon basin and has an abundance of pristine old growth forests. Guyana has a low GDP per capita and faces the decision of how to best use this vast resource to foster growth: clear for agriculture, subsurface minerals and timber, or preserve the forests and wait for payments for ecosystem services.

Godfrey, Sosheel; Behrendt, Karl; Norbblom, Tom

DAIRY ENTERPRISE AND WHOLE FARM PERFORMANCE IN MIXED FARMING SYSTEMS IN PUNJAB, PAKISTAN

Carnac. Friday 1:10 pm - 2:50 pm

Dairy is an integrated component of Pakistan’s dominant small-scale mixed farming system. Milk production is of immense importance to country’s economy. Pakistan ranks third largest for its milk production. A major limitation to the performance of the farms is that no records are maintained by the farmer, which can lead to a poor understanding of the profitability, uninformed management decisions and nonexistent future forecasting for various farm enterprises. This paper estimates the profitability of various enterprises, using the data of 237 farms, from the Australia-Pakistan Agriculture Sector Linkages Programme (ASLP) dairy project’s two year longitudinal survey in Punjab.

Gow, Jeff; Alam, Khorshed

MANGROVE CONSERVATION AND FOREST-DEPENDENT COMMUNITIES: THE ROLE OF PROPERTY RIGHTS REGIME

Orion. Thursday 8:30 am - 10:10 am

The world largest Sundarbans Mangrove Forest (SMF) provides livelihoods to 3.5 million forest-dependent communities (FDCs) in coastal Bangladesh. The first aim of our study was to analyse the efficacy of a state
property rights regime in managing the SMF with a close examination of the association between ownership and mangrove conservation practices. The second aim was to explore FDCs’ perceptions about their participation in its conservation practices and management. A survey of 412 FDC households was undertaken. Consistent with Schlager and Ostrom’s theory, our results indicate the necessity for ownership and management changes to ensure FDCs’ participation in conservation practices.

Gowen, Rebecca; Rolfe, John; Donaghy, Peter
A BIOECONOMIC MODEL OF CARBON OFFSET SUPPLY ON A CENTRAL QUEENSLAND BEEF PROPERTY
Pleides. Friday 8:30 am - 10:10 am
A bioeconomic model is presented to compare the relative returns from a beef enterprise to changing regrowth management practices to increase biosequestration and sell carbon offsets. The model is constructed for two landtypes in Central Queensland; Brigalow and Eucalypt. Initial results were highly dependent on the assumptions regarding transaction costs, previous clearing methods and opportunity costs of cattle production. The impact of these variables and alternative policy settings were evaluated using an optimization model to identify optimal allocation between two enterprises at different carbon prices. Results show an opportunity for ‘win-win’ by utilising lower beef productivity Eucalypt land to sequester carbon. However, the results are highly variable and do not account for the risk and uncertainty associated with long term contracts to supply a non-market good into a new market.

Grant, Bligh; Dollery, Brian; Kortt, Michael
Admiralty. Wednesday 10:30 am - 12:10 pm
The contribution of the grape growing and wine making industries to Australia’s economic prosperity is under threat. While international market dynamics are often cited as the cause, the problem of oversupply and calls for government intervention were the focus of the recently completed NSW Legislative Council’s Standing Committee on State Development Wine Grape Market and Prices Inquiry (Catanzariti Inquiry, 2010). This paper examines the process, recommendations and outcomes of the Inquiry, considering in particular whether a mandatory Code of Conduct ought to be adopted by the industry to govern the relationships between winegrape growers and wine makers.

Gunasekera, Don; Hanslow, Kevin; Cullen, Brendan; Newth, David
ECONOMIC IMPACTS OF CLIMATE CHANGE ON THE AUSTRALIAN DAIRY SECTOR
Abrohdos. Thursday 8:30 am - 10:10 am
We analyse the economic impacts of climate change driven pressures on the pasture-based dairy sector in Australia. First, by using a climate-biophysical response model (the DairyMod) with inputs of changes in climate variables from the CSIRO OzClim scenarios, we estimate the changes in pasture growth, pasture intake by dairy stock, and the downstream affects on dairy stocking rates and milk output. Changes in stocking rates and dairy output estimates are then used in an economy-wide framework (NIAM —the National Integrated Assessment Model) to quantify the economic implications for the Australian dairy sector.

Gunawardena, Aruni
EFFECTS OF INCREASING AGRICULTURAL PRODUCTIVITY: A COMPUTABLE GENERAL EQUILIBRIUM ANALYSIS FOR SRI LANKA
Rottnest. Thursday 8:30 am - 10:10 am
This paper provides a quantitative assessment of the likely economy-wide impacts of agricultural productivity improvements in Sri Lanka. A static multi sectoral Computable General Equilibrium (CGE) model of the Sri Lankan economy using the input-output table for year 2000 is employed highlighting the agricultural sector and its interactions with other production sectors in the economy. The results indicate that increasing agricultural productivity leads to positive economic benefits. However, productivity improvements would lead to reduction in agricultural employment, which in turn may affect the real income of households in agricultural provinces in the short run.
Hailu, Atakelty; Gao, Lei

AN AGENT-BASED INTEGRATED MODEL OF RECREATIONAL FISHING AND CORAL REEF ECOSYSTEM DYNAMICS FOR MANAGEMENT STRATEGY ANALYSIS

Admiralty. Wednesday 3:30 pm - 4:20 pm

An integrated agent-based simulation model of recreational fishing and a coral reef environment is presented in this paper to evaluate both ecological and economic impacts. Angler behaviour in the simulation is driven by empirically estimated site choice models. Coral reef ecosystem dynamics is modelled using a local-scale mathematical coral reef ecosystem model. We apply the model to the assessment of area closure strategies aimed at managing recreational fishing. Recreational fishing sites from the Ningaloo Marine Park (WA) are used in the case study. The results show that not only the effectiveness but also the distribution of management impacts can be very different from what one would expect without the benefit of integrated modelling. The simulation of a management change on site closure demonstrates the extent to which the often controversial subjects of recreational fishing management can be facilitated using integrated modelling.

Harris, Michael; Capon, Tim; Reeson, Andrew

THE DESIGN OF INCENTIVES FOR SOIL CARBON SEQUESTRATION

Pleiades. Friday 8:30 am - 10:10 am

Soil carbon sequestration has potential to contribute to climate change mitigation. Costs of measurement/verification and other transaction costs will ultimately determine the practicality of such policies. The relationship between soil carbon spatial heterogeneity, measurement precision and measurement costs is central to the design of contracts for soil carbon sequestration. This paper considers issues of verification, contracting over actions versus outcomes, contract aggregation, contract length, and alternative accounting schemes.

Harvey, Sallyann; Rolfe, John; Taylor, Bruce

WERE REEF REGULATIONS IMPLEMENTED IN QUEENSLAND BECAUSE ADOPTION FAILED?

Orion. Friday 8:30 am - 10:10 am

Research on water quality improvements from the adoption of Best Management Practices (BMPs) in Great Barrier Reef catchments indicates there is potential to generate both private and public benefits. However, concerns surrounding the pace of adoption of BMPs through voluntary programs saw the introduction of a regulatory approach by the Queensland Government in 2009. While adoption decisions are typically analysed by economists in an expected utility framework, heterogeneity in risk perceptions of BMPs may underpin different decision frameworks. In this paper the voluntary adoption of BMPs and regulatory approaches are reviewed in a risk management and institutional framework.

Heaney, Anna; Beare, Stephen

MANAGING ENVIRONMENTAL FLOW OBJECTIVES UNDER UNCERTAINTY

Garden. Thursday 3:00 pm - 4:40 pm

The economic costs of meeting environmental flow objectives will depend on prevailing climatic conditions. The key to minimising costs to other water users is to time the environmental release to avoid periods of low water availability and take advantage of periods of high availability while still meeting the flow objectives. An environmental manager must weigh current environmental condition against the likelihood of more or less favourable conditions in the future. A stochastic optimisation model is used to develop release strategies trained and evaluated against randomised sequences of inflows. Economic trade-offs between environmental flow objectives, defined as threshold inter-arrival time between events, are elicited. The implications of different institutional arrangements affect the economic efficiency of delivering these objectives were evaluated.

Horne, Avril; Pawley, Shaan

ESTABLISHING A MARKET FOR FARM DAMS – WHAT ARE THE NECESSARY CONSIDERATIONS?

Garden. Thursday 8:30 am - 10:10 am

There are extensive regions of Australia where water is primarily sourced through unregulated streams
and farm dams, and water markets are not currently in place. Key difficulties in developing a farm dam market—making it different to regulated water systems—include the definition of transferrable property rights, the connectivity between dams and appropriate tools to assess third party impacts. This paper discusses the enablers of water trade in the context of farm dams and outlines the steps required for an efficient market.

Hutton, Trevor; Van Putten, Ingrid; Pascoe, Sean; Deng, Roy
FLEET AND SUB-FLEET PROFITABILITY IN THE TORRES STRAIT TROPICAL ROCK LOBSTER FISHERY
Admiralty. Thursday 3:00 pm - 4:40 pm
Current policy initiatives by the Commonwealth necessitate an evaluation of alternative management strategies for the Lobster fishery in the Torres Strait. The sectors targeting the resource range from commercial enterprises to small-scale operations where local inhabitants subsidise income from other sources with revenue from part-time fishing. The methods in the study integrate over analyses that utilise cost structure data, prices, output elasticities from production functions, an elementary inclusion of the supply chain, and additional sub-components that model participation in each fleet. The commonly used output indicators such as profit per fleet (and Net Present Value) do not take into account small-scale operations where priorities around employment and livelihood dominate the economic viability of fishing units. The results of a bio-economic model are presented where adjustments are made to account for the diversity in the fishery.

Iskandar, Deden; Wuenscher, Tobias
FINDING THE STRONGER IMPACT AMONG BRIBERY, FINANCIAL REWARD, AND RELIGIOUS ATTITUDE: THE INSIGHTS OF EXPERIMENT ON ENVIRONMENTAL TAX COMPLIANCE IN INDONESIA
Orion. Friday 1:10 pm - 2:50 pm
The Indonesian government has mainstreamed the environmental tax since 2008; however, the primary potential problem is the issue of noncompliance. Inspired by the case of Indonesia, this study is expected to contribute on environmental regulation literature by examining and comparing the impact of bribery, financial reward, and religious attitude on environmental tax compliance in developing countries where the corruption prevails. The study uses laboratory experiment. The results indicate that bribery has the strongest impact; it significantly deteriorates the compliance. Financial reward enhances the compliance only if the bribery is curbed, while religious attitude has no significant impact.

Islam, Nazrul; Feldman, David; Xayavong, Vilaphonh; Kingwell, Ross
PRODUCTIVITY VARIATIONS OF BROADACRE FARMS IN SOUTH-WESTERN WA
Carnac. Wednesday 10:30 am - 12:10 pm
This paper provides an analysis of productivity variations within broadacre farms located in south-western Western Australia. A panel data from 67 farms was analysed using non-parametric methods. Components of farm productivity were measured over the period from 1998 to 2008. Based on the measures of productivity growth and its variations, farms were classified into four groups and possible sources and relationships between the productivity growth and its variations were identified and explained.

Iwamoto, Hiroyuki
CONSUMERS' WILLINGNESS-TO-PAY FOR LOW-CALORIE LABELED RICE
Admiralty. Friday 1:10 pm - 2:50 pm
The purpose of this study is to examine the importance of the price, local origin label, low calorie content in Japanese consumers’ rice purchasing decisions. The effects of socio-economic variables on choice of rice are also examined. The Choice Modeling is used in order to quantify the welfare change associated with the change in the level of these attributes for the sample of Japanese consumers in March 2009. The consumer has a positive perception of local origin label. Average evaluation of the low calorie content attribute is negative. But, half of samples has positive perception of low calorie content.
Jack, Lisa

FUTURE MAKING THROUGH FARM MANAGEMENT ACCOUNTING: THE AUSTRALIAN BLUE BOOK AND OTHER ATTEMPTS TO STANDARDISE BEST PRACTICE

Carnac. Wednesday 3:30 pm - 4:20 pm

The Australian ‘Blue Book’ and the ACCRA committee in the late 1960s are the starting point for a detailed history of benchmarking, gross margins and other management accounting principles. The investigation considers to what extent standardisation of practice is desirable. The underpinning theme is how best to get primary producers to adopt accounting and economic principles for decision-making, a discussion which still persists. From an interpretative viewpoint, attempts to standardise farm management accounting can be seen as attempts to prescribe future actions and structures, and thus the proponents are engaged in what Barbara Adams terms ‘future making’.

Jahan, Hasneen; Ancev, Tihomir

TRADEOFFS BETWEEN ECONOMIC AND ENVIRONMENTAL IMPACTS OF SHRIMP FARMING IN BANGLADESH

Admiralty. Thursday 3:00 pm - 4:40 pm

Shrimp farming in Bangladesh has experienced a spectacular growth in the last twenty years which benefitted the economy enormously but these benefits are paralleled with substantial environmental and natural resource effects that can be attributed to shrimp farming. This paper examines the environmental efficiency (EE) of shrimp enterprises. The aim is to identify the shrimp enterprises that have created significant environmental degradation, but have had only a modest economic benefit, and those where improvements in environmental performance may be done at lowest cost. The study covers the major shrimp farming regions in Bangladesh and two time points, the years 2000 and 2010. Directional distance functions are used to evaluate the possibilities for improvement in economic performance for a given level of environmental performance, or vice versa. Further, we empirically examine the environmental factors that influence the environmental efficiency of farms by Tobit regression model.

Jain, Dinesh; Gandhi, Vasant

INSTITUTIONAL PERFORMANCE IN NATURAL RESOURCES MANAGEMENT: A STUDY OF INSTITUTIONAL INTERACTION IN THE IMPLEMENTATION OF WATERSHED DEVELOPMENT IN ANDHRA PRADESH, INDIA

Abrolhos. Friday 13:10pm - 14:50pm

The effective management of natural resources is increasingly critical for growth and development in India. The research examines the nature and impact of the interaction between formal and informal institutional structures in the rural areas in the context of the implementation of the major national initiative of watershed development programmes in India. It uses the concepts of new institutional economics and management theories of governance. It develops a conceptual framework which can be used to understand and explain the need and dynamics of institutional interaction and its relationship to institutional performance. The relevance of the framework is examined through case studies and a primary survey on the determinants of institutional performance in Andhra Pradesh, India. It seeks to contribute to the theory of institutions and the better design of institutions in watershed development.

Jonson, Justin; Schilizzi, Steven; Kingwell, Ross

HOW METRICS AND PRICE INCENTIVES AFFECT BROADACRE TREE-BASED CARBON FARMING

Pleaides. Friday 1:10 pm - 2:50 pm

Carbon sequestration by trees planted on farmland is an offset activity that has generated significant interest by policy-makers and industry. How attractive this activity is to farm owners who retain their land, crucially depends on several factors. This study uses bioeconomic modelling to show the importance of some of those factors in affecting the role and value of tree planting in a traditional broad-acre farming region of Australia. The standard sequestration rates in the National Carbon Accounting Toolbox are contrasted against those derived from in situ measurement of tree growth. Tree establishment and monitoring costs, the size of the risk of reversal buffer and the opportunity cost of agricultural activity are additionally shown to affect marginal abatement cost curves. In the study region carbon funded afforestation is shown to only influence the business of farming if a high carbon price is received.
Karanja, Francis; Fraser, Iain; Gilmour, Daniel

**DAIRY PRODUCTIVITY GROWTH IN VICTORIA**

*Carnac. Thursday 3:00 pm - 4:40 pm*

This paper estimates total factor productivity growth for 42 dairy farms in Victoria between 2007–08 and 2009–10. Data envelopment analysis (DEA) is used to estimate the Malmquist index of total factor productivity (TFP) growth. The results indicate that TFP declined by 0.9 per cent per annum, with a 0.6 per cent per annum decline in technological change and a 0.3 per cent per annum decline in technical efficiency. Average technical efficiency was estimated at 90 per cent, meaning that Victorian dairy farms can on average reduce inputs by up to 10 per cent. The analysis also shows that two thirds of farms exhibit increasing returns of scale suggesting technical efficiency could be enhanced through increasing scale of operations. A comparison of estimates of productivity is made to financial measures of farm performance, with an additional contrast made to subjective assessments made by field staff involved in collecting the survey data used in the analysis.

Keating, Jeremy

**EXPLAINING VOLUNTEER CONTRIBUTIONS. THE CASE OF SURF LIFE SAVING**

*Sirius. Friday 1:10 pm - 2:50 pm*

This paper examines the motives that determine overall contributions of time by volunteers, using participation in Surf Life Saving as a case study. While the existing literature attempts to explain motives underlying contributions in single equation models, we aim to improve upon this literature by accounting for the heterogeneity in participation through the use of a finite mixture model. We find evidence of two distinct groups of volunteers, who based on their motives will largely differ in their contributions. Specifically, individuals who are involved in surf lifesaving for the purposes of competing (interpreted mostly as a private good) contribute considerably less on average than those who enjoy socialising or meeting new people, or participating to find employment. Altruism, as measured through the playing of the dictator game, does not seem to play a significant role in explaining the extent of volunteer contributions. We also discuss the role image plays on the different types of participation, and its importance, as analysed through a multinomial probit model. The implications of these findings for the mobilization of time contributions are discussed.

Khairo, Salahadin; Hacker, Ronald; Atkinson, Trudie; Junk, Gemma

**OPPORTUNISTIC HARVESTING OF FERAL GOATS GENERATES NET BENEFITS AND IMPROVES NATURAL RESOURCES IN THE RANGELAND OF NSW**

*Abrohdos. Wednesday 3:30 pm - 4:20 pm*

This paper presents an economic analysis of feral goats management in the Pastoral Zone of NSW. We used conventional cost benefit analysis method to estimate the Net Present Value (NPV) of 20 years streams of costs and benefits of combinations of feral goat management strategies and domestic stocking rates on representative farms in the region. We found that the strategy of opportunistic harvesting generate NPV of about 590,000 whereas that of exclusion and do-nothing return net loss of $119,386 and $241,083, respectively. Results are positively and strongly correlated to feral goat prices than population. We conclude that the opportunistic harvesting can contribute towards the objectives of natural resources conservation; and government intervention, in feral goat management, may be required if feral goat have no economic value.

Khandker, Varsha; Gandhi, Vasant

**INTRODUCTION OF NEW TECHNOLOGIES IN AGRICULTURE: A STUDY OF THE CHALLENGES IN THE ADOPTION OF HYBRID RICE IN INDIA**

*Carnac. Friday 8:30 am - 10:10 am*

Rice is India’s number one food grain and is crucial to its food security. Raising its production with increasing demand and escalating commodity prices is a major challenge. The promising hybrid rice technology, despite its success in neighboring China and Bangladesh, has faced serious difficulties in India. The study examines the complexities in the introduction and adoption behavior of hybrid rice. It develops a conceptual framework to understand the adoption which includes technological, economic, behavioral,
market and policy factors. The research uses secondary data, interviews, and primary farmer sample surveys to explore and test the conceptual model. Preliminary specific findings on the processes, determinants and challenges in the adoption of hybrid rice are reported. This helps in identifying critical factors and recommendations for this and other such technologies.

King, Cameron; Santos, Paulo
INSURING INCOME AGAINST HUMAN CAPITAL SHOCKS USING LABOUR INDEXES
Rottnest. Wednesday 10:30 am - 12:10 pm
For most people, the main component of income is the return from human capital, through wages. However, there are no liquid markets on which human capital risk can be hedged, due to the pervasive importance of problems of moral hazard and adverse selection in the labour market. This paper explores the possibility of developing labour income indexes as a basis for an insurance that would allow individuals to protect income from adverse shocks and structural changes to their occupation or industry of employment. The labour indexes are estimated using the data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The labour income indices are then estimated through wage equations using objectively measured individual characteristics and S&P/ASX sector indices as shocks (signals) in the determination on the trigger points, payoff and fair premium in the possible insurance contracts.

King, Darran; Connor, Jeffrey; Gao, Lei; Ahmad, M; Mainuddin, M; Banerjee, O
A STATISTICALLY CALIBRATED SIMULATION MODEL OF MURRAY-DARLING BASIN IRRIGATION ECONOMICS
Garden. Thursday 3:00 pm - 4:40 pm
This paper describes an economic model of the Murray Darling Basin irrigation sector and its use in integrated hydrology and economic scenario evaluation. The model has unique features including:1) Calibration to the recently observed great variation in water allocations rain, ET and commodity prices;2) linkage to a model of the Murray Darling Basin hydrology in a way that allows integrated hydrologic, economic scenario assessment in a very straightforward and computationally efficient way. We present applications of the model involving: evaluation of climate change with lower allocations, less rainfall and higher evapotranspiration (ET); water allocation reductions involving reduced allocations but no change in rain and ET; and scenarios testing the sensitivity of irrigation sector economic impacts to future crop price developments. In conclusion, we discuss advantages and remaining challenges with econometric simulation approaches to irrigation sector adaptation modelling.

Liu, Esther; Tarrant, Katherine; Ho, Christie; Malcolm, Bill; Griffith, Garry
SIZE AND DISTRIBUTION OF RESEARCH BENEFITS IN THE AUSTRALIAN DAIRY INDUSTRY
Abrohdos. Wednesday 10:30 am - 12:10 pm
An equilibrium displacement model of the Australian dairy industry is being developed for estimating the net benefits from dairy research undertaken by DPI Victoria. In this version, the dairy industry is represented by a system of aggregate demand and supply relationships for two input sectors, raw milk and milk processing inputs, and three output sectors, export and domestic manufactured milk and domestic fluid milk. Quantities and prices are calibrated in terms of milk equivalents. The vertical and horizontal disaggregation of the industry in the model enables the distribution of benefits from farmers to consumers to be assessed. The results for a 1% hypothetical shift in demand or supply curve in each sector are presented. Sensitivity analysis is also conducted for the uncertain elasticity values specified in the model.

Lynch, Brendan; Llewellyn, Rick; Umberger, Wendy
CAN CORPORATE FARMS PROVIDE NEW PATHWAYS TO IMPROVE THE PROFITABILITY AND PRODUCTIVITY OF FAMILY FARMS?
Carnac. Thursday 8:30 am - 10:10 am
The profitability and technical efficiency gap between top performing farms and the average farm is expanding, largely due to management and capital constraints that limit the adoption of existing
technologies (ABARE, 2010; Hughes et al., 2011). The majority of leading farms are owned and operated by family entities; however, corporate farms are increasingly driving technical change. In this paper we define and characterise the existing range of corporate farm business models operating in the Australian broadacre sector. The key innovations adopted by corporate entities are identified, and a new hybrid family farm business model is analysed and the implications discussed.

Maack, Moritz; Maart, Syster; Musshoff, Oliver

THE IMPACT OF PRICE FLOORS: A REAL OPTIONS BASED EXPERIMENTAL APPROACH
Abrohdos. Friday 8:30 am - 10:10 am

In order to stimulate investments, agricultural policies frequently use price floors, which guarantee a price above a certain limit. In some cases, however, a price floor does not have the desired effects. In this study, we experimentally analyse differences in the investment behaviour with respect to the presence of a price floor and compare the actual investment behaviour to normative benchmarks of the net present value and the real options approach. Furthermore, we look at treatment order and learning effects.

MacEwan, Duncan; Howitt, Richard

BEHAVIORAL SALINITY RESPONSE: ESTIMATING SALINITY POLICIES FROM REMOTE SENSED MICRO-DATA
Sirius. Thursday 3:00 pm - 4:40 pm

In arid regions, including Australia's Murray-Darling basin and California's Central Valley, elevated salinity is an increasing and costly problem affecting agriculture, regional economies, urban areas, and the environment. To date most economic analyses of the costs of salinity to agriculture have relied on experimental crop-yield response functions. Pannell and others have noted that in order to better inform policy decisions researchers should estimate the behavioral response of farmers to salinity. We utilize geo-referenced cross-sectional data over 14,000 fields in California to infer the change in expected yield implied by changing rotations across salinity concentrations. As a pre-test we use a Multinomial Logit model to estimate the marginal effect of salinity on crop rotations. We find similar results in our behavioral and experimental models, but most crop yields show a greater response to salinity in our behavioral model.

Madhaven, Karunagaran; Ancev, Tihomir; Drynan, Ross

MANAGING PHOSPHORUS DYNAMICS IN A DEEP URBAN LAKE
Sirius. Friday 8:30 am - 10:10 am

This paper will present preliminary results from an optimal control model of phosphorus pollution in a lake that is used to supply drinking water to a large metropolitan area. This study integrates the effects of the variation of water stored in the lake, and the stochastic nature of the pollution flow, into a conceptual framework for optimal allocation of financial support to agricultural abatement activities. The model is calibrated based on data pertinent to Warragamba Dam and its catchment within the Sydney Catchment Area. The estimates of parameters values in the theoretical model are used to modify and populate the model, and to determine the optimal levels of control through numerical simulation.

Malabayabas, Maria Luz; Gauchan, Davendra; Pandey, Sushil

COMPARATIVE ANALYSIS OF RICE VARIETY ADOPTION PATTERNS IN EASTERN INDIA AND CENTRAL LUZON, PHILIPPINES
Carnac. Friday 8:30 am - 10:10 am

This paper aims to answer the possible reasons why new generation modern rice varieties have faster adoption in the Philippines than in Eastern India. Despite the increasing number of released varieties in the two countries, data shows that varieties released before 1990 are still the major rice variety planted in Easten India covering at least 51% of the total MV area. On the other hand, reverse happened in the Philippines wherein varieties released after 1990 occupies more than half of the area allocated to rice. Findings enumerated possible reasons and these include the following: hydrological condition, farmer's land endowment, farmer preferences, and strong private-public sector partnership.
Maligalig, Rio

INPUT AND LABOR USE PATTERNS OF RICE PRODUCTION IN THE DIFFERENT RICE AGROECOLOGIES IN MAJOR ASIAN COUNTRIES
Rottnest. Friday 1:10 pm - 2:50 pm
For the strategic assessment of international rice research priorities for Asia, eight classes of rice agroecologies are identified to serve as the unit of analysis for the estimation of on farm research product adoption and performance within subregions (South Asia, East Asia, and Southeast Asia). This paper provides a characterization of the input and labor use for each of the eight agroecologies using 21 diverse household survey datasets from across Asia. Input and labor use is estimated by cropping season for the different rice production and post production activities. The patterns in input and labor use could serve as a guide or useful tool in designing future research strategies and programs.

Mallawaarachchi, Thilak; Potgieter, Andries

AGRICULTURAL ADAPTATION TO GLOBAL CHANGE: SOME EVIDENCE FROM QUEENSLAND MURRAY-DARLING BASIN
Pleiadès. Thursday 3:00 pm - 4:40 pm
This paper draws on a study of land use change in the Queensland Murray Darling basin, which combines remote sensing and socio-economic analysis to investigate drivers of land use change over 1990-2011. Queensland Murray Darling basin encompasses five major river catchment areas of south-eastern QLD. The analysis of temporal image data from MODIS with other socio-economic data are used to understand landscape scale human-climate interactions and identify types and dimensions of land use change as influenced by global change drivers. Preliminary results indicate that land use in this broader region is changing in response to climatic and other factors. The paper examines how the changes observed in the region are consistent with emerging multiple land use objectives including changes in rural communities.

Manivong, Vongpaphane; Cramb, Rob

LIVELIHOOD DIVERSIFICATION IN THE RAINFED LOWLANDS OF SOUTHERN LAOS
Rottnest. Thursday 3:00 pm - 4:40 pm
Despite being a low-income, agriculture-based country with a subsistence-orientation, Laos is in the early stages of a major economic transformation whereby rural households have been experiencing rapid change in their farming and livelihood systems. Some households have engaged in what the World Bank classifies as market-oriented farming while other households have adopted labour-oriented or migration-oriented livelihood strategies. This paper explores how rural households in a remote and an accessible district in the the lowlands of Champasak Province in southern Laos make a living, and assesses their prospects in pursuing alternative “pathways out of poverty”.

Matsuda, Hirotaka

THE IMPACT OF AGRICULTURAL RESEARCH AND DEVELOPMENT TO RICE VARIETY IMPROVEMENT IN JAPAN
Abrohdos. Wednesday 10:30 am - 12:10 pm
It is well-known that research and development (R&D) is very important not only for almost all industry but also for agriculture. Agricultural R&D in Japan, in particular in a rice variety improvement, has been implemented by public institutions since national agricultural experiment station was established in 1893. Although some researchers estimate the impact of agricultural R&D to agricultural productivity in Japan, characters of agricultural R&D such as lag structure, depreciation and spillover effect is not considered clearly. The aim of this paper estimates the impact of agricultural R&D to rice variety improvement in Japan with considering the character of it.

Mazur, Kasia

VALUING GAMEFISHING ACTIVITY IN EASTERN AUSTRALIA
Admiralty. Wednesday 3:30 pm - 4:20 pm
Gamefishing in Australia shares target fish stock with commercial fishers. While the gross value of commercial fisheries production is easily estimated, estimating the value of gamefishing activities requires
the use of non-market valuation techniques. Better information about the values associated with gamefishing may allow more informed management and policy decisions. This study tests the application of the non-market valuation travel-cost method in two regions on the east coast of Australia. The Zero-Truncated Negative Binomial model that accounts for over-dispersion was used. The findings reveal the two regions are associated with significantly different values reflecting regional heterogeneity in gamefishing activity.

McCann, Laura; Arocha, Jade

THE ROLE OF CHOICE ARCHITECTURE IN TOILET DESIGN: A BEHAVIORAL ECONOMICS APPROACH TO WATER CONSERVATION

Garden. Wednesday 10:30 am - 12:10 pm

Dual-flush toilets, which use a high-volume flush for solid waste and a lower-volume flush for liquid waste, can reduce water consumption. Behavioral economics was used to analyze the design of the dual flush mechanism of the Sloan Uppercut® toilet. The default option, pushing the handle down, results in a large flush. A field experiment in a municipal building showed that water usage was considerably higher than manufacturer’s projections. While Sloan predicted a 2:1 urination-to-defecation ratio, the observed ratio during the control period was 1:4. Adding signage to each stall only increased the ratio to 2:5, emphasizing the importance of the default.

McNair, Ben; Ward, Michael

WATER RESTRICTIONS AND SOCIAL INTERACTION

Garden. Wednesday 10:30 am - 12:10 pm

A common short-term policy response to urban water shortages is the imposition of restrictions on how water may be used by households. Social interactions between households in relation to such restrictions are prevalent, with utility depending not only on intrinsic preferences relating to a household’s own water use, but also on social status and externalities associated with other households’ water use. We disentangle these components using a split-sample treatment of policy context in a choice experiment in Canberra, with some respondents choosing community-wide supply security alternatives and others choosing tariff options applying only to their household.

McWhinnie, Stephanie; Long, Ngo Van

SABOTAGE IN A FISHERY

Admiralty. Thursday 8:30 am - 10:10 am

This paper presents a simple model of a fishery where fishermen engage in sabotage activities. Sabotage may be conducted to reduce rivals’ output, (raising prices and increasing future stock) or due to envy. We show that adding sabotage into a standard fisheries model increases steady-state fish stock the greater is the effectiveness of the sabotage technology. It seems that sabotage can mitigate over-exploitation from the tragedy of the commons. Interestingly, the presence of sabotage raises steady state profit for low numbers of fishermen but lowers profit after a turning point; this non-monotonicity cannot happen in the standard model without sabotage.

Monjardino, Marta; McBeath, Therese; Brennan, Lisa; Llewellyn, Rick

REVISITING N APPLICATION RATES IN LOW-RAINFALL GRAIN CROPPING REGIONS OF AUSTRALIA: A RISK ANALYSIS

Abrohdos. Friday 8:30 am - 10:10 am

Cropping in the low-rainfall Mallee region of south-eastern Australia is risky business. Mallee farms are characterized by high climatic and spatial variability, while input prices, particularly nitrogen (N) fertilizers, are rising steadily relative to grain prices. Consequently, in anticipation of having a poor season, farmers minimize downside-risk, which is perceived as far more likely than upside gain in such risky environments, by applying fixed low rates of N to their cereal crops. However, farmers might benefit from using higher fertilizer rates and adjusting the rate of N fertilizer applied during the growing season, because if seasons are favourable the crop demands more nutrients. Using a combination of crop simulation, probability theory, profit function and finance techniques to quantify the trade-offs between magnitude and
variability in net returns, we found that tactical N management can significantly increase mean net returns across different soil types. We conclude that the use of higher N rates (relative to the region’s average) can reduce risk in a highly variable dryland environment like the Mallee. Overall, Mallee farmers with low starting N seem likely to benefit from increasing their N rates to up to 90 kg N ha$^{-1}$ from the conservative 15 kg N ha$^{-1}$ currently applied, with less risk-averse farmers being likely to do this by adopting a tactical approach to N fertilization.

Morales, Luis Emilio; Hoang, Nam

**BEEF MARKETING MARGINS IN AUSTRALASIA**

*Admiralty. Friday 1:10 pm - 2:50 pm*

Marketing margins in beef markets have been a focus of interest to determine the factors affecting price transmissions through supply chains. Data of Australia, New Zealand, Pakistan, China and Malaysia from 1971 to 2008 was analysed using panel methods indicating that margins are affected by export prices, then variations in wholesale prices are captured by intermediaries in the supply chain and partially transmitted to farmers. Variations in farmer prices affect marketing margins in most countries of the region, suggesting that farmers have different degrees of negotiation power. Finally, increases in oil price decrease marketing margins, while a raise in GDP per capita increases them.

Morrison, Mark; Parton, Kevin; Duncan, Roderick; Sherley, Chris

**COMPARING AUSTRALIAN AND US PUBLIC ATTITUDES TO CLIMATE CHANGE POLICY: A SEGMENTATION ANALYSIS**

*Pleades. Thursday 8:30 am - 10:10 am*

Australian public support for climate change policies has not been influenced greatly by recent media campaigns run by the Australian government suggesting the need for more targeted media campaigns. Maibach et al (2011) identified six segments within the US population with different attributes towards climate change which could be used as the basis for a targeted media campaign in the US. We replicate the US survey with a sample of over 1800 Australian respondents and find the segments are significantly different within the Australian population. We identify the willingness to pay using contingent valuation of segments for both government and opposition climate policies. We also report characteristics of the Australian segments which could be used to design targeted media campaigns on climate change policy within Australia.

Mugera, Amin

**IMPACT OF DEBT STRUCTURE ON PRODUCTION EFFICIENCY OF AUSTRALIAN BROADACRE FARMS**

*Carnac. Wednesday 10:30 am - 12:10 pm*

Farming activities are often financed using debt yet few studies have investigated the impact of debt structure on farm performance. In a ten years unbalanced panel (1995-2005) of Australian broadacre farms, we relate the impact of long-term, short-term debt, and tax liability on farm performance proxied by input-oriented technical efficiency measure. To check the robustness of our results, both data envelopment analysis and stochastic frontier analysis methods are employed. Results show that debt has a negative effect on production efficiency with tax debt having a higher effect relative to long-term and short-term debt. Farms are about 73 percent technically efficient.

Mwebaze, Paul

**VALUING MARINE PARKS IN A SMALL ISLAND DEVELOPING STATE: A TRAVEL-COST STUDY IN SEYCHELLES.**

*Pleades. Wednesday 10:30 am - 12:10 pm*

The economic value of Marine Parks in Seychelles was investigated using the individual Travel-Cost Model (TCM). The paper used truncated count data models to account for the non-negative integer and truncation properties of recreational trips to marine parks. Average per trip consumer surplus values of approximately $32.59-$92.74 were estimated for each marine site, resulting in an estimate of $4 to $12 million for the total social welfare generated by visits to the selected marine parks. Our estimate of the value of recreational trips to marine parks in Seychelles is similar to other studies conducted in other
countries. These findings will be useful for resource management decisions for marine national parks in Seychelles.

Nath, Tanmoy; Cunningham, Peter; Kingwell, Ross; Islam, Nazrul; Xayavong, Villaphonh; Feldman, David

**IMPACT OF LIVE SHEEP EXPORT RESTRICTIONS ON REGIONAL WESTERN AUSTRALIA: AN ECONOMIC ANALYSIS**

*Orion. Wednesday 10:30 am - 12:10 pm*

The live sheep export trade is an important component of Western Australia’s total agricultural exports. Its share of WA’s total live animal exports is 52 per cent. However, the future of this industry appears to be increasingly vulnerable and uncertain because of the influence of animal welfare lobbyists. This paper assesses the impact on regional sheep industry value chains and on the state economy of a number of scenarios where live sheep exports are restricted. The WA sheep industry value chain model and WA CGE model (WAM) were applied for simulation of these scenarios, with discussion of the ramifications of the results.

Nauges, Celine; Laukkanen, Marita

**IMPACT OF AGRI-ENVIRONMENTAL POLICIES ON FARMING PRACTICES AND NUTRIENT LOADING**

*Orion. Friday 1:10 pm - 2:50 pm*

The purpose of this article is to assess the effectiveness of the agri-environmental subsidy program that has been in place in Finland since 1995 and states water protection as one of its main objectives. Using farm level data for the years 1996 to 2005, we first estimate the impact of agri-environmental subsidies on agricultural practices using appropriate econometric techniques and then we assess the effect of these practices on nutrient loading using an environmental simulation model. We find that the average cost of the environmental subsidy scheme (141 EUR/ha) largely exceeded its benefit as measured by the avoided environmental damage (2.70 EUR/ha), which questions the effectiveness of the system.

Nemes, Veronika; La Nauze, Andrea; Brennan, Tess

**AN URBAN WATER MARKET DESIGN**

*Garden. Wednesday 10:30 am - 12:10 pm*

The aim of an urban water market is to balance supply and demand of water. Urban water is associated with a system of pipelines, storage facilities and treatment plants. These services alter the value of water by changing its location, time period and quality. In order to reveal the value of this infrastructure, a competitive environment is required where pipeline operators (location brokers), storage operators (time brokers) and treatment operators (quality broker) competitively set prices for their services. Such market fundamentally changes the role of government and the private sector, and how objectives like security of supply are achieved. In this paper we discuss the potential of virtual water trading and financial transactions in alleviating or even overcoming the natural monopoly problem traditionally associated with networked infrastructure. Other features such as ‘smart market rules’ (constrained optimization using a market algorithm) are also briefly described.

New, Robert

**MANAGEMENT CHANGES AND VESSEL-LEVEL TECHNICAL EFFICIENCY IN AUSTRALIA’S EASTERN TUNA AND BILLFISH FISHERY: A STOCHASTIC FRONTIER ANALYSIS**

*Admiralty. Thursday 3:00 pm - 4:40 pm*

Changes in fishery management can potentially have adverse effects on efficiency, thereby reducing the fishery’s ability to achieve maximum economic yield. The stochastic frontier method was used to analyse how recent management changes in Australia’s Eastern Tuna and Billfish Fishery affected vessel-level technical efficiency. Fleet composition changes and de-crowding are shown to have positively affected technical efficiency following the structural adjustment package, and input substitution is shown to be of little significance during the period of effort controls. Tracking changes in technical efficiency over time can assist managers of Commonwealth fisheries to achieve their objective of maximum economic yield.
Newby, Jonathan; Cramb, Rob; Bertomeu, Manuel

CAN’T SEE THE POVERTY FOR THE TREES: FOREST TRANSITIONS AND RURAL LIVELIHOODS IN SOUTHEAST ASIA

Rottnest. Thursday 3:00 pm - 4:40 pm

One of the World Bank’s proposed ‘pathways out of poverty’ for rural households is agricultural commercialisation. In particular, smallholder tree farming is advocated as a strategy for upland environments. However, the belief that adoption of commercial tree crops can lift whole populations out of poverty ignores the initial diversity in farmers’ circumstances and the disequalising processes involved in the transition to tree farming. Village studies from Laos and the Philippines show that while some households successfully adopt tree crops and improve their livelihoods, others not only struggle to follow this pathway but come under adverse pressure as the transition proceeds.

Noble, Chris

ORGANISATION OF INFORMATION CHANNELS AND THEIR USE BY PRODUCERS IN SMALL AND MEDIUM BEEF CATTLE ENTERPRISES

Carnac. Friday 8:30 am - 10:10 am

Gaining effective use of information poses problems for producers in the beef cattle industry such as searching for and pricing relevant information, communicating information and verifying relevance to their enterprise. Producers respond to these problems through the selection and organisation of their individual information channels. This study describes in depth the information channels and means producers employ, such as language usage, relationships, routines or divisions of labour to solve information-related problems and develop useful knowledge. Data sourced from producers in the New England area of NSW showed that the timing, purpose and process of acquiring information contribute to the efficacy of outcomes.

Nolan, Elizabeth

WOOL PRICES, MULESING STATUS AND THE MEDIA

Orion. Wednesday 10:30 am - 12:10 pm

We use hedonic pricing analysis to estimate implicit prices for attributes of 2.8 million wool lots sold at auction in Australia over seven seasons from 2004-05. We control for changes in world markets by including exchange rates, GDP growth, prices of substitute fibres and changes in apparel sales in key markets. We investigate the effect on prices of the National Wool Declaration on mulesing status, and whether its impact has changed since its introduction in 2008. We include a measure of media hits to determine to what extent the effect of the declaration is influenced by media attention.

Nolte, Stephan; Natanelov, Valeri; Buysses, Jeroen; Van Huylpenbroeck, Guido

PRICE TRANSMISSION IN THE GERMAN SUGAR MARKET

Admiralty. Friday 1:10 pm - 2:50 pm

The German sugar market is governed by the European Union’s common market organization (CMO). In 2006, the CMO was subject to its first major reform. Among others, the administered price for sugar was reduced by 36%. We use a data set with monthly prices for sugar and sugar containing products to perform a co-integration analysis. Results show that the reduction of the institutional price has led to a reduction of wholesale prices and of retail prices for table sugar. Prices for sugar containing products are not found to be co-integrated with the sugar price, but rather with the overall index of food retail prices.

Nordblom, Thomas

WATER AND CARBON MARKETS UNDER CLIMATE CHANGE: BALANCING PUBLIC WETLANDS AND PRIVATE IRRIGATION AND FORESTRY

Sirius. Friday 8:30 am - 10:10 am

Where carbon sequestration benefits encourage large-scale expansion of tree plantations, the resulting increases in rainwater interception may be expected to reduce river flows to irrigation industries and to public wetlands. Market balance solutions among these sectors have been modelled numerically and in economic experiments for the case of average annual rainfall in the Macquarie Catchment of NSW.
The present study explores experimentally the effects of historical year to year variations in rainfall and stream flows on water market outcomes. Variation in historical stream flows is represented as a variance/covariance matrix and a vector of mean flows. Climate change is simulated with shifts in these parameter values. Experimental subjects respond interactively to the variable conditions of historical weather, and to synthetically changed weather parameters, depicting climate change.

Norman-Lopez, Ana; Pascoe, Sean; Thebaud, Olivier

THE IMPLICATIONS OF CLIMATE CHANGE IN AUSTRALIAN SEAFOOD MARKETS
Admiralty. Friday 8:30 am - 10:10 am
Climate change is believed to have a positive impact on most Australian fisheries. However, climate change is also expected to impact the productivity of wild and farmed fisheries worldwide. Changes in supply from one region will have an impact on producers in other regions supplying the same market. For Australia, where edible seafood exports represents over 50% of the total value of production, changes to export prices will have significant economic implications. In this paper, we investigate the inter-relationship between Australian and other seafood products in international markets, and reassess the impacts of climate change in light of these interactions.

Nossal, Katarina

PRODUCTIVITY AND THE INNOVATIVE CAPACITY OF AUSTRALIAN GRAIN GROWERS
Carnac. Thursday 3:00 pm - 4:40 pm
Slowing productivity growth in the Australian grains industry has led to calls for increasing investment in rural R&D to advance agricultural technology. However, recent research also suggests strong potential to increase productivity by enhancing uptake of existing innovations. The productivity gains from innovation adoption are likely to depend on the capacity of farmers to effectively select, adapt and integrate innovations into existing farming systems. In this paper, the innovative capacity of grain growers is characterised by variables related to the farm, the farmer and their operating environment. The influence of these factors on on-farm innovation adoption is tested using an ordered probit model. Then, the relationship between innovative capacity, innovation adoption and productivity is evaluated. The results suggest that building innovative capacity is effective in increasing agricultural productivity.

O'Donnell, Chris; Kingwell, Ross

NATURAL LEVELS OF INEFFICIENCY IN AUSTRALIAN AGRICULTURE
Carnac. Wednesday 10:30 am - 12:10 pm
Measures of efficiency are measures of distances between observed input-output points and various economically-interesting points on or near an estimated production frontier (e.g., points of optimal scale). In this paper we use standard economic models to explain why a firm may rationally choose to operate at an inefficient point. Among other things, we explain that if the assumptions of the standard neoclassical growth model hold then a firm with a finite planning horizon may periodically choose to operate inside the frontier (i.e., be technically inefficient). We use our models to estimate optimal (or natural) levels of technical, scale and mix inefficiency in Australian agriculture.

O'Keefe, Suzanne; Crase, Lin

MANAGEMENT OF ENVIRONMENTAL WATER- WHAT IS THE SCOPE FOR A LOCALISED APPROACH?
Garden. Thursday 3:00 pm - 4:40 pm
Given that the Commonwealth Environmental Water Holder now controls up to 20% of all water allocations in the MDB, interest has turned to the crafting of water management regimes that are both efficient and effective. Economists have suggested a variety of structures and institutional approaches including the potential for locally-based organisations such as water trusts. In this paper, we examine the challenges and opportunities presented by a localised approach to environmental water management and identify the key institutional factors that influence success.
Otumawu-Apreku, Kofi

INSPECTION, COMPLIANCE & VIOLATION: A CASE OF FISHERIES
Admiralty. Thursday 8:30 am - 10:10 am
The presence of illegal, unregulated and unreported (IUU) fishing activities are considered a serious threat to the sustainable use of marine resources. This paper uses a game theoretic approach to investigate the strategic interaction between fishers and management in the presence of IUU fishing. Managers choose a combination of fines, inspection probabilities and whether to classify a firm as "good" or "bad" to induce a target level of compliance from fishers who choose whether or not to comply. Importantly, this paper finds that equilibrium compliance strategies of fishers affect stock levels over time. In particular, less than perfect monitoring and enforcement lowers illegal harvesting which is beneficial for stocks.

Owens, Katherine

DELIVERING ENVIRONMENTAL WATER REQUIREMENTS: LESSONS FROM AUSTRALIA, COLORADO AND ALBERTA
Sirius. Thursday 3:00 pm - 4:40 pm
It is uncertain whether water allocation markets can be successfully deployed to deliver water for environmental needs, with uneven results demonstrated across jurisdictions that have experimented with markets as a regulatory tool. The Paper will compare and evaluate the regulatory and institutional tools adopted in Australia, Colorado and Alberta for environmental water requirements. It will isolate the push and pull of the institutional, social and political forces at play in the delivery of environmental water requirements within the three jurisdictions, and outline regulatory enhancements that are likely to promote a more reliable platform for the ecologically sustainable development of water resources.

Pandit, Ram; Polyakov, Maksym; Sadler, Rohan

THE IMPORTANCE OF TREE COVER AND NEIGHBOURHOOD PARKS IN DETERMINING URBAN PROPERTY VALUES
Sirius. Thursday 8:30 am - 10:10 am
This paper presents a spatially explicit analysis of the contribution of urban trees and parks to residential property values. We estimated the effects of structural, neighbourhood, and amenity variables on the values for single-family homes in Perth using a generalized spatial two-stage least-squares model. Results indicate that tree cover in adjacent streets and the extent and proximity of neighbourhood parks attract significant price premiums in the Perth housing market.

Pangaribowo, Evita Hanie

THE IMPACT OF RICE FOR THE POOR PROGRAM ON HOUSEHOLD CONSUMPTION
Rottnest. Friday 1:10 pm - 2:50 pm
This study investigates the impact of the 'Rice for the Poor' program - an almost universal program of Indonesian Social Safety Net (SSN) Programs launched in 1998. The general aim of the program was to mitigate the decrease of household nutrition well-being. The program has provided highly subsidized rice for poor households. Using the Indonesian Family Life Survey, this study implements propensity score matching combined with difference in difference method. It is revealed that the program has improved households' dietary diversity even though aid fungibility was also present.

Pannell, David

ACCOUNTING FOR HUMAN BEHAVIOUR WHEN DESIGNING AND IMPLEMENTING ENVIRONMENTAL POLICY
Sirius. Wednesday 10:30 am - 12:10 pm
Many environmental policy programs are designed and implemented without adequate consideration of likely behavioural responses to the program by people who are affected by it. Commonly, naïve and overly optimistic assumptions are made about how responsive people will be. There exists a wealth of research knowledge on behaviour change that should be factored in. In this paper, the relevance of these issues is discussed in relation to prioritisation of environmental projects, the design of effective environmental projects, and the selection of appropriate policy mechanisms. Several tools that have been
developed in this area are outlined.

Park, Geoff; Pannell, David; Roberts, Anna; Alexander, Jennifer
THE PROBLEM WITH RESOURCE CONDITION TARGETS IN REGIONAL NATURAL RESOURCE MANAGEMENT
Orion. Thursday 8:30 am - 10:10 am
Natural resource management organisations routinely establish resource condition targets as a key element of regional plans and strategies. Well-defined targets would assist with economic assessment of investments, as well as with their subsequent monitoring and evaluation. We examined biodiversity, water and community targets set by all Catchment Management Authorities (CMAs) in Victoria and New South Wales over planning cycles since 1997. Analysis of the targets against criteria of being specific, measurable, and time-bound (SMT) revealed that less than 30% satisfied all three. Whilst planning rhetoric often makes claims about the need to set SMT targets our analysis suggests that the overall quality of targets is poor. Disturbingly there are even fewer SMT targets in the most recent CMA plans.

Winner of the AAEA-AARES Heading South Award
Parks, Joanna; Alston, Julian
THE RETURNS TO PROMOTION OF HEALTHY CHOICES—IMPLICATIONS FROM A MARKET EXPERIMENT IN TASMANIA: ARE YOU IN THE DARK ABOUT THE POWER OF MUSHROOMS?
Rottnest. Wednesday 3:30 pm - 4:20 pm
The Australian Mushroom Growers Association (AMGA) has recently developed a revised marketing strategy to promote mushrooms using messages based on scientific findings about the nutrition and health consequences of regularly incorporating mushrooms into meals. This article evaluates impacts based on a test-market experiment in Tasmania. We use a difference-in-difference econometric methodology to quantify the program-induced shifts in demand, and we use the resulting estimates in a supply and demand modeling framework, to quantify the effects of promotion-induced demand shifts on prices, quantities, and measures of economic well-being. We estimate a conservative benefit-cost ratio for Tasmanian producers of 7.6:1 if they were to bear the entire cost and 11.4:1 if the program were financed by a levy on production (or spawn). The aggregate benefit-cost ratio, including benefits to consumers was also 11.4:1.

Pascoe, Sean; Thebaud, Olivier; Vieira, Simon
ESTIMATING ECONOMIC TARGET REFERENCE POINTS IN DATA POOR FISHERIES
Admiralty. Friday 8:30 am - 10:10 am
Bioeconomic models have been applied to a wide range of fisheries around the world. However, an even greater number of fisheries are relatively data poor, and development of traditional bioeconomic models is not feasible. Work on the biological side has resulted in techniques to estimate reference points such as FMSY (fishing mortality at MSY) in such fisheries. In this paper, we extend this work to move from FMSY to FMEY for single species fisheries. We show that good estimates of economic target reference points can be achieved with limited data.

Pearson, Leonie; Crean, Jason
SOIL CARBON SEQUESTRATION IN MIXED FARMING LANDSCAPES: INSIGHTS FROM THE LACHLAN SOIL CARBON PROJECT
Pleiades. Friday 8:30 am - 10:10 am
The potential for soil carbon sequestration to play a significant role in meeting Australia’s greenhouse reduction targets has attracted widespread interest. This paper evaluates the cost-effectiveness of different mechanisms to improve soil carbon sequestration in mixed (wheat-sheep) farming landscapes. This paper draws on the results of an MBI pilot in the Lachlan catchment to reveal landholders costs of soil carbon sequestration and the extent of transaction costs associated with different types of soil carbon contracts. Although markets have been heralded as the most efficient solution in sequestering soil carbon, there are important implications for efficiency and transaction costs in offering different contracts to farmers.
Pede, Valerien; Tatlonghari, Gerlie

REGIONAL INCOME INEQUALITY AND ECONOMIC GROWTH: A SPATIAL ECONOMETRICS ANALYSIS FOR PROVINCES IN THE PHILIPPINES.

*Rottnest. Friday 8:30 am - 10:10 am*

This paper reinvestigates the inequality-growth link using data on provinces in the Philippines over the period 1991-2000. Previous studies on the inequality-growth relationship have often provided conflicting findings. While some study reveal a positive link, other claim a negative link or no significant relationship at all. In this study, we consider a spatially-explicit growth model where per capita growth depends on inequality and other growth factors. Spatial econometrics techniques are used to account for spatial dependency and spillover effects. Results indicate that inequality has a positive and significant effect on per capita income growth. Provinces with higher poverty incidence tend to grow less and human capital appears to be a significant booster to per capita income growth. Urban provinces tend to grow faster than the rural ones.

Petersen, Elizabeth; Brennan, Donna; Que, Nguyen Ngoc; Vanzetti, David

RURAL-URBAN MIGRATION AND VIETNAMESE AGRICULTURE

*Rottnest. Wednesday 10:30 am - 12:10 pm*

Vietnam has achieved remarkable economic growth since it liberalised its markets, and further economic growth and opportunities are predicted both within and outside the agriculture sector. However, growth has not been evenly distributed across regions and significant structural adjustment pressures are expected in the medium to long term. A dynamic, eight region, 13 commodity, non-linear programming model of Vietnam’s agricultural sector is used to analyse the likely impact of a change in rural-urban migration on agricultural production, prices, trade and regional incomes.

**Winner of the NZARES-AARES Heading West Award**

Pham Do, Kim Hang; Houba, Harold; Zhu, Xueqin

A JOINT MANAGEMENT APPROACH TO THE MEKONG RIVER BASIN

*Garden. Wednesday 3:30 pm - 4:20 pm*

The Mekong River Basin is an example of the least developed transboundary rivers in the world due to difficulties inherent in implementing joint management among diverse riparian nations. This paper investigates the welfare improvements arising from joint management and improved governance of the Mekong. Applying a bargaining approach, we show that there are significant welfare gains from cooperation in this region and the Mekong River Committee should be extended to include all affected nations for sustainable management and future development.

Polyakov, Maksym; Pannell, David; Roberts, Anna; Park, Geoff

OPTIMISING THE SPATIAL PATTERN OF LANDSCAPE REVEGETATION

*Sirius. Wednesday 10:30 am - 12:10 pm*

Including economic costs into ecological restoration planning is important if cost effective outcomes are to be achieved. Opportunity costs of revegetating agricultural land depends on a number of farm characteristics (eg. size amongst others). Apart from environmental benefits, native vegetation restoration can also provide private benefits for landowners, and if so these could be excluded from the opportunity costs. We apply a spatially explicit bio-economic model that optimises for restoration of a cleared landscape in the Mt Alexander shire in north-central Victoria. The model uses marginal values of agricultural land as opportunity costs and marginal values of woodlands as private amenity benefits. Our results show that ignoring amenity values and variable opportunity cost can lead to ineffective allocation of ecological restoration.

Printhika, Samla; Jayasinghe-Mudalige, Udith; Thibbotuwawa, Manoj

IMPACT OF MICROFINANCE ON HOUSEHOLD WELFARE: ASSESSING THE CASE OF SAMURDHI PROGRAM IN SRI LANKA

*Rottnest. Thursday 8:30 am - 10:10 am*

Household Income & Expenditure Survey (2006/07) data were used to estimate the impacts of ‘Samurdhi’
– the largest state-sponsored microfinance program in Sri Lanka – on the status of household income, health, education, and food and non-food consumption. Propensity Score Matching was used to minimize selection bias. Propensity scores were estimated using a Probit Model to match “treated” households with “control” group to identify the impacts. The results show that Samurdhi possesses a significant impact on household welfare on income, consumption and education, despite the inefficiencies and political interferences associated with distribution of intended services.

Priyanti, Atien; Cramb, Rob

SMALL-SCALE BEEF CATTLE PRODUCTION AND RURAL LIVELIHOODS IN EAST JAVA, INDONESIA

Rottnest. Thursday 3:00 pm - 4:40 pm

Despite its small area and intensively cropped landscape, East Java accounts for 30% of Indonesia’s beef cattle population. About two million households draw on family labour to raise cattle in backyard sheds and small enclosures, largely for cash income. The paper reports on a study in two contrasting sites – irrigated lowlands and rainfed uplands – to explore the constraints facing cattle producers in these environments and possible means to enhance their production systems and incomes. In particular, the paper focuses on the issue of feed supply and the local market that has emerged for agricultural by-products (rice straw, maize stover, and legume residues) and planted forage grasses. The research shows that intensive cattle production can provide a viable pathway out of poverty, even for resource-poor households.

Qureshi, Muhammed; Ahmad, Mobin; Kirby, Mac; Whitten, Stuart

ASSESSING ECONOMIC IMPACT OF DROUGHT IN THE MURRAY-DARLING BASIN, AUSTRALIA

Pleiades. Thursday 3:00 pm - 4:40 pm

In the last decade, Murray-Darling Basin (MDB), Australia faced many severe droughts which affected its agriculture production. Climate change is expected to impact on future agriculture production and development in the MDB. We developed a biophysical-economic mathematical model calibrated against the observed multi-period land use data utilising the positive mathematical programming approach. The model is used to assess the impact of recent droughts as well as of future climate change scenarios on major agricultural activities across regions of the MDB.

Quiggin, Daniel; Adamson, David

SPECIES SPREAD AND CAPITAL RISK

Garden. Friday 1:10 pm - 2:50 pm

Pest management is an ongoing issue for producers. The background pest mix and density is dependent upon both environmental factors and the producer’s actions to protect their commodity. The concept of economic thresholds helps to understand pest management decisions. The economic threshold is described as the point where the benefit of control is equal to the cost of control, thus justifying management expenditure. As the density and/or damage caused by a pest increases management costs rise and ultimately capital return is reduced. This alters the comparative advantage of production. As pests are highly opportunistic, they can alter the optimal mix of resources within a landscape. The aim of this paper is to examine the implications to capital under alternative pest dispersal rates through a defined landscape.

Rai, Rajesh; Scarborough, Helen

ESTIMATING THE PUBLIC BENEFITS OF MITIGATING DAMAGES CAUSED BY INVASIVE PLANT SPECIES IN A SUBSISTENCE ECONOMY

Garden. Friday 1:10 pm - 2:50 pm

This paper presents analysis of choice experiment (CE) data designed to estimate willingness-to-pay (WTP) to mitigate damages caused by invasive plant species (IPS) in a rural community of Nepal. In order to address the cash constraints problem in a subsistence economy, two payment attributes, labor contribution and membership fee, were included in the choice set. The results reveal that rural farmers have significant WTP for forest management activities, in terms of both cash and labor contributions. The results also suggest that rural farmers value their time in this context at a different rate to the current
wage rate. Some CE issues, including questionnaire design and survey implementation strategy, are discussed in the context of a low-income community application.

Rajakaruna Mudalige, Manoj; Mugera, Amin; White, Benedict

**RICE FARMING IN SRI LANKA: IS THERE ANY SCOPE FOR EFFICIENCY IMPROVEMENT?**

*Rottnest. Thursday 8:30 am - 10:10 am*

This article investigates production efficiency of rice farming in Sri Lanka using cross section survey data. Rice is the main stable food and yield gaps below the attainable potential have implication for food security. Past studies on rice farming have mostly focused on technical efficiency. Here, we examine technical efficiency and cost efficiency using the Bootstrap Data Envelopment Analysis (DEA) approach. On average, the farms were 79% technical efficient with irrigated farms being more efficient (82%) than rainfed farms (76%). Average overall and allocative efficiencies were 63% and 72%. Results are expected to be of interest to researchers and policymakers.

Rammohan, Anu; Pritchard, Bill

**THE DETERMINANTS OF FOOD SECURITY IN RURAL INDIA**

*Abrohdos. Thursday 3:00 pm - 4:40 pm*

Despite making significant economic progress, food insecurity levels remain high in India, with an estimated 21% of the population estimated to be food insecure (FAO, 2009). In this paper we empirically analyse the determinants of food security in rural India, using primary data collected from 800 randomly selected rural households from 8 strategically selected border districts. Our empirical analysis uses probit and ordered probit models to examine the probability of a household being food secure. Our analysis finds evidence that variables such as poverty, income from agriculture, religion and district heterogeneity influence household's food security. Food based safety nets appear to be implemented differentially across different districts.

Raschky, Paul

**A SPATIAL ECONOMETRIC ANALYSIS OF COMPLIANCE WITH AN INTERNATIONAL ENVIRONMENTAL AGREEMENT ON OPEN ACCESS RESOURCES**

*Orion. Friday 1:10 pm - 2:50 pm*

This paper provides an empirical analysis of the role of intergovernmental relations on a country's effort to enforce the objectives of an international environmental agreement on an open access resource. Intergovernmental interaction allows signatory countries to observe compliance behavior of other signees and to punish non-compliance by applying bi- and multilateral sanctions. We use a cross-sectional dataset that contains country level information about compliance with the 1995 UN Code of Conduct for Responsible Fisheries. Our identification strategy combines a spatial autoregressive model with spatial autoregressive disturbances and an instrumental variable approach. We find a strong positive effect of other countries' compliance on the individual country's compliance score. These results suggest that repeated interactions among participants might not only play a role in enforcing the obligations of an agreement at the community level but also at the international level.

Reise, Christian; Liebe, Ulf; Musshoff, Oliver

**DESIGN OF SUBSTRATE SUPPLY CONTRACTS FOR BIOGAS PLANTS**

*Pleiades. Wednesday 3:30 pm - 4:20 pm*

For a sustainable development of energy production in biogas plants, the continuous supply with substrates is essential. To examine relevant factors for the conclusion of supply contracts, we surveyed German farmers using a choice experiment. Results show that, the supply price is paramount. In case remuneration is made at fixed prices - contrary to an orientation towards (future) market prices - an additional premium is charged. The probability of a conclusion of contract decreases with increasing duration of the contract. Regarding the expansion of renewable energies, these findings are meaningful for a target-aimed design of supply contracts.
Rigby, Dan; Burton, Michael; Lusk, Jayson

**JOURNALS, CAREER PROGRESSION AND IMPACT: USING BEST WORST SCALING TO DERIVE JOURNAL RANKINGS**

*Sirius. Wednesday 3:30 pm - 4:20 pm*

We report the results of a journal ranking study based on the preferences of 938 researchers in Ag-Env Economics elicited via a Best Worst Scaling survey. Preferences regarding the impact of publishing in a set of 23 journals on career progression, and also the journals’ impact beyond academia, were sought. Latent Class model results reveal considerable heterogeneity across continents and research areas regarding journals’ performance. The results are combined with existing quality measures (I.Factors etc) to locate the journals in n-dimensional quality space. We highlight the trade-offs and complementarities across the performance attributes for different journals, including the *AJARE*.

Rogers, Abbie

**CONSERVATION VALUES AND MANAGEMENT PREFERENCES FOR THE NINGALOO MARINE PARK: A DISCRETE CHOICE EXPERIMENT**

*Pleiades. Wednesday 10:30 am - 12:10 pm*

The creation of a marine reserve network is an active area of policy in Australia. Successful policy hinges on community support, which requires an understanding of what drives improvements in social welfare. Here, a discrete choice experiment is used to estimate ecological values for the Ningaloo Marine Park. A novel aspect of this research is that it not only considers the values people hold for conservation outcomes, but also their preferences for how those outcomes are achieved. By considering management process within the choice model, we gain a richer understanding of the relationship between social welfare and marine conservation. The results indicate that management process does have an impact on individuals’ preferences for conservation.

Rola-Rubzen, Maria Fay; Batt, Peter; Murray Prior, Roy; Concepcion, Sylvia; Montiflor, Marilou; Real, Rodel; Lamban, Ruby Jane; Axalan, Jerick

**ARE CLUSTER FARMERS MORE TECHNICALLY EFFICIENT THAN NON-CLUSTER FARMERS? THE CASE OF VEGETABLE FARMERS IN MINDANAO, PHILIPPINES**

*Carnac. Thursday 3:00 pm - 4:40 pm*

Cluster farming is considered one of the strategies to link smallholder farmers to institutional markets. The impact of clustering, however, goes beyond improvements in market access as there are direct and indirect benefits (and costs) in clustering. An underlying question is whether clustering leads to improved efficiencies in the farm. Looking at smallholder farmers in Southern Mindanao, findings showed that cluster farmers are more technically efficient than farmers that do not belong to clusters as they altered their production and post-harvest practices to meet the more stringent requirements of institutional markets, thus resulting to more efficient production and higher productivity.

Rolfe, John; Gregg, Daniel

**VALUING BEACH RECREATION ACROSS A REGIONAL AREA: THE GREAT BARRIER REEF IN AUSTRALIA**

*Pleiades. Wednesday 10:30 am - 12:10 pm*

The focus of the research reported in this paper has been to estimate recreation values held by local residents for a large number of beaches over approximately 1,400 kilometres of coastline along the Queensland coast. Negative binomial models have been used to estimate both the visit rate and recreation values associated with beach visits in different regional areas. The value of a single beach visit was estimated per person at 37.84, which extrapolates to $644.3 million in beach recreation values per annum. These values are likely to be conservative because travel time has not been included and other opportunity costs incurred to live closer to the beach (e.g. housing premiums) have not been assessed.

Salih, Thamir

**MALAYSIA: POLICY MAKING, TRADE AND ECONOMIC DEVELOPMENT**

*Rottnest. Friday 8:30 am - 10:10 am*

For the period between 1957 and 1997, Malaysia’s development is analyzed to determine the roles of
inputs, planning, and trade and government intervention in economic activity. Foreign investment is also analyzed. During this period, by international standards, growth that Malaysia experienced was impressive. This growth was achieved through a policy framework that used government planning and investments in conjunction with incentives for the private sector. A unique feature of Malaysia’s planning was its call for social justice to advance the economic interest of its less economically privileged population. By adopting amalgam of development strategies and policies policymakers were successful in improving the socio-economic status of the majority of the Malaysian population.

Samarasinghe, Oshadhi; Daigneault, Adam; Greenhalgh, Suzie
IMPACTS OF FARMER ATTITUDE ON A NUTRIENT REDUCTION POLICY: A NEW ZEALAND CATCHMENT CASE STUDY
Sirius. Friday 8:30 am - 10:10 am
This paper uses responses from a regional farmer survey that identify farmers’ perception towards environmental policies to calibrate a catchment-level environmental economic model (NZ-FARM) to estimate the impacts of a nutrient reduction policy in North Canterbury, New Zealand. The model maximizes farm income across a catchment, accounting for changes in land use, farm output, nutrient loadings and GHG emissions. Simulations estimate that reducing nutrient loads by 15-30% can be achieved with minimal economic impacts (1-6%), but only if landowners are willing to change how they manage their farm. Many farmers are hesitant to implement certain mitigation options though, thus resulting in higher economic costs than initially estimated. Farm-level impacts will likely vary by the current farm practice, the farmers’ attitude towards the regulation, and the ability for policymakers to educate and incentivise landowners to adopt a variety of land management options.

Santos, Paulo; Skidmore, Samuel
SEEING REDD: A MICROECONOMIC ANALYSIS OF CARBON SEQUESTRATION CONTRACTS IN INDONESIA
Sirius. Thursday 8:30 am - 10:10 am
The implementation of the REDD program requires knowledge of the willingness to accept land use change contracts and its effectiveness requires its application over large areas. In this paper we use data from Sumatra, Indonesia, to contrast two approaches to the elicitation of the supply curve for carbon sequestration: a reverse uniform auction and a budgetary analysis of opportunity costs. The analysis of the supply curves highlights that individual preferences, namely time and risk preferences, but not the opportunity costs, play a significant role in determining the price villagers are willing to accept land use contracts that promote high carbon sequestration systems. The results also indicate that there are significant gains from trade to be made through the implementation of this program, as the price requested by land users in the setting we study is much lower than current carbon prices.

Schamel, Guenter
WINE QUALITY AND REPUTATION OF COOPERATIVES VS. PRIVATE FIRMS
Admiralty. Wednesday 10:30 am - 12:10 pm
We address the question whether cooperatives in Alto Adige able to compete with privately owned wineries regarding product quality and reputation. In contrast to private wineries, cooperatives lack some control over their production chain which can lead to larger variation in grape quality and hence higher uncertainty about wine quality and reputation further downstream. Thus, we test if wines from privately owned wineries receive a price premium and if wines from cooperatives receive a reputation discount. The data set also differentiates IGT vs. DOC designated wines, reserve wines, and eco-labels. Our results indicate that we may reject both hypotheses, i.e. that wines from cooperatives receive a reputation premium as well as a price premium. Thus, local cooperatives are characterized by modern production techniques and vineyard management systems resulting in a positive reputation premium as well as a significant quality premium relative to their privately owned competitors.
HOW CAN WE EVALUATE CONSERVATION AUCTIONS? THREE POSSIBLE METHODS.

Orion. Thursday 3:00 pm - 4:40 pm

By design, tenders are used when costs are unknown. But if costs are unknown, how can we evaluate the tenders, when their evaluation involves measuring their cost-effectiveness? We identify three approaches: theoretical, empirical and experimental. We first use experimental data to compare the efficiency of each approach, then apply the most efficient one to field data from the Scottish fishing vessel decommissioning program. We estimate the potential errors one would make in using a less efficient approach. In this case, we demonstrate a novel use of controlled lab experiments for interpreting field data and evaluating policy.

MARKET INTEGRATION AND DEMAND ANALYSIS OF THE AUSTRALIAN EDIBLE OYSTER MARKET

Admiralty. Friday 8:30 am - 10:10 am

The edible oyster industry is Australia’s most widespread aquaculture sector, with farms in Queensland, New South Wales, Tasmania and South Australia. The industry is dominated by the cultivation of two major species, the native Sydney Rock Oyster and the non-native Pacific Oyster. This study examines the integration of the Australian oyster market to determine if there exists a single or several markets within Australia. Using a system of equations and error correction modelling approach, the short and long-run own and cross-price elasticities of demand are estimated for both species. The results allow future development prospects of the edible oyster industry to be better understood.

A REAL OPTIONS ANALYSIS OF GRAPE FARMING IN NORTH WEST VICTORIA

Admiralty. Wednesday 10:30 am - 12:10 pm

This paper reports a study using real options valuation to analyse farm investment under price and yield uncertainties. Entry and exit triggers—in terms of crop revenue expectations—were estimated for a constructed sample of grape farms in North West Victoria. The modelling provided a quantification of crop revenue and land value ranges within which investment response to adjustment pressure could be muted. Results from this modelling highlight the intertwined influence of numerous economic factors—cost structure, economies of scale, market volatility, transaction costs, and sunk and salvaged asset valuation—on farm investment. Drawing on these linkages, the paper discusses different adjustment scenarios to shed light on the scope for policy intervention to assist industry structural adjustment.

SOCIO-ECONOMIC BASELINE SURVEY AND ASSESSMENT OF THE RAIN-FED LOWLAND RICE ECOSYSTEMS IN KAMPOT PROVINCE, CAMBODIA

Rottnest. Friday 1:10 pm - 2:50 pm

A survey of 150 farmers was conducted in the rain-fed lowland rice eco-systems in three districts of Kampot province, Cambodia. Information was collected to (a) benchmark farmer agronomic and management practices, resource use and productivity levels; (b) identify trends, opportunities and preferred strategies for innovation in crop establishment practices, mechanisation and agronomic efficiencies; and (c) establish farmers’ information access pathways, perceptions on novel technologies and constraints to practice change and adoption. The main findings show low adoption levels of direct seeding, mechanisation or improved agronomic, irrigation and input practices. Increased adoption of these practices and inputs could lead to significant improvements in productivity and profitability in subsistence-level rice farms of the study-districts.

CLIMATE CHANGE IMPACTS ON THE GLOBAL FOREST SECTOR

Pleides. Thursday 8:30 am - 10:10 am

This study integrates new Dynamic Global Vegetation Models with a dynamic optimization model of the
world timber market to assess the impacts of climate change on timber markets and carbon sequestration. A dynamic analysis is conducted in order to account for the adjustments that land managers make as forests are perturbed by climate change through changes in forest fire regimes, shifts in species range, and change in growth rates. A global analysis is conducted because climate change has very different effects in different regions of the world. In addition to assessing the impacts in markets, and the effects of climate change on timber market welfare, the paper addresses whether forests continue to be a net carbon sink in the future.

Stafford, Tess

LABOR SUPPLY OF FISHERMEN: AN EMPIRICAL ANALYSIS
Admiralty. Thursday 8:30 am - 10:10 am

This paper examines the responsiveness of the daily labor supply of fishermen to transitory variations in the wage using data from the Florida spiny lobster fishery. Understanding this relationship is key to determining the effectiveness of landing fees as a regulatory tool. The richness of the data makes it possible to look at both the intensive and extensive labor supply margins. Results suggest that the wage elasticity of labor supply (participation) is positive and statistically different from zero, with a range of 1.05 to 1.31 for commercial trappers and 0.76 to 1.82 for commercial divers. Results also suggest that the wage elasticity of hours worked is positive and statistically different from zero. While the effect is modest for trappers (0.06 to 0.09), it is quite large for divers (0.82 to 0.94). These results suggest an upward sloping labor supply curve and refute the notion of reference dependent preferences in this context.

Stoneham, Gary; Nemes, Veronika; O'Keefe, Andrew; Eigenraam, Mark

CREATING ENVIRONMENTAL STOCK ACCOUNTS FOR ECOSYSTEM SERVICES
Sirius. Thursday 3:00 pm - 4:40 pm

Recent developments in economics make it possible to design and create markets in sectors of the economy where they have previously been missing or inefficient. Markets for ecosystem services, such water quality and biological resilience, can be created, for example, by investing in new institutions that resolve information asymmetry problems including a significant investment in science-based landscape information systems. Although of interest from an economic efficiency perspective, market-based approaches offer significant informational advantages from an environmental accounting perspective. Using data from a pilot involving the creation of a market for ecosystem services (an auction of conservation contracts) we demonstrate a methodology to calculate the contribution of conservation activities to GDP, and to establish selected environmental asset accounts consistent with the System of Integrated Environmental and Economic Accounts.

Stott, Kerry; Doole, Graeme; Vigiak, Olga; Roberts, Anna; Kumaran, Thabo

THE RELATIONSHIP BETWEEN FARM PROFIT AND NUTRIENT AND SEDIMENT EXPORTS ON REPRESENTATIVE FARMS IN THE MOE RIVER CATCHMENT, VICTORIA
Sirius. Friday 8:30 am - 10:10 am

Ambitious N and P reduction targets have been set for the Gippsland Lakes, but at what cost to productive agriculture? An interdisciplinary approach is addressing this question for the Moe River catchment, a dairy-dominated catchment that is a major source of pollutants to the Gippsland Lakes. Off-farm nutrient and sediment exports are being estimated by biophysical modellers, and economists are using budgeting techniques to quantify the impact on farm profitability of increasingly effective but costly mitigation measures. This information allows identifying the profit-pollution frontiers reported in this paper. These frontiers will be used to populate a landscape-optimisation model that highlights how land uses can best be spatially allocated to meet end-of-valley pollution targets at least cost.
Susilowati, Sri Hery

**MEASURING AND IDENTIFYING THE FACTORS AFFECTING ADOPTION OF BIOSECURITY ON SMALLHOLDER POULTRY FARMS IN INDONESIA**

*Carnac. Friday 8:30 am - 10:10 am*

This paper builds on past papers by the authors which identify the biosecurity activities already adopted by farmers, and the farm and farmer characteristics that influence this adoption. This paper develops the discussion of how to measure adoption and then use these measures as dependent variables in identifying the factors that influence adoption. The two methods are; the construction of an aggregated Biosecurity Control Score which simply ranks and aggregates farmers’ adoption of 44 Biosecurity Control Indicators and construction of a modified BCS using Principle Components Analysis (PCA). Initial analysis indicates that both models identify similar factors as being important indicating that either method of constructing the BCS is useful.

Thebaud, Olivier; Innes, James; Norman-Lopez, Ana; Slade, Stephanie

**MICRO-ECONOMIC DRIVERS OF PROFITABILITY IN AN ITQ-MANAGED FISHERY: A PRELIMINARY ANALYSIS OF THE CORAL REEF FIN-FISH FISHERY**

*Admiralty. Thursday 3:00 pm - 4:40 pm*

An economic survey of the commercial operators currently active in the Great Barrier Reef Line fishery is being carried out, as part of a research project aimed at evaluating options available to manage the fishery. The paper will present the background analysis of the fishery used as a basis to develop the sampling design for this survey. This involves the analysis of activity patterns of the fleet based on effort and catch information, as well as patterns of quota trading. Based on this information, a fleet profile describing the micro-economic structure of fishing operations is developed. This profile, which serves as a basis for the economic survey, also provides a useful basis to understand the micro-economic drivers of profitability in the fishery, and possible impacts of external shocks on fishing operations.

Thomas, Dylan; Mwebaze, Paul

**COST-EFFECTIVENESS ANALYSIS OF CONTROL OPTIONS FOR A HYPOTHETICAL FOOT AND MOUTH DISEASE OUTBREAK IN THE GOULBURN VALLEY, VICTORIA.**

*Garden. Friday 8:30 am - 10:10 am*

Foot and Mouth Disease (FMD) is a highly contagious virus that would have enormous economic impact on livestock and related industries in Australia. This paper evaluates the effectiveness of stamping out and vaccination as control measures. The AusSpread Epidemiological Model was used to map the spread and eradication of FMD in the Goulburn Valley. Outputs from the model have been used to estimate control costs of approximately $52 and $65.0 million for vaccination and stamping out, respectively. The closure of export markets, and resulting export losses was estimated using a simple economic model. Export losses account for the majority of the cost of an outbreak, ranging between $2.6 billion for Victoria and $12.3 billion for Australia, in 2011 dollar terms. Results show that, as the outbreak size increases the effectiveness of vaccination in containing the virus and reducing the length of export market closure becomes clear.

Thomson, Russell

**THE EFFECT OF PLANT BREEDERS’ RIGHTS ON WHEAT VARIETY IMPROVEMENT IN AUSTRALIA**

*Carnac. Friday 1:10 pm - 2:50 pm*

This paper investigates how the introduction of plant breeders’ rights in 1989 affected the rate of improvement of wheat varieties released by Australian breeders. The study is based on new data covering over 250 wheat varieties released between 1980 and 2009. The data, which are compiled from historic variety trials and from IP Australia’s plant breeders’ rights database, include information about breeders and the varieties they release, including their predicted performance in 24 different agronomic regions. An index of cultivar ‘value’ is calculated which incorporates three key agronomic attributes: predicted yield, grade (quality) and disease resistance. This index is used to investigate the factors which determine the rate of innovation in top performing varieties in each region. Inter alia, the results suggest that the introduction of plant breeders’ rights is associated with a faster arrival rate of new varieties, but also with
Contributed paper abstracts

A lowering of the average inventive step.

Tisdell, John; Iftekhar, Sayed
FISHERIES QUOTA ALLOCATION: LABORATORY EXPERIMENTS ON SIMULTANEOUS AND COMBINATORIAL AUCTIONS
Admiralty. Friday 8:30 am - 10:10 am
The relative performance of simultaneous multi round and combinatorial auctions has been well documented and explored in a number of environments including the allocation of spectrum rights by the U.S. Federal Communications Commission, aircraft takeoff and landing slots, as well as pollution emissions allowances. Markets for individual tradeable fishing quota are evolving and maturing in many countries throughout the world. Synergies in spatial and temporal packages of fishing quotas have yet to be explored and exploited. It is therefore timely and policy relevant to explore the relative performance of simultaneous and combinatorial fishery quota markets in controlled experimental environments. This paper reports the results of a series of economic experiments exploring the relative merits of these alternative fishing quota markets. The results provide important insights into the future development of individual tradeable fishing quotas.

Tozer, Peter
THE COST OF THE “RED DAWN” DUST STORM TO THE NSW ECONOMY.
Sirius. Thursday 8:30 am - 10:10 am
On September 23, 2009 much of New South Wales awoke to a strange phenomenon, a huge cloud of red dust, “Red Dawn” the name given by the media to the event. Economic activity, such as transport, construction, and retail sales, was disrupted by the dust storm. Also, other absenteeism, due to parents and carers and those with health issues remaining home, again reducing production activities and increasing the costs of the event. Households and businesses were further impacted by the dust with the need to clean up after the dust had passed. All of these activities and disruptions imposed costs to the economy of the of $750 million with the major component imposed on households due to cleaning and other associated costs. The impacts on commercial activity varied across sectors, with construction and retail/services sector incurring costs due to loss of production and productivity. Contrary to previous research the impacts on health and emergency services were negligible.

Tran, Lap; Schilizzi, Steven; Kingwell, Ross; Chalak, Morteza
MODELLING THE MANAGEMENT OF MULTIPLE-USE RESERVOIRS: DETERMINISTIC OR STOCHASTIC DYNAMIC PROGRAMMING?
Garden. Wednesday 3:30 pm - 4:20 pm
Modelling complex systems such as multiple-use reservoirs can be challenging. A legitimate question for scientists and modellers is how best to model their management under uncertain rainfall. This paper studies whether it is worth using a stochastic model that requires more effort than a much simpler deterministic model. Both models are applied to the management of a multiple-use reservoir in southern Vietnam. Although no single modelling approach is universally superior, this study indicates that the desirable modelling approach is stochastic if reservoir capacity and water use demands have a high enough impact on the optimal timing of reservoir water use.

Truong, Trang; Vanzetti, David
THE IMPACT OF INVESTMENT RESTRUCTURING AWAY FROM STATE-OWNED ENTERPRISES IN VIETNAM
Rottnest. Wednesday 10:30 am - 12:10 pm
Vietnam was able to maintain a relatively high growth rate during the recent global financial crisis. However, the country is coping with macro instability, including double-digit inflation. Most blamed is the investment-led growth policy, with investment channelled through state-owned enterprises (SOEs). These account for one third of total investment but produce only one fifth of total manufacturing output and provide one tenth of total employment. Shortcomings of the current growth model has forced the government to propose economic restructuring policies, including removing subsidies to SOEs and imposing harder credit constraints on them. We use a simple general equilibrium model to quantify the
impact of such reallocation of investment away from SOEs to the private sector on output, productivity, employment and incomes in the agricultural sector.

Valle, Haydn; Harris, Michael; Capon, Tim; Reeson, Andrew

COORDINATION AND STRATEGIC BEHAVIOIR IN LANDSCAPE AUCTIONS
Orion. Thursday 3:00 pm - 4:40 pm
Designing a conservation auction where bidders know the ecological value of their land poses challenges for policy makers because bidders will tend to increase their asking price. This is known as strategic behaviour, and it is particularly prevalent in sequential auction settings. The tender process ceases to be competitive when strategic behaviour occurs, eroding the efficiency advantages of an auction. To overcome this problem, contract options can be designed such that early winners are restricted in their efforts to strategically manipulate auction outcomes. Simply offering multi-period contracts could achieve this goal if participants need to wait for their contracts to expire before they can change their asking price. This idea was tested in an economic experiment. Results indicate that auctions offering multi-period contracts might be better equipped to constrain strategic behaviour compared to single period contracts, leading to a more efficient outcome.

Van Bueren, Martin

UNFINISHED BUSINESS IN THE EVOLUTION OF AUSTRALIAN WATER MARKETS
Garden. Thursday 8:30 am - 10:10 am
Australia is regarded as a world leader in managing water resources. An outstanding achievement has been the establishment of water markets for reallocating water entitlements and allocations. The total market has grown to approximately $3 billion of annual turnover. This paper provides a synopsis of the key policy and institutional developments that have been responsible for facilitating water trading in Australia. While existing arrangements are delivering efficiency gains, there remains some ‘unfinished business’ in market development. It is concluded that a number of future reforms are necessary before water markets can attain the same level of efficiency as other, more mature markets.

van Grieken, Martijn; Roebeling, Peter; Whitten, Stuart

MARKET BASED INSTRUMENTS FOR THE ADOPTION OF MANAGEMENT OPTIONS FOR WATER QUALITY IMPROVEMENT IN HETEROGENEOUS SUGARCANE FARMING COMMUNITIES
Sirius. Wednesday 10:30 am - 12:10 pm
There is growing recognition that coastal water quality is interdependent with agricultural management in coastal catchments. Market based instruments can be used to internalize the negative externalities from coastal water pollution, such that market behavior could lead to social welfare maximizing outcomes. This paper provides an economic assessment of market based instruments for promoting the adoption of management options for water quality improvement in heterogeneous sugarcane farming communities in the Great Barrier Reef (GBR) region, with emphasis on income, employment and dissolved inorganic nitrogen (DIN) delivery impacts. We combine financial and environmental analyses of farming systems at the paddock scale with a mathematical modelling approach at the farm scale, differentiating for three farm types, aggregated to the catchment scale. Management option adoption rates are assessed by exploring how different types of farmers likely respond to market based instruments, using a nutrient accounting system to institute both levies and bonuses that penalise pollution and provide incentives for reducing DIN deliveries beyond actual.

Vanzetti, David; Peters, Ralf

NOTHING TO DECLARE: DUTY-FREE ACCESS TO IMPORTS FROM LDCS
Rottnest. Friday 8:30 am - 10:10 am
Developed countries have agreed to provide duty free and quota free access to imports from LDCs covered by 97 per cent of tariff lines. However, LDCs would like to extend the agreement to 100 per cent coverage, since 3 per cent of tariff lines can cover a substantial proportion of LDC exports. Products of major interest include textiles and clothing and agricultural goods such as rice, oilseeds, sugar and bananas. The potential trade and welfare impacts of expanding the coverage are analysed using a global
general equilibrium model. Updated estimates indicate LDCs stand to gain $4.2 billion in additional exports, the bulk of which accrues to Bangladesh, Cambodia and West Africa. A further $1.8 billion increase in exports could be obtained if LDCs had duty free access to the markets of China, India, Brazil and South Africa. However, non-LDC developing countries are likely to become worse off as a result of extension of preferences to LDCs.

Vengedasalam, Deviga; Harris, Michael; MacAulay, Gordon
A DYNAMIC SPATIAL PRICE EQUILIBRIUM ANALYSIS IN RICE MARKET
Rottnest. Friday 1:10 pm - 2:50 pm
In this paper, using time-series data from 1980 to 2009, an econometrically estimated dynamic spatial equilibrium model is programmed. Competitive arbitrage is assumed between countries. Four simulated policy scenarios modelled: (1) a baseline scenario with the existing situation; (2) removal of the subsidies in Malaysia but with the presence of a sole importer; (3) imposition of a tariff; and (4) complete liberalization. In the complete liberalization scenario, domestic production declines as the subsidies on rice production are eliminated and thus, imports increase to meet the domestic demand. However, large net welfare gains and a significant reduction in government expenditures are likely if all forms of government interventions were to be eliminated and a free market allowed.

Veroude, Alexandra
THE ROLE OF MINING IN AN AUSTRALIAN BUSINESS CYCLE MODEL
Abrohodos. Friday 1:10 pm - 2:50 pm
The purpose of this paper is to evaluate a business cycle model that includes a mining sector, with the cyclical variations of the Australian Economy. Large quantities of mineral deposits are found in Australia and there exists high demand for these minerals from developing nations. This results in the mining sector contributing to a high proportion of GDP. Surprisingly, the inclusion of a mining sector has not previously been studied in a business cycle model. Australia is a small open economy however, due to a lack of prior literature then, as a first attempt, we assume an economy without a foreign sector. The model built upon a neoclassical growth model, and results were simulated from solving this model via the Blanchard-Kahn method. The statistics generated show that some variables are capable to closely model some of the elements of the Australian economy. As the importance of mining is growing in Australia, research should be undertaken to evaluate the impact of the mining sector in economic models.

Wahida, Wahida; Umberger, Wendy; Minot, Nicholas; Stringer, Randy
EXPLORING INDONESIAN CONSUMERS’ DEMAND FOR CERTIFIED ORGANIC AND PESTICIDE-FREE AGRICULTURAL PRODUCTS
Admiralty. Friday 1:10 pm - 2:50 pm
Few studies have explored the drivers of growing demand in South East Asia for “organic” or “pesticide-free” food products. Data from a survey of 1180 urban Indonesian households is analysed to assess consumers’ understanding, perceptions and demand for “organic” and “pesticide-free” fruits and vegetables, shrimp and poultry. Although 60% of consumers were aware of these claims, only 33% had previously purchased products. Yet, 67% indicated an interest in purchasing and were willing to pay an average premium of 20% for “certified organic” products with 60% preferring certification to be overseen by the Central Government. A Cragg model is used to determine factors influencing willingness-to-pay. Implications for smallholders and policy makers interested in developing certification programs will also be discussed.

Walker, David
THE ECONOMIC POTENTIAL FOR FOREST-BASED CARBON SEQUESTRATION: A CASE STUDY OF THE NEW SOUTH WALES FOREST SECTOR
Pleidies. Friday 1:10 pm - 2:50 pm
Concern for the Earth’s changing climate, as a consequence of rising greenhouse gas (GHG) concentrations in the atmosphere, has led to policies aimed at reducing GHG emissions and increasing carbon sequestration. In Australia this has been acknowledged in the New South Wales Greenhouse Gas
Abatement Scheme and the Carbon Farming Initiative, which provide price incentives for forest-based sequestration. The objective of the paper is to investigate the economic potential for forest-based sequestration to reduce carbon dioxide concentrations in the atmosphere. A model of the New South Wales forest sector is developed to simulate changes in land use from agriculture to forestry; and in forest management, for a range of carbon prices. The model builds on previous modeling of forestry and that of forest-based sequestration by incorporating: endogenous timber prices; the probability of fire destroying a portion of the forest; and an increasing opportunity cost of agricultural land.

Warr, Peter

RESEARCH AND AGRICULTURAL PRODUCTIVITY IN INDONESIA

Abrohdos. Wednesday 10:30 am - 12:10 pm

Growth of total factor productivity has contributed significantly to output growth in the Indonesian agricultural sector and its contribution has exceeded that in the non-agricultural sectors. This study examines the extent to which publicly funded agricultural research within Indonesia contributes to the enhancement of productivity growth, while allowing for other possible determinants of agricultural productivity growth, including international agricultural research, infrastructure investments, extension, weather changes and epidemics. It draws upon the existing literature which estimates the rate of TFP growth in Indonesian agriculture and to attempt to explain its determinants, in particular the contribution of agricultural research.

Wegener, Malcolm

SOME REFLECTIONS ON 50 YEARS OF FARM MANAGEMENT SERVICES IN QUEENSLAND

Carnac. Wednesday 3:30 pm - 4:20 pm

In the late 1950s, the Department of Agriculture and Stock in Queensland was strengthening its graduate workforce by offering scholarships to university entrants and recruiting cadets to meet the needs of Queensland’s expanding agricultural industries. An Economic Services Branch had been established to provide farm management advice to producers and service agriculture more broadly than supervise the numerous marketing boards and cooperatives processing and marketing the state’s agricultural commodities. The Department’s farm management activities were broadly divided between farm surveys and servicing farm management accounting groups. Developments in farm management accounting in Australia are reviewed and current issues assessed including successful large scale farming, the dominance of supermarkets in the fresh food supply chain, food imports, and international investment in farms and other agricultural resources.

Wheeler, Sarah

SELLING THE FARM SILVER? UNDERSTANDING WATER SALES TO THE AUSTRALIAN GOVERNMENT

Garden. Thursday 8:30 am - 10:10 am

This study uses 1,570 surveys from 2008-09 and 2010-11 in the southern Murray-Darling Basin to investigate irrigators’ willingness to sell water, and their actual water sales, to the federal government. Water sales can be classified as either last resort or strategic. Factors such as traditional farming attitudes, debt, farm income, water entitlements, lower water allocations over the past five years, and past water market behaviour play an important role in influencing water sale choices. A dynamic comparison and analysis on a panel data set indicates that it is probable that there will be enough water offered to the program in the future, at least to meet initial minimum environmental water targets.

White, Ben; Sadler, Rohan; Florec, Veronique

AN ECONOMIC ANALYSIS OF OPTIMAL SURVEILLANCE: THE QUEENSLAND FRUIT FLY

Garden. Friday 8:30 am - 10:10 am

The management of Queensland Fruit Fly (Qfly), a major threat to Australia’s fruit exports, depends on effective surveillance. This paper explores the complex economics of surveillance using qfly as a case study. The results show that returns to investment in surveillance are highly variable and depend critically on the biology of the pest and climatic variations. Results are presented for the Sunraysia Pest Free Area in Victoria.
Whitten, Stuart; Medieu, Aurore; Reeson, Andrew; Langridge, Jenny

**LANDHOLDER ENGAGEMENT IN CONSERVATION TENDERS: A CASE STUDY OF BIODIVERSITY TENDERS IN THE WIMMERA CMA REGION, AUSTRALIA**

*Orion. Thursday 3:00 pm - 4:40 pm*

Conservation tenders are designer markets which require the active participation of landholders for success. In this paper we evaluate the participation choices and experiences of approximately 300 landholders across several rounds of three recent conservation tenders run by Wimmera CMA. We find that landholder participation decisions are largely contingent on alignment with their priorities and opportunity for payment. Effective engagement via information workshops and constructive site visits aid participation. Bidding and contracting experiences are neutral. Post contract support may require further attention. While the overall participation experience is positive many landholders choose not to participate for a variety of reasons, thus placing an upper limit on effectiveness – at least in the short term.

Wicks, Santhi; Allen, Ben

**RETURNS ON INVESTMENT IN WILD DOG MANAGEMENT – CATTLE PRODUCTION IN THE SOUTH AUSTRALIAN ARID LANDS**

*Abrohdos. Wednesday 3:30 pm - 4:20 pm*

In recent years cattle producers in the South Australian Arid Lands have reported an increase in calf losses as a result of wild dog attacks. The objective of this paper is to estimate returns to these producers from investing in wild dog control measures. Two Natural Resource Management district groups (Marla–Oodnadatta and Marree–Innamincka) in South Australia were selected for this study. Ground baiting is the main measure used to reduce wild dogs in this area. While controls measures reduce wild dog attacks and calf losses, they also reduce predation on kangaroo populations. Larger kangaroo populations may inadvertently increase competition with cattle, for grazing vegetation. A bioeconomic livestock model is used to estimate the returns from wild dog control programs to reduce calf losses. These results are integrated with the costs from increased kangaroo competition, to determine the breakeven points for control programs.

Wimalasuriya, Rukman; Cacho, Oscar; Chan, Chris

**INTEGRATED MODELLING FOR POLICY ANALYSIS OF CLIMATE CHANGE AND LAND-USE PATTERNS**

*Pleiades. Thursday 3:00 pm - 4:40 pm*

In this paper we describe an integrated modelling approach suitable for analysing the impact of policy, market or environmental change on farm practices in a spatial context of heterogeneous landscape. The approach involves overlaying whole-farm models onto GIS map layers of land use and climate. The integration is implemented through a Matlab platform connected to the suite of Excel-based farm models. It enables flexible, efficient data processing and scenario analysis. To demonstrate its functionality, we present an application that evaluates possible consequences of future climate scenarios and technological adaptations on farming systems and land-use patterns in Victoria.

Xayavong, Vilaphonh; Che, Nhu

**PROFITABILITY AND PRODUCTIVITY ANALYSIS FOR WESTERN AUSTRALIAN BROAD ACRE FARMS**

*Carnac. Friday 1:10 pm - 2:50 pm*

This paper provides the profitability and productivity analysis for Western Australia’s (WA) broad acre farms by benchmark rainfall zones, over 1979/80 to 2009/10. It found that in WA farm profit has been increasing significantly over the past 30 years, especially over the past decade with the increase in wheat price. Across all rainfall zones farm profit demonstrated higher rates of growth in the 20-year period during 1980-99. Profit varied by rainfall zone by specialised production. It also found that WA productivity has been increasing rapidly in 1980s, 1990s, but slowdown over the past ten year. The impact of drought in 2000s was a major influenced to the decreasing trend of productivity during this time. However, the decreasing trend of productivity in WA is much less in comparison with AU and NSW, VIC, SA. With climate adjustment, the slowdown trend of productivity in the last decade becomes further less.
Yamazaki, Satoshi; Hoshino, Eriko; Resosudarmo, Budy

MARINE RESERVES, ILLEGAL FISHING AND ENFORCEMENT
Admiralty. Thursday 8:30 am - 10:10 am

This paper develops a bioeconomic model to examine the interaction between the effects of no-take marine reserves and enforcement strategy for illegal fishing. The incidence of illegal fishing has been documented worldwide, leading to significant economic losses as well as the degradation of marine ecosystems. However, until now there has been no study that investigates how the enforcement for illegal fishing and the implementation of no-take reserves are related. Understanding this relationship is important because no-take reserves have been increasingly adopted as a central tool to restore depleted fish stocks and to rebuild fisheries.

Zhou, Zhangyue; Liu, Hongbo; Cao, Lijuan; Tian, Wei-Ming; Wang, Jimin

FORECASTING CHINA’S FOOD CONSUMPTION: SOME METHODOLOGICAL ISSUES
Rottnest. Wednesday 3:30 pm - 4:20 pm

China’s remarkable economic growth has resulted in striking alterations in food consumption. Given its large population and the increasing amount of income people spend on food, China’s changing food consumption have significant implications on food supply not only within China but also globally. Not surprisingly, China’s food consumption dynamics and likely import needs have attracted much attention from researchers both within and outside China. However, studying China’s food consumption is often with a number of challenges; esp., data availability, consistency and accuracy. This paper discusses methodological issues in addressing some of such challenges.
LISTENING TO IRRIGATORS IN NEW SOUTH WALES

NSW Office of Water Irrigators’ Survey results provide valuable socio-economic monitoring information on water management in NSW to support economic growth in regional NSW. This poster presents results from the NSW Irrigators’ Surveys undertaken in 2006 and 2010. The surveys covered 31 key water use areas in NSW where water sharing plans commenced in 2004. Over 10 per cent of the target population of 11,000 participated in each survey. The poster compares 2006 and 2010 results on

- attitudes to water efficiency
- attitudes to temporary and permanent water trading; and
- attitudes and knowledge of water sharing plans

DETERMINING THE CHANGE IN WELFARE ESTIMATES FROM INTRODUCING MEASUREMENT ERROR IN NON-LINEAR CHOICE MODELS

A key consideration in utilising attitudes in behavioural analysis is that they are unobservable, or latent, and can only be inferred from other data. As such these latent variables are measured with error. It is well known that when included in non-linear choice models, ignoring the error associated with latent variables can bias the parameter estimates. Here we investigate what the implications in the bias in parameter values has for welfare values such as partworths. We show that both welfare values and their significance change when latent variable associated error is ignored.

MATCHING MARKET INFRASTRUCTURE REQUIREMENTS FOR AGRICULTURAL REVOLUTION IN INDIAN PUNJAB

The Indian Punjab agriculture has witnessed decelerating growth followed by stagnating productivities of wheat and rice, the major crops at near the potential levels. A strong need is felt to diversify it in favour of high value farm enterprises such as fruits, vegetables, cotton, basmati, spices, flower cultivation, livestock enterprise, etc. The basic hiccup for this diversion is lack of market infrastructure. The recent trend of organized retail stores appears to have helped in this direction. The value addition in different forms supported with market intelligence system for catering to domestic and export market can help to boost production of such potential farm products.

AGRICULTURAL BIOMASS PRODUCTION AND UTILIZATION IN INDIAN PUNJAB: SOME ENERGY CONSIDERATIONS

The study based on the data for crop year 2009-10 estimated the biomass production from wheat, paddy and cotton, the major crops of Indian Punjab as 48.26 million MT. The stubble of wheat and paddy, which was burnt, accounted for 52 percent of biomass production of the state, which translates into the energy loss of 396.31 billion MJ. Assuming the combustion efficiency of biomass as 30 per cent, the energy equivalent of biomass wasted by way of burning, if substituted for coal, has a potential to run 904 power plants of 5 MW each for 365 days for 20 hours a day, which can produce more than 4520 MW of electricity.

OPTIMISING CONTROL OF AN AGRICULTURAL WEED IN SHEEP PRODUCTION PASTURES

Optimal integrated control strategies for the weed blackberry (Rubus anglocandicans) infesting sheep pastures in Australia are analysed. A wide range of control strategies with moderate to high costs and efficacies are analysed, including chemicals, mowing, grazing goats and biological control. The study
employs a stochastic dynamic simulation model and a stochastic dynamic programming model to find the optimal control strategies under different levels of infestation. Results show that the application of a biological control agent (Phragmidium violaceum) has a low impact on Net Present Value. In contrast with previous studies in weed control, results indicate that the higher the initial density of weeds, the fewer the number of control options should be used. When the labour cost of spraying chemicals increases and weed density is high, it is optimal to replace chemicals with mowing. If the efficacy of chemicals increases it is optimal to use less effective and cheaper chemicals.

Clayton, Helena; Dovers, Stephen; Cary, Geoff

WHAT DOES ECONOMICS HAVE TO OFFER BUSHFIRE MANAGERS INTO THE FUTURE?
The application of resource economics to bushfires has been fairly limited to date, particularly in Australia, but applications are expanding. This is being motivated by various trends, including increased fire activity projected under climate change, upward trends in suppression costs, and an expanding urban-bushland interface. We present a review of the literature, exploring what economics has offered and can offer in supporting bushfire management and policy decisions in Australia into the future. Benefit-cost studies tend to dominate the literature, and more studies are often called for, particularly in the scientific literature. We suggest that other areas of economics with more limited application also warrant consideration. This includes the application of investment decision-support frameworks, behavioural and institutional economics, and Public Choice Theory.

Cleland, Jonelle; Rogers, Abbie

DIVERGING VALUES: WHEN AND HOW COMMUNITY AND EXPERT PREFERENCES DIFFER FOR ENVIRONMENTAL CONSERVATION
Decision makers often rely on expert advice for public policy formation. Experts are important for advising on technical efficiency; however, decision makers also need to be mindful of community preferences. This raises an important, yet often neglected question of whether expert advice and community opinion is similar or different. This poster presents a body of research aimed at identifying instances where community and expert preferences align or diverge. Discrete choice experiments were applied to expert and community samples across a range of conservation issues. Case studies included the Ningaloo Marine Park, the proposed Ngari Capes Marine Park, the Kimberley’s tropical waterways and wetlands, and the Southwest Australia Ecoregion. The results indicate that divergence is context specific, and there is an emerging relationship between public awareness and understanding that helps to explain how closely aligned community and expert preferences are.

Douthwaite, Rebecca

BUY WEST EAT BEST: LOCAL FOOD BRANDING PROGRAM
Buy West Eat Best is a WA food branding program administered by the Department of Agriculture and Food Western Australia. The Buy West Eat Best (BWEB) branding program increases the prominence of Western Australian food products within the consumer’s decision framework through product differentiation. The brand capitalises on the non-price determinants for demand and decreases the elasticity of the particular product. BWEB increases the demand and placement of products and therefore the viability and profitability of Western Australian food production; it acts as a buffer from increased competition, private labels and input cost rises that threaten sustainability of the food industry.

Gibson, Fiona; Burton, Michael

WILLINGNESS TO PAY FOR RECYCLED WASTEWATER: A CASE STUDY IN PERTH, WESTERN AUSTRALIA
We present community preferences towards a proposed recycled wastewater scheme for potable water in Perth, Western Australia. An online survey of Perth residents was used to collect data on attitudes, intentions and economic values. The results show diversity in economic values within the sample: 50% were prepared to pay for the scheme: 20% required compensation and 30% rejected it completely. We use attitudinal data to explain the responses.
Hadley, David
ENVIRONMENTAL EFFICIENCY OF US AND EU AGRICULTURE
We use panel data to estimate the parameters of a hyperbolic distance function and calculate the relative environmental efficiency of eleven European countries and the US over the period 1985 to 2002. National agricultural production data for each of these countries is augmented with data on a variety of indicators of the environmental ‘bads’ that result from that production (these include data on nitrogen and phosphorus balances, greenhouse and acidifying gases and pesticide use). Initial results show that the possibilities available for these countries to reduce their ‘bad’ outputs are remarkably similar (at about 18%), with Greece the least environmentally efficient (according to the limited specification employed in the paper) and the Sweden the most efficient.

Hoshino, Eriko; Van Putten, Ingrid; Yamazaki, Satoshi; Pecle, Gretty; Jennings, Sarah; Grafton, Quentin
CLIMATE CHANGE-INDUCED RANGE SHIFTS IN MARINE SPECIES: ECONOMIC IMPLICATIONS, CHALLENGES AND DIRECTIONS
Changes in the spatial distribution of species, referred to as range shifts, are one of the key attributes of climate change. Although range shifts have been documented in the marine environment, few studies consider the socioeconomic consequences or the appropriateness of existing management instruments. This paper reviews the literature on climate change and marine fisheries to gain better understanding of the economic implications of marine range shifts, identifies the research gaps in fisheries economics, and outlines the challenges and shortfalls of the existing economic methods and fisheries management tools in relation to dealing with range shifts.

Katsunobu, Kondo; Sasaki, Jun; Shin, Yongkwang; Yamamoto, Yasutaka
PRODUCTIVITY AND CONVERGENCE IN KOREAN RICE SECTOR
This study aims to examine productivity growth and productivity convergence in Korean rice sector. First, we analyze the rice productivity in each Korean region using the nonparametric TFP index. Second, we conduct statistical tests for TFP convergence across Korean regions. In our model for testing TFP convergence we assume that regions are at different levels of productivity and that the diffusion of technology from advanced to less productive regions is the main driving force toward convergence. Our model implies that productivity gaps between regions are a function of lagged gaps in productivity.

Kingwell, Ross; Doole, Graeme
HAVE MAJOR WHEAT-GROWING NATIONS EXPERIENCED CONSISTENT CHANGES IN WHEAT REVENUE VARIABILITY?
International wheat industry datasets are used to explore the nature and causes of variation in wheat revenues. The main issue examined is whether or not major wheat-growing nations have experienced consistent changes in wheat revenue variability over the last few decades. International volatility in wheat prices is acknowledged to have increased over the last decade but has similar volatility occurred in production? This paper uses an analytical model that draws on international data sets and allows the causes of revenue variation to be identified. The implications for wheat farmers in different countries are highlighted.

Kirby, Mac; Bark, Rosalind; Connor, Jeffrey; Qureshi, Muhammed; Keyworth, Scott
IMPACT OF THE DROUGHT ON IRRIGATION IN THE MURRAY-DARLING BASIN
The recent drought saw the lowest inflows on record in 2006, and water use by irrigation in 2007-8 and 2008-9 was about one third that of pre-drought levels. There were changes to irrigation in this period, but also the international food price crisis in 2008 and a great increase in water trading. Water use in irrigation overall was down to about 31% and 33% of the 2000-01 value in 2007-8 and 2008-9 respectively. The gross value of irrigated agricultural production in 2008-9 was down to 86% in unadjusted terms, but 80% in price adjusted terms. The gross value (adjusted) per unit of water more than doubled (at 241%). The impact varied greatly amongst industries. The higher value industries largely maintained their water use through trading; lower value industries, in particular rice, appear to have relinquished water either
through trading, or to alternative uses on the farm: the water use and gross value of rice and cotton fell dramatically during the drought.

Kirby, Mac; Mainuddin, Mohammed; Gao, Lei; Connor, Jeffrey
INTEGRATED, DYNAMIC ECONOMIC – HYDROLOGY MODEL OF THE MURRAY-DARLING BASIN
We describe an integrated, dynamic hydrology - economics model of the Murray-Darling Basin. In the model, a hydrology model first determines the monthly runoff, storage and flows, and hence the availability of water for irrigation in the basin, subdivided into 58 catchments. Once per year, the water availability values are aggregated to 17 economic regions, and an economic model determines the irrigation outcome in terms of areas under each commodity group in each region and the gross value of production. The hydrology model simulates reasonably well the full range of flows and diversions in a 114 year simulation period. The economics part of the model is based on regressions amongst the observed areas, production, water use and gross value of production of irrigated agriculture as functions of water available, evaporation and rainfall, and crop prices, for ten major commodity groups. The regressions are based on data for 17 regions and four recent years during the drought.

Kuehne, Geoff; Pannell, David; Llewellyn, Rick; Wilkinson, Roger
ADOPT: ADOPTION AND DIFFUSION OUTCOME PREDICTION TOOL
ADOPT predicts the peak level of adoption of agricultural innovations and the time to reach that peak. Users rate the characteristics of the innovation and the target population by responding to a structured set of questions based on factors known to affect adoption. These are conceptualised as related to either, 1) the relative advantage of the innovation, or 2) learning about its relative advantage. The tool is designed to simplify the vast body of adoption research knowledge into a form able to be used by research, development and extension managers and practitioners. Users are involved in the process, thereby making adoptability principles more readily understood and applicable.

Launio, Cheryll; Manalili, Rowena; Asis, Constance; Javier, Evelyn
UNDERSTANDING FARMERS’ CHOICE OF RICE STRAW MANAGEMENT PRACTICE IN THE PHILIPPINES
This study applies multinomial logit model to survey data to understand why farmers choose to burn, incorporate or remove rice straw from the field. Significant factors include farm type, province dummies, cow ownership, attendance to training, number of adult household members, total area cultivated, income from non-rice farming and distance from farm to house. Significant perception variables include awareness of straw incorporation benefits, awareness of environmental regulations, and attitudes towards incentives. Recommendations include continually providing training to farmers, increasing rice straw demand for other uses, developing options to reduce straw collection and transportation cost, increasing information drives regarding environmental policies.

Mahindu, Truphena; Vilaphonh, Xayavong
STRATEGIES TO BOOST AND SUSTAIN WA’S SHEEP INDUSTRY
WA’s sheep population has declined steadily from 38.4 million in 1990/91 to 14.7 million in 2009/10. Flock liquidation has caused downstream value chain enterprises to operate sub-optimally, now and in the foreseeable future. This paper describes strategic options to reverse this adverse trend in flock size and throughput. A multi market value chain model is applied to simulate different decisions made by key players in the industry in response to different marketing incentives. The effect of those incentives on sheep investment decisions by farmers and ramifications across sheep supply chains are highlighted.

Matsuda, Hirotaka; Nakajima, Toru
AGRICULTURAL RESEARCH AND DEVELOPMENT ACTIVITIES IN INDONESIAN PUBLIC SECTOR
Remarkable economic growth has been found in Indonesian economy. A development of agricultural sector was it. In addition, many Indonesian have still lived in rural area and have been dependent heavily on agriculture. A major key factor of remarkable agricultural development was Green Revolution, in other words, agricultural research and development (R&D). Agricultural R&D by own should have been very important in Indonesia. This research focuses on agricultural research R&D activities with considering the
characters of it such as lag structure, depreciation and spillover effect in Indonesia. Those for agriculture in Indonesian haven’t been considered clearly.

McKinley, Justin; Pede, Valerien

**AN ASSESSMENT OF COST AND RETURN AND COST EFFICIENCY FOR WHEAT FARMERS ENGAGED IN CONSERVATION AGRICULTURE: THE CASE OF BIHAR AND EASTERN UTTAR PRADESH, INDIA**

Agriculture in South Asia is being confronted with a major challenge - how to grow more food with less labor and water - two increasingly scarce resources in the region. The Cereal Systems Initiative for South Asia (CSISA) project is combating this problem through the promotion of resource-conserving technologies (RCTs) such as direct-seeded rice and zero-tillage wheat. In this study, the effectiveness of the combined use of these two RCTs in rice-wheat cropping systems was analyzed through the use of a cost and return analysis as well as a stochastic frontier analysis of cost efficiency. Preliminary results show increased yields, higher net returns, and higher cost efficiency for farmers using these technologies in Bihar and Eastern Uttar Pradesh, India.

McKinley, Justin; Pede, Valerien

**IMPACTS OF RESOURCE-CONSERVING TECHNOLOGIES ON AGRICULTURAL LABOR: THE CASE OF BIHAR AND EASTERN UTTAR PRADESH, INDIA**

The Cereal Systems Initiative for South Asia (CSISA) project hopes to alleviate hunger and malnutrition while increasing the incomes of poor farmers living in South Asia. The project intends to partially achieve these goals through the introduction and promotion of resource-conserving technologies (RCTs), such as zero-tillage and direct-seeded rice. One resource that is reduced through the use of these RCTs is labor. This study looked at RCTs ability to stabilize labor markets over the rice season and investigates if there is a gender bias in labor discrimination associated with the use of these technologies.

Moss, Jonathan; Cacho, Oscar; Mounter, Stuart

**IS IT TIME TO PANIC? LAND-USE OPTIONS IN RESPONSE TO A CHANGING CLIMATE**

There is growing consensus that climate policies should focus on adapting and preparing industries for unavoidable impacts of climate change rather than solely attempting to mitigate greenhouse gases for preventative measures. However, adaptation and greenhouse gas mitigation at farm level are often intrinsically interlinked. For landholders in rural Australia, the adoption of different management practices or land uses may increase their resilience to further changes in climate whilst providing additional income from emerging carbon markets. Landholders’ decisions to change current land uses or management strategies are based on a number of factors, including economic, social and technical aspects. This paper, through the use of a multi-agent model, investigates the expected adoption of different strategies by landholders. The results allow further investigation of how incentive structures and policy instruments may be developed to encourage adaptation to a changing climate.

Moyo, Michelle; Kingwell, Ross; Feldman, David

**BROADACRE FARMLAND INVESTMENT: HOW ECONOMICALLY RATIONAL ARE PRICES PAID?**

Ownership and management of increasingly larger farms is the traditional business model of Australian broadacre farming. This model relies on the occasional purchase of additional land. When land price appreciation is compared to debt-servicing ability, how rational have many farmers’ investment decisions been over the last 15 years. Drawing on Western Australian datasets this study explores this issue of the economic rationality of farm purchases.

Nordblom, Thomas; Hutchings, Tim; Nordblom, Thomas

**RISK, PRICE AND CLIMATE; THE RELATIVE IMPACTS ON LONG-RUN WHOLE-FARM FINANCIAL RETURNS**

This analysis develops optimised whole farm decadal cash flows for three farming systems in four regions of SE Australia. Two sources of variability will be studied:
(a) recent historical commodity price percentiles since 2000, and
(b) historical weather sequences of growing season rainfall for all decades since 1920.
Both price and weather sequences will be varied to simulate the risk profiles of these farms under an
expected climate change scenario, i.e. higher prices and lower effective growing season rainfall. The impacts of these changes on the long-run financial risk profiles will be presented for each farming system in each region. This work questions current “best practice” recommendations based on short-run gross margins, which do not show long run consequences for financial bottom lines. This has significant implications for future RD&E policy.

Pandit, Ram; Polyakov, Maksym; Tapsuwan, Sorada
THE EFFECT OF STREET TREES ON PROPERTY VALUE IN PERTH, WESTERN AUSTRALIA
Trees provide a variety of benefits to urban residents that are reflected in the values of residential properties. We examine the effect of broad-leaved and palm trees located within the residential properties and on the verges of the streets on the property values. A spatial hedonic model was applied to 2006 housing sales data in 23 Perth suburbs. Results indicate that one broad-leaved tree on the verge increases the property value by about A$ 8,750. The result has potential implications in urban landscape planning to consider planting broad-leaved trees along the streets to generate public and private benefits.

Pannell, David; Roberts, Anna; Park, Geoff; Alexander, Jennifer
INFFER: A TOOL FOR PRIORITISING ENVIRONMENTAL PROJECTS
Investment Framework for Environmental Resources (INFFER) is a tool for developing and prioritising projects to address environmental issues. INFFER assists with the integration of a comprehensive set of information about projects, explicit assessment of uncertainties and information gaps, value for money, and analysis of the most appropriate policy mechanism for each project. The Public:Private Benefits Framework, which is embedded in the process, is a simple framework to guide the choice between policy mechanisms. The Project Assessment Form, completed in Step 3, is the key component of the process. The core information is used to calculate a Benefit:Cost Ratio that indicates the project’s value for money.

Pluske, Johanna; Pluske, John
SOURCING CEREAL FEED GRAINS FOR PIGS: WHAT ARE THE VIEWS OF THE SUPPLY CHAIN?
New grain varieties that can compete with those currently available and provide increased nutritive value to pigs are being sought in Australia. This paper reports findings from a study that examined attitudes to growing and sourcing feed grains. Using dimensional sampling techniques, stakeholders, from across the supply chain were selected to participate in a semi-structured interview. Results suggested that grain producers favoured wheat and barley varieties that are dual purpose and for triticale, agronomic traits are important. Procuring grains can be difficult in some regions and premiums and contracts were not widely favoured. Hence, communication with stakeholders will be important.

Rippin, Lisa; Morison, Julian
ECONOMIC INDICATORS FOR THE SA CHARTER BOAT FISHERY, 2009/10
This poster will outline the approach and results of an economic survey of charter boat licence holders in South Australia. It is the first detailed economic analysis of the SA Charter Boat fishery based on a licence holder survey undertaken in early 2011. The poster will present a number of economic indicators relevant to the fishery which can be used to assist in the management of the fishery. The Charter Boat fishery is a commercial platform for undertaking recreational fishing. Unlike in other commercial fisheries, charter boat operators cannot take fish for sale, trade or transfer which creates some interesting questions as to how the economic data can be used in a fisheries management context.

Rogers, Abbie; Pannell, David; Burton, Michael; Rolfe, John; Cleland, Jonelle; Meeuwig, Jessica
THE SWAN-CANNING RIVERPARK: A COMPARISON OF COMMUNITY AND EXPERT PREFERENCES FOR SOCIAL AND ENVIRONMENTAL OUTCOMES
Expert judgements and public preferences for social and environmental outcomes may be quite different. When can organisations rely on experts, how serious is any preference divergence, and when does it matter? In a case study of Perth’s iconic Swan-Canning river system, we are exploring this issue and its consequences for decision makers. Using discrete choice experiments, social and environmental values
held by the West Australian community and experts – including scientists, environmental managers, and planners – will be estimated for the rivers. Different payment vehicles will be tested to determine if the community and experts respond differently to policy change depending on how a program is funded. This poster illustrates the two choice experiments that will be applied – one focussed on environmental outcomes and the other on recreational use of the rivers.

Sachdeva, Jatinder; Sharma, Joginder; Chahal, Satnam

**TECHNICAL EFFICIENCY IN CROP PRODUCTION AND DAIRY FARMING IN INDIAN PUNJAB**

The present investigation was undertaken to estimate the technical efficiency of crop production and dairy farming in Punjab. A Frontier Production Function has been estimated by Corrected Ordinary Least Squares Method. The efficiency indices of input use by the farms have been constructed using Timmer’s Measure of Technical Efficiency. The technical efficiency has shown variation across the zones. Both in the case of crop production as well as dairy farming the average technical efficiency has been found highest in Central-plain Zone followed by South Western Zone and Sub-mountainous Zone. This call for the replication of practices followed in this zone to other zones for augmentation of efficiency of resource.

Truong, Toan; Crase, Lin; O’Keefe, Suzanne

**AN INTERNATIONAL REVIEW ON SUBSIDIES TO IRRIGATION**

Subsidies have become a popular policy instrument in the context of irrigated water management for governments throughout the world. The rationale for government offering a subsidy generally falls into four considerations: market failures, encouragement of economic development, equity matter, and in some part, political drivers. Nevertheless, these types of policies are not without their problems. This paper provides an international review of subsidies to irrigation and discusses emerged problems facing the sector. The paper is used to raise some research questions around the mechanics of promoting policy changes for more sustainable irrigation management in the future.

Velasco, Lourdes; Suphanchaimat, Nongluck; Pandey, Sushil

**THE ECONOMICS AND PATTERNS OF SPREAD OF A LABOR-SAVING INNOVATION IN RICE PRODUCTION: THE CASE OF DRYSEEDING IN NORTHEAST THAILAND**

Dryseeding of rice, a labor-saving method relative to transplanting, is spreading in tropical rice areas of Asia in response to rising scarcity of farm labor. Based on farm-level data, we provide an updated analysis of the patterns of spread of dryseeding and its economics in northeast Thailand, a major rice-growing area. Results indicate that dryseeding accounted for 38% of the total rice area in 2009. Dryseeded rice yield increased over time with farmer learning and this led to improvements in profitability and technical efficiency. Despite the expansion of dryseeding, there are considerable seasonal fluctuations and spatial variations in its spread. Implications for technological development are derived.