



# THE CRAWFORD FUND

FOR A FOOD SECURE WORLD

## 2012 Annual Parliamentary Conference

### THE SCRAMBLE FOR NATURAL RESOURCES: More Food, Less Land?

**Tuesday 9 October**

Parliamentary Conference:

8.30am-5.15pm, The Theatrette, Parliament House

Conference Dinner and Sir John Crawford Memorial Address:

6.30pm-9.30pm, The National Portrait Gallery

**Wednesday 10 October**

Conference Breakfast:

7.30am-9.00am, The Mural Hall, Parliament House

**Canberra, ACT**

"There has been heightened awareness in Australia of the issues surrounding ownership of our natural resources and farming land. While the competition for our natural resources and rural land has raised a set of issues for Australian landowners, developers and governments, the issues for the developing world are far more pressing and complex, given that land ownership and food security for so many means the daily battle of subsistence farming. What are the real issues for developing countries and Australia and how can agricultural research, development and policy change help ensure that the array of competitors for the globe's natural resources all get the fair go they and the planet deserve?"

*The Hon John Kerin AM, Chairman, The Crawford Fund*





THE CRAWFORD FUND

**THE SCRAMBLE FOR NATURAL RESOURCES:  
More Food, Less Land?  
9-11 October 2012**

**A MESSAGE FROM OUR CHAIRMAN**

In the principled belief that a conference built around high quality speakers making evidence-based presentations will lead to more sensible discussion on policy options, the Crawford Fund has never shied away from controversial topics and we have addressed quite a few in our 25 years.

In taking risks on our selection of topics, we have always been comforted by the bipartisan support for investment in international agricultural research and other food security measures that are still a feature of the Australian polity, a bipartisanship that it is our mission to foster. As a former Minister for Primary Industry, I trust that all Parliamentarians share a common belief in the fundamental importance of agriculture and the need to address current issues as objectively as possible. The Crawford Fund's Annual Parliamentary Conferences are held in this venue to give Parliamentarians a chance to have such current issues conveniently discussed before them.

On this basis, I am confident that we will be able to further the Australian debate here today about issues such as foreign investment in land, forestry, the best use of water, and the issues confronting mining and rural industries as they relate to both developing countries and Australia, and how agricultural research, development and policy change can help ensure that the array of competitors for the globe's natural resources all get the fair go they and the planet deserve.

We are particularly fortunate to have an outstanding panel of international and Australian speakers, all of whom have come without remuneration from as far away as West Africa, Europe and the USA. Their participation would not have been possible without our sponsors, including in many cases the speakers' host organisations. They are all listed in this booklet.

Interest in the conference is such that we needed to close registrations early. But the point about the numbers is that as a scan of the registration list reveals, it comprises such a broad grouping of people with an interest in food security – scientists and researchers, policy and decision makers, farmers, NGO reps, aid workers and members of the general public, with many of these returning again and again to this annual event to address sometimes controversial but always interesting issues.

We are particularly pleased to have been able to again offer scholarships for young Australian scientists and concessions for students as part of our efforts to encourage young people into careers in agricultural R&D. A further lowering of our demographic this year has been assisted by us enabling attendance by a number of African scientists, who are beneficiaries of Australia Awards.

None of this would have been possible without the extraordinary talent and commitment of our very small secretariat led by Denis Blight. I express my appreciation for their hard work and make particular reference to Cathy Reade, the Fund's inimitable Director of Public Affairs and Communication and Director of the Conference.

Please enjoy the event and have your tweets to #Crawford2012, or otherwise conveyed comments and questions, ready for the Q&A session when I hope to hear your solutions to these issues.

The Hon John Kerin AM  
Chairman

**For a Food Secure World**  
An initiative of the Australian Academy of Technological Sciences and Engineering





## THE SCRAMBLE FOR NATURAL RESOURCES: More Food, Less Land?

### THE PARLIAMENTARY CONFERENCE

Tuesday 9 October  
Theatre Parliament House

#### 8.30 Registration

#### 9.00 SESSION 1: OPENING AND KEYNOTE PRESENTATIONS

##### Welcome and Introductions

*The Hon John Kerin AM,  
Chairman, The Crawford Fund*

##### Opening Address

*Senator the Hon Bob Carr,  
Minister for Foreign Affairs*

##### How Can Science Help?

*Dr Frank Rijsberman,  
Chief Executive Officer, CGIAR Consortium*

##### Can We Feed A Growing World And Sustain The Planet?

*Prof Jonathan Foley, Institute on the  
Environment, University of Minnesota*

##### A Global Land Rush?

*Dr Derek Byerlee, International Agricultural  
Policy Specialist and author of "Rising Global  
Interest in Farmland"*

#### 10.30 Morning Tea In The Mural Hall

#### 11.30 SESSION 2: DECLINING LAND AVAILABILITY FOR FOOD PRODUCTION

Chair: Ms Cathy McGowan AO,  
Agricultural Consultant and Trainer

##### Degradation Of Land And Water Resources

*Dr Andrew Noble, Senior Fellow, International  
Water Management Institute, Sri Lanka formerly  
Research Program Manager Land and Water  
Resources, Australian Centre for International  
Agricultural Research*

##### Impacts Of Mining On Land And Water Resources

*Prof Chris Moran, Director, Sustainable Minerals  
Institute, Member of the Management Board  
of the International Mining for Development  
Centre*

##### Landscape Urbanisation And Food Security

*Prof Xuemei Bai, Urban Environment and  
Human Ecology, Fenner School of Environment  
and Society, ANU*

##### Forest Lands: More Than Just Trees

*Dr Christine Padoch, Director of Forests and  
Livelihoods Program, Centre for International  
Forestry Research, Indonesia*

#### 12.45 Lunch In The Mural Hall

#### 2.00 SESSION 3: SUSTAINABLE AGRICULTURE TO MEET FOOD SECURITY TARGETS

Chair: Ms Margaret Hartley, Chief Executive  
Officer, Australian Academy of Technological  
Sciences and Engineering

##### Integrated Soil Fertility Management and the African Farmer

*Dr Nteranya Sanginga, Director General,  
International Institute of Tropical Agriculture,  
Nigeria*

#### 2.25 SESSION 4: FUTURE PROSPECTS: THE CASE FOR MALTHUSIAN OPTIMISM

Chair: Mr Peter Baxter, Director General, AusAID

##### Helping Farmers Innovate To Harvest More From Less

*Dr Trevor Nicholls, Chief Executive Officer, CAB  
International*

##### Future Prospects: The Case for Malthusian Optimism

*Dr Shenggen Fan, Director General,  
The International Food Policy Research Institute*

#### 3.15 Afternoon Tea In Theatre Foyer

#### 4.00 QANDA

*All available speakers will join in a discussion and  
extended QandA session to be moderated by Dr Denis  
Blight AO, Chief Executive of The Crawford Fund*

#### 5.15 CLOSE

*The Hon John Kerin AM,  
Chairman, The Crawford Fund*

### CRAWFORD FUND - 25 YEARS OF DOING WELL BY DOING GOOD

2012 is a special year for the Crawford Fund. We are celebrating 25 years working to increase Australian engagement in international agricultural research, development and training for food security, and to make related benefits more widely known so as to sustain community and government support.

To mark the year, all attendees at our conference are being provided with a book about our founder, Em Prof Derek Tribe and the Fund, written by Prof Lindsay Falvey, former Chair of Agriculture at the University of Melbourne. The book will be launched at our conference dinner and copies are available free to registrants at conference events.

### THE BREAKFAST

Wednesday 10 October  
The Mural Hall, Parliament House

#### IMPLICATIONS FOR AUSTRALIAN AND INTERNATIONAL FOOD POLICY

#### 7.30 Welcoming Remarks And Introductions

*The Hon John Kerin AM,  
Chairman, The Crawford Fund*

##### A Global Land Rush?

*Dr Derek Byerlee, International Agricultural  
Policy Specialist and author of "Rising Global  
Interest in Farmland"*

##### Natural Resource And Agriculture Issues In A Nutshell

*Professor Jonathan Foley, Institute on the  
Environment, University of Minnesota*

##### Summing Up The Prospects For Feeding Nine Billion

*Dr Frank Rijsberman, Chief Executive Officer,  
CGIAR Consortium*

#### 8.35 Q&A

*Moderator: Professor Shaun Coffey, Chief  
Executive, Industrial Research Ltd, New Zealand*

#### 9.00 Closing Remarks

*The Hon John Kerin AM,  
Chairman, The Crawford Fund*

#### THE CONFERENCE DINNER AND SIR JOHN CRAWFORD MEMORIAL ADDRESS

Tuesday 9 October  
The National Portrait Gallery  
6.30pm-9.30pm

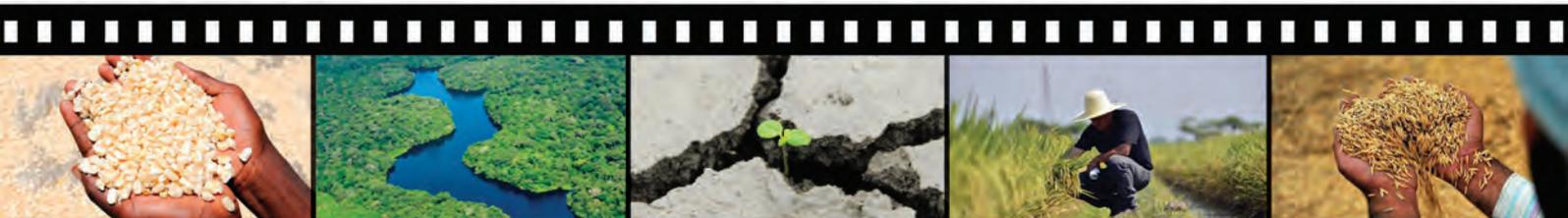


Sir John Crawford was a remarkable Australian who contributed at the highest levels to the development of Australia and other countries, and was a passionate supporter of international agricultural research for development.

The 2012 Sir John Crawford Memorial Address 'Agriculture; the Challenges of the 21st Century' is to be presented by Sir John Beddington CMG FRS, UK Government Chief Scientific Advisor.

During the dinner, to mark The Crawford Fund's 25th Anniversary, the biography of the Crawford Fund's founding director, Emeritus Professor Derek Tribe AO, will be launched.

Vote of thanks will be moved by Ms Joanna Hewitt AO, Chair, ACIAR Commission.





## THE SCRAMBLE FOR NATURAL RESOURCES: More Food, Less Land?

## Biographies &amp; Abstracts

**The Hon John Kerin AM****Chair, Board of Directors, The Crawford Fund**

Born in Bowral, New South Wales, where he worked on the family farm, John Kerin is an Australian economist and former Labor politician. He worked at the Australian Bureau of Agricultural and Resource Economics (ABARE), before being elected to the

Commonwealth Parliament as Australian Labor Party member for Macarthur in 1972. He lost his seat in the Labor defeat of 1975, and returned to the ABARE, before being re-elected as member for Werriwa in 1978, following the retirement of Gough Whitlam. He served as Minister for Primary Industries (1983-1987), Minister for Primary Industries and Energy (1987-1991), Minister for Transport and Communications (1991), Minister for Trade and Overseas Development (1991-1993) and Treasurer (1991) in the Labor government of Bob Hawke. Since leaving politics, Mr Kerin has served with bodies including the Australian Meat and Livestock Corporation, the CSIRO, The Poultry Cooperative Research Centre, The Australian Weed Research Centre; The CRC for Tropical Savannas Management; UNICEF Australia and the National Ovine Johne's Disease Programme Advisory Committee. In 2001, Mr Kerin was appointed as a Member of the Order of Australia for service to the Australian Parliament. In the same year, he was awarded the Centenary Medal for services to Australian society in technological science and engineering. He has a long association with The Crawford Fund - after serving on the Crawford Fund Board and as Chair of the Crawford Fund NSW and ACT Committees for some years, he was elected as Chair of the Crawford Fund Board in October 2010.

**Senator The Hon Bob Carr****Australian Foreign Minister**

Australian Foreign Minister Bob Carr was the longest continuously serving Premier in New South Wales history. He served as Leader of the Opposition from 1988 until his election as Premier in March 1995. He was re-elected in 1999 and again in March 2003 securing

an historic third four-year term. He retired from politics in 2005 after over 10 years as Premier. During these 10 years the State Government set new records for spending on infrastructure, became the first government in the State's history to retire debt, hosted the world's best Olympics in 2000 and achieved the nation's best school literacy levels. Forbes magazine called Bob Carr a "dragon slayer" for his landmark tort law reforms. As Premier he introduced the world's first carbon trading scheme and curbed the clearing of native vegetation as anti-greenhouse measures. He was a member of the International Task Force on Climate Change convened by Tony Blair, and was made a life member of the Wilderness Society in 2003. He has also received the World Conservation Union International Parks Merit Award for creating 350 new national parks. Bob Carr has received the Fulbright Distinguished Fellow Award Scholarship. He has served as Honorary Scholar of the Australian American Leadership Dialogue. He is the author of *Thoughtlines* (2002), *What Australia Means to Me* (2003), and *My Reading Life* (2008).

In March 2012 he was designated by Prime Minister Julia Gillard as Australia's Foreign Minister. He was elected to the Australian Senate to fill a casual Senate vacancy and sworn in to the Senate and Cabinet on March 13, 2012.

**Dr Frank Rijsberman****Chief Executive Officer, CGIAR Consortium**

Dr Frank Rijsberman has over 30 years experience as a researcher and consultant in natural resources management in developing, transition, and developed economies. He is Chief Executive Officer of the CGIAR Consortium. He moved to

the position in May 2012 from a position as the director of the Water, Sanitation, & Hygiene Division of the Bill & Melinda Gates Foundation, and prior to that led Google's philanthropic team after serving as Director General of the International Water Management Institute, one of the 15 CGIAR Consortium Research Centers, from 2000 to 2007 where he initiated the Comprehensive Assessment of Water Management in Agriculture and developed and led the Challenge Program on Water and Food.

**Abstract - How Can Science Help?**

We are facing humanity's greatest challenge. To produce 70% more food by 2050 without destroying the environment means we are going to have to do much more with less. Partly due to the abundant food and record-low food prices achieved by the Green Revolution, overseas development assistance (ODA) for agriculture dropped from over \$20 billion in the 1980s to as little as \$3 billion in 2006.

Stagnation in the yields of major crops such as rice, wheat and maize saw the sector develop cracks, and the status quo finally crumbled with the food prices and price spikes of 2008, 2010, and 2011. Today large segments of the global population are threatened by the depletion or degradation of natural resources. Making a bad situation worse, climate change further threatens agriculture by increasing the risk of droughts and floods, affecting temperatures and crop growing seasons and altering the distribution of pests and diseases. Agriculture holds enormous potential to reduce poverty in the developing world, strengthen the sustainability of our global food system, and to rebuild and revitalise fragile communities so they can move from dependency to self-sufficiency. But it's a holistic approach that is now needed to take scientific innovations and move them along the chain into farmers' hands and people's stomachs. And no one organisation can achieve that alone. This presentation will highlight how science has helped in the past, and talk about what it is going to take if we are to boost agriculture in the future. Science is and always will be the backbone of CGIAR work, but now CGIAR is geared up for 'science plus'. Dr Rijsberman will outline what CGIAR is doing to aggregate resources and disciplines as it works side by side with partners to reduce rural poverty, improve food security, nutrition and health whilst sustainably managing natural resources.



## THE SCRAMBLE FOR NATURAL RESOURCES: More Food, Less Land?



**Professor Jonathan Foley**

**Institute on the Environment, University of Minnesota**

Professor Jonathan Foley is the director of the Institute on the Environment (IonE) at the University of the Minnesota, where he is a professor and McKnight Presidential Chair in the Department of Ecology, Evolution and Behaviour. He also leads the IonE's Global

Landscapes Initiative. Foley's work focuses on the sustainability of our civilisation and the global environment. He and his students have contributed to our understanding of global food security, global patterns of land use, the behaviour of the planet's climate, ecosystems and water cycle, and the sustainability of the biosphere which has led him to be a regular advisor to large corporations, NGOs and governments around the world.

### **Abstract - Can We Feed a Growing World and Sustain The Planet?**

Increasing population and consumption are placing unprecedented demands on agriculture and natural resources across the planet. Today, approximately a billion people are chronically malnourished while our agricultural systems are concurrently degrading land, water, biodiversity and climate on a global scale. To meet the world's future food security and sustainability needs, food production must grow substantially while, at the same time, agriculture's environmental footprint must shrink dramatically. In this presentation, I will present a framework for potential solutions to this dilemma, showing that tremendous progress could be made by halting agricultural expansion (especially into tropical forests), closing 'yield gaps' on underperforming lands, increasing cropping efficiency (especially in terms of water and nutrient use), shifting diets and reducing waste. Together, these strategies could help us double food production while greatly reducing the environmental impacts of agriculture.

**Dr Derek Byerlee**

**International Agricultural Specialist and author of *Rising Global Interest in Farmland***

Dr Derek Byerlee, from Orroroo, South Australia, is currently working with a number of international organisations on foreign investment, corporate agriculture and land use. He was recently co-author of the World Bank report, *Rising Global Interest in*

*Farmland*. Formerly he was Rural Strategy Adviser of the World Bank and Co-Director of the 2008 World Development Report, Agriculture for Development. Before joining the World Bank he was Director of Economics at the International Maize and Wheat Improvement Center, Mexico, and Associate Professor, Michigan State University, USA. He has published widely in several fields of agricultural development and is a Fellow of the American Association of Agricultural Economics.

### **Abstract - A Global Land Rush?**

Recent strong commodity prices have led to rising demand for farmland and this is projected to continue for the medium term, due to increasing population and incomes, and growing use of biofuels. Global analysis indicates that about 450 million ha of suitable land is available to bring into cultivation, much of it in sub-Saharan Africa, Latin America, Russia, and to some extent Australia.

Improved returns in farming and relatively cheap land in some countries have translated into a sharp rise in domestic and foreign investment into farmland, largely focused on the same countries with uncultivated land. Investors have been very heterogeneous, with many from emerging countries and some with little track record in agriculture, but supported by rising portfolio investor interest in agriculture. Despite perceptions, governments and sovereign wealth funds make up a relatively small share of such investments. A surprising development, given the long tradition of family farming almost everywhere, has been the rise of corporate 'superfarms' often managing over 100,000 ha of prime cropland. Where land and other markets work well, these new developments represent an opportunity to tap capital, technology and new markets. However, where land governance is poor and institutional capacity weak, there have been many failures when measured in economic, social or environmental terms, especially in Africa and Southeast Asia. In Australia, given skilled farmers and strong institutions, there seems little reason for concern about recent reports of foreign investment in farmland. Australia has led the world in arguing for freer agricultural trade and investment and should continue to do so. Increased transparency through a register of such investments could alleviate fears in some circles of a foreign 'landgrab' in Australia.



**Ms Cathy McGowan AO**

**Agricultural Consultant and Trainer**

Cathy McGowan AO has a Masters degree in Applied Science in Agriculture and Rural Development, a Bachelor of Arts Degree and Diploma of Education. She is a rural consultant, farmer and academic, a graduate of the Australian Rural Leadership Program

and a Churchill Fellow. In 2001 her work with the dairy industry won an international award for excellence in extension. Her work with rural communities was recognised in 2004 and she was made an Officer in the Order of Australia. Her experience includes researching improved services for rural communities, such as child care and palliative care and the development and delivery of leadership and change management programs for rural industries. She has been working in the area of women in agriculture for over 20 years and regularly provides policy advice. She is the past President of the national organisation, Australian Women in Agriculture. As well as her work in Australia, she is currently working with farming women in PNG, which has been supported in part by the Crawford Fund. Past governance experience has been with the government advisory committee on the World Trade Organisation, chair of the Regional Women's Advisory Council offering policy advice to the Deputy Prime Minister and his department, and she was also on the Rural Research and Development Council designing a long term investment framework for national R&D.

**Dr Andrew Noble**

**Senior Fellow, International Water Management Institute, Sri Lanka and former Research Program Manager, Land and Water Resources, ACIAR**

Prior to being appointed as a Senior Fellow with the International Water Management Institute (IWMI) based in Colombo, Sri Lanka, Dr Andrew Noble was the Research Program Manager for the Land and Water Resources





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program in the Australian Centre for International Agricultural Research (ACIAR) and formerly Regional Director for IWMI for Southeast and Central Asia; Principal Research Scientist with the CSIRO Land and Water; Project Leader and Principal Research Scientist with the Institute for Commercial Forestry Research; and lecturer in the department of Crop Science, University of KwaZulu Natal South Africa. His research career in agriculture spans over 30 years and includes research and academic assignments in South Africa, Australia and Southeast and Central Asia.

### **Abstract - The Slumbering Giant: Land and Water Degradation**

Who feeds the world? The two billion small-scale farmers, who in addition to feeding themselves, also produce surpluses for local markets are the food producers for a global population. These domestic markets along with the food consumed by the producer's families constitute more than 70% of the world's food consumption and are often overlooked in the food security debate.

Whilst the importance of these producers to overall global food security is not in dispute, the ability of these farming systems to continue to perform at current or improved levels is in question considering the influence of anthropogenic induced land and water degradation and associated provisioning of ecosystem services. Soil erosion, nutrient and soil organic matter depletion, salinisation and surface and groundwater pollution are challenges that have confronted agricultural and urban communities for decades, yet addressing these issues continue to elude us. Land degradation associated with inappropriate and unsustainable land use practices are estimated to impact between 5 and 10 million hectares annually; 34 million hectares of the global irrigated area is affected by salinisation; it is estimated that 25% of the global freshwater storage capacity will be lost in the next 25-50 years unless measures are taken to control sedimentation in reservoirs; approximately 2 million metric tons of waste are dumped into rivers, lakes and wetlands each day; and it is now estimated that there are now 12,000 cubic kilometres of polluted water on the planet, a volume greater than the contents of the world's 10 biggest river basins. This litany of land and water degradation issues represents a diminished ability of ecosystems or landscapes to support functions and services required to sustain livelihoods.

Small-scale farmers, the engine of global food supply, are the mainstay of most developing country rural economies and often occupy marginal and vulnerable lands. It makes sound economic sense to address this 'slumbering giant' of degradation through increased conservation investments in land and water resources within this sector. Whilst technologies, technology packages and management practices have been developed that demonstrate the practicalities of addressing these resource degradation issues, adoption at scale has been disappointing.

The central challenge facing government institutions, and development and research organisations tasked with sustainably securing future food supplies is developing greater insights into constraints inhibiting adoption of productivity-enhancing and conserving interventions, and identifying the drivers and relevant levers to address these constraints. Time may not be on our side in addressing land and water degradation, central to one of the nine thresholds that define 'a safe operating space for humanity'.



**Professor Chris Moran**

**Director, Sustainable Minerals Institute, Member of the Management Board of the International Mining for Development Centre**

Professor Chris Moran is Director of the Sustainable Minerals Institute at The University of Queensland and a Member of the Management Board of the newly

established International Mining for Development Centre.

Prior to working at SMI, Professor Moran spent 16 years with CSIRO where he specialised in spatial science. With more than two decades experience in natural resources and water management and sustainability, his expertise is recognised internationally. He serves on various government panels and committees, as well as UQ boards. As the SMI Director, Professor Moran is responsible for research into all aspects of life of mine. His vision is to integrate the Institute's existing disciplinary excellence into NextMine, which will address the complex and multi-faceted challenges facing the resources industry.

### **Abstract - Impacts of Mining on Land and Water Resources**

Mining of energy and minerals is clearly the running down of a large but finite, and therefore non-renewable, resource. It is important to recognise the non-renewable aspect of food production. In particular, net consumption of nutrient and soil as well as the direct and embodied (e.g. manufactured capital) energy sources required to convert the soil and water into food (and fibre). The notion that land is being consumed by mining and not by food and fibre production is inaccurate and largely unhelpful if one is to take a whole system view of resource utilisation. Further, the apparent moral high ground of resource utilisation for food as opposed to mining is also questionable. The relative importance of food over shelter and warmth is not clear even at the inner levels of Maslow's hierarchy of needs.

An overview of demand for energy and minerals and the potential to supply is provided to give context for the Australian situation. Some data is presented to examine the hypothesis that Australia's contribution to global development is jeopardised by resource utilisation for supplying energy and minerals as opposed to food (and fibre). The paper concludes by proposing that the current battle between mining and agriculture in Australia includes a significant emotional component. This is based on the romantic vision of ploughed and green fields tenderly stewarded by salt of the earth folks in contrast to images of earth rent asunder by the ravages of mining under the assault of savages.

**Professor Xuemei Bai**

**Urban Environment and Human Ecology, Fenner School of Environment and Society, ANU**

Xuemei Bai is a Professor of Urban Environment and Human Ecology at the Fenner School of Environment and Society, Australian National University. Her work focuses on urbanisation



and the environment, including drivers and impacts of urbanisation, urban system function and processes, urban environmental governance, cities and climate change, and innovative urban practices and urban sustainability transition, mostly in Asia.



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She is Vice Chair of the Scientific Committee of the International Human Dimensional Program for Global Environmental Change; Board Member of Sustainable Urban Systems Chapter in the International Society of Industrial Ecology, and a Foreign Expert Member of the Task Force for Western Region Development under the China Council for International Cooperation for Environment and Development.

### **Abstract - Landscape Urbanisation and Food Security**

This talk will explore the crucial linkages between urbanisation and food security, based on our recent or ongoing research. Urbanisation is often cited as one of the significant factors that threatens food security.

First of all, urbanisation accompanies landuse conversion from agricultural land to urban landuse, e.g. for infrastructure, industrial, residential/commercial use. Such landuse conversion often reduces the most fertile land, therefore the impact on agricultural production and food security is often larger than the absolute amount of land involved. Our recent research shows that such urban landuse conversion is often driven by economic factors, with positive feedback loop between urban landuse expansion and economic growth in the city, as well as in the region. In addition, urbanisation also brings about changes in dietary structure, which in turn bring about changes to peri-urban areas, where crop production is replaced by higher economic value production such as vegetables, flowers, fish ponds etc. Furthermore, landuse changes associated with urbanisation in developing countries is found to increase social vulnerability in the traditional farming communities in the peri-urban areas. On the other hand, some of our initial research results show that urbanisation might have some positive impacts to agricultural productivity. While all evidence seemingly points to the close urban-rural linkages, our research and policy approach often handles cities and rural areas as separate sectors. Such dichotomised conception and approach hampers the search for an effective, system wide solution, and there is a strong need to consider urban and rural areas as integral parts of a system in the global food security debate or urbanisation policy. The challenge then becomes how can we harness and maximise the positive effects brought about by urbanisation, and avoid/compensate for the negative impacts?



### **Dr Christine Padoch**

**Director of Forests and Livelihoods Programme, Centre for International Forestry Research, Indonesia**

Dr Christine Padoch is an ecological anthropologist and the Director of the Forests and Livelihoods Programme at the Center for International Forestry Research (CIFOR) in Bogor Indonesia. She has spent more than 35 years carrying out research on smallholder patterns of forest management, agriculture, and agroforestry in the humid tropics, principally in Amazonia and Southeast Asia. Her interests and research pursuits have remained broad and, for example, she has investigated small-scale marketing of forest products and marketing networks. She came to CIFOR from the New York Botanical Garden where she was the Matthew Calbraith Perry Curator of Economic Botany. Christine Padoch holds a PhD in anthropology from Columbia University.

### **Abstract - Forest Lands: More Than Just Trees**

Global rates of deforestation and forest degradation continue at persistently high levels, although annual net rates of forest loss have slowed to c 8 million ha as the extent of planted forests increases.

Drivers of deforestation vary geographically, but conversion to both large- and small-scale agriculture remains dominant; conversion to plantations, mining and infrastructure development are important in some regions. Forests, however, continue to be important to the livelihoods of millions of people, poor and rich, men and women, rural and urban. They provide a broad range of products that often escape the attention of decision makers, and an even broader range of services that are both poorly understood and commonly ignored.

The direct contribution of forests to livelihoods varies widely with region, community, gender, ethnicity, and management system. Research done by CIFOR with 50 research partners in over 8,000 households living in and around forests in 25 developing countries shows that forest-derived income constitutes about 20% of their total household income, while income from the environment more generally - both forest and non-forest - makes up more than 25%. Globally, the most important part of that income comes from the sale of fuelwood, with timber sales second. The direct contribution of forests to diets is also considerable and often crucial, but largely hidden from urban and official eyes. Forest foods add not only calories but also necessary protein and micronutrients to the diets of rural people. The importance of forests' direct contribution to diets and incomes may be eclipsed by their inputs to human well-being outside forests. Focusing on food, much more needs to be understood about the environmental services that forests provide to various types of agriculture, including the regulation of water flow and quality, mitigation of climatic extremes, provision of pollination services and germplasm for crop improvement, maintenance of nutrient cycling and soil fertility, control of agricultural pests and diseases, and other essential functions. These services are critical to the maintenance of most agricultural systems, including the most modern agribusinesses, but are seldom valued until they are lost. Knowledge of how forests can be managed to simultaneously optimise production of foods and environmental services is also little understood and thus valued. Without proper attention to these issues, the importance of forests to human well-being will continue to be undervalued, ignored, and diminished, increasingly irreparably.



### **Dr Margaret Hartley FTSE**

**Chief Executive Officer, Australian Academy of Technological Sciences and Engineering**

Dr Margaret Hartley lives in Melbourne and holds a BAppSci and PhD from Monash University. She joined the Academy as Chief Executive Officer in 2009. Dr Hartley was previously the Principal Scientific Advisor in the Australian Government Department of Health and Ageing and the Director of the Office of Chemical Safety, which is responsible for human health risk assessment and chemical safety and environmental health policy, as well as regulatory compliance activities for the licit use of narcotics, other controlled substances, antibiotics and drugs in sports.

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Dr Hartley was Australia's Industrial Chemical Regulator from 1997-2006, responsible for leading and managing the regulation of chemicals and cosmetics and promoting safe and sustainable use of industrial chemicals. As CEO she oversaw governance, financial, and all performance aspects of the business. Dr Hartley is a respected national and international leader and regulatory scientist with wide experience in leading and managing Australia's chemical regulation policy framework, and developing and implementing related health policy. She held research and academic positions in pharmacology and epidemiology at Monash University and the ANU before joining the Government.



**Dr Nteranya Sanginga**  
**Director General, International Institute of Tropical Agriculture, Nigeria**

Dr Nteranya Sanginga assumed the leadership of the International Institute of Tropical Agriculture in November 2011. He has a wealth of experience in agricultural research and development, particularly in applied microbial ecology, plant nutrition,

and integrated natural resources management in Africa, Latin America, and Southeast Asia. He was the Director of CIAT-TBSF and worked at the University of Zimbabwe, IAEA, and IITA where he served as principal scientist, head (soil microbiology unit), project coordinator, and program leader. He has trained more than 30 PhD candidates, who are now leaders in their countries. Dr Sanginga, from DRC, did his postgraduate training at IITA and PhD in Agronomy/Soil Microbiology under a joint program with partners in DRC, Burundi, and Rwanda.

**Abstract - Integrated Soil Fertility Management and the African Farmer**

African agriculture stands at a crossroads. Either food security in Africa will remain elusive with isolated successes fuelling a sense of false optimism in an otherwise dismal situation or decisive action can be taken to assist small-scale farmers to grow more and more valuable crops. Excellent progress is being made in crop improvement and seed systems, and many crop diseases, particularly viruses and fungal leaf pathogens, no longer pose a major problem.

Low soil fertility and nutrient depletion continue, however, to represent huge obstacles to securing needed harvests. Improving access to fertilisers is a necessary countermeasure; however, the low returns from unskilled use of these products present a major impediment to their adoption by most small-scale farmers. Integrated Soil Fertility Management (ISFM) defined as 'the application of soil fertility management practices, and the knowledge to adapt these to local conditions, which optimise fertiliser and organic resource use efficiency and crop productivity'.

ISFM represents a means to overcome this dilemma by offering farmers better returns for investment in fertiliser through its combination with indigenous agro-minerals and available organic resources. Disseminating knowledge of ISFM and developing incentives for its adoption now stand as the challenge before national planners and rural development specialists and if done efficiently will result in more productive and sustainable agriculture, improved household and regional food security and increased incomes among small-scale farmers.



**Mr Peter Baxter**  
**Director General, AusAID**

Mr Peter Baxter is Director General at AusAID. An experienced senior career officer with the Department of Foreign Affairs and Trade portfolio, he joined the Department in 1988 and has been on a number of overseas postings including Fiji, Solomon Islands, Vietnam and, his most recent posting as Deputy Chief of Mission in Washington from 2002 to 2005. In 2000 Mr Baxter was appointed as Special Envoy of the Foreign Minister to Solomon Islands. Prior to moving to AusAID, Mr Baxter headed DFAT's Consular, Public Diplomacy and Parliamentary Affairs Division. His previous Canberra assignments have included senior management roles heading the Consular and Passports (2000), Corporate Management (2000 to 2001), Market Development (2001 to 2002) and North Asia (2005 to 2008) Divisions with DFAT.



**Dr Trevor Nicholls**  
**Chief Executive Officer, CAB International**

Under Dr Trevor Nicholls's leadership, CAB International has developed a strategic focus on providing knowledge to enable poor rural farmers in the developing world to grow more, raise quality and increase income. Previously, his career covered experience of building international businesses in the genomics and life science industries serving major pharmaceutical, biotech and academic clients. He has broad experience of initiating change and restructuring organisations, ranging from start-ups to FTSE 100/Nasdaq quoted companies. Trevor holds a BA and D.Phil in Biochemistry from the University of York and Diploma qualifications in Marketing (CIM) and Company Directorship.

**Abstract - Helping Farmers Innovate to Harvest More from Less**

By 2050, we face the challenge of feeding 50% more people within the finite and diminishing resources on the planet. Significant investment is going into the development of new crop varieties that will offer higher yields, greater pest resistance or better tolerance of adverse conditions. There is also a vigorous debate about the potential to extend available farmland and increase the global area under cultivation. These developments are only part of the solution. Agriculture will face increasing competition for scarce water and land resources as society seeks to balance its needs and desires for more food with demand for increasingly scarce (and hence lucrative) mineral resources, space for urbanisation, protection of ecosystems and protection of biodiversity. Simply expanding agricultural capacity will not be sufficient. We must lose less of what we already grow and use existing inputs more efficiently if we are to meet the challenge of global food security.

On average, 40% of the crops grown worldwide are lost to pests and diseases before they reach the consumer, on top of which is wastage during processing, spoilage at retailers and over-purchasing by consumers. The presentation will consider how innovations in pest management, water usage, fertiliser technology and soil health improvement can help us feed more. To be effective, innovation must be communicated to and adopted by farming communities around the world.



## THE SCRAMBLE FOR NATURAL RESOURCES: More Food, Less Land?

In the face of a chronic shortage of funding, skills and resources to support extension systems worldwide, the presentation will also look at how new approaches and technologies can be used to get relevant, actionable information to rural smallholders.



**Dr Shenggen Fan**

**Director General, International Food Policy Research Institute**

Dr Shenggen Fan is the Director General of the International Food Policy Research Institute. After joining IFPRI as a Research Fellow in 1995, he led IFPRI's program on public investment and later became director of IFPRI's Development Strategy and Governance Division. Dr Fan is a leading researcher on pro-poor development strategies in developing countries. He has published widely in the areas of agricultural R&D policy, public investment, transition economies and agricultural development strategies. Dr Fan received his PhD in applied economics from the University of Minnesota and his PhD and BSc from Nanjing Agricultural University, China.

### **Abstract - Future Prospects: The Case for Malthusian Optimism**

In a little over a decade, the global population is expected to reach 8 billion. The task of feeding this growing population will become harder with rising natural resource constraints, declining or stagnant crop productivity, more frequent extreme weather events, and climate change. These challenges, especially the ensuing increase and volatility of food prices, threaten global food and nutrition security. The Malthusian prediction that population growth would eventually outpace agricultural production growth can be prevented. Technological successes in food and agriculture, such as the Green Revolution, demonstrate that rapid productivity increases in food production can be achieved. However, the goal of achieving global food and nutrition security must encompass food availability, accessibility, and utilisation, as well as the stability of all of these conditions over time. This presentation will highlight major actions needed to achieve these important objectives while simultaneously adopting a sustainable development approach. The actions include: investments in agriculture and technological innovations to boost productivity, especially smallholder productivity; enhance the nutritional value of food crops; and increase resource-use efficiency; productive social safety nets to protect poor and vulnerable groups, especially women and children, to ensure their access to nutritious and healthy food in the short run, and improve their human capital for long term prosperity; global coordination to reduce food price volatility including establishing strategic emergency food reserves, ensuring open trade, and eliminating grain-based biofuel production.

**Dr Denis Blight AO**



**Executive Director, The Crawford Fund**

Dr Denis Blight, the Chief Executive of the Crawford Fund has had a career including positions as an Australian diplomat, public servant and chief executive. His association with international agricultural research began in earnest some 25 years ago. Prior to working for the Crawford Fund, he was Director-General of CAB International, an

intergovernmental body in research, training and publishing in the life sciences, and had 15 years with IDP Education Australia, the international development program of Australian universities and colleges, including the position as Chief Executive.



**Professor Sir John Beddington CMG FRS**

**UK Government Chief Scientific Adviser  
Sir John Crawford Memorial Address Presenter  
'Agriculture; the Challenges of the 21st Century'**

Sir John Beddington was appointed as Government Chief Scientific Adviser (GCSA) on 1 January 2008. Since being in post, the GCSA has led on providing scientific advice to Government during the 2009 swine flu outbreak and the 2010 volcanic ash incident. The GCSA has also been responsible for increasing the scientific capacity across Whitehall by encouraging all major departments of state to recruit a Chief Scientific Adviser. Throughout 2008 and 2009 Sir John raised the concept of the "Perfect Storm" of food, energy and water security in the context of climate change, gaining considerable media attention and raising this as a priority in the UK and internationally. Prior to his appointment as GCSA, he was Professor of Applied Population Biology and headed the main departments of environmental science and technology at Imperial College. His main research interests are the application of biological and economic analysis to problems of Natural Resource Management.



**Ms Joanna Hewitt AO**

**Commission Chair, Australian Centre for International Agricultural Research (ACIAR)**

Ms Joanna Hewitt AO is Chair of the Commission of the Australian Centre for International Agricultural Research (ACIAR). She was Secretary of Department of Agriculture, Fisheries and Forestry (DAFF) from October 2004 until May 2007. During that time, Ms Hewitt served on the ACIAR Board of Management from December 2005 until mid-2007. Prior to her appointment at DAFF, she was Deputy Secretary of the Department of Foreign Affairs and Trade where, amongst her other responsibilities, she was the lead negotiator for the WTO Doha round. Joanna was Australia's Ambassador in Brussels from 2000-2003 and before that Deputy Secretary of the Department of Foreign Affairs and Trade and Australia's APEC Ambassador. Joanna has a long history and affinity with international relations along with a strong knowledge of agriculture both in Australia and overseas.



**Professor Shaun Coffey**

**Chief Executive, Industrial Research Ltd, New Zealand**

An agricultural scientist by training, Professor Shaun Coffey has held a number of senior positions in Australian agriculture, including Director of R&D in the Queensland Department of Primary Industries, and Foundation Chief of the CSIRO Division of Livestock Industries. Since 2006 he has been Chief Executive of Industrial Research Ltd, a Crown-Research Institute providing R&D support for the food, manufacturing and industrial sectors in New Zealand.



## THE SCRAMBLE FOR NATURAL RESOURCES: More Food, Less Land?

### Conference Background

Steep rises and associated volatility in commodity prices have driven a renewed focus on agriculture and food security in international development circles. In Australia the domestic debate has recently focused on how this country's role as a major food exporter is affected by changing patterns of land use and the availability of water resources against the uncertainties of a changing climate.

The global dimensions of the problems are underlined by United Nation projections indicating that the global population will reach about nine billion in the year 2050. In order to feed this burgeoning population, the world's farmers will have to increase food production by 70 per cent. Meat production over the same period will have to increase 85 per cent to meet the demand driven by rising incomes, particularly in Asia. To avoid famine and provide affordable food to the world's poor, these massive increases in production will have to be achieved against a background of increasing competition for natural resources.

The Crawford Fund's 2012 annual development conference will focus on the dynamic interactions between a range of competing uses for land and natural resources, while addressing the need to feed the world's growing population in the face of the constraints and challenges of climate change.

The conference, which has been held every year for over two decades, is a key event in Australia's international development calendar. It attracts 300 development professionals, decision-makers, researchers, agribusiness people, farmers, conservationists, educators, students and other stakeholders.

We believe that this year's event will be another in our series of highly successful, well-attended and nationally reported conferences.

### Agricultural Student Scholarships to 2012 Conference

The Crawford Fund is keen to increase young Australian agricultural scientists' involvement in international agricultural development. To this end, we have enabled a number of students to attend for free, including a group of African PhD students, and we are supporting seventeen young Australian scientists from around the country with travel scholarships to attend the event and they are listed here:

- Ms Sarah Noack, University of Adelaide
- Ms Casey Doolette, University of Adelaide
- Ms Kelly Ryan, Department of Agriculture and Food WA
- Ms Rebecca Jenkison, Curtin University
- Mr David Gale, Department of Primary Industry NSW
- Ms Clare Kerr, Department of Agriculture QLD
- Ms Laura Watson, CSIRO Plant Industry
- Mr Michael Tarbath, University of Tasmania
- Ms Kaylia Cameron, University of Tasmania
- Ms Stephanie Fowler, Charles Sturt University
- Ms Johanna Christensen, University of Melbourne
- Ms Imogen Goode, LaTrobe University
- Mr Gavin Livingston, University of Tasmania
- Ms Felicity Shonk, University of Sydney
- Ms Madaline Healey, Agri-Science Queensland
- Mr Alex Tillack, Southern Cross University
- Mr Ben McGowan, Victoria

### The Crawford Fund

The Crawford Fund is a non-government organisation that promotes and supports agricultural research designed to benefit developing countries. Like Sir John Crawford, we believe it holds the key to alleviating rural poverty in developing countries, and can thus open the door to economic progress, stability, sustainability and is of mutual benefit to developing countries and to Australia - a win-win proposition.

Good news is worth sharing, and the Fund's Public Awareness Campaign increases understanding of the importance and potential of international agricultural research, its achievements and needs through public events, journalist visits, impact stories, meetings and policy development.

The Fund also has a training program that fills a niche by offering practical, highly focused non-degree instruction to women and men engaged in agricultural research and management in developing countries.

### Training in Science and Research for Food Security

Are you involved in an agriculture for development project that would benefit from training for your developing country partner scientists?

The Crawford Fund's training program encourages the transfer of technology and knowledge to people employed in agricultural development in developing countries:

- Our master classes are aimed primarily at mid-career agricultural scientists, senior administrators, senior academic personnel, decision makers and public servants in developing countries, and focus on new areas of knowledge which are changing the way research is conducted.
- Our training awards and courses offer practical, short-term, hands-on training tailored to the needs of an individual or for a group to increase the practical skills of scientists and technical personnel in developing countries.
- The Crawford Fund offers two separate awards for outstanding researchers in developing countries. The Derek Tribe Award is made biennially in recognition of distinguished contribution to the application of agricultural research and the Crawford Fund Fellowship is awarded each year to provide further training of an agricultural scientist whose work has shown significant potential.

#### CONFERENCE PRESENTATIONS AND PROCEEDINGS

Following the conference, speakers' powerpoints will be available on our website and a formal proceedings will be available by the end of the year.

#### MEDIA ENQUIRIES:

Media are encouraged to contact us if they are planning on attending part or all of the event. A media kit, with all presenter biographies, abstracts, backgrounders and press releases will be available at the conference. To pre-arrange interviews or for other media enquiries, contact Cathy Reade, Director Public Affairs and Communications, The Crawford Fund, telephone 0413 575 934 or email [cathy.reamde@crawfordfund.org](mailto:cathy.reamde@crawfordfund.org)





## **The Crawford Fund**

The Crawford Fund  
PO Box 447  
KINGSTON ACT 2604  
Tel: 02 6285 8309  
crawford@crawfordfund.org  
www.crawfordfund.org

## **Conference Sponsors and Supporters**

The Crawford Fund wishes to thank the following sponsors and supporters for this year's conference:

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