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To: Hasnah Hasnah
Subject: AARES Conference - submission of Final Papers



18 February 2013

Dear Hasnah,

**AARES 2013 Annual Conference
Upload of Papers and Presentations**

On behalf of the AARES Local Organising Committee, I would like to thank you for attending the AARES 2013 Annual Conference in Darling Harbour, Sydney, and trust you found the conference both interesting, enjoyable, and good value. We had over 320 delegates from all corners of the globe, an excellent program of workshops, mini-symposia, presentations and posters, and some great social events.

We would like to make copies of the invited, selected and contributed papers and presentations from the conference available to everyone through AgEcon Search and the AARES website.

If you presented a paper or displayed a poster at the AARES 2013 Conference and are willing to have this available to the general public, please upload your paper and/or poster (as a .pdf file) through the AARES [abstract submission program](#) before 1 March 2013. If you have any problems loading your submissions, please send them instead to Annie Hurst at office@aares.org.au. The papers will become available on AgEcon Search as soon as possible.

All of the Powerpoint presentations made at the conference, including those to the pre-conference workshops, invited papers, mini-symposia, and contributed paper sessions were retained by the audio-visual team and will be available on the AARES website in due course.

If you do not wish to have your submissions made available, please advise Annie Hurst at office@aares.org.au. In some cases, you may want to edit some of the material in your presentations so please send a revised version to the AARES office by 1 March. Unless we hear from you to the contrary, it will be assumed that all papers and presentations may be made available (in .pdf format) through the AARES website and AgEcon Search .

Thanks again for your support of this event.

Kind regards,

Annie

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Structural Causal Model for Cacao Marketing in West Sumatra, Indonesia

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Abstract

Structural equation modelling was used to identify the determinants of cacao prices received by farmers in West Sumatra, Indonesia. Results revealed that the prices at the farm level were correlated with the marketing practices of farmers and marketing intermediaries (village buyers and wholesalers). On the farmers' side, "ability to meet required quality", "the main buyer" and "the distance from farmers' location to export point" directly influenced the farm-gate price. From the buyers' perspective, farm-gate price was affected directly by the selling price received by marketing intermediaries. Capital and price information were the main determinants of their selling price.

Keywords:

Price determinants, bargaining power, price information, structural equation modelling.

Introduction

Cacao industry has played an important role in Indonesian export earnings. Exports of cacao beans reached 535,236 tonnes with a value of US \$1.414 billion in 2009 (Directorate General of Plantations of Indonesia, 2012) that placed it as the third largest export earner in the Indonesian agricultural sector after palm oil and rubber. Indonesia is the third largest cacao-producing country after Ivory Coast and Ghana.

Indonesian cacao industry has competitive advantages regarding low cost, high production capacity, efficient infrastructure and an open trading/marketing system (Badcock, Matlick, and Baon, 2007). A competitive market structure with limited intervention by the government in cacao marketing generates a greater share of price received by farmers relative to export value than in other major cacao-producing countries (Akiyama and Nishio, 1997). Abbott, Wilcox, and Muir (2005) found that farmers' share of free-on-board prices for cacao in Ghana, which has controlled marketing system, was much lower (48 per cent) than in other countries including Brazil, Ecuador, Indonesia and Malaysia (on average of 84 per cent). Yet

the price of cacao beans could be a source of concern for cacao producers. It directly affects their welfare and has multiplier effects on non-agricultural sectors in rural areas.

Panlibuton and Meyer (2004) figured the major functions and participants in the Indonesian and global cocoa value chain. Cacao producers, marketing intermediaries (local collectors and local traders), processing industries, and exporters are the actors in the supply chain of Indonesian cacao. In the global value chain, the Indonesian cacao products from small-scale exporters go through one marketing channel, while it involves multiple marketing channels for cacao products from other exporters including medium and large scale exporters, multinational affiliates, and manufacturing and processing companies.

A competitive market structure should be encouraging farmers to maximise production in order to utilise the benefit through the price they receive; however there are other non-market factors that limit their ability to maximise their returns. The small size of landholding restricts farmers' endeavours to increase their cacao output. This factor is worsened by the unavailability of farm credit in which borrowing capital from brokers, called *tengkulak*, is the only option for farmers to finance their production and daily consumption needs (Arsyad, 2010). Arsyad noted that the smallholders have to repay their debt with cacao products at the price set by *tengkulak*, which is sometimes lower than the market price. This condition indicates that there is an interest rate charged to farmers for their debt. Moreover, Arsyad observed that smallholders also lack access to market information, agricultural extension and non-agricultural business opportunities.

A study by Handayane (2007) in Padang, West Sumatra found that cacao production was unprofitable with a B/C ratio of 0.9. This ratio was much lower than that in Kolaka, Southeast Sulawesi accounting for 2.8 (Sahara, Abidin, and Dahya, 2005). Marketing problems facing cacao farmers as observed by previous studies may partly contribute to unprofitable of cacao farming via low price received by farmers.

Price is one of factors contributing to the profitability of cacao farming. It has a critical bearing on poverty and the vulnerability of smallholders. It can be an incentive for farmers to adopt technology on agronomic practices properly in order to increase the yield of cacao trees. A study by [Alene et al. \(2008\)](#) found that maize price influenced adoption and intensity of use of fertilizer. In short term, cacao output responds 1.2 per cent to every 10 per cent change in price, while it reaches 18 per cent for every 10 per cent change in price in long-term (see: Norton, Alwang, and Masters, 2010). Therefore, determinants of the price of cacao beans received by farmers need to be explored in order to increase the potential of the cacao industry to improve farmers' welfare that leads to poverty alleviation.

Dependency of information on cacao price from buyers (Asmelia, 2007) and indebtedness to buyers (ACDI/VOCA, 2005; Asmelia, 2007) can be factors influencing low price received by farmers. This condition may weaken bargaining position of farmers relative to buyers and rely on particular buyers to sell their cacao beans. Low quality of cacao beans due to infestation of cacao pod borer is another factor contributing to low price received by farmers (Badcock, Matlick, and Baon, 2007).

[Jano and Mainville \(2007\)](#) observed that marketing intermediaries possess market power in cacao markets in Ecuador that enables them to extract rents from farmers. This market power results from spheres of influence in the market and exclusive rights to buy in specific areas, and farmers' dependency on intermediaries for credit to fund crop production activities. This

condition forces farmers to sell their cacao to the same intermediaries who provide the loan, ensuring these dependent farmers have less bargaining power than farmers who do not rely on borrowing from the cacao buyers.

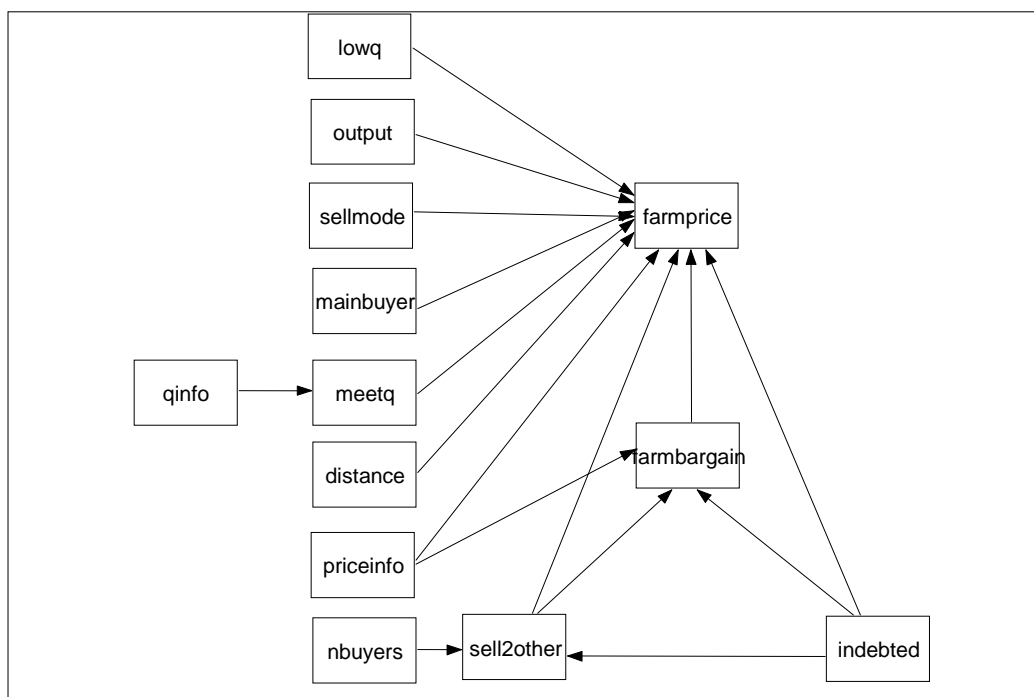
Imperfect information and collusion by marketing agents contribute to low prices received by farmers (ACDI/VOCA, 2005; [Alwang and Marió, 2008](#)). Low levels of marketing skill and knowledge among cacao farmers in Indonesia limit their options in the local market, and constrain income generation (ACDI/VOCA). Their lack of knowledge of market prices, poverty and weak bargaining power arising from illiteracy and low social status often enable traders to cheat farmers ([Pokhrel and Thapa, 2007](#)).

Norton, Alwang, and Masters (2010) asserted that a large difference between the price received by producers and the retail prices is a signal of weaknesses in marketing systems. They noticed that infrastructure deficiencies, lack of information on producers' level, the weak bargaining position of producers, and government's intervention in marketing are the main weaknesses in marketing systems in developing countries.

This paper discusses issues in cacao marketing from the farmers' and buyers' perspectives using path analysis. This method allows researchers to assess the cause-effect relationship among variables in a complex system. The discussion focuses on factors affecting the price received by farmers and buyers for the cacao they sell in the domestic market in West Sumatra, Indonesia.

The proposed model for cacao marketing from farmers' perspective is depicted in Figure 1. The model illustrates the factors affecting the price of cacao beans received by farmers. It includes 13 measured variables with unidirectional paths, which are characteristic of a recursive model.

Figure 1. Initial Model for Cacao Marketing from the Farmers' Perspective



Farmprice in the model represents the price received by individual farmers. At farm level, individual transactions occur between farmers and marketing intermediaries (village buyers and wholesalers). The price difference in individual transactions can be influenced by unique attributes such as variation in quality of individual lots, different locations, differing terms of trade and imperfect information ([Tomek and Robinson, 2003](#)).

The initial model in Figure 1 can be written in four sets of structural equations. Equation (1) presents the relationship between sources of quality information and the variable, *meetq* (quality meets the buyer's requirement). Equation (2) describes factors contributing to the price received by farmers. Equation (3) formulates factors affecting the ability of farmers to bargain on price, and equation (4) relates to factors affecting the ability of farmers to sell their cacao beans to buyers other than the main buyer.

$$meetq = \alpha_1 + \beta_1 qinfo + \varepsilon_1 \quad (1)$$

$$\begin{aligned} farmprice = & \alpha_2 + \beta_{21} lowq + \beta_{22} output + \beta_{23} sellmode \\ & + \beta_{24} mainbuyer + \beta_{25} meetq + \beta_{26} distance \\ & + \beta_{27} priceinfo + \beta_{28} sell2other + \beta_{29} farmbargain \\ & + \beta_{210} indebted + \varepsilon_2 \end{aligned} \quad (2)$$

$$\begin{aligned} farmbargain = & \alpha_3 + \beta_{31} priceinfo + \beta_{32} sell2other + \beta_{33} indebted \\ & + \varepsilon_3 \end{aligned} \quad (3)$$

$$sell2other = \alpha_4 + \beta_{41} nbuyer + \beta_{42} indebted + \varepsilon_4 \quad (4)$$

where:

α_i refers to the intercept associated with the i^{th} dependent variable
 i is the first subscript to identify the dependent variable in the equation, which has value of 1, 2, 3, ...

β_{ij} represents the path coefficient that links the i^{th} dependent variable and the j^{th} independent variable.

j is the second subscript to identify the variable that has a direct effect on the dependent variable in the equation, which has a value of 1, 2, 3, ...

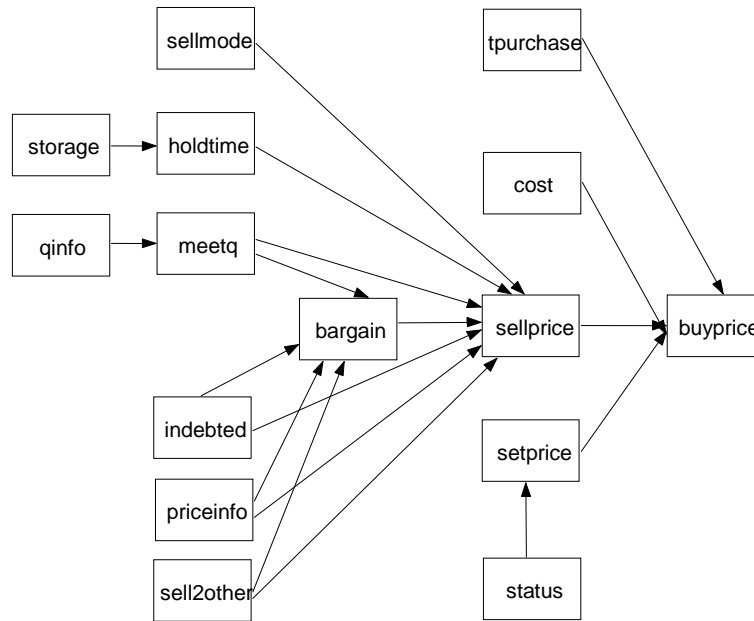
ε_i is the error associated with the i^{th} dependent variable.

The description of the equations above also applies to structural equations for cacao marketing model from buyers' perspective.

The cacao marketing model from the buyers' perspective, illustrated in Figure 2, involves 15 variables. In the diagram, *buying price* (*buyprice*) is the variable that links buyers to farmers. It is the price paid by marketing intermediaries to farmers, which is the reflection of *farm price* from farmers' perspective. *Buying price* at the marketing intermediary level is presumed to be determined directly by five variables.

Selling price is the price received by village buyers from wholesalers and by wholesalers from exporters. It is presumed affected directly by seven variables and indirectly by two variables. These nine variables indirectly influence marketing intermediaries to set their *buying price* via *selling price*.

Figure 2. Initial Model of Cacao Marketing from the Buyers' Perspective



The relationships among variables in the path model in Figure 2 can be written in structural equations which consist of six equation sets. Equations (5) - (7) describe factors contributing to the buying price. Equations (7) – (10) relate to factors affecting the selling price.

$$setprice = \alpha_1 + \beta_1 status + \varepsilon_1 \quad (5)$$

$$buyprice = \alpha_2 + \beta_{21} tpurchase + \beta_{22} cost + \beta_{23} sellprice + \beta_{24} setprice + \varepsilon_2 \quad (6)$$

$$sellprice = \alpha_3 + \beta_{31} sellmode + \beta_{32} holdtime + \beta_{33} meetq + \beta_{34} bargain + \beta_{35} indebted + \beta_{36} priceinfo + \beta_{37} sell2other + \varepsilon_3 \quad (7)$$

$$holdtime = \alpha_4 + \beta_{41} storage + \varepsilon_4 \quad (8)$$

$$meetq = \alpha_5 + \beta_5 qinfo + \varepsilon_5 \quad (9)$$

$$bargain = \alpha_6 + \beta_{61} meetq + \beta_{62} indebted + \beta_{63} priceinfo + \beta_{64} sell2other + \varepsilon_5 \quad (10)$$

Methods

This study was conducted in West Sumatra province for two reasons. First, West Sumatra is designated as the production centre for cacao in Western Indonesia. Second, cacao development in this province is mainly funded by the provincial and regency governments, indicating their strong interest in developing the cacao industry. Three municipalities are involved in this study – Pasaman, 50 Kota and Solok – which were selected based on their distance to the export point. Solok is located close to the major provincial city and market of

Padang; Pasaman is remote from Padang; and 50 Kota is located between these two spatial extremes. The aim of involving three different locations is to capture the effect of the proximity to market on farm-gate price.

Participatory impact pathway analysis workshops were conducted in the three municipalities at the initial stage of the study, which allowed a cause-and-effect model drawn as the basis for structural equation modelling (SEM) in this study. Information related to variables in that model was then gathered by interviewing a random sample of 100 heads of farm households and 36 marketing intermediaries using a structured questionnaire. Respondents considered as buyers in this analysis are marketing intermediaries who buy cacao beans from farmers. They consist of village buyers and wholesalers.

The description of the variables in the cacao marketing model from farmers' perspective and buyers' perspective are presented in Table 1 and Table 2, respectively.

Table 1. Description of Variables in Cacao Marketing Model from the Farmers' Perspective

Variable	Description
<i>farmprice</i>	Price of cacao beans received by farmers (Rupiah / kg)
<i>sellmode</i>	Mode of selling (1 = picked up; 2 = delivered)
<i>output</i>	Total output sold by farmers (kilograms)
<i>meetq</i>	The quality of cacao beans sold meets the buyer's requirement (1 = no ; 2 = yes)
<i>qinfo</i>	Source of information on cacao beans' quality (1 = the main buyer; 0 = otherwise)
<i>distance</i>	Distance of farmers' location to export point (kilometres)
<i>mainbuyer</i>	Main buyer (1 = village buyer; 2 = wholesaler)
<i>priceinfo</i>	Source of price information (1 = the main buyer; 0 = otherwise)
<i>indebted</i>	Indebted to main buyer (1 = no ; 2 = yes)
<i>farmbargain</i>	Ability of farmers to bargain on price of cacao beans (1 = no ; 2 = yes)
<i>sell2other</i>	Ability of farmers to sell their cacao beans to buyers other than main buyers (1 = no ; 2 = yes)
<i>nbuyers</i>	Number of buyers in the village (people)
<i>lowq</i>	The quality of cacao beans is low (1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly agree)

A cacao marketing model was estimated using SEM. This approach supports the formulation of complex models that involve numerous variables, which is its most important feature (Mulaik, 2009). As the cacao marketing model involves only observed variables, this study used a special type of SEM called 'path analysis'.

Path analysis is a method developed by Sewall Wright in the 1920s to interpret and decompose correlations among variables in linear causal models (Burridge and Schwabe, 1977; Kingsolver and Schemske, 1991). It is a specific structural equation modelling (SEM) that represents hypotheses about effect priority by involving observed variables (Kline, 2011; Wolfle, 1980), which is constructed based on the algebraic manipulation of standardized unidirectional path coefficients in systems of variables (Wright, 1965). This approach has

been widely used in social sciences since the work of Duncan (1966). The construction of linear recursive models using path analysis and multiple regression analysis has become widely recognized as a useful approach to quantifying and interpreting causal theory in sociology ([Alwin and Hauser, 1975](#)).

Table 2. Description of Variables in the Cacao Marketing Model from the Buyers' Perspective

Variable	Description
<i>buyprice</i>	The price paid by marketing intermediaries to farmers (Rupiah / kg)
<i>setprice</i>	Ability of marketing intermediaries to set buying price (1 = no ; 2 = yes)
<i>sellprice</i>	The price of cacao beans received by Selling price (Rupiah / kg)
<i>tpurchase</i>	Total purchase of cacao beans in one year (tonne)
<i>cost</i>	Marketing cost per kilogram of cacao beans (Rupiah / kg)
<i>status</i>	The status of marketing intermediaries in trading (1 = independent; 0 = otherwise)
<i>holdtime</i>	Time to hold cacao beans before selling (1 = < 1 week; 2 = 1 - 2 weeks; 3 = > 2 weeks)
<i>bargain</i>	Ability of marketing intermediaries to bargain on price of cacao beans (1 = no ; 2 = yes)
<i>meetq</i>	The quality of cacao beans sold meets the buyer's requirement (1 = no ; 2 = yes)
<i>sellmode</i>	Mode of selling (1 = picked up; 2 = delivered)
<i>priceinfo</i>	Source of price information (1 = the main buyer; 0 = otherwise)
<i>indebted</i>	Indebted to the main buyer (1 = no ; 2 = yes)
<i>sell2other</i>	Ability of marketing intermediaries to sell their cacao beans to buyers other than main buyers (1 = no ; 2 = yes)
<i>storage</i>	Have storage facilities (1 = no ; 2 = yes)
<i>qinfo</i>	Source of information on cacao beans' quality (1 = the main buyer; 0 = otherwise)

This method does not only estimate the direct effect of exogenous variables on endogenous variables; it also estimates indirect effects of exogenous variables in the model while incorporating the intervening variables ([Hunn and Heath, 2011](#)). This method works based on a priori knowledge that is constructed with assumption of linear relationship among variables ([Iriondo, Albert, and Escudero, 2003](#); [Kingsolver and Schemske, 1991](#)).

Path analysis uses correlation coefficients and regression analysis to model more complex relationships among observed variables ([Schumacker and Lomax, 2004](#)). The use of path analysis improves the rationale of conventional regression calculations ([Duncan, 1966](#)). It is a useful tool to analyse observational data sets in ecology, evaluation ([Mitchell, 1992](#)) and in sociological problems involving the decomposition of a dependent variable ([Duncan, 1966](#)). This modelling approach is also known as causal modelling which is often drawn in the form of path diagrams with the advantage of a visual presentation of a complex argument ([Biddle and Marlin, 1987](#); [Li, 1975](#)).

Casual models inspired the development of SEM ([Biddle and Marlin, 1987](#)) through its integration with a confirmatory factor model ([Schumacker and Lomax, 2004](#)). Grace (2006:

p.10) defined SEM as “the use of two or more structural equations to model multivariate relationships”. Poon (2007) suggested SEM as an approach that can be used to verify substantive theories that is also applicable to estimate a model that involves various types of data. Many analysts have referred to SEM as a mathematical tool for drawing causal conclusions from a combination of observational data and theoretical assumptions (Pearl, 2011). Barrett (2007) referred to SEM as a modelling tool that fits models to data. Model testing is an important requirement to determine the fit of a model to data when using SEM.

There are several sociological applications of path analysis. Pajares and Miller (1994) used path analysis to test the predictive and motivational role of self-efficacy beliefs in mathematical problem solving. They stated that path analysis is appropriate in an investigation when social cognitive theory and previous findings have strong theoretical and empirical support for the hypothesized relationships. Hunn and Heath (2011) used path analysis to assess causal relationship between life circumstances and depression, and their sequent effect on employment and welfare use. They found that economic hardships and adverse life events have direct effects on depression. The depression reduces earnings and increases welfare use. Economic hardships and adverse life events reinforce the effect of depression, as mediator variable, on employment and welfare use. Another application of path analysis was used in the work of Lee, Weaver, and Hrostowski (2011) to test a conceptual model of the effect of work environment and psychological empowerment on worker outcomes in public child welfare. The application of path analysis has extended to deal with poverty issues. Arsyad and Kawamura (2009) used this method to assess their poverty causal model of cocoa smallholders in Indonesia. Said and Sallatu (2004) used it to examine structural causal model for poverty incidence.

The application of path analysis involves five steps: model specification, model estimation, model testing, model modification and model interpretation. These steps, according to Kline (2011), are iterative because it may require a return to an earlier step if there is a problem at a later step. Model specification is the critical step where a model is constructed based on knowledge by sequentially ordering the variables in a linear causal model that determines how a variable relates to another and whether the variables are endogenous or exogenous. The application of path analysis for cacao marketing follows these steps.

Statistical analysis of the structural equation models for cacao marketing was performed using *Stata* Version 12. This is the latest version of *Stata* software that includes structural equation models. The *Stata* program includes graphical user interface (GUI) tool that allow us to construct a diagram for a complex model. We found this tool to be able to perform easier estimation procedures than using command.

The strength of relationships between two factors in the model is indicated by the path (β) coefficients with 95 per cent confidence intervals or at 5 % level of significant. A satisfactory model usually has a high comparative fit index (CFI) and Tucker-Lewis index (TLI) preferably higher than 0.9 and root mean squared error of approximation (RMSEA) is less than 0.05. A z-value greater than 1.96 is considered to be significant.

Results

Path analysis of cacao marketing from the farmers' perspective

The estimation results of the model using *Stata 12* show that the coefficients of most variables in the initial model had expected signs. Path coefficients from *farmbargain* and *output* to *farmprice* had an unexpected sign. The level of multicollinearity of the model was measured using variation inflation factor (VIF). A model is considered to have high multicollinearity when value of VIF greater than 10 (El-Dereny and Rashwan, 2011) or correlation among the exogenous variables greater than 0.9 (Grewal, Cote, and Baumgartner, 2004). Stata results show that VIF values for all variables in the model are below 3. It indicates that multicollinearity is not a problem in the model.

Among the ten variables presumed to affect farm price, only three variables (*meetq*, *mainbuyer*, and *distance*) had a significant relationship with farm price. While all predictor variables of *meetq* and *sell2other* were significant, *farmbargain* did not have any significant variables. Nine paths of insignificant variables were considered to be removed from the model. However, before revising the initial model, it needed to be assessed whether it fits the data.

The model fit test for the initial model using CFI, TLI and RMSEA indicated that the model was a poor fit. The values of CFI (0.801) and TLI (0.679) for the model were lower than 0.90 and the value of the RMSEA was 0.098. In order to improve the goodness of fit, the initial model needed to be respecified by building or trimming the model.

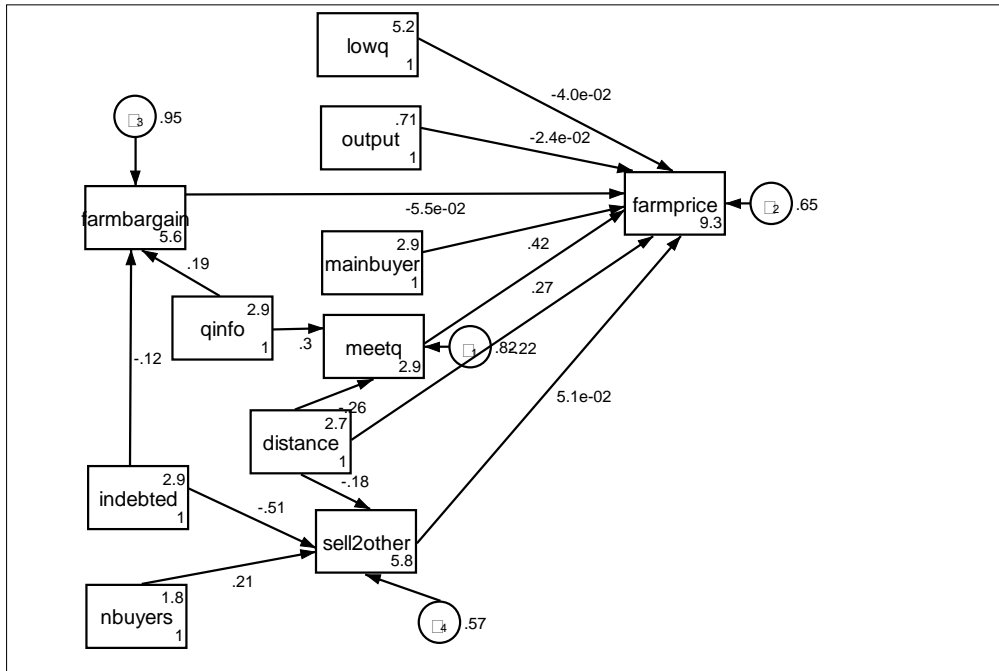
Modification of the initial model began with a Modification Indices test. This test suggested seven additional paths to improve the model fit. However, some of them do not make sense from a theoretical perspective. Therefore, only three paths were added in the initial model. The additional paths are from *qinfo* to *farmbargain*, from *distance* to *meetq* and from *distance* to *sell2other*.

The resulting model had a better fit to the data than the initial model. Its CFI and TLI values increased to 0.908 and 0.831, respectively. The value of the RMSEA was 0.071. The model was categorised as a good fit according to CFI and as a reasonable fit based on TLI and RMSEA. However, the upper bound of the RMSEA was still high (0.117) meaning that the poor-fit hypothesis was not rejected. Therefore, another round of modification was undertaken.

The variable *sellmode* and *priceinfo* were removed from the model because they did not have significant correlation to any variable in the model. Even though *lowq* and *output* were not significantly related to any variable, they remained in the model because removing them resulted in worse model fit. The insignificant path from *indebted* to *farmprice* was also removed. This second modification generated the final model, presented in Figure 3, which is a good fit (CFI = 0.944; TLI = 0.905; RMSEA = 0.058).

The numbers near to the arrows are path coefficients between the variables, while error values are located close to the error terms. For endogenous variables, intercepts are written in the rectangles. For exogenous variables, means and variances are written on the top and on the bottom in rectangles, respectively.

Figure 3. Final Model of Cacao Marketing from the Farmers' Perspective



The estimation results of the final model are presented in Table 3. The final model shows that farm-gate price is significantly influenced by variables *meetq*, *mainbuyer* and *distance*, while the variables *farmbargain*, *sell2other*, *lowq*, and *output* do not affect it significantly. The variable *meetq* has an expected positive and significant effect on the price of cacao beans received by farmers with a standardized path coefficient of 0.271 and z-value of 3.03. It implies that if farmers sell cacao beans that meet the quality required by buyers, they receive a higher price.

An insignificant correlation between farmers' ability to bargain and the price they receive indicates that whether or not farmers are able to bargain, the price they receive remains the same. In other words, farmers who are able to bargain do not receive a higher price than those who are unable to bargain. This result suggests that farmers have low bargaining power. The opportunity of farmers to sell their cacao beans to buyers other than the main buyer does not significantly affect the price they receive ($\beta = 0.051$, $z = 0.57$). It means that farmers do not believe that the price at the farm gate can increase even though they are free to sell their cacao beans to their preferred buyer.

The relationship between the main buyer and the farm-gate price is significant with a path coefficient of 0.422 and z value of 5.34. The positive coefficient means that if farmers are correct in their perception, they receive a higher price when they sell cacao beans to wholesalers than when they sell them to village buyers. The survey results found that 24 per cent of farmers sold cacao beans to wholesalers at an average price of Rp.22,250 per kilogram, while 76 per cent of them sold cacao beans to village buyers at an average price of Rp.19,901 per kilogram.

The negative sign of the coefficient between quality of cacao beans and farm-gate price is insignificant. This result indicates that farmers believe that the quality of cacao beans does not affect the price received for them. The quantity of output sold by farmers does not affect the

farm-gate price significantly. It indicates that whatever the quantity sold by farmers, they received the same price.

Table 3. Maximum Likelihood Estimation of Final Model of Cacao Marketing from the Farmers' Perspective

Endogenous variable	Exogenous variable	Standardized path coefficient (β)	z-value
<i>farmprice</i>	<i>meetq</i>	0.271*	3.03
	<i>farmbargain</i>	-0.055	-0.67
	<i>sell2other</i>	0.051	0.57
	<i>mainbuyer</i>	0.422*	5.34
	<i>lowq</i>	-0.040	-0.47
	<i>output</i>	-0.024	-0.28
	<i>distance</i>	-0.217*	-2.47
	<i>constant</i>	9.265*	8.82
<i>meetq</i>	<i>qinfo</i>	0.299*	3.49
	<i>distance</i>	-0.258*	-2.96
	<i>constant</i>	2.895*	6.38
<i>farmbargain</i>	<i>qinfo</i>	0.189*	1.98
	<i>indebted</i>	-0.122	-1.25
	<i>constant</i>	5.603*	9.74
<i>sell2other</i>	<i>distance</i>	-0.181*	-2.19
	<i>nbuyers</i>	0.207*	2.56
	<i>indebted</i>	-0.514*	-8.09
	<i>constant</i>	5.841*	14.10

*significant at $\alpha = 0.05$ using a two-tail test.

The effect of distance from export point on the price at the farm gate is significant with the expected negative sign of the path coefficient ($\beta = -0.217$, $z = -2.47$). It means that farmers estimate that the farther their location from the export point, the lower the price they receive. This figure implies a price deduction for the extra transport costs.

Distance from export point (*distance*) also has a negative and significant effect on farmers' perceived ability to meet required quality. It indicates that buyers require better quality for cacao beans coming from a farther location in order to maintain the average quality of cacao beans at the export point.

Farmers are confident that they can meet the quality of cacao beans required by the main buyer when they obtain the information on the quality from this person. This correlation is supported by the estimation results in which *qinfo* has a significant effect on *meetq* with a path coefficient of 0.299 and z-value of 3.49. Obtaining information on the quality of cacao beans from the main buyer enables farmers to have bargaining power.

Indebtedness is presumed to have a negative influence farmers' bargaining power. However, the insignificant path coefficient for this relationship indicates that farmers do not view it as important. Indebtedness, in fact, restrains farmers' ability to sell their cacao beans to buyers

other than the main buyer, which is indicated by the estimation result with a path coefficient of -0.514 and z-value of -8.09. If farmers' perceptions are correct, it means that if they borrow money from the main buyer, they have to sell their cacao beans to this buyer.

Farmers believe that the number of buyers operating in a farmer's location is another variable that significantly affects the ability of farmers to sell their cacao beans to buyers other than the main buyer ($\beta = 0.207$, $z = 2.56$). The positive coefficient between *nbuyers* and *sell2other* suggests that the more buyers are operating in a farmer's location, the more chance farmers have to sell their cacao beans to buyers other than main buyer.

Path Analysis of Cacao Marketing from the Buyers' Perspective

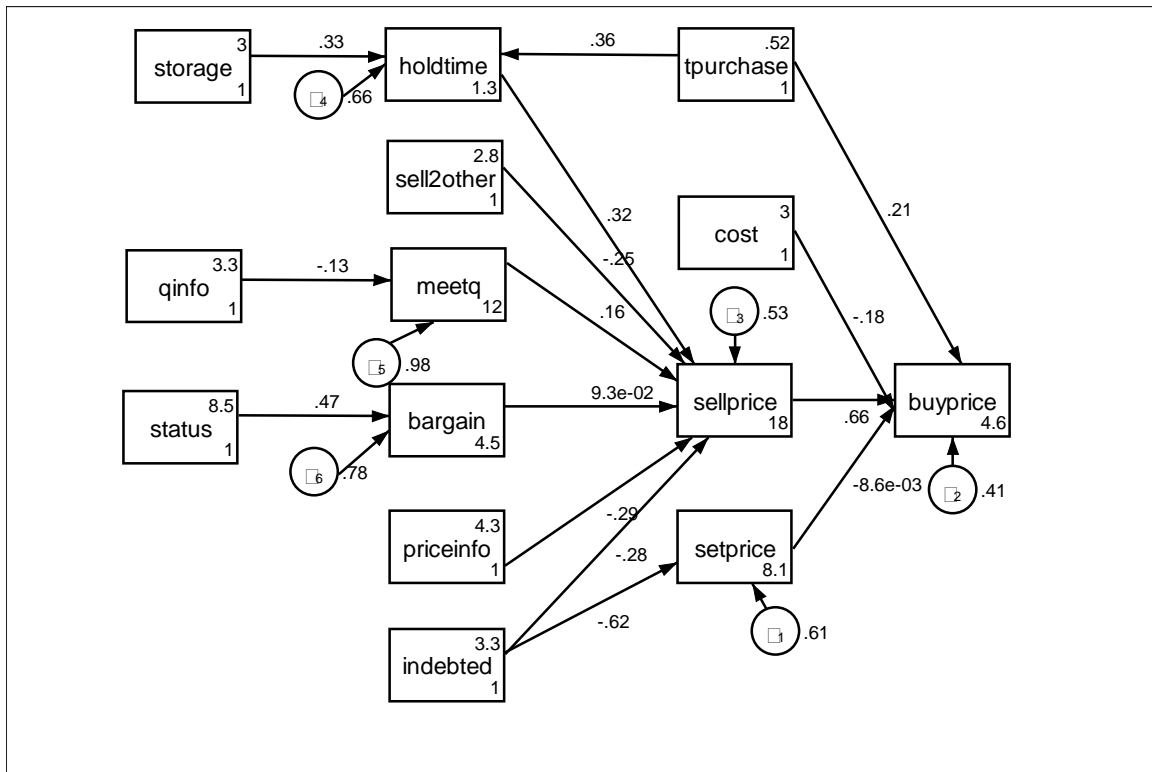
The results of the estimation for the initial model cacao marketing from the buyers' perspective reveal that seven exogenous variables did not have a significant relationship with any variables in the model. They include *tpurchase*, *cost*, *bargain*, *meetq*, *sellmode*, *sell2other* and *qinfo*. These variables were considered to be removed from the model. Most exogenous variables had expected signs while some (*setprice*, *meetq*, *sell2other* and *qinfo*) did not hold expected signs. Multicollinearity test shows that all VIF values were less than 2, well below the maximum acceptable cut-off value of 10. It indicates a lack of evidence of multicollinearity.

Based on the model fit test, the initial model had a poor fit. Its values of CFI (0.503) and TLI (0.328) were much lower than 0.90 and the value of RMSEA was very high (0.174). The test suggested model respecification to improve the goodness of fit. Maximum likelihood estimation indicates some insignificant variables that can be removed to improve the model fit. However, before removing these variables, the modification indices test was applied. In this way, there was a chance that insignificant variables able to improve the model fit by building paths remained in the model. Of the six paths suggested by the modification indices test to improve model fit, some did not make sense from a theoretical perspective. Therefore, only three paths were added to the initial model. The additional paths were from *indebted* to *setprice*, from *tpurchase* to *holdtime*, and from *status* to *bargain*.

The modification indices test showed that the path from *indebted* to *setprice* had the largest change in the observed χ^2 value (12.250). If this path were added to the initial model, it would generate a large improvement. In addition, it had the highest standardized EPC. The two other additional paths also had a large modification index (> 5) with high standardized EPC (> 0.30). The first modification of the model had a better fit to the data with CFI and TLI values increased to 0.715 and 0.590, respectively. The value of RMSEA decreased to 0.136. However, the model was still in the poor fit category according to the three model-fit tests. Therefore, further revision of the model is required.

The second revision of the model was conducted by removing paths of some insignificant variables. The removed paths were from *sellmode* to *sellprice*, from *status* to *setprice*, and from *priceinfo*, *indebted*, *sell2other* and *meetq* to *bargain*. As *sellmode* did not connect to other variables in the model, it was totally removed from the model. Although *cost* had an insignificant effect on *buyprice* and did not have a significant correlation to other variables in the model, it was retained because it theoretically has a strong relationship with *buyprice*. The second modification of the model generated a final model, which is illustrated in Figure 4.

Figure 4. Final Model of Cacao Marketing from the Buyers' Perspective



The final model was much better than previous two models. It was a good fit with CFI (0.997), TLI (0.996) close to 1 and its RMSEA (0.012) lower than 0.05. For these reasons, the final model is used for further analysis.

The estimation results from the final cacao marketing model from the buyers' perspective are presented in Table 4. Most variables are significant with expected signs. Among the four predictor variables of *buyprice*, only variable *sellprice* has significant effect on *buyprice* with coefficient of 0.664 ($z = 5.97$). This finding supports the hypothesis that intermediaries who received a higher selling price from their buyers they were likely to increase the price they paid to farmers.

The final model shows that, according to the buyers, indebtedness significantly affected the ability of marketing intermediaries to set the price ($\beta = -0.625$, $z = -6.85$). The negative path coefficient for this relationship means that marketing intermediaries were not able to set the buying price if they borrowed money from the main buyer. However, this condition does not reflect on buying price, which is proved by the insignificant correlation between ability to set the price and buying price.

Buyers believe that the variable *tpurchase* does not significantly influence *buyprice*. If they are correct, this result indicates that large-scale buyers do not set higher buying prices than small buyers. However, large-scale buyers can hold cacao beans for a longer time when there is no promising selling price. This condition is proved by the significant relationship between *tpurchase* and *holdtime* ($\beta = 0.362$, $z = 2.63$) and its subsequent effect on *sellprice* ($\beta = 0.321$, $z = 2.63$). Marketing intermediaries consider that their ability to hold cacao beans for a longer time is significantly influenced by the storage facilities they have ($\beta = 0.333$, $z = 2.39$). The

negative path coefficient between *cost* and *buyprice* suggests that the higher the marketing cost the lower the buying price, but this relationship is not statistically significant.

Table 4. Maximum Likelihood Estimation of the Final Model for Cacao Marketing from the Buyers' Perspective

Endogenous variable	Exogenous variable	Standardized path coefficient (β)	z-value
<i>buyprice</i>	<i>setprice</i>	-0.009	-0.07
	<i>sellprice</i>	0.664*	5.97
	<i>tpurchase</i>	0.212	1.57
	<i>cost</i>	-0.184	-1.63
	<i>constant</i>	4.567*	1.60
<i>setprice</i>	<i>indebted</i>	-0.625*	-6.85
	<i>constant</i>	8.068*	12.68
<i>sellprice</i>	<i>holdtime</i>	0.321*	2.63
	<i>bargain</i>	0.093	0.73
	<i>meetq</i>	0.158	1.25
	<i>priceinfo</i>	-0.289*	-2.44
	<i>indebted</i>	-0.277*	-2.28
	<i>sell2other</i>	-0.246	-1.89
	<i>constant</i>	18.492*	6.25
<i>holdtime</i>	<i>tpurchase</i>	0.362*	2.63
	<i>storage</i>	0.333*	2.39
	<i>constant</i>	1.335*	2.55
<i>bargain</i>	<i>status</i>	0.471*	3.85
	<i>constant</i>	4.494*	2.77
<i>meetq</i>	<i>qinfo</i>	-0.135	-0.83
	<i>constant</i>	12.447*	8.44

*significant at $\alpha = 0.05$ using a two-tail test.

Path coefficients from *bargain* and *meetq* to *sellprice* are positive. They indicate that the ability to bargain and meet required quality enable marketing intermediaries to receive a higher price. Nevertheless, those exogenous variables do not significantly affect the selling price. Moreover, the effect of an intermediary's ability to sell to other buyers on selling price does not have the expected sign. Their relationship is also not significant.

Estimation results show that the source of price information significantly affects the selling price with a path coefficient of -0.289 and z-value of -2.44. The negative coefficient implies that when marketing intermediaries obtain information on price from their main buyer, they expect to receive a lower price. This condition shows that the main buyer gets an advantage deriving from the limitation of marketing intermediaries to obtain information on price from other sources. In addition, the opportunity of marketing intermediaries to receive a higher price is, they believe, restricted by their indebtedness to the main buyer ($\beta = -0.277$, $z = -2.28$).

Marketing intermediaries believe that their status significantly affects their ability to bargain, with a path coefficient of 0.471 and z-value of 3.85. This figure indicates that independent marketing intermediaries have more ability to bargain than those who act as the buying agents of wholesalers or exporters.

The source of quality information was presumed to influence the ability of a marketing intermediary to meet quality of cacao beans required by firms that buy from this intermediary, but it proved not to be the case on the basis of the statistical test. It means that even though quality information was obtained from the main buyer, it will not necessarily guarantee that the quality of cacao beans meets the quality required by that main buyer.

Decomposition of effects of predictor variables on the farm-gate price

As the model involves intervening variables, the effects need to be decomposed into direct and indirect effects. The decomposition method provides information about the effect of a variable on another through intervening variable. The estimation results for the decomposition of effects are presented in standardized values in order to allow comparison of the effects among variables in the model. To identify the more important effects in the model, this study follows the criterion by [Burrige and Schwabe \(1977\)](#) in which a direct or indirect effect of at least ± 0.30 standard units is considered a major causal effect in the model. The standardized estimates of the effects of predictor variables on farm-gate price from farmers' perspective are presented in Table 5.

Most variables in the model influence the farm-gate price directly, while three variables affect it indirectly and only one variable has a direct and indirect effect. Among the predictor variables, *main buyer* has the highest standardized total effect (0.422) on farm-gate price and contributes a strong effect in the model, followed by *distance* (-0.296), and *meetq* (0.270).

Table 5. The Effects of Predictor Variables on the Farm-Gate Price

Endogenous variable	Exogenous variable	Standardized direct effect	Standardized indirect effect	Standardized total effect	z-value
<i>farmprice</i>	<i>meetq</i>	0.270	-	0.270*	3.04
	<i>farmbargain</i>	-0.055	-	-0.055	-0.67
	<i>sell2other</i>	0.051	-	0.051	0.57
	<i>mainbuyer</i>	0.422	-	0.422*	4.85
	<i>lowq</i>	-0.040	-	-0.040	-0.47
	<i>output</i>	-0.024	-	-0.024	-0.28
	<i>qinfo</i>	-	0.071	0.071	1.79
	<i>distance</i>	-0.217	-0.079	-0.296*	-3.39
	<i>nbuyers</i>	-	0.011	0.011	0.56
	<i>indebted</i>	-	-0.020	-0.020	-0.42

The total effects of *meetq* and *mainbuyer* on farm-gate price are due to the direct casual effect, while the total effect of *distance* on farm-gate price is constructed by direct and indirect effects. About 24 per cent ($= -0.07 / -0.296$) of the total effect of *distance* on *farmprice* is transmitted via *meet*, 3 per cent ($-0.009 / -0.296$) is mediated by *sell2other* and 73 per cent ($-0.217 / -0.296$) is unmediated by variables in the model. The indirect effect of *distance* on *farmprice* is constructed by the direct effect of *distance* on *meetq* and its subsequent effect on *farmprice*. The direct effect of *distance* on *meetq* is -0.258 and the direct

effect of *meetq* on *farmprice* is 0.270. Thus, the indirect effect of *distance* on *farmprice* can be computed as $-0.258 \times 0.270 = -0.07$. In the same way, indirect effect of *distance* on *farmprice* via *sell2other* is $-0.181 \times 0.051 = -0.009$.

From buyers' perspective, among 13 variables presumed to affect marketing intermediaries' buying price, three variables have a direct effect, nine variables have an indirect effect, and one variable has both effects. The standardized estimates of the effects of predictor variables on buying price are presented in Table 6.

Table 6. Effects of Predictor Variables on the Marketing Intermediaries' Buying Price

Endogenous variable	Exogenous variable	Standardized direct effect	Standardized indirect effect	Standardized total effect	z-value
<i>buyprice</i>	<i>holdtime</i>	-	0.214	0.214*	2.49
	<i>setprice</i>	-0.009	-	-0.009	-0.07
	<i>bargain</i>	-	0.062	0.062	0.73
	<i>sellprice</i>	0.664	-	0.664*	4.96
	<i>meetq</i>	-	0.105	0.105	1.25
	<i>tpurchase</i>	0.212	0.077	0.289*	2.17
	<i>cost</i>	-0.184	-	-0.184	-1.60
	<i>status</i>	-	0.030	0.030	0.71
	<i>priceinfo</i>	-	-0.192	-0.192*	-2.09
	<i>indebted</i>	-	-0.178	-0.178	-1.53
	<i>sell2other</i>	-	-0.163	-0.163	-1.75
	<i>storage</i>	-	0.071	0.071	1.58
	<i>qinfo</i>	-	-0.014	-0.014	-0.68

Among significant exogenous variables in the model, the variable *sellprice* has the highest total effect (0.664) on *buyprice*, followed by *tpurchase* (0.289), *holdtime* (0.214), and *priceinfo* (-0.192). The total effects of *sellprice* is due solely to the direct causal effect. The total effects of *holdtime* and *priceinfo* are mediated by *sellprice*.

The effect of *total purchase* on *buying price* involves two pathways. The first pathway is via *holdtime* and its subsequent effect on *sellprice* and *buyprice*, while the second pathway is a direct effect. The direct effects of *tpurchase* on *holdtime* and *holdtime* on *sellprice* are 0.362 and 0.321, respectively. Thus, the effect of total purchase on buying price through the first pathway is 0.077 ($= 0.362 \times 0.321 \times 0.664$).

The effect of *total purchase* on *buying price* is extension pathway from the effect of *holdtime* on *buying price*. The total effect of *holdtime* on *buying price* (0.214) via *sellprice* is formed by 0.321×0.664 .

The effect of *priceinfo* on *buying price* is transmitted by *selling price*. As the direct effect of *priceinfo* on *selling price* is -0.289, its total effect *buying price* via *selling price* is constructed by $-0.289 \times 0.664 = -0.192$.

Discussion

This paper discusses issues in cacao marketing identified at a workshop of stakeholders from the perspectives of farmers and buyers (marketing intermediaries). The core issue is the price

of cacao beans received by farmers and factors that are thought to be affecting it. Findings reveal that smallholder farmers perceived themselves to have low power in marketing transactions. They could not get force the price higher even though they perceived to be able to bargain on the price, be able to sell their cacao beans to buyers other than main buyer, and deliver cacao beans to the buyer's place thereby fulfilling one of the marketing functions. Moreover, the distance of farmers' location to export point also causes farmers to receive a lower price.

Lack of capital, which is partly a function of lack of access to credit, causes the main buyer to become the chief source of credit for smallholders to fund their farming activities. This indebtedness restricts the ability of cacao farmers to sell their cacao beans to buyers other than the main buyer. Vigneri and Santos (2007) found similar conditions in cacao marketing in Ghana, where the availability of cash as a loan was the most important reason to sell to a specific buyer. These findings are similar to a study of cacao marketing in Ecuador by [Jano and Mainville \(2007\)](#) where, as mentioned above, intermediaries have market power that enables them to extract rents from farmers. Farmers' dependency on intermediaries for credit to fund crop production activities forces them to sell their cacao to the same intermediaries who provided the loan. It causes farmers to have less bargaining power than those farmers who do not have any such commitment.

This study found that there is an opportunity for farmers to receive higher price through selling cacao beans of the quality required by the main buyer and selling them to wholesalers. Obtaining information on the quality from the main buyer enabled farmers to meet the required quality. [Jano and Mainville \(2007\)](#) found that cacao farmers faced lack of information on quality standards. Because they did not know exactly the quality of their cacao beans, they were unable to negotiate the price. This situation also exists in cacao marketing in West Sumatra. Farmers do not fully understand what the characteristics of good-quality cacao beans. About 40 per cent of farmers relied on the main buyer to obtain information on quality standards and 22 per cent farmers did not get any information on cacao beans' quality. No grading system at the farmers' level may contribute to this lack of quality information.

From the buyers' perspective, the selling price of marketing intermediaries was the only factor significantly affecting their buying price. The study results indicate that marketing intermediaries increased the price they paid to farmers if they received a higher price for their cacao beans. Three significant factors influencing the price received by marketing intermediaries are the length of time holding cacao beans, source of price information and indebtedness.

Findings show that marketing intermediaries expected to receive a lower price if they were in debt to the main buyer and relied on the main buyer for price information. This condition subsequently influenced their decision to set the buying price. On the other hand, marketing intermediaries who had strong capability to finance their business obtained price information from other sources and were able to hold the products for a longer time, received higher price for their cacao beans. The estimation results reveal that the bigger the business scales of marketing intermediaries, the greater their ability to hold the product for longer time. This condition was proved by a statistical relationship between total purchase and having storage facilities with the ability of marketing intermediaries to hold cacao beans for longer time. Two marketing constraints, lack of price information and lack of capital, did not only face farmers but they were also constraints on the buyers' side. This is because most buyers were village buyers who purchased cacao beans directly from farmers and ran small-scale

businesses with rapid turnover. They sold their cacao beans to wholesalers. Their condition influenced the way they set up their buying price that, in turn, affected the price received by farmers.

From the discussion above, there are several policy implications in order to improve marketing conditions in the West Sumatra cacao industry. The recommendations relate to better infrastructure, quality information, selling practices and access to credit. Although estimation results show that farmers perceived that the quality of cacao beans did not influence the price they received, 'meet the required quality' as a proxy for assessment on quality of cacao beans sold is one of determinants of price received by farmers. To capture higher price, farmers should obtain information on quality required by buyers, because quality information is a significant indirect determinant of farm-gate price.

This study confirms the expectation that farmers located far away from the export point received a lower price due to high transfer costs. A better road infrastructure may reduce transfer costs that in turn lead to an increase in the price received by farmers.

As selling cacao beans to wholesalers rather than to village buyers provide a chance for farmers to get higher price, farmers should exploit this opportunity. However, most farmers sell their cacao beans in small amounts, which restrict their ability to sell them to wholesalers who are usually located in the capital city of the municipality. Selling small amount of cacao beans in the capital city can incur a high transportation cost. Establishing farmer cooperatives is one solution for this issue because it allows farmers to sell cacao beans in large amounts.

Provision of credit for farmers may also be a means of improving cacao marketing as most farmers lack capital. Obtaining a loan from the main buyer limits their opportunity to sell cacao beans to other buyers. This places them in a disadvantageous bargaining position and is a lost opportunity to get a better price offered by other buyers. The loan from buyers is often considered as an advance payment. From the farmers' point of view, the buyers (who are also money lenders) provide credit, which suits the farmers even though they are perceived as an obstacle to the improvement of cocoa quality and prices (ACDI/VOCA 2005). Well-functioning markets are important in generating growth and expanding opportunities for poor people (UNDP, 2002). Therefore, farmers' income can increase only with the combination of new technology and improved markets ([Abdoulaye and Sanders, 2006](#)).

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WELCOME

It is my pleasure, on behalf of the Local Organising Committee, to welcome fellow delegates to the 57th annual conference of the Australian Agricultural and Resource Economics Society. We have selected the Sydney Convention Centre at Darling Harbour as the conference venue for its excellent facilities and ideal location. We are confident that you will find the services match the very high standards set by previous AARES conferences.

The AARES President-Elect, Peter Warr, has assembled an outstanding list of invited speakers on the compelling themes of Australia's role in the Asian Century; climate change, global food security, and poverty; food, nutrition, and health; and herbicide and insecticide resistance. In addition, plenary sessions will feature AARES President Malcolm Wegener and AAEA President Richard Sexton.

Combined with the two mini-symposia sessions covering themes in environmental economics and policy, efficiency in the water and electricity sectors, freshwater quality, climate change adaptation, biosecurity, and resilience in natural resources systems, we are sure that you will find the program challenging and interesting.

For 2013 there are four pre-conference workshops with themes including climate adaptation decisions on farms, marine biodiversity offsets, impact assessment for international development funding decisions, and agriculture and carbon.

This year's conference follows the recent pattern of gradual evolution in the program. A new category, selected (refereed) papers, has been included among the contributed papers, and we continue to raise the profile of contributed posters by reserving the period immediately following afternoon tea on Wednesday for poster presentations.

This year's conference received most welcome support from new and continuing sponsors, led by Premier Sponsors ACIAR and Rio Tinto. Sponsorship allows us to present a higher-quality conference while maintaining affordability. As well as our financial sponsors, several organisations provided substantial in-kind support, for example supporting travel and participation expenses for invited speakers and workshop and mini-symposia presenters from their own and in some cases other organisations. We have made every effort to acknowledge organisations that provided substantial in-kind support in the handbook.

The social program has been designed to offer delegates a variety of events in addition to the Welcome Reception and the Conference Dinner. We would particularly encourage early-career professionals to participate in the Young Professionals Event at Zilver in nearby Chinatown, following the Welcome Reception. On Thursday, we have organized a Social and Networking Event at the Australian (Heritage) Hotel, 100 Cumberland St, The Rocks, preceded by an optional walking tour of The Rocks historical district.

Every year, the LOC makes a major contribution to the success of the AARES conference. This year's LOC members are listed below, followed by acknowledgment of subcommittees and individuals who undertook major areas of responsibility. Please let these loyal AARES members know that you appreciate their service.

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 Sydney and New South Wales.

Alan Randall
Chair, Local Organising Committee
AARES, 2013

AARES

President:	Malcolm Wegener, University of Queensland
President Elect:	Peter Warr, Australian National University
Past President:	John Quiggin, University of Queensland
Secretary:	Bob Farquharson, University of Melbourne
Treasurer:	Terrence Farrell, Charolais Society of Australia
Promotion and Development:	Bronwyn Crowe
Central Office:	Annie Hurst, AARES Office Manager
Media Liaison:	Cathy Reade, Crawford Fund

LOCAL ORGANISING COMMITTEE

Alan Randall, Chair	University of Sydney
Tihomir Ancev	University of Sydney
Matt Arthur	NSW E&H
Jason Crean	NSW DPI
David Godden	University of Sydney, Charles Sturt University
Michael Harris	DAFF
Gordon MacAulay	GrainGrowers
John Madden	Arche Consulting
Rod McInnes	Sydney Catchment Authority
Emily Ray	GHD
Todd Sanderson	University of Sydney
Facilities:	Tiho Ancev
Sponsorship and promotion:	Rod McInnes, Michael Harris, John Madden, Bronwyn Crowe (ex officio) (ex officio)
Selected and contributed papers and posters:	Gordon MacAulay, David Godden, Todd Sanderson Sanderson
Pre-conference workshops and mini-symposia:	Alan Randall
Social events:	Emily Ray, Mathew Arthur, Todd Sanderson
Sommelier:	Jason Crean

THE ASSOCIATION SPECIALISTS

Daniel Evans	Event Manager
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REGISTRATION DESK CONTACTS

Daniel Evans	E: daniel@theassociationspecialists.com.au
Annie Hurst	E: office@aares.org.au

GENERAL INFORMATION

CAR PARKING

The Sydney Convention and Exhibition Centre parking is located off Darling Drive, underneath the Centre's five exhibition halls, in Darling Harbour. The car park provides direct access to the Centre and the Darling Harbour precinct. The car park is open 24 hours, Monday to Sunday. Please visit <http://www.scec.com.au/Visit/Parking/> to view current rates.

CATERING

Lunch and morning and afternoon teas will be served in the Parkside Foyer on Level 1 of the Sydney Convention Centre.

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 event <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

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 and will 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

The Sydney Convention Centre in Darling Harbour is adjacent to a Metro Light Rail (<http://www.metrolightrail.com.au/>) Station "Convention" with services connecting directly from Sydney Central Train Station.

Alternatively, the Sydney Convention Centre is approximately 15 minutes walking time from both Central Train Station and Town Hall Train Station. George Street, which runs the length of the Sydney CBD, has regular bus services and is also approximately 15 minutes walking time from the Convention Centre. There is a CBD free shuttle bus which runs every 10 minutes on a loop from Central Station to Circular Quay via George and Elizabeth Streets (www.131500.com.au).

Sydney Domestic and International Airports each have train stations with regular services to Sydney Central Station (<http://www.airportlink.com.au/index.php>).

Taxi companies in Sydney include:

Taxis Combined – 13 33 00

Silver Service – 13 31 00

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 Parkside Foyer on Level 1 of the Sydney Convention Centre 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 5pm on Friday, 8 February, 2013.

REGISTRATION and INFORMATION DESK

All delegates should collect their registration pack upon arrival to the Conference. The registration desk will be located in the Parkside Foyer on Level 1 of the Sydney Convention Centre, and will be open during the following times:

Tuesday 7 February 2013:

8:00am - 9:00am and 4:00pm - 6:00pm

Wednesday 8 February 2013:

7:30am - 4:30pm

Thursday 9 February 2013:

7:30am - 4:30pm

Friday 10 February 2013:

7:30am - 4:00pm

SECURITY AND EMERGENCIES

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.

In the case of an emergency of any type, contact the **Centre's Security Control (9282 5555)** or **NSW Emergency Services (000)**.

In the case where an evacuation is necessary, the evacuation alarm "Whoop Whoop Whoop" is designed to notify all occupants. On hearing the evacuation alarm, all persons should proceed to the nearest emergency exit and make their way to an assembly area:

Assembly Area 1: Between Entertainment Centre and the Novotel Hotel

Assembly Area 2: Beneath the road overpass, adjacent to the IMAX Theatre

SPECIAL REQUIREMENTS

If you have advised the Conference Organisers of any special dietary requirements, please identify yourself to the wait staff for assistance.

TIME ZONE

Sydney operates on Eastern Daylight Time, which is GMT plus 11 hours. Sydney does observe daylight savings time.

TOURIST INFORMATION

Tourist information about Sydney and surrounds, including maps and attractions, is available from

<http://www.sydney.com> and

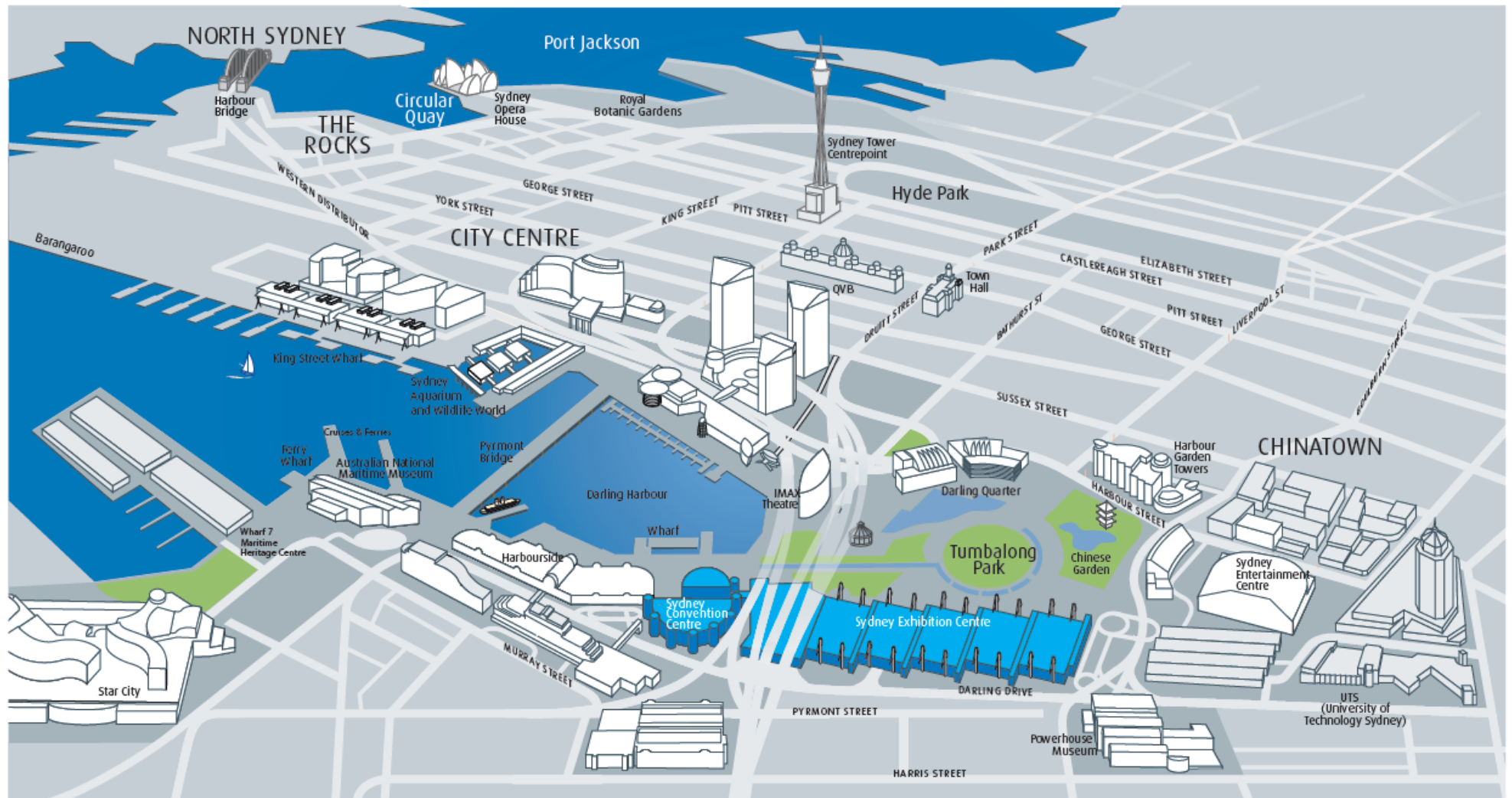
<http://www.cityofsydney.nsw.gov.au/aboutsydney/visitorguidesinformation/default.asp>

Please visit the registration desk if you would like further information.

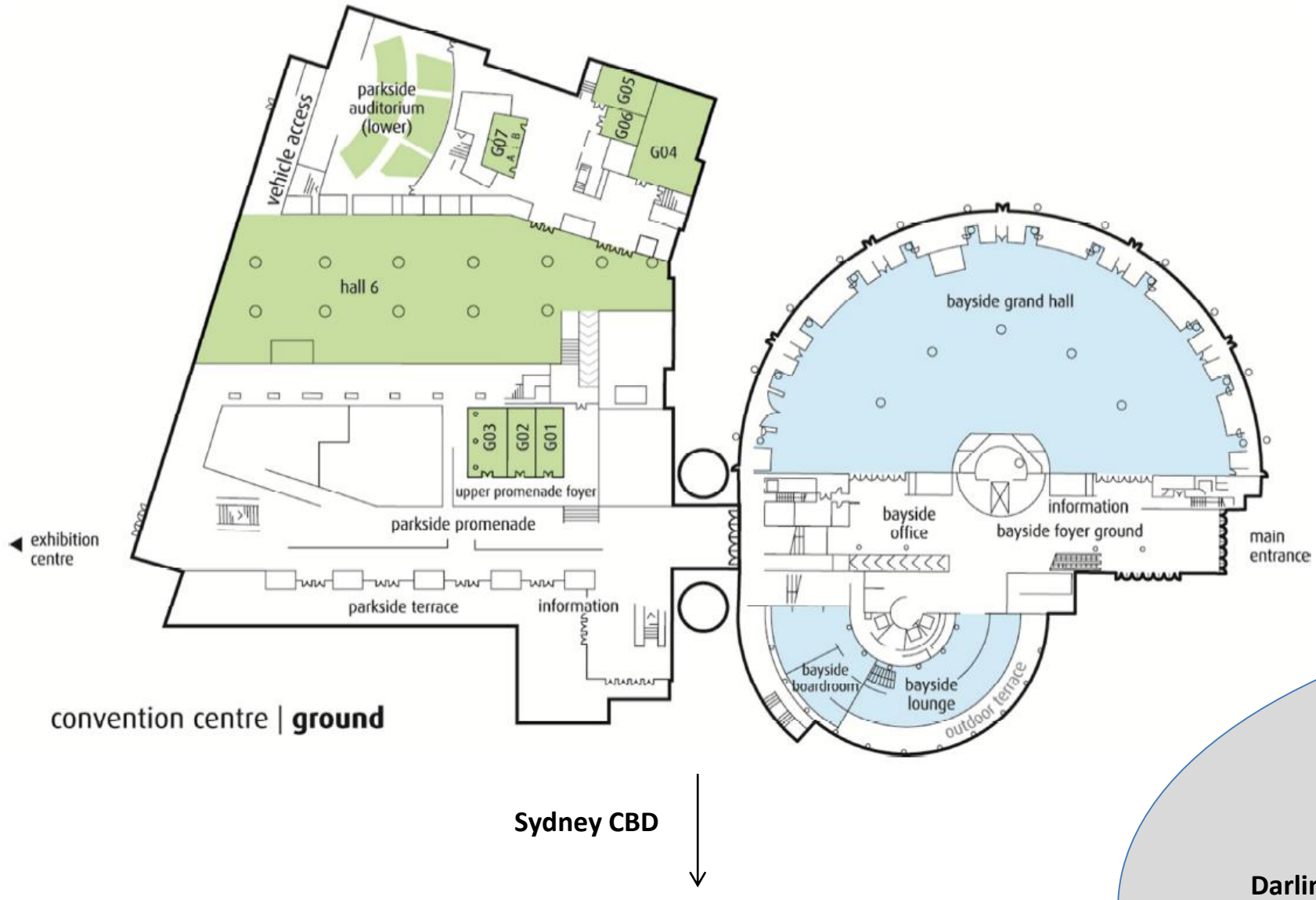
TRADE EXHIBITION

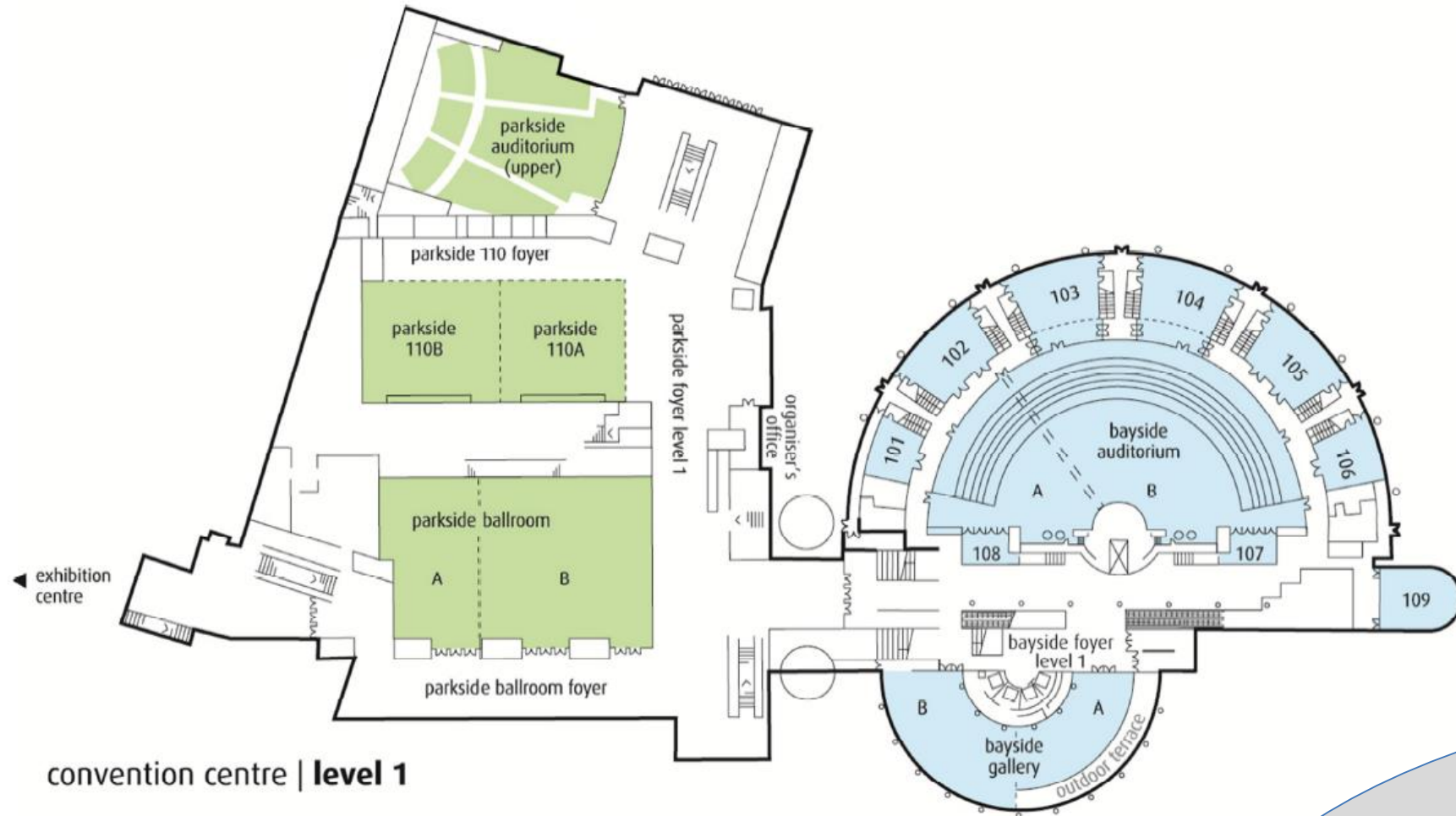
Delegates are encouraged to visit the Trade Exhibition, located in the Parkside Foyer on Level 1 of the Sydney Convention Centre during catering breaks.

LOCATION MAP – DARLING HARBOUR, SYDNEY



VENUE MAP – SYDNEY CONVENTION CENTRE





Sydney CBD



Darling Harbour

PRE-CONFERENCE WORKSHOPS

PRE-CONFERENCE WORKSHOP 1

ECONOMIC TOOLS FOR ADAPTATION AND TRANSFORMATION TO CLIMATE CHANGE: REAL OPTIONS FOR ADAPTIVE DECISIONS

Convenor: Greg Hertzler, University of Sydney; Todd Sanderson, University of Sydney



Speakers: Greg Hertzler, Todd Sanderson, Tim Capon

This workshop is primarily concerned with adaptive capacity, options for adaptation response and transformational change in Australia's primary industries as a response to climate change. In light of projections of a warmer drier future, this workshop will cover the nature of economic decisions which are made at the level of 1) adjusting practices and technologies, 2) changing production systems, or 3) transforming to new areas or industries. Adjustment changes are relatively easy to make but system and transformation changes may be irreversible, or partially irreversible, leaving stranded assets. Making the switch will require investments and infrastructure. As producers in Australia adapt, so will producers in the rest of the world. Adaptations around the world will affect Australian producers, Australia's food security and international trade. Understanding the future structure of primary industries is relevant to policy makers, researchers and primary producers because each of these changes has implications for the resilience of regional economies and communities.

The workshop will involve both presentations as well as demonstration of practical computer based applications to develop the economic analytical tools for promoting efficient, sustainable adaptation policies. Case studies developed for the workshop will have a specific focus on New South Wales, South Australia and Western Australia.

This workshop aims to develop among participants:

- The capacity and skills in the economic analysis of adaptive and transformational responses to climate change
- The use of transects across space to identify future scenarios for more favourable areas as they become less favourable with climate change
- The use data to model the transformations from current agricultural systems
- The use climate data to assess the trends and increasing variability of crop and pasture production
- The use of the economic frameworks to find the thresholds and expected times until an agricultural enterprise switches from one production system to another.

Primary support for this workshop was provided by the NSW Department of Trade and Investment (<http://www.chiefscientist.nsw.gov.au/home>). Additional support was provided by NCCARF and the University of Sydney.

PRE-CONFERENCE WORKSHOP 2

MARINE BIODIVERSITY OFFSETS

Convenor: Sean Pascoe, CSIRO Marine and Atmospheric Research

Sponsorship:



Speakers: Sean Pascoe, Anthea Coggan, Sarah Jennings, Nick Hanley, Nicola Beaumont, Norman Meade, Michael Burton, Samantha Paredes

Increasingly, coastal development is having an impact on coastal marine habitats in Australia. These include coastal development due to urban expansion, port development to support exporting industries, and the development of marine mining. These have an impact on fisheries production, but also result in impacts on marine biodiversity that are less easy to assess as these largely involve non-use values to the broader community. In terrestrial environments, offsets are proposed as one of several market based instruments for compensating for environmental damage when such damage is unavoidable. In the marine environment, the potential for direct offsets is limited due to the impracticality of actually rehabilitating underwater habitats. Further, the lack of property rights prevents approaches such as habitat banking for conservation purposes. Consequently, there is increasing reliance on indirect offsets.

The use of indirect offsets requires some measure of value forgone. Consequently the issue of offsets and non-market valuation of marine habitats is intrinsically linked. However, deriving values for marine habitats to determine appropriate amounts of compensation is complex. Many marine habitats are poorly understood by the general public and, with the exception of a limited few (e.g. coral reefs, mangroves etc), have little iconic status and may be actually unappealing (e.g. mud) although have a valuable ecological function. The issue of what to value (i.e. habitats or species affected) is also unresolved for the purposes of determining appropriate offsets in the marine environment.

The aim of this workshop is to examine issues in marine offsets and non-market valuation in marine environments. The workshop will involve both presentations by Australian and international researchers involved in offset policy analysis and non-market valuation in the marine environment. The workshop will conclude with a discussion on the research agenda needed to develop effective offsets in the marine environment.

This workshop aims to develop among participants:

- Deeper understanding of the economic issues around the potential for offsets in the marine environment;
- Understanding of some of the economic analysis tools that can be applied for assessing biodiversity conservation in marine (and terrestrial) environments.

The workshop is being sponsored by CSIRO and the NERP Marine Biodiversity Research Hub.

IMPACT ASSESSMENT ANALYSIS TO SUPPORT INTERNATIONAL AGRICULTURAL RESEARCH FUNDING DECISIONS: NEW METHODOLOGIES AND APPLICATIONS

Convenor: Jeff Davis, formerly RIRDC



Speakers: Cynthia Bantilan, Jeff Davis, Kizito Mazvimavi, Kai Mausch, Kumara Charyulu, Swamikannu Nedumaran, Irshad Ahmed, Kamanda Josey

For nearly half a century AARES members have contributed significantly to understanding the economics of the impact of agricultural research. The objective of this Workshop is to provide an overview of the International Crops Research Institute for the Semi-Arid Tropics' (ICRISAT) economic analysis which supports strategic research choices and have this reviewed by many of these Australian contributors to this field, amongst these will be Julian Alston, Jeff Bennett, Ron Duncan, Geoff Edwards, John Freebairn, Jenny Gordon, David Pearce, John Mullen and Jim Ryan. The Workshop will be of significant interest to those applying this type of economic analysis to support research decision-making. It will include sufficient time for in depth discussion of identified key issues.

PRE-CONFERENCE WORKSHOP 4

AGRICULTURE – SOURCE OR SINK? FARM LEVEL IMPLICATIONS OF PRICING CARBON AND POLICY RESPONSES TO MANAGE GREENHOUSE GAS EMISSIONS

Convenors: Malcolm Wegener, University of Queensland; David Pannell, University of Western Australia; Mick Keogh, Australian Farm Institute, Sydney

Speakers: Malcolm Wegener, Mick Keogh, Suzi Kerr, Scott Jeffrey, Bruce McCarl, Tas Thamo, Natalie Brown, David Pannell

Agriculture plays an important role in many developed economies, including those of Australia and New Zealand. While the farming sector in both nations is currently exempt from any direct cost of greenhouse gas emissions, in both cases the agriculture sector is a significant contributor to national greenhouse emissions, and in both cases the sectors are under political and community pressure to be more accountable for environmental impacts, including greenhouse emissions.

In many respects the sectors need either to address greenhouse emissions, or have them addressed through policy measures that impose costs on farm businesses.

How Australian and New Zealand agriculture can best respond to the challenge is an important question. In New Zealand, the proposal is to impose a liability for farm emissions on the downstream sector, and in that way create incentives for a 'whole of supply chain' approach to emissions reduction. In Australia, the Carbon Farming Initiative represents an incentive-driven approach that could reward farmers for undertaking sequestration or mitigation projects that have the net impact of reducing emissions.

Which of these approaches is more likely to be successful? Are there other policy options available that will enable Australian and New Zealand agriculture to reduce emissions while remaining globally competitive? What lessons have been learnt from agricultural emission abatement schemes internationally that are relevant to this question?

The overall objective of the workshop is to bring together speakers from several countries to discuss various strategies to reduce greenhouse gas emissions from agriculture and to provide some assessment of the capacity of agriculture to absorb carbon from other industries.

The workshop will be structured in three parts and a draft program follows. The program is still subject to change since all potential contributors have not yet been contacted by the organisers.

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.

Monday 4 February 2013		
Time	Session	Location
9.00 am – 5.00 pm	Pre-Conference Workshop 1 “Economic Tools for Adaptation & Transformation to Climate Change: Real Options for Adaptive Decisions” Organiser: Greg Hertzler, University of Sydney; Todd Sanderson, University of Sydney	University of Sydney
1.00 pm - 5.00 pm	AARES Outgoing Council Meeting	

CONFERENCE PROGRAM

Tuesday 5 February 2012		
Time	Session	Location
8.00 am - 9.00 am	Registration for workshop delegates only	
9.00 am - 5.00 pm	Pre-conference Workshop 2 "Marine Biology Offsets" Organiser: Sean Pascoe, CSIRO	Darling Harbour Convention Centre (Convention) Room: G01
9.00 am - 5.00 pm	Pre-Conference Workshop 3* "Impact Assessment Analysis to Support International Agricultural Research Funding Decisions: New Methodologies and Applications" Organiser: Jeff Davis, ICRISAT <i>* Limited places</i>	Convention Room: G03
9.00 am - 5.00 pm	Pre-Conference Workshop 4 "Agriculture – Source or Sink? Farm level implications of pricing carbon and policy responses to manage greenhouse gas emissions" Organisers: Malcolm Wegener, University of Queensland; David Pannell, University of Western Australia; Mick Keogh, Australian Farm Institute	Convention Room: G02
10.00 am - 10.30 am	Morning tea	Adjacent G02, Convention
12.00 pm - 1.00 pm	Lunch	Adjacent G02, Convention
3.00 pm - 3.30 pm	Afternoon tea	Adjacent G02, Convention
4.00 pm - 6.00 pm	Registration for conference delegates	Adjacent G02, Convention
6.00 pm - 8.00 pm	Welcome reception	Parkside Foyer
8.00 pm – 10.00 pm	Early Career Members' Dinner	Silver Restaurant 477 Pitt Street, Sydney

CONFERENCE PROGRAM

Wednesday 6 February 2013		
Time	Session	Location
7.30 am - 4.30 pm	Registration	Parkside Foyer
8.30 am - 9.00 am	Conference Official Opening Her Excellency Marie Bashir (AO), Governor of New South Wales; Chancellor Emerita, University of Sydney Simon Hearn, ACIAR Chair: Malcolm Wegener, President AARES	Convention Room: 110
9.00 am - 10.00 am	Opening Plenary Session 1. Ross Garnaut (AO), University of Melbourne and Australian National University "Comments on the Henry Report – 'Australia in the Asian Century'" 2. Bob Gregory (AO), Australian National University, "Implications of the end of the resources investment boom" Chair: Malcolm Wegener, President AARES	Convention Room: 110
10.00 am - 10.30 am	Morning tea	Parkside Foyer
10.30 am - 12.00 pm	Contributed papers session 1	See separate program
12.00 pm - 12.45 pm	Lunch	Parkside Foyer
12.45 pm - 2.30 pm	Mini-symposia Session 1	See separate program
1(a)	Reducing Carbon Emissions from the Electricity Sector: Design Experiences and Challenges Organisers: Iain MacGill and Regina Betz, Centre for Energy and Environmental Markets, University of New South Wales	Convention Room: G04
1(b)	Environmental Economics in the Real World Organiser: Alan Randall, University of Sydney	Convention Room: 110
1(c)	Risk Management for Intensification of Rain-fed Agriculture in Africa and Australia Organisers: Mulugetta Mekuria, CGIAR and John Dixon, ACIAR	Convention Room: G03
1(d)	Market-Based Instruments for Freshwater Management in New Zealand Organiser: Adam Daignault, NZ Landcare Research	Convention Room: G05
2.30 pm - 3.00 pm	Afternoon tea/Introduction to Poster session	See separate list for poster presenters
3.00 pm - 3.30 pm	Poster presentations	Parkside Foyer
3.30 pm - 4.40 pm	Contributed Papers Session 2	See separate program
4.45 pm - 5.45 pm	Presidential address: Malcolm Wegener "The challenge of renewable energy policy in Australia" Chair: John Quiggin, University of Queensland	Convention Room: 110
7.00 pm – 11.00 pm	Conference Dinner Master of Ceremonies: John Mullen Presentation of awards (including Distinguished Fellows) Featured Speaker: Hon John Kerin (AO), Chair Crawford Fund and Hon Life Member AARES	Dockside Restaurant, Cockle Bay

CONFERENCE PROGRAM

Thursday 7 February 2013		
Time	Session	Location
7.30 am - 4.30 pm	Registration	Parkside Foyer
8.30 am - 10.00 am	Contributed Papers Session 3	See separate program
10.00 am - 10.30 am	Morning Tea	Parkside Foyer
10.30 am - 12.00 pm	Invited Papers Session A 1. Mark Rosegrant, IFPRI, "Climate change and food security in Asia" 2. C. Peter Timmer, Harvard University, "Coping with climate change: a food policy approach" Chair: Will Martin, World Bank	Convention Room: 110
	AAEA Organised Session – Invited Papers Session B "Food, Nutrition, Health and Related Policy: Some International Perspectives" 1. Ellen Goddard, University of Alberta, "Determinants of dietary diversity in the US, Canada and India – do different policies play a role?" 2. Wendy Umberger, University of Adelaide, "Dietary transformation in Indonesia: is the supermarket revolution to blame?" 3. Gary Sacks, Deakin University, "Drivers of the global obesity epidemic and potential solutions" Chair: Julian Alston, University of California, Davis	Convention Room: G04
12.00 pm - 12.45 pm	Lunch	Parkside Foyer
12.45 pm - 2.30 pm	Mini-Symposia Session 2	
	2(a) Measuring Productivity and Efficiency of Water Industries Organiser: Tihomir Ancev, University of Sydney	Convention Room: G05
	2(b) Empowering Adaptation: From Top-down Livelihoods to Participatory Assessment Organiser: Brent Jacobs, University of Technology, Sydney	Convention Room: G03
	2(c) New Resource Allocation Tools and Approaches for Biosecurity Decision Making Organisers: Paul Mwebaze, CSIRO	Convention Room: G04
	2(d) Resilience Thinking and Economics in Natural Resource Management Organiser: Michael Harris, ABARES	Convention Room: 110
2.30 pm - 3.00 pm	Afternoon Tea	Parkside Foyer
3.00 pm - 4.30 pm	Contributed Papers Session 4	See separate program
4.30 pm - 5.30 pm	Annual General Meeting	Convention Room: 110
5.30 pm – 7.00 pm	The Rocks Walking Tour	The historical Rocks district
7.00 pm – 10.00 pm	Networking Event	Australian (Heritage) Hotel 100 Cumberland St, The Rocks

CONFERENCE PROGRAM

Friday 8 February 2013		
Time	Session	Location
7.30 am - 4.00 pm	Registration	Parkside Foyer
8.30 am - 10.00 am	Contributed Papers Session 5	See separate program
10.00 am - 10.30 am	Morning Tea	Parkside Foyer
10.30 am - 12.15 pm	Invited Papers Session C 1. Rick Roush, University of Melbourne, "The management of insecticide and herbicide resistance: slowing evolution" 2. Rick Llewellyn, CSIRO, "Managing herbicide and insecticide resistance" Chair: Bob Farquharson, University of Melbourne	Convention Room: G04
	Invited papers Session D 1. Will Martin, World Bank, "Managing food price volatility" 2. Sommarat Chantararat, Australian National University, "Poverty and risk in developing countries of Africa and Asia" Chair: C. Peter Timmer, Harvard University	Convention Room: 110
12.15 pm - 1.00 pm	Lunch	Parkside Foyer
1.00 pm - 2.30 pm	Contributed Papers Session 6	See separate program
2.30 pm - 3.00 pm	Distinguished Fellows Address Professor Rich Sexton, University of California, Davis, President AAEA "Modern agricultural markets" Chair: Peter Warr, President AARES	Convention Room: 110
3.30 pm - 3.45 pm	Conference close	Convention Room: 110
3.45 pm - 4.15 pm	Afternoon Tea	Parkside Foyer
4.00 pm - 5.30 pm	AARES Incoming Council Meeting	

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, 5 February 2013

6.00 – 8.00pm

Parkside Foyer, Level 1, Sydney Convention Centre

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

EARLY CAREER MEMBERS' DINNER

Tuesday, 5 February 2013

8.00 – 10.00pm

Zilver Restaurant, 477 Pitt Street, Sydney (an easy walk from the Sydney Convention Centre through Chinatown)

What better way to celebrate the Asian Century than yum cha? Join us for dinner at Zilver Restaurant, in the heart of Sydney's iconic Chinatown district. Build your network and share your experiences over both contemporary and traditional Chinese dishes. Postgraduate students, recent graduates, early career professionals and young members new to AARES are encouraged to attend.

CONFERENCE DINNER

Wednesday, 6 February 2013

7.00 – 11.30pm

Dockside Restaurant, Cockle Bay

Join us for dinner at Dockside where you'll enjoy great food and wine, the company of your peers and 180 degree views over Darling Harbour. Recognise the achievements of some of Australia's leading agricultural and resource economists, and seize the opportunity to engage in some professional debate.

THE ROCKS WALKING TOUR

Thursday, 7 February 2013

5.30 – 7.00 pm

Shop 4a, Clocktower Square, Corner Argyle & Harrington Streets, The Rocks

Get up close and personal with the living history and heritage of Sydney as you weave your way through hidden narrow alleyways, along charming cobbled lanes and into shady courtyards, linger by quaint terrace cottages and visit a gothic church. The Rocks may be Sydney's oldest neighbourhood but it's lost none of its zest for life. Let experienced guides entertain you with lively tales from Sydney's colourful past while enjoying the ambience of our vibrant present. The tour will finish at The Australian Heritage Hotel for those who wish to attend the Networking Social Event.

NETWORKING EVENT

Thursday, 7 February 2013

7.00 – 10.00pm

The Australian Heritage Hotel, 100 Cumberland Street, The Rocks

Kangaroo pizza? Or is crocodile more your style? Enjoy these and other varieties, along with drinks and finger food, at the Australian Heritage Hotel in Sydney's Rocks district. 2013 marks the hotel's 100th birthday, so kick back, relax and enjoy the ambience of this Sydney landmark.

INVITED SPEAKER BIOGRAPHIES

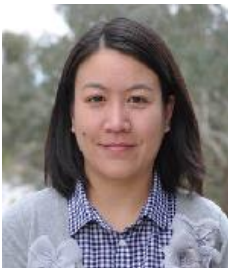
Her Excellency Professor Marie Bashir (AO), Governor of New South Wales



Professor Bashir, the first woman to be appointed Governor of New South Wales, took up her office on 1 March 2001. Born, of Lebanese descent, in Narrandera, New South Wales, and educated at Narrandera Public School and Sydney Girls High School, Marie Bashir gained her bachelor degrees in medicine and surgery in 1956 from the University of Sydney. Dr Bashir taught at the Universities of Sydney and New South Wales, increasingly working with children's services, psychiatry and mental health services, and indigenous health programs. At the time of her appointment as Governor of New South Wales, she was Clinical Professor of Psychiatry at the University of Sydney (a post she took up in 1993); Area Director of Mental Health Services Central Sydney (from 1994); and Senior Consultant to the Aboriginal Medical Service, Redfern (from 1996) and to the Aboriginal Medical Service, Kempsey.

Professor Bashir's widespread involvements and interests have included juvenile justice, research on adolescent depression, health issues in developing countries, education for health professionals and telemedicine and new technologies for health service delivery. Along with many professional medical association roles, she was, at the time of her appointment as Governor, a member of societies as diverse as Amnesty International, the National Trust, the New South Wales Camellia Research Society and the Tandanya National Aboriginal Cultural Centre, as well as being a patron of the Sydney Symphony and Opera Australia. She was appointed an Officer of the Order of Australia in 1988 for her services to child and adolescent health; and was invested by Her Majesty, the Queen, with the insignia of a Commander of the Royal Victorian Order (CVO) in 2006.

Sammarat Chantararat, Australian National University



Dr Chantararat is a Research Fellow at the Crawford School of Economics and Government, Australian National University. Dr Chantararat received a BA in Economics at Thammasat University, Thailand, a M.Phil (Economics) at the University of Cambridge, an M.Sc. (Financial Mathematics) at the University of Chicago and a PhD (in Economics) from Cornell University. Prior to joining the ANU, Dr Chantararat worked as a Postdoctoral Associate with the Dyson School of Applied Economics & Management, Cornell University; a Graduate Fellow at the International Livestock Research Institute, Nairobi, Kenya and in various research and teaching roles at Cornell University and the Economics Department of the Ministry of Foreign Affairs in Thailand.

Dr Chantararat's research interests span the following areas of development microeconomics: Poverty traps, vulnerability and rural welfare dynamics; risk management mechanisms in poor communities; rural financial markets,

microinsurance and microcredit; field experiments in development economics; and policy impact evaluation. Her current works involve the use of risk modeling and original field surveys and experiments in tackling development of pro-poor risk management and credit instruments as a means to reduce poverty and vulnerability among poor communities.

Ross Garnaut (AO), University of Melbourne/Australian National University



Professor Garnaut is a Vice-Chancellors Fellow and a Professorial Fellow in Economics at the University of Melbourne as well as a Distinguished Professor of the Australian National University. He is currently Chairman of the PNG Sustainable Development Program Ltd (Singapore) and its nominee Director on the Board of Ok Tedi Mining Limited (PNG). He is also a member of the board of several international research institutions, including Asialink (Melbourne), the Centre for Strategic and International Studies (Jakarta) and the China Centre for Economic Research at Peking University (Beijing).

Professor Garnaut has also had longstanding and successful roles as policy advisor, diplomat and businessman. He was the Senior Economic Adviser to Prime Minister R.J.L. Hawke from 1983 to 1985 and subsequently served as the Ambassador to China (1985 to 1988). In September 2008, he presented the Garnaut Climate Change Review which examined the impact of climate change on the Australian economy and provided potential medium to long-term policies to ameliorate these. In November 2010, he was commissioned to update his 2008 Review, and the final report was presented to the Australian Government in May 2011.

Ellen Goddard, University of Alberta



Professor Goddard is Cooperative Chair in Agricultural Marketing and Business, University of Alberta. She came to Alberta from a position as National Australia Bank Professor of Agribusiness, and Associate Dean at the Institute of Land and Food Resources, University of Melbourne. Prior to that Australian appointment, Ellen Goddard worked in the Department of Agricultural Economics at the University of Guelph.

Over the past 20 years, Professor Goddard's research has been focused on economic modeling of domestic and international markets for food products (particularly meat) for policy analysis purposes. Current research includes various aspects of food marketing including consumer response to food safety incidents, consumer interest in labels, demand for credence attributes, traceability and certification. She also currently leads a national policy research network for Agriculture and Agri-food Canada in Consumer and Market Demand for Food.

Bob Gregory (AO), Australian National University



Professor Gregory is Emeritus Professor in the Research School of Economics, College of Business and Economics, Australian National University as well as Professorial Fellow at Victoria University and Adjunct Professor, Queensland University of Technology. In the past, he held positions at various international universities. Professor Gregory's areas of interest include labour economics and public policy and he has been closely involved in the analysis and development of Australian economic policy. He has been a member of the Board of Management at the Australian Institute of Family Studies, a principal consultant in a series of government Aged Care Reviews, was a member of the committee that recommended the introduction of student income contingent loans, on the Board of the Reserve Bank of Australia, and the Australian Sciences and Technology Council.

Professor Gregory has been awarded the Order of Australia Medal and has an honorary doctorate from the University of Melbourne.

Simon Hearn, ACIAR



Dr Hearn has a BSc (Hons) in Agriculture and Economics from Reading University and a PhD in Agricultural Economics from London University. He has worked in agricultural and mining policy development and economic analysis both nationally and internationally. Dr Hearn has also occupied a number of senior research and senior executive positions and participated in a range of Government and industry delegations negotiating trade and commodity matters in Europe, Asia, America and Africa, including as Minister Agriculture in the Australian Mission to the European Union. He has served on a number of commodity and research boards and councils including the Energy Research and Development Corporation, the BHP Coal Research Council, the Australian Meat and Livestock Corporation, Wool International and the Australian Rural Leadership Foundation. Dr Hearn has also worked as a senior research economist for ABARE; First Assistant Secretary and Executive Manager in the Department of Agriculture, Fisheries and Forestry, Australia; the Chief of Staff for the former Minister for Employment, Education and Training and was most recently the Managing Director of the Rural Industries Research and Development Corporation.

The Honourable John Kerin (AO), The Crawford Fund



Born in Bowral, New South Wales, where he worked on the family farm, John Kerin is an 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 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 Weeds 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. After a long association with The Crawford Fund, he was elected Chair in October 2010.

Rick Llewellyn, CSIRO Sustainable Ecosystems



Dr Llewellyn is a Senior Research Scientist (Farming Systems) with CSIRO Sustainable Ecosystems. He has an Agricultural Science degree from the University of Adelaide and a PhD from the School of Agricultural & Resource Economics, University of Western Australia. Prior to joining CSIRO he was a lecturer in agricultural systems and extension at the University of Western Australia. He has led adoption and farming systems research projects funded by the Grains Research and Development Corporation, the Cotton Research and Development Corporation, and ACIAR. Current research includes developing strategies for more extensive adoption of no-till and conservation farming in cropping regions of Australia. He leads a multidisciplinary CRC Future Farm Industries initiative to develop a model to predict and evaluate the adoptability of new NRM and agricultural practices. He has also applied farming systems research approaches to improving the sustainability of weed management strategies and rice production through projects in the Philippines and more recently north-east Thailand where decreasing labour and water availability are major drivers for farming systems change. Dr Llewellyn's research into the adoption of integrated weed management by grain growers received the AARES PhD Research Prize in 2003.

Will Martin, World Bank



Dr Martin is Research Manager, Agriculture and Rural Development, in the Development Research Group of the World Bank. He obtained his first degrees from the University of Queensland and the Australian National University, and Masters and PhD degrees from Iowa State University. Before joining the World Bank, he worked as a researcher and manager at the Australian Bureau of Agricultural and Resource Economics, and as a Senior Research Fellow at the Australian National University.

He has published extensively on agricultural trade policy and developing countries, with a particular focus on the World Trade Organization and economic development, often based on using quantitative models such as the Global Trade

Analysis Project, and has a particular interest in using detailed data to build up a complete picture of the effects of policies on welfare impacts at national and household levels.

Mark Rosegrant, IFPRI



Dr Rosegrant is the Director of the Environment and Production Technology Division at the International Food Policy Research Institute (IFPRI) in Washington, DC. With a Ph.D. in Public Policy from the University of Michigan, he has 30 years of experience in research and policy analysis in agriculture and economic development, with an emphasis on water resources and other critical natural resource and agricultural policy issues as they impact food security, rural livelihoods, and environmental sustainability.

Rick Roush, University of Melbourne



Dr Roush holds degrees in entomology from the University of California, Davis and Berkeley. From 1987-1995, he was Associate Professor of Entomology at Cornell University. In 1995, he joined the Department of Crop Protection at the University of Adelaide, and from 1998 to 2003, was Chief Executive Officer of the Cooperative Research Centre for Weed Management. Between 2003 and 2006, Rick was Director of the Integrated Pest Management and Sustainable Agriculture Programs for the University of California, before moving to the University of Melbourne.

Gary Sacks, Deakin University



Dr Sacks is a Research Fellow at Deakin University, where his research focuses on policies for the prevention of non-communicable diseases. He has tertiary qualifications in economics, information systems and health informatics and completed his PhD (Public Health) in 2010. His PhD thesis investigated policies for obesity prevention, including studies on the cost-effectiveness of junk-food taxes and traffic-light nutrition labelling. Gary has a broad range of international public health research and policy experience. This includes research placements at the World Health Organization (Switzerland), Harvard University (USA), the University of Oxford (UK), and the International Telecommunications Union (Switzerland). Prior to entering the field of public health, Gary worked as a management consultant, providing strategic business advice to multi-national corporations and State and Federal governments in Australia.

Rich Sexton, University of California – Davis and President, AAEA



Dr Sexton is the Department Chair at the Department of Agricultural and Resource Economics, University of California, Davis. He previously served as Department Chair from 1994 to 1998 and as Director of the University of California’s Giannini Foundation of Agricultural Economics from 2000 to 2003. His research focuses primarily on the analysis of agricultural markets, with special emphasis on the fruit, vegetable and nut industries in California. A particular focus is the role that imperfect competition plays in agricultural markets. Dr Sexton has been a leading authority on the application of "new industrial organization" methods to agricultural markets, including applications of game theory, and the use of structural econometric models to analyse competition in specific agricultural industries. He has over 100 publications, including journal articles, books, book chapters and publications for non-specialist audiences.

In 2004 he was elected a Fellow of the AAEA and subsequently served as Director of the Association’s Executive Board until 2007 and is currently its President. He served as co-editor of the American Journal of Agricultural Economics from 1998 to 2001.

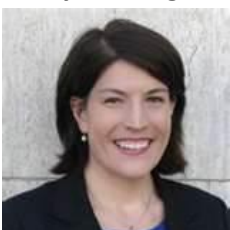
C. Peter Timmer, Harvard University/Australian National University



Dr Timmer is a leading authority on agriculture and rural development who has published widely on these topics. He has served as a professor at Stanford, Cornell, three faculties at Harvard, and the University of California, San Diego, where he was also the dean of the Graduate School of International Relations and Pacific Studies. A core advisor on the World Bank's World Development Report 2008: Agriculture for Development, Timmer also works with several Asian governments on domestic policy responses to instability in the global rice market. In 1992, he received the Bintang Jasa Utama (Highest Merit Star) from the Republic of Indonesia for his contributions to food security. He is an advisor to the Bill and Melinda Gates Foundation on agricultural development issues.

Timmer's work focuses on three broad topics: the nature of "pro-poor growth" and its application in Indonesia and other countries in Asia; the supermarket revolution in developing countries and its impact on the poor (both producers and consumers); and the structural transformation in historical perspective as a framework for understanding the political economy of agricultural policy.

Wendy Umberger, University of Adelaide



Dr Umberger is a Lecturer in the Agri-Food and Wine Business at the University of Adelaide’s School of Agriculture, Food and Wine. She has a B.S. in Animal Science and M.S. in Economics from South Dakota State University, and received a Ph.D. in Agricultural Economics from the University of Nebraska-Lincoln, USA.

Prior to joining the University of Adelaide, Dr Umberger was an Assistant Professor in the Department of Agricultural and Resource Economics at Colorado State University (CSU). Her research focused on consumer preferences for food attributes, such as country-of-origin and the value of traceability systems in the food and agricultural value chain. While at CSU she was involved in outreach work with agricultural producers, industry and policy makers. This included workshops on agribusiness marketing and management. She has taught courses in agricultural production economics, agricultural marketing, agricultural policy and integrated resource management. Dr Umberger is passionate about working with agricultural producers and industry to explore marketing alternatives for their agricultural and food products.

Malcolm Wegener, University of Queensland and President, AARES



Dr Wegener is a senior research fellow and former lecturer in agricultural and resource economics at The University of Queensland and member of the Research Advisory Committee of the Australian Farm Institute. Mal obtained both a bachelor's and a master's degree in agricultural science at The University of Queensland, where he also completed his PhD. He worked for the Queensland Department of Primary Industries as a regional agricultural economist and for the Bureau of Sugar Experiment Stations before joining the University in 1991.

He has been involved in sugar industry research since 1978 as a researcher, information manager, and crop modeller. Most recently he was a seconded staff member of the CRC for Sugar Industry Innovation through Biotechnology. Dr Wegener's main professional interest was in production economics and farm management but the challenges associated with the production of biofuels from crops and in the interaction between improved environmental management on farms and industry income, led to an interest in environmental Life Cycle Analysis and its application to agricultural production and products.

Mal was awarded Honorary Life Membership of AARES in 2010 for his outstanding contribution to the Society and received a similar honour from the International Association of Agricultural Economists at the Conference in Brazil in 2012.

INVITED SPEAKER ABSTRACTS

Sommarat Chantararat, Australian National University

Poverty and risk in developing countries of Africa and Asia

Extreme risks of weather, health and other disasters are on a rise and disproportionately affect poor households in developing world due to high dependency on agricultural and resource-based livelihoods, inequality in the access and effectiveness of public and (informal) risk management mechanisms, and incompleteness of the financial markets, commonly used in developed world to smooth consumption. Recent theoretical and empirical evidence suggests various mechanisms, by which uninsured risks could reinforce extreme poverty. The combination of considerable *ex-post* asset and income losses due to shocks, and the likewise substantial, albeit less obvious, opportunity costs of ineffective *ex-ante* risk management among risk averse poor, e.g., through precautionary adoption of low-risk (but low-return) livelihood portfolios, could dampen household's productivity, asset accumulation and income growth. As risk exposures leave lenders vulnerable to default, uninsured risks also commonly limit access to credit (and so investment), especially for the poor who lack collateral. The regressive roles of risks in poverty and economic development become more silent, diverse and perhaps irreversible in the settings with multiple-equilibria poverty traps, commonly found in very poor subsistent areas especially of Africa where the expected asset accumulation and income growth are conditioned by at least one required asset threshold. Altogether, these underlie the importance of well-targeted safety net and suites of risk management tools as part of a strategy for reducing the chronic poverty associated with poverty traps. The presentation will also discuss the on-going research on development and impact evaluation of innovative and potentially market viable microinsurance products for poor farmers in developing countries of Africa and Asia.

Ross Garnaut (AO), University of Melbourne/Australian National University

Comments on the Henry Report – 'Australia in the Asian Century'

The Australian economy has experienced extraordinarily rapid growth in incomes so far in the early twenty first century, driven by high terms of trade and investment in energy and metallic minerals capacity for export. Until the Great Crash of 2008, this was driven by historically strong growth in demand for commodities across much of the world economy, with the Chinese contribution being large but not singular. Global demand collapsed briefly in the immediate aftermath of the Great Crash, but recovered quickly mainly in response to stimulators fiscal and monetary policies in China. Since 2008, the global and Australian resources booms have been China booms. China's strong growth is continuing, but with immense structural change which is transforming the nature of Australian export expansion opportunities. These imitations were alluded to without analysis of their origins in the recent Australian Asian Century White Paper. The AARES paper will discuss structural change in China and place it in the context of economic growth in Asia more generally. This provides a basis for assessment of the White Paper's discussion of Australian opportunity.

Bob Gregory, Australian National University

Implications of the end of the resources investment boom

Economists forecast poorly during normal times but when macro shocks occur forecasts become extremely bad (RBA, 2012; IMF, 2013). Furthermore, macro shocks usually reveal our inadequate understanding of how the macro economy actually works.

Australia is experiencing the biggest, most sustained and largely unanticipated resources boom in its history and it is to be expected that forecasting well and understanding the evolution of the economy will not be easy.

Peter Sheehan and I have shown that over the past decade sustained economic growth in Australia has lifted income levels probably of the order of 25 per cent relative to our normal comparators – the US and OECD Europe. This increase moves our per capita incomes from 85 per cent of the long run average relativity with the US to marginally above US income levels.

After describing how Peter and I analyse the evolution of the mineral boom I briefly discuss two broad questions. Can we expect this new income relativity to be permanent? How might the economy, and particularly the labour market, evolve over the next decade? The emphasis is placed on exploring many of the key empirical relationships which, as yet, have not received sufficient attention.

Ellen Goddard, University of Alberta; Gary Sacks, Deakin University; Wendy Umberger, University of Adelaide

AAEA Organised Session: Food, Nutrition, Health and Related Policy: Some International Perspectives

Around the world, in both rich and poor countries alike, policymakers are grappling with the links between food, public health, related policies, and their implications. Of particular concern is a range of diet-related health problems, including the modern paradox of food insecurity and obesity, as well as and other health problems associated with deficiencies of some nutrients and excessive consumption of some foods. The presentations in this session encompass a range of these complex and challenging issues and policies as they arise in a range of countries. The first paper assesses the effectiveness of different food and nutrition policy interventions in the United States, India and Canada on diet diversity and food security; effective strategies for reducing food insecurity are offered. The second paper examines the relationship between modern market access, diet quality and health status using data from a survey of 1,180 urban Indonesian households. The final paper examines the global obesity epidemic, its drivers, and potential solutions drawing on a range of evidence from around the world. Against the background of the presentation of particular issues and specific empirical analyses, the session will be opened up to broader discussion of data and methodological issues, and key questions and messages for researchers, policymakers and other stakeholders.

Rick S. Llewellyn, CSIRO, Sustainable Agriculture Flagship

The management of herbicide resistance

The management of pesticides by farmers has rarely aligned with the pesticide resistance management recommendations of entomologists and weed scientists. While there is a long history of agricultural

economics research into insect resistance management where highly mobile pest populations can create common pool resource problems, herbicide resistance has attracted less attention from economists. The global importance of herbicide resistant crops; the increasing level of resistance to the dominant herbicide glyphosate; the rapidly increasing extent of herbicide resistance in major grain producing regions, reliance on very few herbicide modes of action and the lack of new herbicide modes of action over the past 2 decades are factors now leading to increasing demand for economic understanding of herbicide resistance management. Herbicide resistance in weeds is not only a major cost to crop production but a major determinant of farm management and in some cases farming system. There is evidence that farmers view herbicide efficacy as a valuable but potentially exhaustible resource to be managed over time, however, farmer management of herbicides has largely involved development of resistance in weeds to a particular herbicide before shifting to the next best herbicide alternative. In this presentation, the contribution of herbicide resistance R, D & E to reducing uncertainty and improving resistance management is considered from the decision-makers' perspective; including decisions that lead to selection for resistance or investment in preventative behaviour. On-farm and external factors influencing economically optimal herbicide resistance management are described, including the factors influencing the decline in new herbicide development by agrichemical companies. Importantly, some regions and cropping systems in the world have had decades of experience managing serious levels of herbicide resistance, while others are only now facing the evolution of substantial resistance in weeds for the first time. There are opportunities for lessons learned and greater attention to the economics of resistance management to reduce the future cost of resistance.

Will Martin, World Bank

Managing high and volatile food prices

The recent period of high and volatile food prices has cast doubt on many longstanding assumptions such as the inevitability of declining real food prices, and brought to an end a long period of food price stability. Some of the key driving forces appear to have been declines in yield growth for major commodities and the rapid growth of biofuels. Both high food prices and volatile food prices are justly causes for concern. Key elements of the cure for high food prices include a strong focus on rural research and development, as well as rural development more generally, and a reconsideration of the role of biofuels. The most promising approaches to reducing food price volatility involve improving market information and reducing output volatility. Social safety nets are the best policy for coping with its effects, while the widely-used trade and storage policy measures have many complex and uncertain effects.

Mark W. Rosegrant, International Food Policy Research Institute

Climate change and agriculture in the Asia-Pacific region: impacts and policy responses

This presentation assesses the impacts of climate change on agricultural production, prices of major commodities, calorie availability and child malnutrition in the Asia-Pacific Region in 2050. The modelling methodology seeks to reconcile the limited spatial resolution of macro-level economic models that operate through equilibrium-driven relationships at a national level with detailed models of dynamic biophysical processes.

For Asia and the Pacific, depending on the General Circulation Model (GCM) and scenario used, biophysical crop model results show yield reductions under climate change compared to a no-climate change scenario.

By 2050, for irrigated rice, the expected reduction is 14–20 percent; irrigated wheat, 32–44 percent; irrigated maize, 2–5 percent; and irrigated soybean, 9–18 percent. Spreads across crops and GCM are somewhat wider for rain fed crops, with positive yield effects under some GCM, especially in more temperate areas. In Pacific Islands, traditional staple crops like taro, sweet potatoes, and cassava are projected to suffer significant yield declines due to climate change. Climate change is projected to have a strong effect on cereal prices and moderate impact on livestock prices; both cereal and meat prices will increase with climate change as compared to the no climate change scenario.

Price increases for cereals and soybeans due to climate change are on the order of 20 to 70 percent by 2050. Higher food prices lead to declines in total demand for cereal and other crops and a reduction in calorie consumption across all Asia, by 13–15 percent, on average. Childhood malnutrition levels, which are directly linked to calorie availability, are projected to increase dramatically under climate change between 9-11 million children, in addition to the 65 million children projected to remain malnourished in 2050 even under current climate conditions in Asia. Avoiding such an increase is difficult but not impossible.

Aggressive increases in agricultural research, rural roads, and irrigation investments under the agricultural adaptation scenario raises calorie consumption significantly and cut about three-quarters of the increase in childhood malnutrition due to climate change. Non-agricultural investments for clean water and maternal education further reduce child malnutrition.

Results show that Asian countries need to increase agricultural adaptation funding. Most adaptation investments are also good development policy, but due to climate change, higher investments will be required to meet development goals. Several important adaptation policies should be implemented: increased investments in agricultural research and rural infrastructure and in market and climate information, including integrated data management, monitoring, and evaluation systems for agriculture from the community to the national level. The global agricultural trading regime should be further opened so that the risks associated with climate change can be shared and thus resilience increased. In the Pacific Islands, institutional development is particularly important for climate change adaptation. Rationalizing land policy will be necessary to retain indigenous land ownership, while securing commercial land use rights, facilitated by the creation of land banks and incorporated land groups that provide flexible management and farm-level investment. In addition to increasing investment in agricultural research, it is necessary to harmonize research at the regional level across the Pacific by establishing centres of excellence that link national research institutions across countries and access services from international agricultural research centres. Extension systems need to be revitalized to incorporate strong local participation and effective coordination of public, private, and NGO providers.

Rick Roush, University of Melbourne

The management of insecticide and herbicide resistance: slowing evolution

The evolution of resistance to insecticides, herbicides, fungicides, antibiotics, and other biocides has been documented for nearly 100 years, but accelerated into hundreds of species and chemicals after 1947 with the introduction of synthetic pesticides with very specific biochemical target sites, first in insect nervous systems. For the sake of brevity, the focus here will be just on insecticides and herbicides to illustrate the major features of this evolutionary process. Despite the complexity of individual cases, the factors that drive selection for resistance are relatively simple; (1) the initial frequency of resistance alleles (often casually called “genes”), the proportion of population escaping selection (called the “refuge”), and generally

most importantly, the fitnesses of genotypes, especially the heterozygous individuals carrying one resistance allele and one susceptible allele at one gene locus (much like the major alleles for brown and blue eye colour). For at least 30 years, all of the major strategies for delaying resistance to insecticides and herbicides have been well known. The most promising strategies include reducing pesticide by greater reliance on alternative controls, targeting applications only to infestations that cause economic losses, allowing untreated refuges where these can be managed with minimal economic loss, rotations of different pesticide types across generations of the pests or weeds and, under specialised circumstances, higher pesticide concentrations (or exposures) and mixtures. Refuges are difficult to practice economically for weeds (although seeds that remain dormant for more than a year effective become a refuge), but in contrast, resistance management for weeds can often be managed at the level of farms, whereas dispersal generally requires large-area strategies for insects and mites. Despite general clarity in the scientific literature about best practice, there have been relatively few successful case histories for delaying pesticide resistance, especially for herbicides. The typical response is to use a preferred pesticide (usually the most cost-effective) until it fails, then move on to the next best choice available. Prominent success stories for resistance management have included insecticide rotation schemes, such as in Australian cotton production, but most impressively for insecticidal transgenic crops using genes modelled on those found in the bacterium *Bacillus thuringiensis* ("Bt"). First introduced in 1996, these crops have lasted for at least twice as long without resistance problems as sprays used comparably. Foreshadowed by models and experiments, the few cases in which resistance has evolved to Bt crops clearly show the importance of significant and deliberately structured refuges, high expression of the Bt toxins relative to the susceptibility of the pests, and the use of pyramided varieties with multiple Bt genes each showing adequate expression. Another key element of success has been modest government involvement requiring application of these resistance management tactics.

Rich Sexton, University of California, Davis

Modern agricultural markets

I argue that concerns about buyers power are often overstated in agricultural markets. This is because traditional models of buyer power are incapable of depicting the economic interactions that are fundamental to modern agricultural markets, where exchange is governed by stable contractual relationships. Exercising short-run oligopsony power is inimical to the long-run interests of buyers in these settings because below-competitive returns will lead to the exodus of resources from input production. Policy proposals grounded in the presumed linkage between concentration, competition, and market power may well be misguided and detrimental to the objectives proponents seek to advance.

The central message, thus, is that increasing buyer concentration need not be a bad thing for farmers and may be beneficial both in terms of overall economic efficiency and farmer welfare. The crucial element is that market conditions enable buyers to take a long-run perspective on their position in the industry thereby providing incentives for them to take actions to preserve the supply of farm product to their facilities.

C. Peter Timmer, Harvard University/Australian National University

Coping with climate change: a food policy approach

The early drafts of Food Policy Analysis were stimulated by the attention to high food prices following the world food crisis in 1973-74, and the fears of a repeat in 1979-80. But by the fourth full draft, in 1982, it became apparent that surpluses were returning to world food markets. A volume predicated on a world running out of food would have been out of date before the ink was dry, and a full-scale revamping of the analytical messages was needed. After a nearly complete re-write, the new theme, which has stood the test of thirty years of market fluctuations, was the need for flexibility to cope with market instability. That message is even more relevant now, as we learn to cope with a new source of instability – climate change.

Such flexibility is not a natural feature of domestic policy making, in the food sector or elsewhere, and providing the analytical tools for understanding how to create flexible responses turned out to be a real challenge. The task in this paper is to ask specifically how climate change would alter the basic message of Food Policy Analysis. Virtually all of the analysis was focused on national policies and domestic markets, an approach that seems problematical for preventing or mitigating climate change, but entirely appropriate for designing adaptation strategies.

Climate change is imposing itself as a reality via the increased probability of extreme weather events in general, but also on both global and localized food security outcomes in particular. The ecosystem services provided by the climate are essential for all agricultural production. The most important effects of climate change on agriculture are likely to include a net global loss of agricultural land, changing crop suitability, an increase in the frequency of natural disasters, and greater temporal and geographic variance in production. It will also have negative effects on other areas of agriculture broadly interpreted – reducing the carrying capacity of many rangelands and posing threats to fisheries and aquaculture production systems.

Climate change is expected to have highly variable effects on different regions; tropical and equatorial regions will bear the heaviest burdens, with some gains in yields and land availability in temperate regions. Since rural poverty is concentrated in tropical and, in South Asia, coastal areas, climate change is expected to have a disproportionate effect on the already vulnerable. The challenge is to design, analyse and implement in-country “climate-smart agriculture” adaptation projects and programs, which are now part of the food policy agenda, as well as improve the openness to trade in agricultural commodities to even out geographical instability. Designing appropriate policies for bio-fuels also needs to be on the analytical agenda.

Malcolm Wegener, University of Queensland

The challenge of renewable energy policy in Australia

Cane sugar industries around the world have consumed renewable fuel for as long as sugar has been made from sugarcane.

There has been interest from within and from outside the sugar industry in contributing more renewable energy to the mix of fuels consumed in Australia since the first Arab oil crisis quadrupled crude oil prices in the mid-1970s. This was partly an attempt to copy what was being done in Brazil where ethanol from sugarcane is widely used as a gasoline extender or used as a transport fuel on its own.

More recently, against a background of increasing concern globally about climate change and rising atmospheric CO₂ levels, Australia signed to extend the Kyoto Protocol until 2020, and introduced the Clean Energy Future legislative package which put an initially fixed price on carbon emissions. The policy attention

has switched from primarily being concerned about rising cost and availability of transport fuels, to reducing our overall level of greenhouse gas emissions, essentially focusing on replacing a substantial part of Australia's electricity output with less emissions intensive renewable energy. Specifically, Australia's obligation under the second commitment period of the Kyoto Protocol requires our emissions to be reduced by 5 percent below 2000 levels by 2020. Since such a high proportion of Australia's greenhouse gas emissions arise from electricity generation, it is logical to substitute renewable energy sources in place of coal-fired electricity to make a significant reduction in emissions.

Early reports suggested a substantial part of the renewable electricity required in Australia could be generated from biomass, specifically sugarcane bagasse. Sugar milling companies that tried to capitalise on this opportunity by making substantial investment in new generation capacity have found operating conditions difficult, largely due to the falling wholesale electricity prices and the low value of Renewable Energy Certificates

Extensive policy changes have been introduced since 2007. While the underlying intention of the policies introduced to encourage greater adoption of renewable fuels in Australia has been commendable, there have been many unintended consequences. Some guidelines for better policy in regard to renewable energy, drawing on sugar industry experience, are suggested.

MINI-SYMPOSIUM SESSION 1 DESCRIPTIONS

TITLE: REDUCING CARBON EMISSIONS FROM THE ELECTRICITY SECTOR: DESIGN EXPERIENCES AND CHALLENGES

Convenor: Iain MacGill and Regina Betz, Centre for Energy and Environmental Markets, University of NSW

Speaker 1:	Elizabeth Bernold, University of Sydney	The effect of alternative carbon pricing mechanisms on investment in abatement by the electricity sector
Speaker 2:	Frank Jotzo, Australian National University	Carbon price expectations, policy uncertainty and energy sector investment
Speaker 3:	Richard Evan and Regina Betz, Centre for Energy and Environmental Markets, UNSW	Trading beyond compliance: an analysis of electricity firm participation in the European Union emissions trading scheme
Speaker 4:	Stefan Trueck, Macquarie University	The pass-through cost of carbon in Australian electricity markets

Since July 2012 Australia has introduced a carbon price and recently the government has announced that they plan to link the Australian scheme to the European Emissions Trading Scheme in 2018. The electricity industry is one of the biggest carbon emitters in Australia and also bears the highest mitigation potential. This mini-symposium will focus on the design of market mechanisms to incentivise carbon emissions reductions from the electricity sector. It will on the one hand focus on market design questions which affect the effectiveness of trading schemes and on the other hand present some empirical insights on effects of carbon pricing schemes on the electricity industry. Elizabeth Bernold will show the results of an experiment which was testing different market designs and their impacts on mitigation in the electricity sector. Frank Jotzo will present the results of an expert-survey on how uncertainty around the carbon price in Australia is impacting investment decisions in the electricity sector. Richard Evan is using transaction data from the EU emissions trading scheme to show how the electricity industry has been trading to maximise profits. Finally, Stefan investigates the impacts of the recently passed carbon tax on Australian electricity prices using futures contracts for regional electricity markets. Frank Jotzo and Tiho Ancev (University of Sydney) will lead a panel discussion following the presentations.

TITLE: ENVIRONMENTAL ECONOMICS IN THE REAL WORLD

Convenor: Alan Randall, University of Sydney

Speaker 1:	Jeff Bennett, Australian National University	Incorporating environmental values in practical decision making: a dream or a nightmare?
Speaker 2:	Nicola Beaumont, Plymouth Marine Lab	Has the ecosystem services approach made non-market values more relevant, more influential in policy?
Speaker 3:	Nick Hanley, University of Stirling	Do Genuine Savings indicators predict well-being in the long run?
Speaker 4:	Alan Randall, University of Sydney	Does the rather odd ethical vision of environmental economics limit our influence in the real world?

The intent of the session is to focus on the successes and failures of environmental economics to influence the real world for the better. Following three key case-study examples (Bennett, Beaumont, and Hanley), Randall will highlight the areas where the ethical stance of environmental economics raises eyebrows among most everyone else. We expect these presentations will set the stage for lively and interactive panel-audience discussion.

TITLE: MARKET-BASED INSTRUMENTS FOR FRESHWATER MANAGEMENT IN NEW ZEALAND

Convenor: Adam Daignault, NZ Landcare Research

Speaker 1:	Suzie Greenhalgh, Landcare Research New Zealand	Status and challenges with freshwater governance and management in New Zealand
Speaker 2:	Mindy Selman, World Resources Institute	Status of and challenges with using market-based instruments for managing water quality in the United States
Speaker 3:	Suzi Kerr, Motu Economic and Public Policy Research; Levente Timar, Motu and GNS-Science	Desired and predicted cost incidence in water quality markets and combined water quality/greenhouse gas markets
Speaker 4:	Adam Daignault, Landcare Research New Zealand	Economic and environmental impacts of nutrient reduction policies and their design at the catchment-level

Freshwater management is highly contested. New policy and governance structures are increasingly being explored to protecting freshwater ecosystems and preventing and clean up pollution of waterways. This symposium reviews the current state of freshwater management in New Zealand and highlights the potential for market-based instruments to play an integral role in reducing nutrients from New Zealand's waterways. Stuart Whitten (CSIRO) will lead a discussion following the presentations.

TITLE: RISK MANAGEMENT FOR INTENSIFICATION OF RAIN-FED AGRICULTURE IN AFRICA AND AUSTRALIA

Convenors: Mulugetta Mekuria, CGIAR and John Dixon, ACIAR



Speaker 1:	Mulugetta Mekuria, CIMMYT	Determinants of risk in sustainable intensification of smallholder agriculture
Speaker 2:	Menale Kassie, CIMMYT	Sustainable intensification technologies and downside risk
Speaker 3:	John Dixon, ACIAR	Understanding and measurement of risk in conservation agriculture in Australian cereal based systems: lessons for African farming systems
Speaker 4:	Bekele Shiferaw, CIMMYT	Policy options to support smallholder farmers to manage risk in African agriculture

African agricultural systems are heavily dependent on rain fed production which has a heavy risk component given the variable and unreliable rainfall pattern. Understanding and measuring risk is a critical area of research and will add value to some of the new initiatives in Sustainable Intensification in African farming systems. Recent interest and investment in sustainable intensification of smallholder agriculture in Africa reveals the need to create a platform among African and Australian researchers to add to the knowledge on risk analysis and contribute to the promotion and adoption of agricultural technologies in both Africa and Australia. The mini-symposia will focus on the understanding of risk analysis and measurement in sustainable intensification of small holder agriculture in African farming systems. It will attempt to draw lessons from CIMMYT executed projects such the ACIAR funded program SIMLESA (Sustainable Intensification of Maize Legume cropping Systems for food security in eastern and Southern Africa) in partnership with Australian Scientists from University of Queensland (QAAFI) who will bring in their experiences with the risk analysis and modelling. Stein Holden (Norway University of Life Sciences) and Kamel Shideed (ICARDA) will lead a panel discussion following the presentations.

MINI-SYMPOSIUM SESSION 2 DESCRIPTIONS

TITLE: MEASURING PRODUCTIVITY AND EFFICIENCY OF WATER INDUSTRIES

Convenor: Tihomir Ancev, University of Sydney

Speaker 1:	Michael Cunningham, Essential Services Commission Victoria	Benchmarking Australian water utilities using stochastic frontier analysis
Speaker 2:	Phil Manners, Centre for International Economics	Measuring the productivity and efficiency of Australian urban water utilities
Speaker 3:	Kristopher Morey, ABARES	An efficiency analysis of irrigated dairy producers in the Murray-Darling Basin
Speaker 4:	Samad Azad, University of Sydney	Measuring water use efficiency in Australian agriculture: a non-radial DEA approach

While the last several years of above average rainfall has somewhat shifted the focus of public and scholarly debate away from efficiency in water use, it is inevitable that in not too distant future we will again witness dams being nearly empty, restrictions on residential and agricultural water use being imposed, and rivers running dry. It is therefore crucially important that an ongoing research is conducted into understanding factors that determine efficiency in water use, and possibilities for improving that efficiency. Fortunately, such research has been happening in the last few years. The aim of this mini-symposium is twofold. One is to take stock of the current knowledge and metrics on the productivity and efficiency of Australian water industries, with a focus on agricultural and urban water uses. The second is to discuss methodological challenges in evaluating productivity and efficiency in the context of water industries. Francesc Hernandez Sancho (University of Valencia) and Ejaz Qureshi (CSIRO) will lead a discussion following the presentations.

TITLE: EMPOWERING ADAPTATION: FROM TOP-DOWN LIVELIHOODS TO PARTICIPATORY ASSESSMENT

Convenor: Brent Jacobs, UTS

Speaker 1:	Rohan Nelson, University of Tasmania	Rural livelihoods in Australia: a retrospective
Speaker 2:	Christopher Lee, NSW Office of Environment and Heritage	Integrated regional vulnerability assessment for climate change
Speaker 3:	Peat Leith, Tasmanian Institute of Agriculture, University of Tasmania	Diagnosis for developing and evaluating adaptation options for fisheries
Speaker 4:	Brent Jacobs, Institute for Sustainable Futures, University of Technology Sydney	Participatory assessment of natural resource manager capacity

In 2005, Rohan Nelson used rural livelihoods analysis to measure the vulnerability of Australian rural managers involved in broad acre agriculture. These ideas were later integrated into a framework for understanding and measuring the adoption of sustainable farming practices. Since that time, the livelihoods approach, based around the concept of the stock and transformation of human, social, natural, physical and financial capital in supporting livelihoods, has proven to be a remarkably robust tool to assist in understanding vulnerability and adaptive capacity of communities throughout Australia. It has evolved in a number of surprising ways to include participatory self-assessment techniques that have been incorporated into Integrated Assessments of climate change vulnerability and adaptive capacity, and meta-analysis of NRM capacity at regional scale.

TITLE: NEW RESOURCE ALLOCATION TOOLS AND APPROACHES FOR BIOSECURITY DECISION MAKING

Convenor: Paul Mwebaze, CSIRO

Sponsorship:



Speaker 1:	Jean Chesson, Department of Agriculture, Fisheries and Forestry	Biosecurity risk-return resource allocation framework
Speaker 2:	Drew Collins, BDA Group, Canberra	Improving biosecurity investment decision making-a review of tools and approaches
Speaker 3:	Tom Kompas, Crawford School of Public Policy, Australian National University	Economics in biosecurity decision making

Appropriate allocation of scarce resources across the spectrum of biosecurity threats is a challenging problem for policy and decision makers. Economic tools may be used to support the allocation of available resources to maximise the desired objectives set by the decision-maker. The role of economics in the biosecurity context can be to evaluate a policy, to identify the most cost-effective measures to attain a specified objective, or to prioritise between different objectives and measures. The aim of this session is to explore and discuss recently developed innovative tools and approaches to analysing resource allocation options in biosecurity. It is intended to organise similar workshops in the future to support further research in this area and ensure that research results are communicated effectively to government and stakeholders including, academia and the wider biosecurity community. Following the three presentations, there will be an interactive discussion panel.

Support for this mini-symposium was provided by CSIRO.

TITLE: RESILIENCE THINKING AND ECONOMICS IN NATURAL RESOURCE MANAGEMENT

Convenor: Michael Harris, ABARES

Speaker 1:	Nick Abel, CSIRO	Resilience thinking in NRM
Speaker 2:	David Pannell, University of Western Australia	INFFER and the role of economics in NRM
Speaker 3:	Graham Marshall, University of New England	Economics, complexity, and resilience thinking
Speaker 4:	Bryce Wilde, NSW Natural Resources Commission	Planning and practice: the umpire’s perspective
Speaker 5:	David Godden, University of Sydney and Charles Sturt University	Using heuristics

Natural resource management in Australia, especially as it involves CMAs, has been heavily influenced by two key paradigms: the public-private-benefits paradigm of INFFER (prioritising interventions using economic assessments), and “resilience thinking” that aims to improve the resilience of key systems on which our agricultural production depends. The purpose of this mini-symposium is to reflect critically on the relative strengths of these paradigms, and their potential compatibility. The presentations will be followed by a panel discussion.

SELECTED PAPER ABSTRACTS

Burton, Michael; Rigby, Dan

THE MARKET FOR ESSAYS

GO2 - Wednesday 3:30 pm - 4:40 pm

We investigate the market in bespoke essays from commercial providers which students buy to submit at their University. We conduct choice experiments at 3 universities to investigate students' willingness to enter the market. Half of the samples reveal a willingness to buy. We identify valuations of essays of varying grades and how these values decay as students' assessments of their own abilities, and the penalty if caught, increase. A choice experiment over monetary gambles yields individual-specific risk aversion estimates which significantly affect the probability that a student will buy, as does having English as their first language.

Hertzler, Greg; Sanderson, Todd; Capon, Tim; Hayman, Peter; Kingwell; Ross

WILL PRIMARY PRODUCERS TRANSFORM THEIR INDUSTRY IN RESPONSE TO CLIMATE CHANGE - AN APPLICATION OF REAL OPTIONS

GO1 - Wednesday 10:30 am - 12:00 pm

Australian crop and livestock farmers face uncertain climate change and variability and a challenge for adaptation decisions. These decisions can be (1) adjustments to practices and technologies, (2) changes to production systems, or (3) transformation of industries, for example, by relocation to new geographical areas. Adjustments to existing practices are easy to make, relative to changes to production systems or transformations at the industry level. Transformations require new investments and infrastructure and can leave assets stranded. Hysteresis effects can make switching difficult and mistakes costly to reverse. This paper develops a decision framework applied to adaptation, referred to as 'Real Options for Adaptive Decisions'(ROADs), which extends traditional analyses of agricultural investment decisions based on net present values to better represent incomplete knowledge and uncertainty. Some results of an application to wheat dominant Australian agriculture are presented.

Kragt, Marit

COMPARING CHOICE MODELS OF PREFERENCE HETEROGENEITY FOR ENVIRONMENTAL MANAGEMENT

GO1 - Wednesday 10:30 am - 12:00 pm

Choice experiments have become a widespread approach to non-market environmental valuation. Given the vast range of public opinions towards environmental management changes, it is desirable that analysis of discrete choice data accounts for the possibility of unobserved heterogeneity in preferences amongst the survey population. This paper compares five approaches to modelling heterogeneity, using case study data for catchment environmental management in Australia. The latent class (LC) and mixed logit (MXL) models incorporate heterogeneity in the attribute coefficients (systematic component of utility). The Covariance Heterogeneity (CH) and scale heterogeneity (S-MNL) models account, instead, for potential differences in scale (the random component of utility). A generalised mixed logit (GMXL) model shows how both preference and scale heterogeneity can be included. We evaluate the impacts of models on welfare estimates and discuss the merits of increasing model complexity.

Komarek, Adam

COSTS AND BENEFITS OF CROP RESIDUE RETENTION IN SUBSISTENCE FARMING SYSTEMS

GO3 - Friday 8:30 am - 10:00 am

The effect of crop residue retention on the different components of farmer livelihoods remains an open question. In this article, long-term simulation modelling was conducted to compare the economic, production and environmental outcomes associated with different crop residue retention practices in a subsistence farming system located in a semi-arid region of China. Despite crop residue retention increasing grain yields and biomass production, livestock income declines with increased residue

retention and family heating and cooking costs rise as more residues are retained in the field. The net effect is that retaining 20 per cent of crop residues as a mulch leads to the highest economic returns and also lowers the relative variability of economic returns. Providing financial incentives to farmers to retain crop residues could be one option for policy consideration as residue retention can reduce erosion potential.

Loch, Adam

SEQUENTIAL DECISION-MAKING: THEORY AND EVIDENCE FOR IRRIGATOR WATER ALLOCATION TRADE PARTICIPATION AND VOLUMETRIC CHOICES

GO4 - Friday 8:30 am - 10:00 am

Greater understanding of irrigator water trade decision-making processes provides insight into the efficient reallocation of water resources between competing uses. Water trade decisions are often modelled as single processes, although results in this paper suggest that sequential decision modelling is more appropriate. We devised a theoretical model of experienced and naïve irrigators, based on the search literature. Next, we empirically tested for the presence of sequential decision-making in water allocation trade decisions using sample-selection techniques. There is evidence of positive selection effects, which motivate different drivers for the decision to participate in water trade and the subsequent decision about how much water to buy or sell.

Miran, Bülent; Atis, Ela; Bektas, Zerrin; Salali, Ece; Cankurt, Murat

AN ANALYSIS OF INTERNATIONAL SULTANAS TRADE: A GRAVITY MODEL APPROACH

PS110 - Wednesday 3:30 pm - 4:40 pm

The countries competing for the world Sultana Market are Chile, Greece, Iran, South Africa, Turkey and the United States. Sultanas are one of the top Turkish export products. The Turkish sultana sector is facing increasing competition in international markets. The aim of this work is to explain the magnitude of the trade flows for sultanas from Turkey and other exporting countries to its main importing countries. This objective has been reached by establishing an appropriate econometric model derived from an extended form of the 'Gravity Model'. To apply the gravity model, a panel data with the most important six exporters of sultanas and their importing countries between the years of 2000-2010 was set up. Panel data models estimated with pooled ordinary least squares and fixed effects model under some diagnostic tests. Finally, some proposals and suggestions are developed for increasing the international competitiveness of the sultana production.

Schilizzi, Steven

EVALUATING AUCTIONS FOR PROCURING ENVIRONMENTAL SERVICES

GO4 - Friday 1:00 pm - 2:30 pm

By design, auctions are used when costs are unknown. But if costs are unknown, how can we evaluate the auctions, 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 effectiveness.

Ubilava, David

EL NINO SOUTHERN OSCILLATION AND PRIMARY COMMODITY PRICES: ASSESSING CAUSAL INFERENCES USING SMOOTH TRANSITION MODELS

PS110 - Thursday 8:30 am - 10:00 am

Global climate anomalies affect world economies and primary commodity prices. One of the more pronounced climate anomalies is El Niño Southern Oscillation (ENSO). In this study I examine the relationship between ENSO and world commodity prices using monthly time series of the sea-surface temperature anomalies in Nino 3.4 region, and the real prices of the twenty four food and agricultural

commodities. I apply smooth transition modelling techniques to assess causal inferences that could potentially be camouflaged in the linear setting. I find evidence of causality between ENSO and prices in the case of thirteen commodities, three of which reveal evidence of nonlinear causal relationship. I illustrate these results using generalized impulse-response functions.

Velarde, Orlee; Olivier Pede, Valerien

PATTERN OF INVESTMENT ALLOCATION ON CHEMICAL INPUTS ON TECHNICAL EFFICIENCY: A STOCHASTIC FRONTIER ANALYSIS OF FARM HOUSEHOLDS IN LAGUNA, PHILIPPINES

GO2 - Thursday 8:30 am - 10:00 am

This study focuses on the pattern between investment on chemical inputs such as fertilizer, pesticides and herbicides and technical efficiency of farm households in Laguna, Philippines. Using a one-stage maximum likelihood estimation procedure, the stochastic production frontier model was estimated simultaneously with the determinants of efficiency. Results show that farmers with low technical efficiency score have high investment share on chemical inputs. Farmers who invest more on chemical inputs relative to other variable inputs attained the same or even lower output level and less efficient as compared to those farmers who invest less. The result shows that farmers who spent and invested wisely on chemical inputs can stimulate farmers to apply chemical inputs more optimally.

Watto, Muhammad

GROUNDWATER USE EFFICIENCY FOR COTTON PRODUCTION IN THE PUNJAB PROVINCE, PAKISTAN: A DEA APPROACH USING THE SUB-VECTOR AND SLACK-BASED MODELS

GO2 - Wednesday 3:30 pm - 4:40 pm

Rapid declining trends in groundwater aquifer have raised many environmental and economic concerns in Pakistan. The groundwater resources are increasingly becoming scarce due to over-exploitation for irrigation. However, few empirical studies have investigated groundwater use efficiency in the agro economic literature. This paper estimates groundwater use efficiency in irrigation in the Punjab province, Pakistan. We estimate technical efficiency using the data envelopment analysis (DEA) method. We also estimate groundwater use efficiency using the DEA sub-vector and slack-based models. We then use a second stage bootstrap truncated regression to investigate factors that influence technical efficiency and groundwater use efficiency.

Zuo, Alec; Nauges, Celine; Wheeler, Sarah

WATER TRADING AS A RISK-MANAGEMENT TOOL FOR FARMERS: NEW EMPIRICAL EVIDENCE FROM THE AUSTRALIAN WATER MARKET

PS110 - Friday 1:00 pm - 2:30 pm

We used a two-step empirical procedure to estimate the impacts of variability in profit and down-side risk in profit on the volume of water allocation purchased and sold using an unbalanced panel data sample of 1449 farm observations across four industries in the southern MDB over from 2006-07 to 2009-10. Our results confirm that farmers experiencing higher variability in profit and facing more down-side risk purchase greater volumes of water allocations. There was only weak evidence found for the broadacre industry to suggest that higher variance in profit and greater down-side risk drives the greater volume of water allocations sold. The different findings between buying and selling water allocations are reflective of the fact that water allocation sellers represent a more heterogeneous group of farmers than water allocation buyers, and that sellers of water allocations may be more strategic in general with their farm management overall. The results of this paper provide clear guidance on the importance that water markets play in reducing and managing risks for irrigators in the MDB.

CONTRIBUTED PAPER ABSTRACTS

Adamson, David

MODELLING CLIMATIC UNCERTAINTY IMPACTS ON WATER RESOURCES WITH STATE CONTINGENT ANALYSIS

GO1 - Friday 8:30 am - 10:00 am

Knight (1921) defined true uncertainty as an event that cannot be predetermined and Taleb (2007) described this as a Black Swan event. Climate change is not a Black Swan event but rather a Grey Swan event or, as Knight would have described it, an incomplete specification of a known risk. Climate change impacts on water and the subsequent economic value of that asset needs to be examined within a state contingent framework that allows for the separation of the climatic event and the management response to that event. The question remains how a grey swan event should be described in a state contingent framework?

Alexander, Corinne

DETERMINING THE BARRIERS TO ORGANIC CERTIFICATION: AN EXPLANATORY ANALYSIS OF INFORMATION

GO2 - Friday 8:30 am - 10:00 am

Consumer demand continues to outpace U.S. supply growth of certified organic products. Previous studies found adoption barriers such as the risk of conversion, higher managerial costs, inadequate training programs, and lack of information. We utilize a multivariate probit model to identify the information barriers to adoption of organic certification, using data from a survey of fruit and vegetable growers in 16 states with 1,559 responses. We find that growers who obtain organic information through Extension are more likely to view information as a barrier which suggests there is a gap between the growers' information needs and resources offered by Extension.

Amjad, Amjad

PARTICIPATION AND EMPOWERMENT: ROLE OF GENDER, AN EXPLORATION OF POTATO PRODUCTION IN PAKISTAN

GO2 - Friday 8:30 am - 10:00 am

This paper examines the level of contribution by men and women in potato production and marketing with particular focus on exploring income effects of participation by men and women. The relationship between participation, income and women's empowerment in Pakistan is examined. The primary objective is to determine gender roles in potato production, the impact of women's participation on farm-household income and the relationship between women's participation and their empowerment. The study employs the Women Empowerment Index (WEI), developed by the International Food Policy Research Institute, and applies it to the Pakistani context. The research is expected to provide valuable information for policy makers when considering gender mainstreaming in Pakistan.

Anders, Sven; Bocionek, Milena

PRICE RIGIDITY IN VERTICALLY DIFFERENTIATED FOOD PRODUCT CATEGORIES WITH PRIVATE LABELS

G04 - Thursday 3:00 pm - 4:30 pm

The rapid vertical differentiation of retail private labels into premium quality segments raises questions over its implications for brand competition and retail pricing strategy. This paper estimates price rigidity in vertically differentiated categories with private labels. Detailed, weekly, store-level scanner data for a major American retail chain (2004-2007) are employed in two case studies to estimate differences in the impact of retailer pricing, promotional strategies, and wholesale price movements on price rigidity for quality differentiated manufacturer and private label brands. The results of regression and logistical models indicate higher price rigidities for private labels, and especially premium private labels compared to competing manufacturer brands. Price fluctuations are mainly explained by price promotions. Changes

in product-level wholesale price do not matter, indicating the existence of long-term retailer-manufacturer contracts and retailer market power.

Anders, Sven; Schroeter, Christiane

FOOD VS PILL - DIET-HEALTH BEHAVIOR AND THE RISE OF VITAMIN SUPPLEMENTS

GO4 - Friday 1:00 pm - 2:30 pm

Declining fresh produce consumption is reaching concerning levels in America and Australia. U.S. consumers only meet 64% (50%) of the recommended vegetable (fruit) servings. Australians eat 69% (48%) of what is recommended by the Australian Guide to Healthy Eating. Dietary supplements have become a major substitute for fresh produce making it a \$60 billion industry in the U.S. alone. We estimate the impact of vitamin supplement intake, lifestyle, health indicators, food culture, and demographics on diet quality outcomes measured by the Healthy Eating Index-2005. The analysis applies data from the U.S. NHANES Survey. The econometric strategy employs alternative instrumental variable estimators addressing endogeneity and complex sample designs often problematic in studies of diet-health behaviour. Our results emphasize the impact supplement intake behaviour, lifestyle factors, health indicators and food culture covariates have on diet quality.

Anderson, Kym

GROWTH IN EMERGING ECONOMIES TO 2030: IMPACTS ON GLOBAL FOOD SECURITY AND RESOURCE-RICH COUNTRIES

PS110 - Wednesday 10:30 am - 12:00 pm

Rapid trade-led economic growth in emerging Asia is shifting the global economic and industrial centres of gravity to Asia and altering the product composition and directions of trade. This paper examines how Asia's rapid growth is altering agricultural markets in particular and thereby food security. It does so by projecting a model of the world economy to 2030. Projected impacts on sectoral shares of GDP and the composition and direction of trade are drawn out, plus the effects on agricultural self-sufficiency and real food consumption per capita in Asia and elsewhere. The paper concludes by drawing implications for policies that can address food security concerns.

Arsil, Poppy

EXPLORING CONSUMER MOTIVATIONS TOWARDS BUYING LOCAL FRESH PRODUCE: A MEANS-END CHAIN APPROACH

GO4 - Friday 1:00 pm - 2:30 pm

Support of the local-food movement as an alternative food system involving concerns about food sources, long-term economic benefits and waste minimization has been emerging in many countries around the world. This article investigates how consumers from developing country background such as Indonesia make local fresh food decisions for daily eating. The Mean-End Chain (MEC) approach is utilized as a measure of attributes, consequences and values of locally produced products. In-depth interviews (n = 184) were conducted in urban and rural locations of Yogyakarta and Purbalingga regency. 'Good health', 'cheap price' and 'save your time for food preparation' are prominent views that motivate consumers purchasing their local food.

Asante, Bright; Villano, Rene; Battese, George

IMPACT OF ADOPTION OF YAM MINISSETT TECHNOLOGY ON THE TECHNICAL EFFICIENCY OF YAM FARMERS IN THE FOREST SAVANNAH TRANSITION ZONE OF GHANA

GO3 - Wednesday 3:30 pm - 4:40 pm

This paper uses cross-sectional data collected from 375 smallholder yam farmers in 2010 to examine whether adoption of yam minisett technology has had an impact on the technical efficiency of yam production. We use propensity-score-matching approach to estimate the average treatment effect using stochastic frontier analysis. Our analysis suggests average technical efficiencies of 85.4 per cent and 89.2 per cent in the Ashanti and Brong Ahafo regions, respectively. Additionally, the impact of adoption of the yam minisett technology on the technical efficiency of smallholder farmers was positive and significant in

the Ashanti region but negative in the Brong Ahafo region.

Atis, Ela; Miran, Bülent; Bektas, Zerrin; Ciftci, Kenan; Karabat, Selcuk

AN ANALYSIS OF MARKETING PREFERENCES OF SULTANAS PRODUCERS IN TURKEY IN TERMS OF SUSTAINABLE MARKET POWER

GO4 - Friday 8:30 am - 10:00 am

Sultanas are among the most important products in the Turkish economy in terms of being a principal export crop and many producers' occupation. Although the share of sultanas in export is high, Turkey aims at having a sustainable place in the international competition. A sustainable competition power calls for paying special attention to producer preferences. It is important to reveal and analyse those markets sultana producers' prefer and particularly the reasons for those preferences. The study deals with analysing tendencies of the sultana producers related to supplying their products to national market and international market with respect to some criteria such as high price, payment guarantee and ease of marketing by means of analytical hierarchy process (AHP). Data was gathered from randomly chosen 300 sultana producers in Manisa where sultana production is very widespread. Scores from AHP are analysed by Tobit for a deeper analysis of the producer preferences.

Bark, Rosalind; Schmidt, Becky

DOING INTERDISCIPLINARY SCIENCE: LINKING ECOLOGICAL RESPONSES AND MONETARY VALUATION IN THE MURRAY-DARLING BASIN

GO7 - Friday 1:00 pm - 2:30 pm

Policy leaders world-wide are facing a series of complex challenges to the way natural resources are managed that demands an interdisciplinary approach to policy making. Ideally, world integrated biophysical and social science underpins policy making. Interdisciplinary science seeks to do science in a way that combines science methodologies and data to generate new knowledge, for example, on the interactions and critical thresholds that characterise biophysical and social systems. Doing integrated, interdisciplinary science better requires an active learning approach. Yet reviews of large, interdisciplinary science projects are rarely undertaken. In this paper we use material from a post-project review of CSIRO's Multiple Benefits of the Basin Plan project to summarise lessons learned. We discuss tools and practices for collaboration, the crucial role of integrators and external reviewers, and opportunities for future improvements.

Bashir, Muhammad Khalid; Schilizzi, Steven

FOOD SECURITY POLICY ASSESSMENT IN THE PUNJAB, PAKISTAN: EFFECTIVENESS, DISTORTIONS AND THEIR PERCEPTIONS

GO6 - Thursday 3:00 pm - 4:30 pm

This study aims to assess the impact of short term policies on small farmers' household food security. It answers three key questions: What is the impact of selected policies on farmers' household food security? What would have been the impact of these policies if implemented perfectly? Are the perceived impacts of food security policies in line with their estimated impacts? Using a partial equilibrium model approach, a conceptual model is proposed. The model identifies policy impact pathways. Two demand and two supply side policies are assessed. Results show that one of each improves farmers' household food security. Furthermore, these policies are poorly implemented and are estimated to substantially reduce their potential benefits. The comparison of farmers' perceptions and their estimated monetary gains shows notable divergence.

Batstone, Chris

AN INVESTIGATION INTO THE USE OF EXPERIENCED UTILITY SCORES TO ASSESS MULTI-ATTRIBUTE CHANGES IN ENVIRONMENTAL QUALITY.

GO2 - Friday 1:00 pm - 2:30 pm

Much contemporary socio-economic environmental policy evaluation is undertaken using decision utility based approaches such as choice modelling and contingent valuation. In this paper we describe an

investigation into the use of the contrasting “experienced utility” concept to assess changes in environmental quality. The research context is the development of a spatial decision support system that discriminates between catchment development options in terms of their effects on the receiving water bodies of urban storm water. We report the outcomes of the application of an expert elicitation process from the risk assessment literature to the trial of a visual analogue method designed to elicit experienced utility scores from consultation workshops to assess the effects of multi-attribute changes to ecosystem services in urban estuaries.

Beddow, Jason; Pardey, Philip

MOVING MATTERS: THE EFFECT OF LOCATION ON CROP PRODUCTION

GO4 - Wednesday 3:30 pm - 4:40 pm

The landscape of crop production is dynamic—where crops are produced changes dramatically over time. Most studies of agricultural production and productivity are aspatial, and therefore overlook the effect of changes in natural inputs that are inherently spatial. Novel, spatially-sensitive indexes of changes in agricultural output are developed and applied for U.S. maize production for the period 1879-2007. We estimate that some 15 to 20 percent of the increase in U.S. maize output is attributable to changes in the location of production. In addition, the average U.S. maize plant now grows in a substantially cooler climate (3-4°C, depending on the month) than it did a century ago, with important lessons for modelling the future effects of climate change on global agricultural production.

Blackmore, Louise; Doole, Graeme; Schilizzi, Steven; Pannell, David

DETERMINANTS OF COST-EFFECTIVENESS IN MARKET-BASED INSTRUMENTS (MBIS) FOR AUSTRALIAN BIODIVERSITY CONSERVATION

GO5 - Friday 8:30 am - 10:00 am

Recent decades have seen increasing implementation of MBI programs for biodiversity conservation throughout Australia. A survey of researchers, government and regional natural resource management (NRM) groups was used to investigate key drivers of cost-effectiveness in Australian conservation tender and biodiversity offset programs. Cluster analysis identified systematic divergence between these non-landholder groups, with certain clusters displaying optimistic attitudes towards biodiversity MBIs, and others a more circumspect view. General maximum entropy (GME) analysis revealed that key drivers of cost-effectiveness are ease of organisation, low crowding-out of voluntary conservation effort, landholder competition for funds, sound monitoring and significant investment in relationships with landholders by implementing agencies. However, cost-effectiveness is ultimately constrained where funding is too low to attain meaningful biodiversity outcomes.

Brand, Ellana; Ancev, Tihomir

IS THE MONEY DRYING UP? THE EFFECT OF DROUGHT LENGTH ON FARM EQUITY RATIOS IN THE MURRAY-DARLING BASIN.

GO3 - Thursday 3:00 pm - 4:30 pm

This research uses survey data from four regions within the Murray-Darling Basin between 1977-78 and 2009-10 to determine how the length of the drought effects the equity ratio of farms. Results indicate that a single year drought has significant and negative effects on the equity ratio of farms two and three years after the event, while the effect of multi-year droughts have a longer time lag of four years. Further, the negative effect of any year within a multi-year drought on the equity ratio was found to be greater than the negative effect of a similar magnitude single year drought.

Brown, Pike; Daigneault, Adam; Greenhalgh, Suzie

INVASIVE SPECIES MANAGEMENT IN THE PACIFIC USING SURVEY DATA AND BENEFIT-COST ANALYSIS

GO7 - Wednesday 10:30 am - 12:00 pm

Invasive species threaten the terrestrial biodiversity and livelihoods of Pacific Island communities. Limited public resources for control and prevention of invasive species necessitates using benefit-cost analysis to prioritise interventions, yet methods for controlling many species are poorly understood. Moreover, the

benefits of managing invasive species – both financial and time – are difficult to assess due to the data-poor environment of the Pacific. Using a unique survey of 500 agricultural households in 40 villages located across Fiji, we analyse the socioeconomic impacts of invasive species and quantify the benefits of control. We also quantify the costs of proven control methods to enable specific policy recommendations for each species. Finally, we use innovative contingent valuation methods to document the importance of control for Fiji's rural population.

Boughlala, Mohamed

ECONOMIC COMPARISON BETWEEN CONVENTIONAL AND NO-TILLAGE FARMING SYSTEMS IN MOROCCO

GO3 - Wednesday 10:30 am - 12:00 pm

Soil degradation is becoming a normal feature of landscapes in semiarid Morocco. This deterioration is mainly due to poor soil management through conventional tillage practices. According to soil scientists, no-tillage systems save soil moisture, fuel, labour, and machinery costs, as well as reduce wind and water erosion. Despite the perceived benefits of this technology, adoption rates in Morocco have been low, particularly among small farmers. The objective of this study was to compare the economics of conventional tillage (CT) and no-tillage (NT) systems on bread wheat at the level of three arid zones of Morocco. The general finding of this study is that bread wheat production in the no-tillage system is more profitable than in the conventional tillage system as the farm saves various tilling steps. Due to the water saving effect, yields are higher in the no-till system.

van Bueren, Martin

A POLICY FRAMEWORK FOR MANAGING CUMULATIVE IMPACTS OF IRON ORE MINING IN WESTERN AUSTRALIA'S PILBARA REGION

GO6 - Friday 8:30 am - 10:00 am

New mining development in the central Pilbara region is expected to put considerable pressure on the environment, primarily through mine dewatering. While there are various options for managing the effects of dewatering, the challenge is to select options that are socially efficient and ensure an efficient sharing of responsibilities between multiple mining companies. The current regulatory approach in Western Australia, in which project proposals are assessed on a 'first-in, first-served' basis, is not well equipped to deliver a socially efficient outcome. This paper examines the weaknesses of the current approach and proposes an alternative framework.

Cassells, Sue; Lee, Peter; Holland, John

THE NON-MARKET VALUE OF ABEL TASMAN NATIONAL PARK, NEW ZEALAND: A CHOICE MODELLING APPLICATION

GO5 - Thursday 3:00 pm - 4:30 pm

National parks and protected areas form the basis of global conservation initiatives and provide a raft of benefits in the form of various consumptive and non-consumptive uses. However, it is extremely difficult to express these economic benefits in monetary terms. The lack of economic values for these areas often results in sub-optimal conservation outcomes. Non-market valuation techniques can be used to estimate monetary values for these key environmental assets. This research applied the choice modelling approach to assess the value of non-market goods and services associated with Abel Tasman National Park in New Zealand. A standard multinomial logit model was used to analyse visitor preferences. The results indicate park users were willing to pay actual cash value for the ecological and recreational attributes of the park. These monetary values can be used to guide future development, inform resource allocation decisions, and ensure adequate conservation financing.

Chalak, Morteza; Pannell, David

CLIMATE CHANGE, UNCERTAINTY AND THRESHOLDS

GO1 - Wednesday 10:30 am - 12:00 pm

Increases in global temperature may result in melting of the ice sheets of Greenland and west Antarctica,

causing dramatic sea-level rise and economic damages. There may be a threshold temperature above which this occurs, but the level of this threshold is uncertain. We study the economic consequences and policy implications of this type of uncertain threshold, using climate change as an illustration. Nordhaus's RICE model of global climate change is adapted to provide a case study.

Chantararat, Sommarat

INDEX-BASED RISK FINANCING AND DEVELOPMENT OF NATURAL DISASTER INSURANCE PROGRAMS IN DEVELOPING COUNTRIES

GO1 - Friday 8:30 am - 10:00 am

This paper explores innovations in index-based risk transfer products (IBRTPs) as a means to address important insurance market imperfections that have precluded the emergence and sustainability of formal insurance markets in developing countries, where uninsured natural disaster risk remains a leading impediment of economic development. Using a combination of disaggregated nationwide weather, remote sensing and household livelihood data commonly available in developing countries, the paper provides analytical framework and empirical illustrations how to design nationwide and scalable IBRTP contracts, to analyse hedging effectiveness and welfare impacts at the micro level and to explore cost effective risk-financing options. Thai rice production is used in our analysis with the goal to extend the methodology and implications to enhance development of national and regional disaster risk management in Asia.

Church, Benjamin; Nolan, Elizabeth

THE EFFECT OF WEATHER CONDITIONS ON THE YIELD DISTRIBUTIONS OF CROPS IN AUSTRALIA: A CASE STUDY OF WHEAT AND CANOLA

GO1 - Friday 1:00 pm - 2:30 pm

We analyse, and compare, the effect of agronomic inputs and weather conditions on the yield distribution of Australian wheat and canola. Using data from the National Variety Trials for all growing states from 2005-2011 at 220 locations we obtain the mean effect of inputs on yield using a fixed effects model for each crop, with variety as the cross section to control for varietal change. We include agronomic and weather variables to control for management, and weather conditions, and dummy variables to account for year and locational differences. Following the flexible moments approach, we obtain the residuals from the fixed effects model, and square (cube) them to find variance (skewness). We regress these moments on the independent variables to determine marginal variance and skewness of yield, conditional on the agronomic inputs, location, and weather conditions.

Coggan, Anthea; van Grieken, Martijn; Whitten, Stuart; Jardi, Xavier

TRANSACTION COSTS OF IMPLEMENTING BEST MANAGEMENT PRACTICES (BMPS): WHAT IS THE COST TO SUGAR CANE FARMERS AND WHAT CAN BE DONE?

GO3 - Thursday 3:00 pm - 4:30 pm

Current research suggests that changing cane farm management in the Great Barrier Reef (GBR) catchments can generate water quality improvements and long term financial benefits to the farming community. Research indicates that adopting 'best practice' sugarcane management practices (BMPs) generates a reduction in direct costs to farmers with a marginal change in yield. The fact that some cane farmers are reluctant to make these seemingly profitable changes indicates that there may be substantial transaction costs or other impediments to changing land management practice. Following a survey of sugar cane farmers in GBR catchments we describe the level of transaction costs borne by landholders who have implemented BMPs. We identify the causal factors in their transaction costs and suggest potential policy improvements that may reduce transaction costs to sugar cane producers implementing BMPs in the future.

Cook, David

AN EXAMPLE OF HOW CHEMICAL REGULATION IS AFFECTING BIOSECURITY POLICY-MAKING: MEDITERRANEAN FRUIT FLY IN WESTERN AUSTRALIA

GO7 - Wednesday 10:30 am - 12:00 pm

The principal chemicals used by Western Australia's horticultural industries for field control and post-harvest disinfestation procedures for Mediterranean fruit fly are soon to be withdrawn from use due to public health concerns. When this occurs, the necessary switch to alternative control methods such as bait sprays and intensive fruit fly trapping will involve additional producer costs of around \$9.2 million per annum. Given these costs, this paper explores the option of eradicating Mediterranean fruit fly from the State and discusses possible cost sharing arrangements between government and industry that could be reached for mutual gain.

Cooper, Bethany; Burton, Michael

PRODUCT CHOICE IN AUSTRALIAN URBAN WATER: INVESTIGATING WILLINGNESS TO PAY

GO5 - Thursday 3:00 pm - 4:30 pm

The search for improved water pricing is central to urban water reform in Australia. Getting water prices right is critical on several fronts, not least because different customers have different demands that are presently suppressed by a one-size-fits-all approach. Against this background, there has been substantial interest in the notion of 'unbundling' the water product to provide a better fit between customer preferences and choice of service. This paper uses a choice experiment to investigate householder's willingness to pay for a range of flexible water tariff options, that includes the possibility of paying higher bills in order to avoid the risk/lessen the severity of water restrictions. This allows investigation into the variation in customer characteristics, preferences and their attitude to risk relative to urban water services. Accordingly, the work improves our understanding of the most desirable way to use water in urban contexts.

Cramb, Rob

POLITICAL ECONOMY OF OIL PALM DEVELOPMENT IN THE ASIA-PACIFIC REGION

GO4 - Friday 8:30 am - 10:00 am

The expansion of oil palm cultivation in the Asia-Pacific region has engendered a major agro-environmental transformation. We provide an overview of the economic, social, and environmental issues associated with this transformation, the different modes of production that have been employed, and the varying ways in which land, labour, and capital have been mobilised in the region. We conclude that local oil palm livelihoods and economies vary considerably from place to place; that there are differences within and between countries, which makes generalisation across the region difficult. Nevertheless, there is a clear interconnectedness in the processes at work throughout the region, especially in transnational flows of capital and labour, that gives rise to the notion of an 'oil palm complex'.

Crean, Jason; Singh, Rajinder; Milham, Nick

ECONOMIC ASSESSMENT OF TECHNOLOGIES AIMED AT REDUCING AIR POLLUTION IN RICE-WHEAT FARMING SYSTEM IN NORTH-WEST INDIA

GO3 - Wednesday 10:30 am - 12:00 pm

Due to lack of suitable technology to direct drill wheat into combine harvested rice residues, burning of rice stubbles is widely practiced in rice based farming systems in north-west India (Punjab, Haryana and Uttar Pradesh), leading to severe air pollution and associated adverse health effects, increased greenhouse emissions, loss of soil organic matter and overuse of water. The recently developed 'Happy Seeder' (HS), a tractor powered machine capable of direct drilling wheat in standing rice stubbles, provides an alternative to burning. To date adoption of this technology has been limited and burning of rice stubbles remains widespread. The Australian Centre for International Agricultural Research (ACIAR) is funding research to assess possible policy responses to encourage alternatives to stubble burning. Whole farm models are used to evaluate potential policy incentives that might lead to the wider adoption of Happy Seeder or other strategies to reduce environmental pollution.

Cullen, Ross

BREAD AND BUTTER ISSUES. FOOD, AGRICULTURE AND COMPETITION POLICIES IN NORWAY.

G04 - Wednesday 10:30 am - 12:00 pm

Norway has the highest food prices and the most heavily protected agricultural sector in Europe. Fifty percent of food consumed in Norway is imported but food shops have a limited range of goods and can at times run short of basic items. Cross border shopping is rapidly increasing and five percent of all Norwegian grocery expenditure occurs in Sweden. Norwegian competition policy uses as its test 'effects on general welfare including utilisation of resources' and not solely effects on consumer welfare. I review Norway's food, agriculture and competition policies, examine the pressures for changes, and the political economy of changing the policies.

Bailey, DeeVon; Curtis, Kynda

WILLINGNESS TO PAY FOR PRIVATE LABELS, NATIONAL BRANDS, AND LOCAL DESIGNATIONS AT THE RETAIL LEVEL

G04 - Thursday 3:00 pm - 4:30 pm

A shopper survey, including sensory testing, was conducted to determine consumer willingness to pay (WTP) for ice cream with store, national, and local labels at five retail grocery outlets in Utah. McFadden's conditional logit model was used to estimate WTP and confidence intervals for WTP and marginal WTP were calculated via parametric bootstrapping. The results suggest that brands, such as store and national labels, positively affect willingness to pay for ice cream, but shoppers were willing to pay significantly more for ice cream with a local designation. Target consumers for store brands and locally labelled products differed, indicating that locally labelled products do not compete with store brands.

Davis, Katrina; Pannell, David; Schilizzi, Steven; Kragt, Marit

SPATIAL OPTIMISATION OF MARINE AREAS IN CHILE: COMPLIANCE MAY BREAK THE MOULD

G04 - Wednesday 3:30 pm - 4:40 pm

This investigation evaluated the optimal spatial allocation of the central Chilean marine environment, between 28° and 36°S, amongst extractive (artisanal fishing) and non-extractive (tourism and conservation) activities. Minimum biodiversity targets were established and the model solutions were those which best achieved those targets at the lowest cost. A second analysis was conducted to investigate the principal determinants of stakeholder compliance in the Chilean marine environment. Finally, the impact of differing or predicted levels of stakeholder compliance on the successful establishment and enforcement of zoning regimes was considered.

Debreceeny, Gabrielle; Randall, Alan

RISK AND RELIABILITY IN URBAN WATER SYSTEMS: A CASE STUDY OF SOUTH EAST QUEENSLAND

PS110 - Friday 8:30 am - 10:00 am

Across Australia, urban areas are growing in population and experiencing climate variability, placing increasing pressure on the reliable supply of urban water. Water agencies have responded by diversifying supply infrastructure and altering demand management strategies. This study investigates the maintenance of supply reliability in a dynamic urban water system facing climate uncertainty over time. Simulations were used to incorporate stochastic inflows within a model of a diversified water system. The solutions allow for the determination of the risks, costs and storage dynamics of a system facing a growing population, under various management strategies. The methodology is applied to a case study of South East Queensland. Under the assumption of a cost recovery operation, the results provide a guide to the price of risk management, allowing for the identification of management strategies that reduce cost or increase reliability.

Deevi, Kumaracharyulu; MCS, Bantilan; Amand, Rajalaxmi

DEVELOPMENT AND DIFFUSION OF SORGHUM IMPROVED CULTIVARS IN INDIA: IMPACT ON GROWTH AND VARIABILITY IN YIELD

GO6 - Wednesday 3:30 pm - 4:40 pm

Sorghum is the third most important cereal crop after rice and wheat in India, mostly grown under marginal and stress-prone areas of the Semi-Arid Tropics (SAT). NARS, ICRISAT and private seed companies are the major stakeholders working for sorghum crop improvement in the last five decades (1960-2012). Altogether more than 256 improved cultivars have been notified and made available to farmers during the same time. Current knowledge about the spread and impact of improved sorghum varieties in the country is incomplete. The present study made an attempt to address these issues with help of primary as well as secondary sources of information. The analysis has concluded that nearly 80 per cent of total sorghum area uses improved cultivars which helped to increase the country's productivity levels by 71 per cent between 1960 and 2010. This aptly shows the important role of improved sorghum cultivars in sustaining higher yields.

Doshi, Amar

INVESTIGATING THE EFFECTS OF SAMPLE HETEROGENEITY ON THE TRAVEL COST MODEL FOR CORAL DIVING IN SOUTHEAST ASIA.

GO5 - Wednesday 3:30 pm - 4:40 pm

In mid-2010, an impact assessment was undertaken to ascertain the value of coral reefs in Thailand, Malaysia and Indonesia among scuba divers. A travel cost method was employed and it was found that divers had a consumer surplus of about US\$590 per dive. However, given the sample consisted for a much larger proportion of international visitors (84%), an analysis was undertaken to ascertain the effects of the sample heterogeneity on the economic value estimates. The results indicated that the pooled results were biased towards the international sub-sample. Domestic visitors had a much lower consumer surplus of about US\$130 per dive. In addition, the split-sampling suggested that assumptions of endogenous stratification using count data models were inaccurate for the international sub-sample. Applying the split-sampling illustrated large disparities in consumer surplus between the three countries.

Duncan, Roderick

THE RELATIONSHIP BETWEEN RELIGIOUS PERSUASION AND CLIMATE CHANGE ATTITUDES IN AUSTRALIA

GO7 - Thursday 8:30 am - 10:00 am

Previous research has demonstrated that religious persuasion can have a substantive effect on environmental attitudes, although some studies have found that significant effects are due simply to socio-demographic factors, knowledge or political conservatism. Using a survey of almost 2000 Australian households we examine links between membership of five religious groupings and the relationship to climate changes attitudes. Substantive differences are found across religious groups in terms of their belief in human induced climate change, consensus among scientists, efficacy and the need for policy responses. Some of these differences are due to socio-demographic factors, knowledge, environmental attitude or political conservatism, however significant effects due to religious persuasion remain, and they range from medium to large in size.

East, Miriam; Poggio, Mark; Edwards, Brooke

DOES CONTROLLED TRAFFIC FARMING PAY IN AUSTRALIAN SUGARCANE?

GO3 - Friday 8:30 am - 10:00 am

Australian national and state level policy is driving changes in farming practices to improve water quality in the Great Barrier Reef. Controlled traffic farming is one such practice, and is slowly being adopted by Australian cane growers. However while the transition to controlled traffic farming seems logical both financially and environmentally, growers have been cautious in their uptake of these new technologies. This paper looks at the experiences of six cane growers. The results show that adoption of controlled traffic farming may or may not be a profitable move for individual growers, depending on their scale,

current operations, capital investment required and perceived benefits. Economic analysis of proposed technologies at the farm level plays an important role in facilitating industry wide change by making public the costs and benefits incurred by growers.

Edwards, Brooke; Sluggett, Robert; Star, Megan; East, Miriam

POLICY DESIGN FOR WATER QUALITY IMPROVEMENTS IN THE SUGAR CANE INDUSTRIES ADJACENT TO THE GREAT BARRIER REEF: A CASE STUDY APPROACH.

PS110 - Friday 8:30 am - 10:00 am

To achieve water quality targets, management practice change in the sugar cane industry has been a key focus for reef initiatives such as Reef Plan and Reef Rescue. Considerable public funds have been targeted at landholders to change on-ground management practices. However, the economic implications for landholders are not well understood. To further inform future policy development of the upcoming Reef Water Quality Protection Plan 3 and Reef Rescue 2, the economic costs and benefits to landholders are required. This research used a case study approach to consider the economic implications of improved soil management through an extended fallow period in the Mackay-Whitsunday region. The results demonstrate the complexity of creating effective policy design for improved water quality in a perennial farming system.

El-Baghdadi, Omniya; Desha, Cheryl; Hargroves, Karlson

CONSIDERING THE ROLE OF ENVIRONMENTAL ECONOMICS IN VALUING BIOPHILIC ELEMENTS

GO5 - Wednesday 3:30 pm - 4:40 pm

With increasing signs of climate change, governments all over the world are grappling with how to rapidly transition to low-carbon living. Internationally, the concept of “biophilic urbanism” is emerging as a key component in addressing such climate change challenges in rapidly growing urban contexts. However, the economics of incorporating such options is not well understood. Indeed, there appears to be an ad hoc, reactionary approach to creating economic arguments for or against the design, installation or maintenance of biophilic elements. With this issue in mind, this paper considers the potential for using a number of environmental economic valuation techniques to systematically estimate the economic value of biophilic elements in the urban context. Considering existing literature on environmental economic valuation techniques, the paper highlights opportunities for creating a standardised language for valuing biophilic elements.

Fleming, Euan

APPLYING A ‘CHAIN GOODS SOLUTION’ TO DECISIONS TO FUND R&D IN FOOD VALUE CHAINS

GO6 - Wednesday 10:30 am - 12:00 pm

We assess the practicality of applying a ‘chain goods solution’ to internalise positive externalities through research and development (R&D) in food value chains in Australia. We begin with the premise that if a sufficient number of members of a particular food value chain join forces and their joint benefits exceed the cost of R&D, a socially desirable project will be funded even if the chain members do not capture all the benefits. Potential problems with this solution are then canvassed and assessed, including transaction costs, economic inefficiency, risk of monopolisation and governance. We also examine the suitability of two-part and three-part tariffs as means to fund R&D in food value chains.

Fleming, David

REGIONAL IMPACTS OF RESOURCE EXTRACTION BOOMS: THE CSG CASE IN QUEENSLAND

GO2 - Friday 1:00 pm - 2:30 pm

To reveal the extent to which energy resource-led regional economic development has distributed benefits across communities and households, the socioeconomic impacts of Coal Seam Gas (CSG) extraction in southern Queensland are empirically investigated. This region of Australia has undergone a large inflow of investment into CSG development over the last few years with a large potential for future growth. Using 2001-2011 Census data we find that regions in which CSG extraction occurs at a large scale have higher total personal income and growth in house prices and rents compared to the rest of regional

Queensland. Results are less clear for population and median household income growth, which suggests that the benefits to local communities and households vary.

Fleming, Christopher; Ambrey, Christopher; Chan, Andrew

ESTIMATING THE COST OF AIR POLLUTION IN SOUTH EAST QUEENSLAND: AN APPLICATION OF THE LIFE SATISFACTION APPROACH TO NON-MARKET VALUATION

GO5 - Wednesday 10:30 am - 12:00 pm

Making use of data from the Household, Income and Labour Dynamics in Australia (HILDA) survey coupled with air pollution data generated by The Air Pollution Model (TAPM), this paper employs the life satisfaction approach to estimate the cost of air pollution in South East Queensland. Results indicate that air pollution reduction is a normal good, yet some adaptation to higher levels of air pollution is apparent. Younger and older residents are more adversely affected by air pollution and, of the pollutants measured, particulate matter (PM10) imposes the highest costs. These results are broadly consistent with similar studies undertaken in Europe and the United States.

Florec, Veronique; Pannell, David; Burton, Michael; Kelso, Joel; Mellor, Drew; Milne, George

ECONOMIC ANALYSIS OF PRESCRIBED BURNING FOR WILDFIRE MANAGEMENT

PS110 - Thursday 3:00 pm - 4:30 pm

Bushfires can cause significant damage to ecosystems, life and property. Bushfire events that do not involve people and property are becoming rare and with the expansion of the wildland-urban interface, objectives of life and property protection become more difficult to achieve. The aim of this project is to provide a comprehensive economic evaluation of alternative prescribed burning programs in Western Australia to determine the optimal allocation of scarce resources for bushfire management and gain improved understanding of trade-offs between conflicting objectives, such as asset protection and biodiversity conservation. The objective of society is to determine the total resources used for fire management to achieve the most efficient outcome in terms of costs and damages avoided, and thus maximise social welfare. In this paper we present our initial investigations into the application of an economic model to bushfire management programs in Western Australia.

Fraser, Iain

USING ATTRIBUTE IMPORTANCE RANKINGS WITHIN DISCRETE CHOICE EXPERIMENTS: AN APPLICATION TO VALUING BREAD ATTRIBUTES.

GO5 - Thursday 8:30 am - 10:00 am

We present a new Bayesian econometric specification for a Discrete Choice Experiment (DCE) incorporating respondent ranking information about attribute importance. Our results indicate that a DCE debriefing question that asks respondents to rank the importance of attributes, as opposed to simply indicating attendance or non-attendance, helps to explain the resulting choices. We also examine how mode of survey delivery (online and mail) impacts model performance, finding that results are not substantively affected by the mode of survey delivery. We conclude that the ranking data is a complementary source of information about respondent utility functions within DCE.

Freebairn, John

MINING BOOMS AND THE EXCHANGE RATE

GO6 - Friday 8:30 am - 10:00 am

The response of a flexible exchange rate to a mining boom is assessed from the balance of payments equilibrium identity linking net exports, net capital inflows and net national saving and investment. Four phases of the boom are discussed: demand shift, investment, production, and end. The direction, timing and magnitude of the exchange rate response to a boom varies with: a demand or supply shift boom; the phase of the mining boom; investment funded by domestic or foreign funds; domestic or foreign sources of investment inputs; and, income distribution including taxation. A simple link between the terms of trade and the exchange rate is found to be unlikely.

Goddard, Ellen

CANADIAN VIEWS ON LIVESTOCK GENOMICS AND PUBLIC INVESTMENT IN GENOMIC TECHNOLOGIES

G06 - Thursday 8:30 am - 10:00 am

The use of genomics in livestock production provides immense opportunities to enhance economically valuable traits in animals. It is possible that the context of the particular genomic application (identifying markers for disease resistance/susceptibility or feed efficiency) may influence how the public views the process and the need for regulation. Using data collected in two national Canadian on-line surveys (Sept 2012) the economic value associated with reducing PRRS and PCVAD susceptibility in hogs and/or increasing residual feed efficiency in cattle is identified through stated preference experiments. People are also asked to identify their preferred public policy for the use of genomics in livestock breeding in terms of traceability, labelling, mandatory use within the livestock industry and increasing public research investment.

Godfrey, Sosheel

IDENTIFYING PRODUCER, VENDOR AND CONSUMER ISSUES IN A PRO-POOR VALUE CHAIN

PERSPECTIVE: A CASE STUDY FROM PAKISTAN'S PUNJAB

G04 - Thursday 8:30 am - 10:00 am

Traditional milk value chains are a dominating link between millions of farmers (producing 97% of domestic production) and consumers in Pakistan. Development strategies, however, have not been able to capitalise on the potential of these chains, targeting instead, high profile processors. A survey undertaken during 2011 enabled the development of a quantitative model for traditional milk value chains from the farm gate to final consumers in the large urban centre of Lahore. This study describes the key attributes of this chain, its pro-poor potential for affecting the livelihood of farmers, vendors and low income consumers, and avenues of possible policy intervention.

Gregg, Daniel

A MODEL FOR THE CONTROL OF WEEDS ON EXTENSIVE BEEF PROPERTIES IN CENTRAL QUEENSLAND

G07 - Wednesday 3:30 pm - 4:40 pm

Weeds are a significant and costly problem for Australia, and responsibility for their management stretches from Australia's international obligations through all levels of government to individual landholders. The research presented in this paper developed a simulation model of weed infestation growth, grazing impacts, and control informed by empirical results from field trials in the region. The aim was to consider the limits to adoption of control actions by landholders using a realistic model of weed infestation growth. The model was developed in the open source R programming language and shows the flexibility of this program in facilitating rapid and complex models for analytical exploration in research projects.

Gregg, Daniel

RESOURCE AUGMENTATION: A BROADER DEFINITION OF PRODUCTION FUNCTIONS FOR

AGRICULTURAL PRODUCTION ANALYSIS

G07 - Friday 1:00 pm - 2:30 pm

Agricultural economics is credited with many important contributions to the theory of the firm and the theory of production in particular. Most of these contributions originated from examination of a range of functional forms which relate inputs to output either directly (the production function) or indirectly (cost, revenue and profit functions). Underlying these functional forms is a 'technology' which characterises the nature of production. Agricultural production is, however, largely based on the augmentation of natural production relations – i.e. the technology is an augmentative one rather than one of a manufactured character. This paper presents a conjectural model of agricultural production linking economic production theory and population ecology theory which may provide a far deeper understanding of agricultural production. The implications of such a model are explored analytically in this paper.

Greiner, Romy; Ballweg, Julie

ESTIMATING THE SUPPLY OF ON-FARM BIODIVERSITY CONSERVATION SERVICES BY NORTH AUSTRALIAN PASTORALISTS: DESIGN OF A CHOICE EXPERIMENT

GO5 - Wednesday 3:30 pm - 4:40 pm

The tropical savannas of Australia cover 25% of the continent and support an abundance of both plants and animals, many of which are endemic and adapted to the harsh climatic conditions. Land use since European settlement, in particular overgrazing, has contributed to biodiversity decline. Beef cattle grazing operations average several hundred thousand hectares in size and individual land use decisions can have a large impact on regional biodiversity. A research project is underway using choice modelling to estimate the potential supply of on-farm conservation of biodiversity, based on potential program attributes and pastoralist characteristics and attitudes. The paper details the choice experimental (CE) design. The design draws on recent advances in CE design by accounting for response certainty to increase the degree of confidence that can be placed on respondents' stated choices and using alternative ranking. Generalized ordered logit modelling is proposed for data analysis.

Gunasekera, Don; Cai, Yiyong; Newth, David

POTENTIAL EFFECTS OF FOREIGN DIRECT INVESTMENT IN AFRICAN AGRICULTURE

GO6 - Friday 8:30 am - 10:00 am

Low investment in African agriculture is a constraint to expansion in local agricultural production while foreign direct investment (FDI) can play an important role in supplementing the investment requirements. Agricultural FDI in Africa has grown on average by 2.5% p.a. during 2003-10. This paper uses an integrated analytical framework, the Global Integrated Assessment Model (GIAM) to analyse the potential long term implications of agricultural FDI for raising agricultural productivity in Africa while taking into account possible climate change impacts. We also focus on possible implications for food security and global agricultural trade of FDI driven productivity enhancement of African agriculture.

Guo, Zhibo

HEDGING EFFECTIVENESS FOR WESTERN AUSTRALIAN CROPS

GO1 - Friday 8:30 am - 10:00 am

This paper reports a series of pre-trade investigations into the hedge effectiveness of futures contracts of wheat, barley, and canola for Western Australia hedgers. Hedge ratios were estimated through the ordinary least square model, the vector autoregressive model, and the vector error-correction model. Hedging effectiveness was measured using risk reduction method and utility maximization method. Results indicate that, despite being thinly traded contracts, futures on the Australia Securities Exchange are more effective in wheat, barley, and canola in terms of price risks minimization and utility maximization, compared with futures contracts on Chicago Board of Trade and Intercontinental Exchange. Results suggest that using the local exchange is more efficient in risk management.

Hailu, Atakelty

RECREATIONAL FISHING MANAGEMENT: EVALUATION OF BAG-LIMIT BASED STRATEGIES

G07 - Friday 8:30 am - 10:00 am

This study uses data from a survey of recreational fishing in WA to estimate random utility models of site choice. These models describe recreational fishing destination choice among 47 destination in coastal Western Australia as a function of site and angler characteristics. The models are used to evaluate the economic welfare impacts of bag-limit based management strategies similar to those recently proposed by the government. These strategies are compared to other strategies that have different combinations of bag limits on high and low value fish. Fishing effort redistribution and spill-over effects of these management strategies are also evaluated.

Hanley, Nick

THE EFFECTS OF EXPERIENCE ON PREFERENCE UNCERTAINTY: THEORY AND EMPIRICS FOR ENVIRONMENTAL GOODS.

GO5 - Thursday 8:30 am - 10:00 am

This paper develops a model of demand estimation in which consumers learn about their true preferences through consumption experiences. We develop a theoretical model of Bayesian updating, perform comparative statics over the model, and show how the theoretical model can be consistently incorporated into a reduced form econometric model. We then estimate the model using data collected for two environmental goods, namely biodiversity conservation and coastal water quality improvements. We find that the predictions of the theoretical exercise that additional experience with a good will make consumers more certain over their preferences in both mean and variance are supported in each case. A literature on “experience goods” has developed for market goods, relating to uncertainty over preferences on behalf of individuals. As individuals gain more experience with a good, they update their estimate of their true type. This leads to changes in willingness to pay for individuals, but also changes in the balance between the deterministic and random components of utility within a random utility model, and in how scale varies over the population. This constitutes an alternative way of thinking about the effects of information within a stated preferences approach to demand estimation. We develop a reduced form econometric model from our theoretical model of learning, and use this to investigate the effects of measures of experience on preference estimates for two environmental goods; on individual scale parameters; and on scale variance. Using measures of experience based on number of trips, we show that variations in this index have significant effects on scale and scale variance. As experience increases, people become less random in their choices, whilst the difference across people in terms of how deterministic or how random their choices are also falls. Most of the literature on information effects in stated preferences has focussed on impacts on mean Willingness to Pay and its variance. We show that an alternative theoretically consistent approach is possible which allows the researcher to investigate other aspects of information and learning, by focussing on the random element of utility with a standard RUM set-up.

Hassan, Roger

A THIRST FOR EFFICIENCY: FINDING THE RELATIONSHIP BETWEEN WATER TRADING AND AGRICULTURAL WATER USE EFFICIENCY IN THE MURRAY-DARLING BASIN

GO2 - Thursday 8:30 am - 10:00 am

The Australian government has put forward many policies in the past three decades with the aim of increasing water market activity. Water trading is widely thought to transfer water to its highest productive use in order to extract the greatest benefit to society. This paper employs an empirical analysis of the agricultural water market in the Southern Murray-Darling Basin in order to determine whether trading has indeed induced agricultural water use efficiency. This thesis focuses on technical water use efficiency as it searches for evidence that water trade has induced innovation in minimizing water use at the farm level. This research is done on three different scales in order to test the relationship between water trade and the efficiency of its use in several situations.

Hoshino, Eriko

PRICE INTEGRATION AND DEMAND ANALYSIS OF ABALONE IN THE HONG KONG MARKET

GO4 - Thursday 8:30 am - 10:00 am

Abalone is one of the most valuable fisheries products in Australia, and is of key interest to the Australian Seafood industry. Recently, abalone has undergone substantial production changes worldwide due to an expansion of aquaculture, but such rapid changes in productions on the global abalone demand and potential implications for wild abalone prices have not been studied adequately. This paper investigates price integration and demand analysis for abalone in the Hong Kong market—the world’s largest abalone market, and the implications for the prices of wild abalone produced in Australia.

Hualda, Luis Antonio; Murray-Prior, Roy; Batt, Peter

THE ENABLING ENVIRONMENT FOR SMALLHOLDER VEGETABLE PRODUCERS IN THE SOUTHERN PHILIPPINES: A GAP ANALYSIS

G04 - Friday 8:30 am - 10:00 am

The enabling environment for smallholder vegetable producers in the southern Philippines contains the right conditions that will allow them to overcome constraints in meeting market requirements. These conditions are provided by government, non-government organisations (NGO) and the private sector. This paper characterises the enabling environment by determining the importance accorded by smallholder producers to enabling conditions, and how these are fulfilled based on their experiences. Using a survey, gaps were identified by comparing the differences between importance given and level of fulfilment of conditions based on experiences of smallholder producers. ANOVA was used to determine differences in characteristics of the enabling environment and fulfilment of conditions between members and non-members of organisations. Roles that the government, non-government organisations (NGO) and the private sector play in enhancing the enabling environment are also highlighted.

Iftekhar, Md. Sayed; Tisdell, John

AN AGENT BASED MODELING STUDY OF COMBINATORIAL AUCTIONS FOR CORRIDOR FORMATION

G05 - Friday 8:30 am - 10:00 am

Establishing national wildlife corridors has been identified as a policy priority for environmental and biodiversity conservation in Australia. Combinatorial landscape auction designs in theory could account for the multiple-objective nature of such conservation strategies and the connectivity of landholdings across the landscape. In this paper, we study the performance of a combinatorial landscape auction design in achieving environmental outcomes using an agent based simulation model. Landholder agents submit multiple bids covering single or multiple corridors. They can also form coalitions with their neighbours and submit joint bids. They can learn through their previous experiences and revise their bids. Using this model, we explore the impact of network structure, program coverage and cost heterogeneity on performances of a combinatorial landscape auction.

Innes, James; Thebaud, Olivier; Norman-Lopez, Ana; Little, Rich

THE AUSTRALIAN CORAL REEF FIN-FISH FISHERY ITQ MARKET

G07 - Friday 1:00 pm - 2:30 pm

The Australian coral reef fin-fish fishery on the Great Barrier Reef has been managed under ITQs since 2004. The operational side of the fishery is relatively heterogeneous and distinct sub-divisions exist between participants in terms of individual vessel characteristics and the species and product forms landed. The ITQ system has introduced an additional dimension for heterogeneity between fishers whilst also allowing investors not participating in the fishery to hold and trade quota. The analysis in this paper uses data on individual level quota holdings and trades to assess the CRFFF quota market and its evolution through time. Fishery level trends in ownership and trade are determined and the emergence of groups such as investors and lease dependent fishers is clear. The incentives faced by the groups within the fishery differ, as do their vulnerabilities and resilience to natural or management related changes in the fishery's situation.

Islam, Nazrul; Uddin, Nasir; Wardell-Johnson, Angela; Nath, Tanmoy; Stockwell, Brian

CLIMATE CHANGE AND THE WA DAIRY INDUSTRY: COSTS AND BENEFITS OF MITIGATION AND ADAPTATION

G02 - Thursday 3:00 pm - 4:30 pm

Economic viability of the Australian dairy industry is expected to be impacted by climate change. Increased temperature, reduced rainfall and drought will drive higher farm input costs, creating intense competition for feed and water supplies potentially exacerbating viability of farms. In this study, using predicted scenarios of climate change and a range of social, economic and ecological adaptive capability indicators, the costs and benefits of adaptation and mitigation options are evaluated for the WA dairy industry. The options relating to herd, feed and soil management were identified through a series of

expert panel workshops conducted with a stratified representation of food systems participants in WA. The results demonstrate potential mitigation and adaptive action that can deliver significant net benefits. This integrated model presents critical elements covering triple-bottom-line options for sustainable dairy industry development planning facing climate change impacts.

Islam, Nazrul ; Xayavong, Vilaphonh; Kingwell, Ross; Anderton, Lucy

BROADACRE FARM PRODUCTIVITY TRAJECTORIES AND FARM CHARACTERISTICS

GO1 - Thursday 8:30 am - 10:00 am

Improving farm productivity is often touted as essential for the future prospects of Australian agriculture, particularly for the export-oriented broadacre farm sector. This paper draws on farm panel data for the period 2002 to 2011. The annual productivity of the same group of 235 farms is measured each year for a decade. Results show pronounced variability in the productivity ranking of these farms, both within and between regions. Farms are classed according to their average productivity and the stability of their productivity. The convexity of this relationship suggests that to achieve high growth in productivity in broadacre farming, farm businesses are exposed to greater volatility in productivity. There is only a small proportion of farms that over the decade were able to achieve high, stable growth in productivity. The characteristics of those farm businesses are examined to gauge if any findings are generalisable.

Iwamoto, Hiroyuki

THE POTENTIAL OF FOOD WASTE REDUCTION THROUGH THE GREEN PURCHASING

PS110 - Thursday 8:30 am - 10:00 am

The purpose of this study is to examine the potential of food waste reduction through the green purchasing in Japanese consumers' tofu purchasing decisions. Tofu is indispensable ingredient in Japanese cooking. But, huge amounts of food waste are produced during the paper production process. The Choice Modelling (Random Parameter Logit Model) is used in order to quantify the welfare change associated with the change in the level of local origin label, food recycling label, freshness of tofu, and price attribute for the sample of Japanese consumers in August 2012. The consumer has a positive perception of local origin label, food recycling label, freshness of tofu. The choice probability of food recycling labelled tofu is estimated at approximately 70%. The results suggest that green purchasing holds potential for food waste reduction in tofu manufacturing sector.

Jahan, Hasneen; Anceev, Tihomir

PRODUCTIVITY GROWTH AND ENVIRONMENTAL PERFORMANCE IN THE SHRIMP FARMING INDUSTRY

GO2 - Wednesday 10:30 am - 12:00 pm

Shrimp farming is Bangladesh's fastest growing agricultural sector in terms of value added. However, environmental degradation is a major concern for the sustainable development of this industry. This paper examines the economic and environmental performance of shrimp farming. A directional distance function approach is employed to estimate the Luenberger total factor productivity indices under the assumptions of weak and strong disposability of bad outputs. Based on average farm level data from shrimp farming, this study estimates the productivity change between the years 2000 and 2010, and compares how the different directional vectors and output sets influence productivity. Total factor productivity is further decomposed into efficiency and technical change components to explain the reasons for productivity change. For effective environmental policy, bad outputs should be included in the productivity measurement to avoid underestimating productivity growth.

Jeffrey, Scott; Pannell, David

ECONOMICS OF PRIORITISING ENVIRONMENTAL RESEARCH: A BAYESIAN FRAMEWORK FOR ESTIMATING EXPECTED VALUE OF PARTIAL PERFECT INFORMATION (EVPPPI)

GO1 - Friday 8:30 am - 10:00 am

Significant public funds are spent on projects designed to improve environmental quality. Design and implementation of these initiatives is contingent on knowledge generated from environmental research. Funding agencies have many demands for research dollars while having limited research budgets. A

prioritisation process is required for efficient and effective allocation of research funds. A review of research prioritisation literature suggests that ad hoc approaches are often used for ex ante analyses examining the value of environmental research (e.g., Delphi techniques, information gaps from literature reviews). This paper characterises environmental research prioritisation in the form of an economic decision problem, based on expected value of information concepts. A Bayesian modelling approach is used with research priorities being made based on estimates of expected value of partial perfect information. A case study illustrates the potential use of this model in informing environmental research funding decisions.

Jeffrey, Scott; Trautman, Dawn; Unterschultz, Jim

IMPACT OF CANADIAN BUSINESS RISK MANAGEMENT (BRM) PROGRAMS ON PRODUCER (DIS)INCENTIVES TO ADOPT BMPs

GO6 - Wednesday 3:30 pm - 4:40 pm

Risk management and environmental stewardship are key components of the current Canadian agricultural policy framework and both initiatives feature prominently in objectives for the next agricultural policy framework which will take effect in 2013. However, these two policy areas are not “coupled” in terms of producer participation and the policy objectives may not be compatible. Canadian research has shown that participation in public business risk management (BRM) programs (e.g., crop insurance) stabilize producer returns as well as enhance them (i.e., subsidization effects). Production practices and land uses that contribute positively to environmental stewardship (i.e., beneficial management practices or BMPs) often result in net costs for producers. BRM program participation may result in greater financial disincentives to adopt BMPs. Consequently, increased environmental program costs (i.e., economic incentives) may be necessary to achieve socially optimal levels of BMP adoption by producers. This study investigates and quantifies the tradeoff between participation in Canadian BRM programs and producer incentives to adopt BMPs. Using dynamic Monte Carlo simulation analysis, adoption of alternative BMPs is modelled for a set of representative Alberta crop and livestock operations. Alberta, with \$8.6 billion (AUD) in gross farm revenue in 2010 and 20.8 million hectares of farmland is one of the largest agricultural producing provinces in Canada. The simulation results are used to estimate the net benefit or cost associated with adoption. The analysis is done with and without participation in current public BRM programs to estimate the net impact of program participation of on-farm BMP adoption. Initial results for a representative cropping operation suggest that BRM program participation reinforces the incentives or disincentives associated with adoption of BMPs. For BMPs that contribute positively to wealth (e.g., shifts in crop rotations), farm wealth with adoption is further increased by the BRM programs. The opposite is true for BMPs for which adoption results in a net opportunity cost for the producer (e.g., buffer strips or permanent cover). Implications for policy development as it relates to the interactions between environmental stewardship and producer risk programs are discussed.

Ji, Yaoyao

FACTORS AFFECTING ILLEGAL TIMBER HARVESTING IN INDONESIA

PS110 - Thursday 3:00 pm - 4:30 pm

Illegal logging, which is one of the key drivers of deforestation in developing countries, could exacerbate the global warming problem. Since Indonesia has a large forested area, it is important to understand the factors that lead to illegal harvesting and evaluate strategies to minimize them. This paper develops an econometric simultaneous-equation model to estimate factors of illegal logging in domestic markets of Indonesia. It also considers the influence of key factors in Indonesia’s main timber trading partners such as Japan and China. Results suggest that corruption in Indonesia has a significant adverse impact on illegal logging. Additionally, excess demand in the Japanese market, as well as China’s labour wages, are key drivers of illegal logging in Indonesia.

Jury, Alexander; Nolan, Elizabeth

WEATHER AND RISK IN UNITED STATES CORN TRIALS.ALEXANDER JURY AND ELIZABETH NOLAN

GO1 - Friday 1:00 pm - 2:30 pm

We investigate the relationship between yield of corn hybrids and specific weather variables, including monthly average, and extreme, weather conditions. We use yield data from results of hybrid trials by ten universities in the USA, and weather data from the NOAA. We use a fixed effects model to investigate the effects of weather variables on mean yield. The residuals are squared, cubed and raised to the fourth power to obtain the second, third and fourth moments. Each moment is regressed on the explanatory variables to obtain its estimates conditional on the variables. We compare results for mean and extreme weather conditions, to determine if there is a statistical difference. We find, as expected, that weather is a major cause of production risk, and increased downside risk, and that in the presence of extreme weather conditions, the effects on risk and downside risk are greater than when mean conditions are considered. Timing of extreme events affects their impact.

Kamanda, Josey

STRATEGIC POSITIONING OF CGIAR CENTERS: COMPARATIVE ADVANTAGE AND TRADE-OFFS FROM A TRANSACTION COST ECONOMICS PERSPECTIVE

GO6 - Wednesday 10:30 am - 12:00 pm

CGIAR centres have a mission to reduce poverty and hunger, improve human health and nutrition, and ensure sustainability of natural resources. Their role in the research-development continuum has been a subject of discussion, often emphasizing that they are expected to conduct research with products having wide applicability and accessibility across countries (IPGs). However, with insufficient NARS capacity in developing countries and dependence on bilateral funding, they have increasingly engaged in downstream work to address the range of issues facing the poor. This paper uses insights from literature to discuss the rationale for setting up IARCs, their governance and transformation over the years, and the critical question of how centres should position themselves. A conceptual framework is explored based on transaction cost economics, and fiscal federalism literature can be used to complement discussions on the comparative advantage of the centres from a normative point of view.

Kandulu, John

ECOSYSTEM SERVICE THINKING FOR MORE COMPREHENSIVE CONSIDERATION OF EXTERNAL COSTS IN INTEGRATED WATER RESOURCE MANAGEMENT ASSESSMENTS

PS110 - Friday 8:30 am - 10:00 am

To enhance water security, water planners are increasingly considering less rain-dependent water infrastructure investments. In making water supply management decision, water agencies and utilities have an obligation to consider broad public welfare outcomes of water infrastructure investments including economic and environmental impacts. With growing understanding of water cycle interdependencies, there is also increasing attention to how investments in one part of the water cycle affect other parts. Examples of systematic integrated assessments of impacts of water supply investments across the water cycle are scarce. Using the Parafield catchment in South Australia, we draw from three concepts including integrated water management, ecosystem services typology, and benefit-cost analysis to illustrate application of a systematic integrated assessment of broad public welfare outcomes of stormwater harvesting considering impacts across all stages of the water cycle.

Karimov, Aziz

IMPACT OF FINANCIAL CRISIS AND FOREIGN AID ON GLOBAL AGRICULTURE

G06 - Thursday 3:00 pm - 4:30 pm

The speed with which global economic conditions have changed has been unprecedented, and has left many in agriculture very uncertain about future prospects. Record high agricultural commodity prices suddenly slumped during the second half of 2008, and many markets have since struggled to establish anything resembling a new sense of normalcy. We use several financial crisis indicators and formulate an econometric model to identify the impact of financial crisis on global agriculture. We also fill the gap in

the literature and include Foreign Aid variables and interactions with financial crisis in the main model. Our preliminary results show that financial crisis negatively influenced global agricultural production. An interesting finding is that interaction terms have a positive significant sign which would suggest that those countries that received foreign aid during the financial crisis were less influenced by its negative side effects.

Khan, Md. Farid

PRODUCTIVITY GROWTH AND R&D SPILLOVERS IN AUSTRALIAN BROADACRE AGRICULTURE: AN EMPIRICAL ANALYSIS BY USING ALTERNATIVE APPROACHES

G06 - Thursday 8:30 am - 10:00 am

To date there have been very few studies undertaken in Australia examining the relationship between R&D and productivity growth in agriculture. Australian broadacre agriculture achieved some strong productivity gains during the 1980s and 1990s but these haven't been maintained over the last decade or so. Recent productivity falls in agriculture has renewed interest in exploring the role of public R&D in agriculture. This study will examine the relationship between public R&D and productivity growth and explore the spillover effects of foreign R&D on productivity using standard time series econometrics for country level data. Further, using state-level panel data this study will capture state level heterogeneity in the effects of R&D by using a novel methodology: semi-parametric smooth coefficient frontier approach. This study will shed light on the direction for future policies in investments in agricultural R&D in boosting productivity growth in Australian agriculture.

Kingwell, Ross; Anderton, Lucy; Wardell-Johnson, Angela; Speijers, Jane; Xayavong, Vila

SOCIO-MANAGERIAL CHARACTERISTICS OF BROADACRE FARMERS AND FARM PERFORMANCE: WEAK OR STRONG LINKS?

G03 - Friday 8:30 am - 10:00 am

Farm business performance often is assessed using a suite of financial metrics. Occasionally the role of management and the influence of the social setting for farm production are mentioned as factors affecting farm performance but their difficulty of measurement often ensures they are included in descriptive rather than numeric analyses. This paper is a departure from the usual analyses of farm performance. Detailed information about the socio-managerial setting of over 235 broadacre farms over the years 2002 to 2010 is presented. These socio-managerial characteristics are related to the usual financial metrics of farm performance to generate insights about their interplay. Results show that there are significant relationships between socio-managerial characteristics and farm performance measures. There are implications for social policy and the enhancement of farm business health and resilience.

Kragt, Marit; Muger, Amin; Kolikow, Steven

MAPPING THE LIMITS AND BARRIERS TO CLIMATE CHANGE ADAPTATION IN AGRICULTURE: AN INTERDISCIPLINARY FRAMEWORK

G05 - Thursday 3:00 pm - 4:30 pm

Farmers need to undertake adaptive action to protect their livelihoods from the impacts of climate change. There is an emerging discourse about existing limits (absolute obstacles) and barriers (mutable obstacles) to climate change adaptation. Given the complex, multifaceted nature of climate change, interdisciplinary research is the most effective way to improve understanding of these obstacles. However, the success of interdisciplinary projects tends to be hindered by a lack of common definition of limits and barriers. In this study, we develop a framework that integrates the different understandings of limits and barriers to climate change adaptation in agriculture. We address biophysical, technological, and socio-economic factors. Our integrated framework provides a guiding tool for future integrative projects to overcome the epistemological challenges that are typically encountered in multi-disciplinary research.

Kravchenko, Alexey

ESTIMATING DAIRY FARMS' DEMAND FOR WATER

GO3 - Thursday 8:30 am - 10:00 am

New Zealand's Resource Management Act's current "first come first served" method of distributing water rights is fast becoming inadequate to handle this increasingly over-allocated factor of production. Water markets or tariffs are one way to achieve allocative efficiency. To establish such markets or tariffs, it is imperative to estimate users' responses to having, for the first time, to pay for this currently largely unpriced input. This study seeks to provide a viable "starting point" estimate of the response curve to water price tariffs of dairy farmers – NZ's largest fresh water consumers – using the Ministry of Primary Industries' dairy monitoring dataset. This paper suggests that under the assumptions of inelastic input substitutability, the farms' supply curves can provide an approximation of the farms' responses to at-site (irrigation cost inclusive) changes of water costs.

Kuehl, Rainer

RELATIVE PERFORMANCE PAYMENT IN COOPERATIVES – A MODEL-THEORETIC ANALYSIS

GO4 - Wednesday 10:30 am - 12:00 pm

Governing the cooperatives' management by payment systems turns out to be a non-trivial problem due to the specific characteristics of the legal structure. Evaluating management's performance is complicated by the business relations between members and their cooperative. A relative performance payment can make a significant contribution to the reduction of target inconsistencies between the members and the management of cooperatives.

Lennox, James; Turner, James; Daigneault, Adam; Jhunjhnuwala, Kanika

REGIONAL, SECTORIAL AND TEMPORAL DIFFERENCES IN CARBON LEAKAGE

GO1 - Thursday 8:30 am - 10:00 am

Carbon trading schemes or taxes have been implemented or are proposed in many countries and regions. Appropriately designed, they can deliver mitigation at least economic cost. However, as shown in many modelling studies, the effectiveness of such schemes may be reduced if emissions increase in countries with lower or no carbon pricing (or equivalent incentives). This problem has most often been studied in a unilateral and static context. Using a multiregional dynamic general equilibrium model, we model the imposition of harmonised, increasing carbon taxes on industrial and energy greenhouse gas emissions in OECD countries and China. We decompose carbon leakage by country and sector, by omitting one participating region at a time, and seeing how this affects the emissions of non-participating regions. Carbon leakage rates are lowest for China and highest for Europe and Australia. The sectoral composition of leakage also changes over time and varies widely between countries.

Lin, Jeff

CHEAPER AND EASIER WAY OF ACHIEVING EMISSION REDUCTIONS - ENERGY DEMAND MANAGEMENT THROUGH ENERGY INCENTIVE POLICY

GO1 - Thursday 8:30 am - 10:00 am

This paper proposes an environmental scheme, 'Energy Incentive Policy' (EIP), in addressing an imminent energy crisis facing Australian families. Energy prices have been rising significantly in the past few years and are set to soar with the introduction of emission reduction schemes. EIP is designed to address issues behind these price rises as it sets out to improve efficiency in energy consumption, reduce emissions from energy production and, at the same time, ensure provisions of utilities to all members of society. Once implemented, EIP lets market forces direct investments into various sources of renewable energy and influence households' and businesses' energy consumption levels. Not only does it promote conservatism and a switch to renewable energy, the scheme has the potential to reduce emission levels at a much faster pace. EIP is the most promising scheme for all individuals to embark on a lifestyle change and contribute to the economy's social and environmental wealth.

Maghraby, Wahida; Umberger, Wendy; Yi, Dale; Minot, Nicholas; Stringer, Randy

PRODUCTIVITY AND TECHNICAL INEFFICIENCY OF MAXIMUM RESIDUE LIMIT COMPLIANT AND NON-COMPLIANT FARMERS: THE CASE OF SHALLOT GROWERS IN INDONESIA

GO2 - Thursday 8:30 am - 10:00 am

Rising disposable incomes and food safety concerns have prompted food retailers to require production certifications in order to market food products with higher quality and safety assurances. For example, in Indonesia demand is increasing for high value horticultural products guaranteed to be produced using 'low pesticide' methods. However, little is known about how the production of 'low pesticide' or Maximum Residue Limit (MRL) compliant production compares to typical production methods. This study investigates the differences in productivity and technical efficiency between pesticide MRL-compliant and non-compliant shallot growers. The relationship between technical efficiency and land tenure status, participation in extension and training programs, crop diversification, and household characteristics is also examined for both the MRL-compliant and non-compliant farmers. To control for potential endogeneity issues, a matching method is used before proceeding to the stochastic production frontier analysis. Results of this study provide insight on the effectiveness of extension and training programs in improving productivity and identify the most inefficient and vulnerable farm households among MRL compliers and non-compliers.

Malabayabas, Maria Luz; Paris, Thelma; Gauchan, Davendra

ASSESSING WOMEN'S EMPOWERMENT AMONG RICE FARMING HOUSEHOLDS IN BANGLADESH, EASTERN INDIA, AND NEPAL

G07 - Friday 8:30 am - 10:00 am

Rice is one of the important crops grown in Bangladesh, India, and Nepal and which is mostly considered to be rainfed. However, rainfed rice regularly suffers from abiotic stresses (flood, drought, and salinity). In these stress problems, what are the roles of women in decision-making which pertains to farming and household issues? This paper aims to assess women empowerment in making farm-related and family-related decisions among rice farming households. Findings revealed that men still dominate the overall decision-making authority in the household. The proportion of female household members and share of modern variety area significantly affect the Women Empowerment Index (WEI). Thus it is important to empower women by providing them adequate technical knowledge and skills to enable them to be efficient farmers. Consequently, farming households can better cope with environmental stresses and have greater opportunities to improve their livelihood.

Mallawaarachchi, Thilak

IMPROVING INVESTMENT IN NATURAL RESOURCE MANAGEMENT: SOME POLICY INSIGHTS THILAK MALLAWAARACHCHI AND RICHARD GREEN* [ABARES]*PRESENTING AUTHOR

G03 - Friday 1:00 pm - 2:30 pm

Over the past three decades public investment in natural resource management has grown steadily. The purpose of this investment is to protect natural capital whilst maintaining productive use of land. This paper relates to the design and evaluation of policies to encourage landholders to adopt practices that reduce negative externalities and the depreciation of natural capital. Some policies are predicated on "win win" situations where a landholder can make private gains while contributing to public goods. We examine conditions for beneficial joint production, drawing on farmer case studies to develop a framework that can evaluate government programs that encourage practices that maintain or improve farm profitability through efficient resource use. This productivity based framework could isolate the effect of interventions on private gains, as well as their influence on improving environmental outcomes in a manner consistent with motivations of landholders undertaking practice change.

Marsh, Thomas; Piggott, Nicholas

MEASURING PRE-COMMITTED QUANTITIES THROUGH CONSUMER PRICE FORMATION

GO4 - Wednesday 10:30 am - 12:00 pm

We investigate how to theoretically and empirically measure pre-committed quantities through price

formation utilizing translating in the consumer distance function. The translated consumer distance function is defined as a dual to the translated utility, indirect utility, and expenditure functions. Translating procedures also provide more general analytical means to incorporate pre-committed quantities (and other shift or demographic variables) into inverse demand systems. This approach yields a class of inverse demand functions that can nest most known functional forms. For example, the Inverse Generalized Almost Ideal Demand (IGAI) model can be formed by applying translating procedures to the Inverse Almost Ideal Demand model. An empirical example of the IGAI model with inferences on the translating parameters themselves is provided for illustrative purposes.

Marsh, Dan

WHICH FUTURE FOR THE HURUNUI? COMBINING STAKEHOLDER CONSULTATION WITH CHOICE ANALYSIS

GO2 - Friday 1:00 pm - 2:30 pm

The future of New Zealand's Hurunui River has been hotly contested between those who seek to divert water to increase agricultural production and those who would like to see the river undeveloped. We combine stakeholder consultation with choice analysis and use a choice experiment to describe and quantify the preferences of Canterbury Region residents with respect to existing conditions and potential future land use and water quality scenarios. We also investigate factors that influence the error variance or scale factor. Choices which included one or more alternatives with a negative price (a reduction in local taxes) had higher error variance and this has implications for estimates of gain/loss asymmetry.

Marshall, Graham

TRANSACTION COSTS, COLLECTIVE ACTION AND ADAPTATION IN SOCIAL-ECOLOGICAL SYSTEMS

GO7 - Thursday 3:00 pm - 4:30 pm

This paper presents a framework for economic evaluation of institutional choices that are intended to reduce the transaction costs of solving the kinds of complex problems of collective action commonly encountered in attempts to adapt to changes in social-ecological systems. It proposes and illustrates a procedure for boundedly rational empirical application of this framework. Finally, it outlines a research strategy designed to support this procedure by facilitating inductive identification of heuristics that decision makers can employ in applying this procedure.

Massam, Genevieve; Kragt, Marit; Burton, Michael

PUBLIC PREFERENCES FOR THE CO-BENEFITS OF CARBON FARMING

GO1 - Wednesday 3:30 pm - 4:40 pm

The Australian Government's Carbon Farming Initiative aims to encourage carbon sequestration or emission reductions on agricultural land, through carbon credit incentives for farmers who undertake 'carbon farming' activities. As well as carbon sequestration, these activities often generate ancillary benefits such as native habitat or erosion prevention. We conduct a choice experiment study to estimate community values for carbon sequestration and ancillary effects of carbon farming methods. Analysis revealed that values for carbon farming benefits depend on respondent's perceptions of climate change and on their political preferences. Our value estimates will allow for more targeted development of carbon farming policies.

Mausch, Kai; Bantilan, Ma. Cynthia

REGIONAL OR CENTRALIZED RESEARCH - NEW MEASURES OF INTERNATIONAL WELFARE GAINS FROM SPILLOVERS TO SUPPORT ICRISAT'S INVESTMENT STRATEGIES

GO6 - Wednesday 10:30 am - 12:00 pm

To examine key factors influencing global research spillovers, this study compares direct and spillover impacts of groundnut (GN) and pigeon pea (PP) research to be used for resource allocation. The estimation of global research benefits from breeding research uses an economic surplus based international trade model. GIS tools are used to analyse applicability of new technologies across a range of agro-climatically homogeneous zones. High photoperiod sensitivity and concentrated production of PP

severely limits global applicability of varieties and thus spillover effects are lower as compared to GN. Comparing these two crops highlights centralization (GN) and regionalization (PP) opportunities. Utilization of spillover measures will assist in tailoring research investments to the characteristics of the crop, and thus increase research efficiency and ultimately enhance diffusion of improved varieties for the benefit of smallholder farmers globally.

McClintock, Anthea; Malcolm, Bill; Crean, Jason; Jackson, Tom

A PRAGMATIC APPROACH TO RD&E INVESTMENT SELECTION

G06 - Thursday 8:30 am - 10:00 am

The risk and uncertainty of selecting projects in RD&E investments is of particular relevance to the National RD&E program. Gardner (2004) likened the investment selection process to recruiting football players or breeding racehorses. In this paper an approach to improving the odds of weeding out more of the investments that are least likely to succeed, and selecting more of the projects with the greatest potential to succeed, is examined. The approach proposed is a pragmatic approach to ex ante investment evaluation. It is intended to inform the investment of research resources when research opportunities are unlimited and budgets in decline.

McFarlane, Jim

ECONOMIC IMPACTS OF VITICULTURE AND WINEMAKING ON EMPLOYMENT AND INCOME IN THE CENTRAL RANGES ZONE OF NEW SOUTH WALES

G02 - Friday 1:00 pm - 2:30 pm

The Central West region of New South Wales has the potential for high grape yields, creating a wide range of quality especially when irrigation is used. In this paper the economic influence of viticulture and wine-producing industry is assessed in terms of the direct, indirect and induced effects on regional output, value added, income and employment. Through the use of Input-Output tables to derive the multipliers we are able to analyse and determine the regional economic and employment impacts of the region and to assess the kinds of interlocking relationships between industry types, so indicating particular strengths or weaknesses in the region's economic system. These answers will be invaluable at the local government level in compiling economic reports for assessing and implementing regional development policy.

McWhinnie, Stephanie; Chesnokova, Tatyana

WHO MAKES FISHERIES ACCESS AGREEMENTS WITH WHOM?

G07 - Friday 8:30 am - 10:00 am

Fisheries access agreements allow one country's fishermen to fish in another's waters. We empirically examine which countries make access agreements with each other. We combine datasets on agreements, stock status and factors that influence international trade. We test the hypotheses of whether access agreements are made because of differing stock status or because countries are geographically or culturally close. Preliminary results suggest that better host country stock status is an important determinant of agreements. Results on measures of closeness have interesting impacts, for example, sharing a border increases the probability of an agreement but sharing a language reduces the probability.

Miran, Bülent; Atis, Ela; Bektas, Zerrin; Salali, Ece; Cankurt, Murat

AN ANALYSIS OF INTERNATIONAL SULTANAS TRADE: A GRAVITY MODEL APPROACH

PS110 - Wednesday 3:30 pm - 4:40 pm

The countries competing for the world Sultana Market are Chile, Greece, Iran, South Africa, Turkey and the United States. Sultanas are one of the top Turkish export products. The Turkish sultana sector is facing increasing competition in international markets. The aim of this work is to explain the magnitude of the trade flows for sultanas from Turkey and other exporting countries to its main importing countries. This objective has been reached by establishing an appropriate econometric model derived from an extended form of the "Gravity Model". To apply the gravity model, a panel data with the most important six

exporters of sultanas and their importing countries between the years of 2000-2010 was set up. Panel data models estimated with pooled ordinary least squares and fixed effects model under some diagnostic tests. Finally, some proposals and suggestions are developed for increasing the international competitiveness of the sultana production.

Montiflor, Marilou; Concepcion, Sylvia

MEASURING FARMER'S PERCEPTIONS USING DIFFERENT METHODS

G03 - Thursday 8:30 am - 10:00 am

In the Philippines, most vegetable farmers have small farms or "gardens". They finished elementary or reached high school and cannot read or understand English. Previous research used instruments that disregarded these factors. This resulted in incomplete or vague responses, inconclusive data, and inaccurate analysis. In the current research, different instruments were formulated. Data showed that farmers were able to grasp the questions if translated in the vernacular and using visual aids. These different approaches have proven to be essential in gauging farmers' responses. Through these, the limitations of language, educational background and social status are neutralized, thus resulting in a clearer analysis.

Morales, Luis Emilio; Hoang, Nam; Ramsay, Tony

MODELLING VOLATILITY OF AUSTRALIAN BEEF EXPORT PRICES

PS110 - Wednesday 10:30 am - 12:00 pm

Beef price variations have been widely analysed to identify the factors that influence these fluctuations over the time as a way to reduce negative risk effects over the whole industry. Quarterly data of Australian live cattle exported from 1988 to 2011 was analysed using a GARCH-X model, indicating that volatility of beef export prices is positively related to international macroeconomic conditions and oil price variations, while it is negatively related to variations in corn price, the first quarter of the year and when the cycle of beef prices is moving up. Finally, variations in exchange rate are insignificant in relation to volatility in beef export prices.

Mottaleb, Khondoker

QUANTIFICATION OF THE ECONOMIC IMPACTS OF DROUGHT AND SUBMERGENCE ON RAINFED RICE: THE CASE OF BANGLADESH

G03 - Wednesday 10:30 am - 12:00 pm

Drought and submergence are two of the major abiotic stresses that cause substantial yield and income losses for rice farmers in the rainfed areas in Asia and Africa. Using rainfed Aus and Aman rice in Bangladesh as a case study, this article demonstrated that while both drought and submergence negatively affected rice production and income at the household level, only the loss caused by drought is statistically significant. Based on the findings, this paper suggest that international donor agencies should fund more research, development, and dissemination of new high-yielding rice varieties that are more tolerant to droughts.

Mullen, John; Keogh, Michael

THE FUTURE PRODUCTIVITY AND COMPETITIVENESS CHALLENGE FOR AUSTRALIAN AGRICULTURE

G06 - Wednesday 3:30 pm - 4:40 pm

The objective of this paper is to review likely trends in key drivers of productivity with a view to suggesting the rate of productivity growth that is likely to be required to maintain the competitiveness of Australian agriculture both within the Australian economy and relative to the agricultural sectors of other economies. The paper also canvasses how this level of productivity performance might be achieved over the period to 2030.

Mwebaze, Paul; Monaghan, Jim; Revell, Brian; Hare, Martin; MacLeod, Alan

THE IMPACT OF EU PESTICIDE RESIDUE REGULATIONS ON AFRICAN FRESH PRODUCE EXPORTS TO THE UK

GO7 - Wednesday 10:30 am - 12:00 pm

This paper estimates the impacts of pesticide maximum residue level (MRL) standards imposed by the European Union (EU) on trade-flows from African exporting countries to the United Kingdom (UK) using a fixed-effects gravity model specification with corrections for the zero trade-flows. Using five different estimation methods produced mixed results. Most variables have the expected signs and were statistically significant, consistent with the trade literature. The volume of trade increases with the GDP of the exporting countries and the UK. The volume of trade decreases with geographical distance. The variables describing cultural and economic proximity of countries, such as colonial relationships positively affect the volume of trade. Regarding the impact of MRLs on trade flows, the results were not completely consistent between the estimation methods. However, some commodities exhibit sensitivity to changes in pesticide MRL standards imposed by the EU and hence applied in the UK.

Mwebaze, Paul

A RISK-EFFICIENT PORTFOLIO ALLOCATION MODEL TO PRIORITISE INVESTMENTS IN BIOSECURITY-AN APPLICATION TO THE MANAGEMENT OF WEEDS IN VICTORIA.

GO6 - Thursday 8:30 am - 10:00 am

Appropriate allocation of scarce resources across the spectrum of biosecurity threats is a challenging problem for policy and decision makers. Economic tools can be used to support the allocation of available resources to maximise the desired objectives set by the decision-maker. The role of economics can be to evaluate a policy, to identify the most cost-effective measures to attain a specified objective, or to prioritise between different objectives and measures. Portfolio theory was originally developed to address the problem of finding the combinations of financial products that would maximise expected return on investment while minimising risk. The theory describes how to select a portfolio with the highest possible expected return for a given level of risk. This paper extends the application of portfolio theory to the management of weeds in Victoria.

Nakajima, Toru

CONTRIBUTION OF SOCIAL LEARNING TO DIFFUSION PROCESS OF NEW RICE-VARIETIES

GO7 - Thursday 3:00 pm - 4:30 pm

The purpose of this paper is to investigate the role of social learning in the diffusion of new rice varieties with the production methods in Asahikawa, Hokkaido, Japan. The core elements of the technology diffusion process in agriculture are farmers learning by themselves, and spill over from others. A unique data set on network structures amongst farmers for introducing new rice varieties with production method is used. In addition, since the Local Indicator of Spatial Autocorrelation (LISA) should be considered in the estimation, the Markov Chain Monte Carlo Method (MCMC) is utilised as the empirical strategy in this paper to address LISA. An estimation model is proposed in this paper.

Nakajima, Toru; Matsuda, Hirotaka; Rifin, Amzul

THE IMPACT OF SOCIAL NETWORK ON TECHNOLOGICAL CHOICE IN RICE PRODUCTION: A CASE OF RURAL INDONESIA

GO3 - Friday 8:30 am - 10:00 am

The purpose of this study is to demonstrate the impact of social networks in communities on agricultural technological choice taking rice production in Indonesia as an example. Selection of planting rice varieties is particularly examined. In the case study area, new or suggested varieties provided by government via official diffusion systems such as extension schools are not necessarily adopted by farmers. Estimation results indicate that close ties with practical farmers, who decide their planting strategy relying on their own experience and which have large benefits, have a large impact on selection of varieties and improve farm productivity.

Nath, Tanmoy

CHANGES IN FOOD HABITS AND RISE OF SUPERMARKETS IN ASIA: IMPLICATIONS FOR WA AGRI-FOOD SECTOR

GO5 - Friday 1:00 pm - 2:30 pm

Over the past half century, rapid economic and income growth, urbanisation, and globalisation have led to a dramatic shift of Asian diets away from staples and increasingly converging towards Western diets. The rapid spread of global supermarket chains in Asia and fast food restaurants is reinforcing these trends. Given large population, limited land resources and food habit changes, food import is likely to increase to maintain food security in the region. Western Australia (WA) being in the proximity to Asia can take advantage of this potential food import growth opportunity. Using the content analysis method, this paper investigates agrifood product development opportunities in WA that suit the changing food preferences and future food needs of Asia. Useful insights of demand growth scenarios of such food in Asia are also provided in the paper so that necessary industry development and restructuring of WA agrifood industry can be planned.

Nauges, Celine; Mallawaarachchi, Thilak; Quiggin, John; Sanders, Orion

FARMERS' RESPONSE TO WEATHER VARIABILITY: A STATE-CONTINGENT APPROACH USING FARM LEVEL DATA

GO1 - Friday 1:00 pm - 2:30 pm

The agricultural sector is commonly considered as one of the most exposed to climate change. The implicit assumption (made in most models) that farmers operate under a fixed technology set across different states of nature is often too restrictive in representing adaptation to changing conditions, and may understate farmers' responses to climate change. The possibility for farmers to adapt production technology in response to unforeseen events is at the core of the state-contingent theory advanced in Chambers and Quiggin (2000), where it is argued that producers can manage uncertainty through the allocation of productive inputs to different states of nature. In this study we test the assumption that farmers' observed behaviour is consistent with the state-contingent production theory using farm-level data for a sample of irrigated dairy farms from the southern Murray-Darling basin over the years 2006-07 to 2009-10.

Nelgen, Signe

HAS POLICY REFORM REDUCED AGRICULTURAL PRICE INSULATION?

PS110 - Wednesday 3:30 pm - 4:40 pm

Despite the fact that there has been much reform of agricultural price and trade policies over the past three decades, the recent spike in international food prices showed that governments are still inclined to insulate their markets from such spikes). This reaction of governments can be ineffective from a domestic viewpoint when both food-exporting and food-importing countries so respond, and yet it amplifies the fluctuations in international prices that other countries face. This paper revisits empirically the phenomenon of incomplete pass-through of international price movements for farm products. It does so by making use of a comprehensive database of annual domestic and border prices and derivative indices for the period 1955 to 2010 for 82 countries and 75 products.

Newby, Jonathan; Manivong, Vongpaphane; Cramb, Rob

INTENSIFICATION OF LOWLAND RICE-BASED FARMING SYSTEMS IN LAO PDR IN THE CONTEXT OF DIVERSIFIED RURAL LIVELIHOODS

GO7 - Thursday 8:30 am - 10:00 am

The cultivation of glutinous rice remains the platform on which most rural livelihoods are based in the lowlands of Lao PDR. Over the past decade the adoption of new technologies has resulted in productivity improvements, yet further gains will be required to maintain national food security. The Government of Laos has established optimistic yield targets for both lowland rainfed and irrigated rice production systems. However, survey evidence shows that most rainfed farmers remain subsistence-oriented and that there is a significant yield gap between the current situation and the targets. An analysis of drivers

and constraints suggests that we are likely to see the adoption of low-input, labour-efficient and stable rice production systems for most households, with small areas of high-input, commercially-oriented systems in favourable conditions. We argue that research and extension efforts should recognise this diversity of production systems and household livelihood strategies.

Nguyen, Nga

INTERACTIONS BETWEEN IRRIGATORS AND AN ENVIRONMENTAL WATER HOLDER IN THE MDB: AN AGENT-BASED SIMULATION OF THE MURRUMBIDGEE CATCHMENT

PS110 - Friday 8:30 am - 10:00 am

As environmental water is being acquired in the Murray Darling Basin (MDB), how efficiently and effectively the Commonwealth Environmental Water Holder (CEWH) manages this water is integral to the success of achieving environmental objectives. A hydro-economic agent-based model is constructed to simulate environmental and economic outcomes arising from the interactions between the CEWH and irrigators under alternative trading and carryover rules. Scenarios in which the CEWH has some flexibility in deviating from some watering targets will also be considered. The agent-based simulation allows an ex ante exploration of how the CEWH's market entry and operation affect the irrigation sector. In particular, the model demonstrates how the rules governing the operation of the CEWH can influence the opportunity cost (in terms of irrigated agriculture's profit) of achieving environmental outcomes. The simulation is calibrated to be representative of the Murrumbidgee catchment in the MDB.

Nordblom, Thomas; Finlayson, John; Hume, Iain

PUBLIC-PRIVATE BENEFIT ANALYSIS OF POLICY ON WATER USE BY UP-STREAM TREE PLANTATIONS

PS110 - Friday 1:00 pm - 2:30 pm

Research on the net private benefits of new tree plantations in the higher rainfall zones of a case study catchment in New South Wales, the Macquarie Valley, also includes consideration of impacts of reduced water supply to downstream sectors: urban water, irrigation industries, stock and domestic users and wetland environmental assets. Effects of four tree product price levels on new plantation areas and downstream sectors are found under two policy settings: (a) expansion of new plantations limited only by profitability for land owners; and (b) given a policy that new plantations are permitted only after first obtaining water entitlements from the downstream parties. Assuming fresh water first, we repeat the analysis with a case of one subcatchment producing such saline water that urban water quality would be compromised if fresh dilution flows were reduced by new tree plantations. We show how results of all scenarios can be summarised simply by Public:Private benefit analysis.

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

CLIMATE CHANGE EFFECTS IN AUSTRALIA'S PRAWN MARKETS

GO1 - Wednesday 3:30 pm - 4:40 pm

The aim of this analysis is to identify whether an increase in the supply of low price farmed prawn imports from South East Asia into Australia's market will affect the prices received by Australia's wild and farmed prawn producers. Climate change projections suggest South East Asia's prawn farmers could expand production and hence exports due to sea level rise increasing mangrove areas. Increased levels of prawn imports have the potential to reduce the prices received by Australian domestic producers if prawns from different locations and production methods are considered substitutes. We use Australian wild and farmed prawn prices and import prawn prices to conduct a co-integration analysis of market integration in Australia's prawn industry.

Nossal, Katerina; Wei, Hui; Sheng, Yu

INTERNATIONAL COMPARISONS OF AGRICULTURAL PRODUCTIVITY: NEW DATA, METHODS AND FINDINGS FOR AUSTRALIA AND ITS COMPETITORS

GO2 - Thursday 3:00 pm - 4:30 pm

This paper compares Australian agricultural productivity with that of two key competitors—the United States and Canada—for the period 1961 to 2006. A new data series is developed (using a growth

accounting approach and adjusting by purchasing power parities) to derive, for the first time, input and output indexes for estimating total factor productivity consistently across countries. In contrast to previous studies, both the level and growth rate of agricultural productivity can be compared. We find that agricultural productivity growth in Australia has exceeded Canada, but has not kept pace with the United States. This has led to a widening gap in productivity levels between Australia and the United States over the period, although the gap between Australia and Canada has diminished. The paper will consider the implications of these findings for the international competitiveness of Australian agriculture.

Ogundari, Kolawole

THE CONTRIBUTION OF AGRICULTURAL ECONOMICS TO PRICE TRANSMISSION ANALYSIS AND MARKET POLICY IN SUB-SAHARA AFRICA: WHAT DOES THE LITERATURE SAY?

G05 - Friday 1:00 pm - 2:30 pm

Price transmission studies have become increasingly important in sub-Saharan Africa over the last two decades because of their application in assessing the impact of market reforms policies embarked upon by the region's governments between the mid 1980s and early 1990s. In this study, a meta-database obtained from 43 price transmission studies published between 1978 and 2011, is used to provide an overall assessment of the potential impact of selected, study-specific attributes on estimated price transmission coefficients and in identifying asymmetric price transmission. Despite the large dispersion of estimated price transmission coefficients of about 0.002- 0.99, the mean coefficient of 0.34 is an overall assessment that the extent of price transmission in SSA is comparatively low. The impacts of the study-specific attributes on the price transmission coefficients, and on the likelihood of the primary studies to report asymmetric price transmission however differ consistently across the attributes, and provide in general evidence on the critical role such attributes may play in determining price transmission results and their implications for policy formulation. Therefore, future research on price transmission should carefully take into account the study-specific attributes identified in this study.

O'Keefe, Suzanne; Kinoshita, Yukio; Crase, Lin

INSTITUTIONAL CHALLENGES IN WATER MANAGEMENT: ANALYSING THE NEXUS BETWEEN WATER AND LAND IN JAPAN AND AUSTRALIA

PS110 - Friday 1:00 pm - 2:30 pm

Institutional arrangements for managing water resources remain a contested area of policy worldwide. One critical element is the extent to which environmental, social and financial outcomes are supported by present governance arrangements. In this paper we aim to shed light on the generic problems associated with water property rights and the distribution of decision making power and incentives within institutional hierarchies for land and water. Unlike earlier works in this field, we do not seek to prescribe a generic formula for reform. Rather, we hope that the comparison can highlight broader issues about the way irrigation and land policies might be developed to achieve multiple and desirable ends.

Oktaviani, Rina; Setyoko, Nur Rakhman; Vanzetti, David

DRINK MORE MILK: POLICIES SUPPORTING THE INDONESIAN DAIRY INDUSTRY

GO4 - Thursday 8:30 am - 10:00 am

The Indonesian Government has several policies to assist the local dairy sector. On the demand side is a policy to encourage consumption of fresh milk. The government campaigns to increase fresh milk consumption by 200 per cent. On the supply side are efforts to increase productivity and the number of dairy cattle. A computable general equilibrium model, GTAP, is used to estimate the impact of the various policies. The results suggest while these policies are somewhat effective in supporting the sector, removing tariffs on dairy product imports would provide greater gains to the economy as a whole.

Ortega, David; Wang, Holly; Olynk, Nicole

EFFECTS OF MEDIA HEADLINES ON CONSUMER PREFERENCES FOR FOOD SAFETY, QUALITY AND ENVIRONMENTAL ATTRIBUTES

GO5 - Friday 1:00 pm - 2:30 pm

Although the U.S. food supply comes primarily from domestic sources, the share of imported foods has shown steady growth over the past decade. In recent years, Asia has emerged as an important supplier of food imports in the United States. This increasing share of imported food in the U.S., coupled with highly publicized incidents of food contamination and adulteration in Asia, particularly China, is posing new challenges for consumers and food safety regulators. In this study we focus on a major aquaculture commodity, shrimp, to evaluate consumer willingness-to-pay for enhanced food safety, use of antibiotics, and eco-friendly environmental practices used in producing the product in the presence of country-of-origin labelling.

Otumawu-Apreku, Kofi; McWhinnie, Stephanie

NERLOVIAN AND DIRECTIONAL DISTANCE FUNCTION APPROACH IN PROFIT EFFICIENCY: THE CASE OF SOUTH AUSTRALIAN ROCK LOBSTER FISHERIES.

GO2 - Wednesday 10:30 am - 12:00 pm

Efficiency analysis in fisheries mainly focuses on productivity and costs, with few researchers investigating profit efficiency. Negative profits and small sample sizes have been obstacles diverting attention from profit efficiency so new methods are used to address these issues. Nerlovian and Directional Distance function methods are used to decompose profits in the South Australian rock lobster fisheries into technical and allocative efficiencies. Econometric analysis of factors determining efficiency, using a truncated bootstrap technique, were undertaken. Results indicate that allocative inefficiency is the major determinant of profit inefficiency and there is significant variability in efficiency in the Northern and Southern zones.

Pangaribowo, Evita

AGRICULTURE, INCOME, AND NUTRITION NEXUS IN INDONESIA: EVIDENCE FROM LONGITUDINAL DATA

GO2 - Friday 8:30 am - 10:00 am

Indonesia is on track to achieve the Millennium Development Goal (MDG) of reducing malnutrition by 2015. While existing studies have focused more on nutrition intervention, this study attempts to fill the void by exploring the linkage between agricultural production, household incomes and nutrition. Using the Indonesian Family Life Survey, this study found rather a weak relationship between income and nutrition outcome. Agricultural production - as reflected by livestock possession, irrigation, and the number of crops produced - improve diet diversity. This study concludes that economic processes alone will not be sufficient to improve the nutrition outcome.

Paris, Thelma

SOCIAL AND ECONOMIC IMPACT OF AGRICULTURAL MECHANIZATION IN EASTERN UTTAR PRADESH, INDIA

GO3 - Thursday 3:00 pm - 4:30 pm

Agricultural mechanization is rapidly taking over land preparation, harvesting and threshing operations of rice and wheat due to labour shortage and rising labour costs in eastern India. This study examines the adoption and impact of mechanization on the livelihoods of male and female agricultural workers and service providers. A random sample of 324 rice farming households in eastern Uttar Pradesh were interviewed. A probit model was used to examine the factors which determine the adoption of combine (harvester-thresher) machines which has the highest rate of adoption. Focus group discussions with different social groups and thematic individual interviews with men and women were also conducted. This study highlights the importance of social (class, caste, age, gender, status) and not only the economic dimension, in impact assessment of agricultural technologies on the society.

Parks, Joanna; Okrent, Abigail; Alston, Julian

EFFECTS OF U.S. PUBLIC AGRICULTURAL R&D ON U.S. OBESITY AND ITS SOCIAL COSTS

GO2 - Friday 8:30 am - 10:00 am

Public agricultural research and development (R&D) may have contributed to obesity by making farm commodities cheaper and more abundant, or by making calorie-dense foods cheaper and more abundant relative to healthier alternatives. To assess the effects of public agricultural R&D on obesity and social welfare in the United States, we simulated the likely effects of changes in past R&D expenditures on calorie consumption, body weight, obesity, and public healthcare expenditures related to obesity. Preliminary estimates suggest that agricultural R&D has had relatively little effect on average daily calorie consumption of American adults and hence very little effect on weight.

Pascoe, Sean

PROXY MEASURES FOR MEY IN DATA POOR MULTISPECIES FISHERIES

G07 - Friday 8:30 am - 10:00 am

The Australian Harvest Strategy Policy requires that maximum economic yield (MEY) be the target in all Commonwealth managed fisheries. For multispecies fisheries, unlike single species fisheries, the optimal yield is not independent of the optimal yield of the companion species (i.e. those species with which it is caught). In fisheries with many species, the cost of undertaking assessments of all species is prohibitive and may be more than the actual rent generated. As a result, the species have a varying level of information, and targets are often defined primarily for those species with good information with others being given “precautionary” targets that may not be consistent with maximising economic returns from the fishery. In our study, we use simulation/optimisation modelling approaches to estimate rules of thumb for improving catch targets in multispecies fisheries when full stock assessment are unavailable.

Patrick, Emma; Randall, Alan

INTERNATIONAL META-ANALYSIS OF GREEN SPACE FOR BENEFIT TRANSFER

GO5 - Wednesday 10:30 am - 12:00 pm

Green space is defined as open areas that provide recreational, aesthetic and ecological services. Valuation of green space is important for successful policy development; primary valuation is widely accepted as the most preferred option, but is costly and time consuming. Benefit transfer is a technique that overcomes these problems by using existing information to estimate value in new situations. This paper uses meta-analysis to generalise the results of the vast literature valuing green space in specific contextual settings. A random effects model is used, reflecting the panel nature of the data, which contains 104 studies and 202 observations. These studies span the regions of North America, Europe, Australia-Pacific, Asia, South America and the Middle East. This analysis finds that the size of a site and the type of green space are important in explaining the value of green space. The function estimated through meta-analysis can then be applied in benefit transfer.

Pemberton, Josh; Kerr, Suzi

VALUE AND NATURAL CAPITAL: EXAMINING THE ECONOMIST'S PERSPECTIVE

PS110 - Thursday 8:30 am - 10:00 am

This paper considers what economics has to bring to a conversation about environmental value, and what the limits of its contribution might be. Two parties with expertise in dissimilar fields might view the same problem or issue through differing conceptual lenses. A failure to make each party's underlying assumptions and goals explicit may diminish the effectiveness of the communication between them. With this in mind, this paper seeks to highlight and examine the assumptions and implicit goals that underpin the way in which economists think about value in general, and environmental value in particular. It also aims to draw attention to the useful concepts that economics brings to a discussion of environmental value that other disciplines may overlook – such as opportunity cost, option value, and the distinction between marginal and average valuations.

Pezzey, Jack; Jotzo, Frank

WHY A CARBON TAX-THRESHOLD NEEDS TO BE ON THE CLIMATE POLICY MENU

GO1 - Thursday 8:30 am - 10:00 am

Since it was first promoted in the late 1980s as a policy mechanism for curbing global warming, a carbon tax has almost always been assumed to be pure, i.e. collected on all emissions. Almost always ignored has been the alternative of a carbon tax-threshold: a tax collected only on carbon emissions above a threshold level. This raises far less revenue and opposition from taxpayers, and apart from its pure novelty has characteristics under certainty very similar to a carbon trading scheme with partly free permits. We review key policy debates since 1990 in countries where a pure carbon tax was proposed, and then either abandoned, watered down in terms of tax rate and/or its sectoral coverage, or replaced by a carbon trading scheme, all mainly because of opposition to the large revenue raised by a pure tax at any significant tax rate. A carbon-tax threshold thus needs to be added to the menu of mainstream climate policy-making; yet it is still being ignored in recent literature.

Pezzey, Jack; Burke, Paul

MEASURING GLOBAL SUSTAINABILITY USING A PRECAUTIONARY VALUATION OF CO2 EMISSIONS

GO1 - Wednesday 10:30 am - 12:00 pm

Adjusted Net Saving (ANS) is the only sustainability measure available for estimating directly whether a society's current, average human well-being can be maintained indefinitely. The World Bank's reassuring result for global ANS includes a small value for the expected future damage from CO2 emissions which is incompatible with severe warnings from scientists on climate change risks. We broaden this result by modelling a much higher, precautionary value for CO2 emissions, and including the sustainability cost of population growth and benefit of technical progress. Our revised ANS shows that the prospect for sustained growth of average global well-being may be good if CO2 emissions are optimally controlled; but bad if they are uncontrolled, with our underlying model predicting peak well-being before 2100.

Polyakov, Maksym; Pandit, Ram; Pannell, David; Park, Geoff; Tapsuwan, Sorada

CAPITALIZED AMENITY VALUE OF NATIVE VEGETATION IN A MULTIFUNCTIONAL RURAL LANDSCAPE: A SPATIAL HEDONIC ANALYSIS

PS110 - Thursday 3:00 pm - 4:30 pm

In this study, we value private benefits generated by environmental assets in agricultural landscapes in order to inform decisions regarding ecological restoration. Using sales data of rural properties in north-central Victoria from 1990 to 2010, we develop a spatio-temporal hedonic model that estimates the marginal amenity value of native vegetation on rural lifestyle and agricultural properties. Our results suggest that native remnant vegetation has a positive marginal value that diminishes with its amount and with property size, implying that these environmental assets provide amenity benefits to the landowners, that the marginal value is highest at smaller quantities, and that it has a greater value for the lifestyle landowners and part-time farmers. Findings from this study will be used to support prioritisation of ecological restoration on private lands in landscapes dominated by fragmented agriculture by applying the public-private benefits framework.

Pradhan, Deepa; Ranjan, Ram

AN EMPIRICAL ASSESSMENT OF CROP TECHNOLOGY ADOPTION FOR DROUGHT SURVIVAL IN RURAL INDIA

G03 - Thursday 8:30 am - 10:00 am

Reliance upon groundwater for farming has been increasing all over the world due to increasing frequency of droughts. As a result of this, groundwater is getting depleted fast due to over exploitation resulting from lack of well-defined property rights, unequal water sharing agreements, market incentives to grow cash crops, etc. Farmers in drought prone areas of South India are facing significant water scarcity. Drought resistant crops and water-saving technology are some means that can help farmers survive repeated drought stretches. Based upon a detailed survey conducted over three districts in Andhra Pradesh, this paper evaluates crop choice decisions of farmers. A multinomial logit model is

developed to analyse farmers' crop choice behaviour during three types of rainfall years i.e. normal year, drought year and excess rainfall year. The model is estimated using survey responses from 354 households. Findings indicate that while skilled and educated farming households are likely to grow drought-resistant crops, the tendency to grow water-intensive crops increases with household wealth (such as annual income).

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

IMPACT OF CLIMATE VARIABILITY ON ECONOMIC VALUE OF IRRIGATION WATER IN THE MURRAY-DARLING BASIN, AUSTRALIA

GO1 - Friday 1:00 pm - 2:30 pm

Climate variability caused by climate change poses substantial economic risk to irrigators. Understanding the economic value of irrigation water is essential for supporting policies relating to investments in the irrigation sector, efficient allocation of irrigation water and water pricing and to compare the variable impacts of water reform within and across sectors of the economy. The major difficulty in determining value of irrigation water for both annual and perennial agricultural activities and in ranking them is risk and uncertainty associated with the key economic and biophysical factors. Climate change can affect on rainfall, crop water requirement and available water for irrigation. Consequently these factors can affect on the value of irrigation water depending on crop and region. An analytical framework has been developed to estimate and compare the net value of irrigation water in both annual and perennial agricultural activities in different regions of the Murray-Darling Basin. Using Monte Carlo simulation, probability theory, and finance techniques, we estimated the combined impact of both biophysical and economic factors on the value of irrigation water use by the individual activities. Using ABS land and water use data we also estimated total value of irrigation water and the impact of drought in the NRM regions across Murray-Darling Basin, Australia.

Rajakaruna Mudalige, Manoj

A COMPARATIVE ANALYSIS OF PRODUCTIVE EFFICIENCY AND TECHNOLOGY GAP IN IRRIGATED AND RAINFED RICE FARMING SYSTEMS IN SRI LANKA: NON PARAMETRIC APPROACH

GO2 - Wednesday 10:30 am - 12:00 pm

This paper uses the data envelopment analysis for cross section survey data to analyse the production efficiency differences between irrigated and rainfed rice systems in Sri Lanka from two different perspectives; first relative to a common metafrontier, defined as the boundary of an unrestricted technology set and second relative to group frontiers defined as the boundaries of restricted technology sets in each group. Group frontier result shows no significant difference in production efficiency between the two systems. Rainfed farms move significantly towards inefficiency under the metafrontier. These results are further confirmed by the relative technical, allocative and cost gap ratios between the two systems. Truncated regression results show the importance of water availability, large lands, land ownership, quality seeds and family labour in improving production efficiency. We can infer from the results that irrigation development is significantly associated with efficiency.

Rifin, Amzul

THE EFFECT OF EXPORT TAX ON INDONESIA'S COCOA EXPORT COMPETITIVENESS

PS110 - Wednesday 10:30 am - 12:00 pm

The government of Indonesia implemented an export tax policy on cocoa beans since April 2010 to promote development of a cocoa processing industry. The objective of this article is to analyse the competitiveness of Indonesia's cocoa export using constant market share analysis. The results indicate that, with the implementation of export tax, the composition of cocoa export products shifted from cocoa beans to processed cocoa products. On the other hand, Indonesia's cocoa export growth is lower than the growth of cocoa world demand. In addition, Indonesia has higher export competitiveness on cocoa paste and butter and lower competitiveness cocoa beans, powder and chocolate.

Rogers, Abbie; Petersen, Elizabeth; Gibson, Fiona; Kragt, Marit; Pannell, David; Burton, Michael
NON-MARKET VALUATION: PRAISE, PROTEST AND PERFORMANCE IN ENVIRONMENTAL POLICY
GO5 - Thursday 3:00 pm - 4:30 pm

A vast literature exists on environmental non-market valuation (NMV) research. The large volume of academic research appears to contrast with the actual use of non-market values in policymaking. Here, we investigate how, when, and why NMV is used to inform environmental policy in Australia and New Zealand. NMV researchers were surveyed about studies they believed to have influenced policy. Then, decision makers were interviewed about the level of influence that NMV has or has had on their decisions. We examine potential reasons for the low uptake of NMV in policy, including: high cost or long time frames associated with original studies; concerns about the limitations of NMV; limitations of an agency's administrative process or capacity; and philosophical objections to monetising the environment.

Rolfe, John; Windle, Jill; Bennett, Jeff; Mazur, Katarzyna
CALIBRATION OF VALUES IN BENEFIT TRANSFER TO ACCOUNT FOR VARIATIONS IN GEOGRAPHIC SCALE AND SCOPE: COMPARING TWO CHOICE MODELLING EXPERIMENTS
GO5 - Wednesday 10:30 am - 12:00 pm

Two choice modelling studies in Australia involving river catchments and the Great Barrier Reef were designed to test for the effects of variations in geographic scale and scope on WTP values. The results show that increases in the amount of an amenity offered are valued positively and display diminishing marginal utility. Unit value estimates vary inversely with increases in the geographic scope, but marginal values for the same unit of environmental improvement could be several thousand times higher when only very small areas were considered compared to when the whole amenity was framed. These results confirm that calibration factors are needed in benefit transfer applications between different geographic scopes. A double log inverse relationship was identified between the ratio of quantities involved and the ratio of the WTP amounts to perform this calibration.

Santos, Adelson
SOCIAL TECHNOLOGIES: AN EFFECTIVE STRATEGY TOWARDS SUSTAINABLE RURAL DEVELOPMENT
GO7 - Thursday 8:30 am - 10:00 am

This research aims to describe the main social technologies created or adopted by rural communities in the municipality of Triunfo - PE, noting how they collaborate in the process of sustainable rural development. The preparation of this work adopted the hypothetical-inductive method based on the assumption that social technologies promote improvements in living conditions among rural communities through increases in opportunities for income generation. With this study it was characterized that the adoption of social technologies is related to a higher educational level and in that case, social technologies are developed, adopted and disseminated, leading to positive jumps in quality of life in rural communities. Moreover, it was found that such technological processes obey the logic of the concept of sustainable development by respecting principles of social equity and maintaining the quality of the environment.

Saunders, John
CONSUMER ATTITUDES AND WILLINGNESS TO PAY FOR ATTRIBUTES OF FOOD, IN PARTICULAR FROM NZ
GO4 - Friday 1:00 pm - 2:30 pm

For New Zealand (NZ) assessing consumer attitudes in global food markets is important to maximizing the value of exports. This study aims to assess consumer attitudes and preferences towards a number of food attributes and origins. These attributes include factors such as quality and safety but also animal welfare, environmental quality and recyclability and the willingness to pay (WTP) for these. The overall impact of the WTP for these attributes was estimated using the Lincoln Trade and Environment Model (LTEM). The study focuses on the UK, China and India using surveys of consumers stratified by social class or income. The LTEM was used to calculate the impact on NZ from the various WTP's. This study found that consumers valued the attributes positively. In many cases, India and China valued attributes more than in

the UK especially for environmental quality, animal welfare and recyclable attributes. The LTEM showed the impact on NZ producer returns was significant.

Sefriadi, Hasnah; Villano, Renato A.; Patrick, Ian; Fleming, Euan; Sefriadi, Hasnah

A STRUCTURAL CAUSAL MODEL FOR CACAO MARKETING IN WEST SUMATRA, INDONESIA

GO4 - Wednesday 10:30 am - 12:00 pm

Structural equation modelling was used to identify the determinants of cacao prices received by farmers in West Sumatra, Indonesia. Results revealed that the prices at the farm level were correlated with the marketing practices of farmers and marketing intermediaries (village buyers and wholesalers). On the farmers' side, "ability to meet required quality", "the main buyer" and "the distance from farmers' location to export point" directly influenced the farm-gate price. From the buyers' perspective, farm-gate price was affected directly by the selling price received by marketing intermediaries.

Singh, Rajinder; Beecher, Geoff; Sotheary, El; Sophal, Chuong; Desbiolles, Jacky

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

GO3 - Thursday 3:00 pm - 4:30 pm

In an ACIAR project, a survey of 150 farmers was conducted in the rain-fed lowland rice eco-systems in three districts of Takeo 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. The main findings show low adoption levels of direct seeding, mechanisation, or improved agronomic, irrigation and input practices. Increased adoption of these practices could lead to significant improvements in productivity and profitability on rice farms of the study districts.

Skirtun, Maggie

UNDERSTANDING THE DRIVERS OF PROFITABILITY IN TWO KEY COMMONWEALTH PRAWN FISHERIES

G07 - Friday 1:00 pm - 2:30 pm

This paper uses an index number profit decomposition approach to examine recent drivers of change in profitability in two key Commonwealth prawn fisheries. This approach allows the drivers of profitability that can be influenced by a fishery manager (fish stocks and productivity) to be separated from those that cannot (output prices and input prices). The results reveal that a divergence in the economic performance of the two fisheries has been the result of differences in productivity trends. These differences are the likely result of differences in fishery management arrangements between the two fisheries.

Spring, Daniel; Croft, Luke; Kompas, Tom

ERADICATION OF INVASIVE SPECIES AT LARGE SPATIAL SCALES: BENEFITS, COSTS AND RISKS

PS110 - Thursday 8:30 am - 10:00 am

Programs to eradicate invasive species at large spatial scales can have substantial benefits but also substantial costs and risks of failure. We conducted a benefit-cost analysis of Australia's largest eradication program, the campaign to eradicate red imported fire ants. Despite an increase in the cost of eradication due to recent spread, the program has large estimated net benefits. Costs can be reduced substantially by introducing a new, lower-cost surveillance technology but this depends on the probability of detection, which is imperfectly known. Limitations on the use of benefit-cost analysis as an evaluation tool for eradication programs are discussed.

Star, Megan; Rolfe, John; Donaghy, Peter

VALUING AGRICULTURAL POLLUTANT EMISSIONS FOR IMPROVED GREAT BARRIER REEF HEALTH: A CHOICE MODELLING CASE STUDY APPROACH.

G05 - Thursday 8:30 am - 10:00 am

Excessive pollutants from the grazing and sugarcane industries have been identified as having a detrimental impact on the health of the Great Barrier Reef. A number of natural resource management programs targeting on-ground improved management practices in both these industries have been implemented over the last five years. Although significant public funds have been allocated to improved agricultural management practices, the public benefit of these funds in achieving water quality targets is not well understood. This research undertook a choice modelling case study to investigate the public benefit of agricultural emission reductions and improved reef health. The research explored the methodological impacts of using labelled surveys, and differences in values between coastal and Brisbane populations. The results indicated that the values were more sensitive to the type of pollutant rather than the industry which generates it.

Stephan, Mary

TRENDS IN TOTAL FACTOR PRODUCTIVITY IN KEY COMMONWEALTH MANAGED FISHERIES

G02 - Thursday 3:00 pm - 4:30 pm

Total factor productivity indexes have been developed for five Commonwealth managed fisheries. Productivity estimates are calculated using the Fisher index method together with vessel-level financial and catch data. Where fish stock biomass information is available, estimates are also adjusted for changes in fish stocks. These results are part of ongoing work to develop a methodology that allows productivity estimates to be continuously updated as new data become available. Changes in productivity can provide information regarding the response of fishing fleets to policy settings and how changes in fish stocks, technology and fleet structure have influenced a fishery's economic performance.

Swamikannu, Nedumaran

TRADEOFF BETWEEN NON-FARM INCOME AND ON-FARM CONSERVATION INVESTMENTS IN THE SEMI-ARID TROPICS OF INDIA

G03 - Friday 1:00 pm - 2:30 pm

A dynamic crop-livestock integrated bio-economic model was developed and calibrated for a watershed village in the semi-arid tropics (SAT) of India. The model was used to assess the impact of improved access to off-farm employment on household welfare, land degradation and on-farm labour used for soil and water conservation to reduce run-off and soil erosion. The simulation results revealed that the improved non-farm employment opportunities in the village increases household income and welfare but reduces the household's incentive to use labour for conservation leading to higher levels of soil erosion and rapid land degradation in the watershed. This indicates that returns to labour are higher in non-farm than on-farm employment opportunities in the village. There appear to be no win-win benefits from improving access to non-farm income in SAT rained farming villages. Complementary policies are required to protect the natural resource base in rained SAT regions.

Tessema, Yohannis; Asafu-Adjaye, John; Rodriguez, Daniel; Mallawaarachchi, Thilak; Shiferaw, Bekele
FARM TYPOLOGY ANALYSIS FOR BETTER TARGETING TECHNOLOGY AND POLICY INTERVENTIONS IN SMALLHOLDER FARMING SYSTEMS UNDER CLIMATE RISK

G03 - Thursday 8:30 am - 10:00 am

Rainfall variability presents a major source of risk in smallholder farming systems. It is also well documented that smallholder farmers are risk averse. This has been manifested in low technology adoption and productivity, often leading resource poor farmers to remain trapped in a risk-adoption-poverty vicious circle. Thus, it is useful to classify households based on risk profiles in order to identify pro-poor technology and policy options that could break the nexus between risk averse behaviour, technology adoption and poverty. In this paper we present a farm typology analysis using a smallholder farm household survey in Ethiopia. The analysis draws on two districts, which have

contrasting climatic conditions. Principal component analysis based cluster analysis proved useful in identifying a set of farm typologies for developing bioeconomic models to evaluate adoption pathways to mitigate climate risks.

Thennakoon, Jayanthi; Anderson, Kym

ECONOMICS AND POLITICAL ECONOMY OF THE PROPOSED WTO AGRICULTURAL SPECIAL SAFEGUARD MECHANISM

PS110 - Wednesday 10:30 am - 12:00 pm

This paper critically assesses the proposal by some developing country members of the World Trade Organization for an agricultural Special Safeguard Mechanism (SSM). It does so by first analysing the economic effects and the political economy behind the SSM, and then by using an empirical model to estimate effects for rice in Indonesia. The empirical results confirm a significant negative association between the nominal assistance coefficient (NAC) and downward price spikes, and a significant positive association between the NAC and import surges. The results suggest that the larger a price spike or an import surge, the higher will be the rice NAC. The paper therefore provides insights into the possible adverse effects that the SSM would have if it is adopted. The paper also discusses the potential effects if not only food-importing countries but also food-exporting countries actively raise their rice NAC in response to a downward price spike.

Thomson, Russell

END POINT ROYALTIES AND THE PERFORMANCE OF AUSTRALIAN WHEAT BREEDERS (1976-2011)

G06 - Wednesday 10:30 am - 12:00 pm

Since 1996 Australian wheat farmers have been paying end-point royalties on deliveries of applicable varieties. The rate of end-point royalties levied by wheat breeders plays a potentially important role in determining the rate of adoption of new varieties, the profitability of private breeding programs, and the distribution of surplus generated by variety improvement programs. However, to date, little is known about how breeders determine the royalty rate charged. Using new data on all wheat varieties released in Australia between 1996 and 2011 we model the rate of end-point royalty on an array of cultivar performance attributes including yield, end-use quality and disease resistance. Our preliminary results suggest that yield is the most important determinant of the rate of end-point royalty levied, but that even controlling for these factors the rate of end-point royalties is increasing over time.

Tisdell, John; Iftekhhar, Sayed

INTERGENERATIONAL ISSUES IN LONG TERM LAND CONSERVATION CONTRACTS: AN EXPERIMENTAL ANALYSIS

G05 - Friday 8:30 am - 10:00 am

Effective land conservation strategies often require long term agreements with private landholders that may span generations. Previous experimental studies have focused on the intergenerational nature of common pool resources and found that, while participants exhibit altruistic behaviour, it is not sufficient to achieve the social optimum. In our experiments, participants choose between land use options with varying levels of payments, certainty and intergenerational consequences. It is assumed that participants will choose certain options over stochastic options depending on their risk preference and maximise their payout at the expense of others. The choice of altruistic behaviour is tempered by uncertainty surrounding the impact on future generations and the returns associated with agricultural land uses. The findings of the study have important implications for the design of future conservation programs.

Tisdell, John

PRIVATE LANDS FOR BIODIVERSITY CONSERVATION: REVIEW OF CONSERVATION COVENANTING PROGRAMS IN TASMANIA, AUSTRALIA

G05 - Friday 8:30 am - 10:00 am

To promote biodiversity conservation on private lands, conservation covenanting has become an important policy tool. Existing studies have focused either on economic performance of specific programs

or on ecological performances of a range of programs. There is a lack of comprehensive economic analysis of the private land covenants at wider regional level using long-term data, particularly in Australia. In this paper, we analyse the role of a range of institutional and ecological factors affecting two main attributes (size and financial support per hectare) of covenants in Tasmania, Australia. While project selection mechanism (tender vs negotiation) does not influence the average size of the covenant, the choice of a tender-based selection mechanism increased cost of securing covenants significantly. It is also found that covenants with an active management requirement may require a higher rate of incentive payment.

Truong, Trang; Vanzetti, David

STATE-OWNED ENTERPRISES IN VIETNAM: WELL-FED BUT STUNTED

GO6 - Friday 8:30 am - 10:00 am

The Vietnamese government provides state-owned enterprises (SOEs) favourable access to capital, including land. A large share of capital used by SOEs is supplied by the State. In 2001 this amounted to US\$35 billion in total, or 35 per cent of GDP. Any profits can be retained for reinvestment. SOEs could also apply for commercial loans, accounting for 18 per cent of total bank loans in 2011. However, the performance of SOEs is poor, according to results drawn from the annual enterprise surveys in Vietnam. Our analysis of the unbalanced panel of 328,116 enterprises over 2000–2008 shows that given the same amount of capital and labour, non-state enterprises produce significantly higher outputs than SOEs. That result suggests reforming the management of SOEs as well as accelerating the privatization process. This issue is highly relevant in the context of Vietnam's recent economic downturn and on-going negotiations of the Trans-Pacific Partnership.

Vanzetti, David

TRADE AND AGRICULTURAL EMPLOYMENT LINKAGES IN GENERAL EQUILIBRIUM MODELLING

PS110 - Wednesday 3:30 pm - 4:40 pm

Trade negotiators are frequently concerned about the possible negative effects of trade liberalisation on employment in specific sectors. The agricultural sector in developing countries has characteristics that make it different from industrial or service sectors. These characteristics are an informal labour force, low productivity, absence of regulations and a tie to land. These features affect adjustment costs. A global computable general equilibrium model, GTAP, is used to analyse employment and wage effects of trade liberalization in three developing countries — Indonesia, Bangladesh and Guatemala. The ability to fully utilize all resources, including labour, is important. The results highlight the advantage of a functioning and flexible labour market that can readily adjust to trade shocks.

Vieira, Simon

RECENT CHALLENGES TO IMPLEMENTING MAXIMUM ECONOMIC YIELD IN AUSTRALIAN COMMONWEALTH FISHERIES

GO2 - Wednesday 10:30 am - 12:00 pm

In 2007, the Australian Government implemented the Commonwealth Fisheries Harvest Strategy Policy (HSP). This policy requires that key fish stocks be managed under harvest strategies that pursue maximum economic yield (MEY). While it is generally accepted that the HSP has achieved a more strategic approach to fishery management decision making, meeting the MEY objective specifically has had mixed success across fisheries. This paper outlines some of the key constraints that have prevented MEY being successfully pursued and potential options to resolve these issues. It draws on the international literature and examples of MEY being applied in Commonwealth fisheries.

Wang, Huaiyu

NONFARM WORK AND ITS IMPACT ON TECHNICAL EFFICIENCY OF RICE PRODUCTION IN SRI LANKA

GO2 - Wednesday 3:30 pm - 4:40 pm

Non-farm work is becoming an important part of farm household activities in many Asian countries, and earnings from non-farm sources are increasingly contributing to total household income. The effects of non-farm work on agricultural productivity could be direct and indirect. The objective of this study is to

determine whether non-farm income affects technical efficiency of rice producing households in Sri Lanka based on primary data from 120 households. Results suggest that there is substantial potential to improve rice farmers' practices, and non-farm income reduces technical inefficiency at an increasing rate, i.e. farmers become more and more efficient as non-farm income increases.

Wheeler, Sarah

FARMERS' CLIMATE CHANGE BELIEFS AND ADAPTATION STRATEGIES FOR A WATER SCARCE FUTURE IN AUSTRALIA

GO1 - Wednesday 3:30 pm - 4:40 pm

Climate change is likely to require irrigators in the MDB to cope with less water, which will require ongoing farm adjustment. Possible adjustment strategies include expansive, accommodating and contractive on-farm strategies. Using historical surveys we provide a comparison of the consistency between irrigators' planned and actual on-farm water management strategies over the past fifteen years. We explore influences associated with farm adjustment strategies and, in particular, the role climate change beliefs play and the causal relationship between beliefs and behaviour. Those convinced that climate change is occurring are more likely to plan accommodating, but not expansive, strategies.

White, Benedict

TAKING A LONG HARD LOOK: AN ECONOMIC ANALYSIS OF INSECT PEST SURVEILLANCE

GO7 - Wednesday 3:30 pm - 4:40 pm

Managing major agricultural pests by coordinated area wide surveillance and eradication is an important strategy for managing agricultural pests worldwide. Underpinning area wide management is a surveillance grid that gives an early warning of the presence of the pest and may also provide evidence of its eradication. The optimal investment in a surveillance grid involves an assessment of the value of information. In turn the value of information is contingent upon the value of the crops protected, biosecurity rules and the actions at the regulators disposal. These issues are analysed with reference to Queensland fruit fly in Northern Victoria.

Whitten, Stuart

POLICY MIXES FOR LANDSCAPE OUTCOMES IN AGRI-ENVIRONMENTAL SETTINGS: HALLENGES, PRINCIPLES AND POTENTIAL FOR IMPLEMENTATION

GO4 - Wednesday 3:30 pm - 4:40 pm

Growing interest in coordinated landscape scale conservation actions to deliver the functional ecological connectivity across scales necessarily involves the private landholders who own or manage those tracts of land between conservation areas. Intervening tracts of land (the agricultural matrix) need to generate multifunctional outcomes: agricultural production, support ecological processes and ecosystem services, and buffering and core areas. This challenge is addressed in this paper by: 1. Reviewing existing literature on policy design for landscape outcomes, and 2. Comparing the proposed responses against a suite of managements that will be needed in different locations (and potentially at different times) to support landscape scale outcomes. The obvious conclusion is that a mix of policy mechanisms will be required to deliver landscape objectives. Some principles for an integrated policy mix are identified along with practical guidance for their implementation.

Wilson, Alison; Pannell, David; Kragt, Marit; Qureshi, Muhammed; Jakeman, Anthony

IRRIGATED PRODUCTION ADAPTATIONS: THE IMPACT OF WATER POLICY CHANGES IN THE NAMOI CATCHMENT, MURRAY-DARLING BASIN.

PS110 - Friday 1:00 pm - 2:30 pm

Agricultural users of surface water and groundwater in the Namoi catchment have received reductions in water allocations through the NSW Water Sharing Plans (2003), and further reductions are anticipated under the proposed Murray Darling Basin action plan (2012). Together these two policy changes may result in a water allocation reduction of between 10 - 35% for Namoi farmers. Irrigated crop production contributes an estimated half billion dollars to the Namoi catchment economy. A farm cropping model is

used to analyse irrigation adaptations and changed water management strategies, quantifying the effectiveness of adaptation to these water reductions at the farm level.

Windle, Jill; Rolfe, John

THE LIMITATIONS OF APPLYING BENEFIT TRANSFER TO ASSESS THE VALUE OF ECOSYSTEM SERVICES IN A PERI-URBAN, COASTAL TOWN IN AUSTRALIA

GO5 - Wednesday 10:30 am - 12:00 pm

In many countries, including Australia, the stock of economic value estimates for ecosystem services is limited and this restricts the application of benefit transfer. In this paper, the nonmarket economic values of four ecosystems (native vegetation, waterways, wetlands and coastal beaches) in an Australian peri-urban community are assessed using benefit transfer. Ecosystems in a peri-urban environment are generally fragmented and in a degraded condition, but can have very high values within the residential urban area. Three main limiting factors are identified. First, there is a general paucity of relevant source study estimates. Second, there is a need for scale adjustment factors so that source study estimates which are often assessed at a catchment or regional level can be adjusted to a small local council jurisdiction. Third, there is a need for some level of scope adjustment to account for the very high values of very small patch sizes, with low ecological value, within an urban area.

Wolbert-Haverkamp, Matthias

ARE SHORT ROTATION COPPICES AN ALTERNATIVE TO TRADITIONAL AGRICULTURAL LAND USE? A REAL OPTIONS APPROACH

PS110 - Thursday 3:00 pm - 4:30 pm

Short rotation coppice (SRC) is an interesting economic alternative to agricultural land use. Nevertheless, farmers often do not switch to SRC. Thus, it seems like the farmers do not act according to the classical investment theory. A relatively new approach which can help to explain farmers' reluctance is the real options approach (ROA). Compared to the classical investment theory, the investment triggers are shifted upwards. We want to answer the question of whether the ROA is an explanatory approach for farmers' reluctance to invest in SRC. To do so, we develop a model to calculate the investment triggers of the gross margins (GM) of SRC when a farmer would switch from rye production to SRC. The results show that the trigger GMs calculated according to the ROA are higher than those of the net present value, and a risk-averse farmer invests earlier than a risk-neutral farmer. It can be concluded that part of farmers' reluctance concerning SRC can be explained by the ROA.

Wright, Vic

FRAMING AND MANAGING THE ADOPTION OF PRACTICE CHANGE FOR NRM BY FARMERS.

GO3 - Wednesday 3:30 pm - 4:40 pm

Public good objectives have long encouraged governments to target farmers with propositions for change to their production practices. Initially attempts to accelerate the adoption of innovations that offer enhanced productivity, the propositions can now include change designed to enhance environmental stewardship. Coarse or incomplete specification of the costs and benefits of practice change, and of the whole process in which its promotion is embedded, impedes meaningful analysis. In this paper frameworks from marketing and organisational behaviour are applied to a case study to evaluate their possible usefulness.

Xayavong, Vilaphonh; Kingwell, Ross; Radhakrishnan, Manju

DEVELOPMENT STRATEGIES FOR A PREMIUM WINE REGION OF AUSTRALIA: AN APPLICATION OF VALUE CHAIN MODELLING

G04 - Thursday 3:00 pm - 4:30 pm

The wine industry in Western Australia, like its counterparts in some other wine-making regions across the globe, faces some interesting investment choices regarding the relative merits of expenditure on promotion or production, and whether export or domestic markets should be the focus for sales growth. This paper uses value-chain modelling to examine the economic consequences of investment scenarios

involving promotion and the enhancement of the productivity of premium wine grape production. A value-chain model is constructed that considers grape growers, wineries, wholesalers, retailers and exporters. The model is applied to estimate the economic ramifications of three different investment scenarios. The main findings are that promotion activity in overseas markets that stimulates premium wine grape production in Western Australia, generates the greatest economic gains for the WA wine industry.

Yang, Yuwen; Cullen, Ross; MacDonald, Ian; Hearnshaw, Edward

EVALUATION OF SELF-GOVERNANCE IN THE NEW ZEALAND BLUFF OYSTER FISHERY – AN INDICATOR SYSTEM APPROACH

GO7 - Thursday 3:00 pm - 4:30 pm

Self-governance of commercial fisheries by industry members is increasing in New Zealand and some other nations. Fisheries research literature has argued that self-governance can lead to improved fisheries management. Evaluations of self-governance must be subtle to distinguish self-governance impacts from other influences on fisheries performance. In this paper an indicator system is developed to evaluate the contribution of self-governance to the performance of the Bluff Oyster fishery (OYU5), which is itself managed under New Zealand's Quota Management System. We find some evidence that self-governance makes a positive contribution to economic efficiency, institutional effectiveness and resource preservation in the Bluff Oyster fishery.

Yi, Dale; Reardon, Thomas

THE EFFECT OF MARKET CONCENTRATION ON ALLOCATIVE EFFICIENCY: THE CASE OF INDONESIAN SHRIMP TRADERS

GO4 - Thursday 8:30 am - 10:00 am

The trade segment is playing an increasingly important role in overcoming logistic and information problems in global food value chains. However, very little is known regarding the performance of these agents. For this study, we analyse the performance of traders in the shrimp sector in Indonesia using stochastic cost-frontier analysis. The results show how the degree of concentration in the shrimp trade segment affects the efficiency of traders. In addition, we test for scale efficiency and also if different institutional arrangements with suppliers, such as vertical integration or contracting, affect the cost efficiency of traders. Results from the study inform policy makers on how industry structure affects performance and also inform industry on efficient scale and institutional arrangements.

Yi, Dale; Reardon, Thomas; Stringer, Randy

MODERN VARIETY ADOPTION AND INTENSIFICATION IN INDONESIAN SHRIMP AQUACULTURE: ARE POOR FARMS EXCLUDED?

GO3 - Wednesday 3:30 pm - 4:40 pm

Aquaculture is the world's fastest growing food production sector and these farming systems are undergoing major transformation as new high yielding varieties (HYVs) are being disseminated. However, little is known regarding which farmers are able to shift to aquaculture HYV, and which HYV adopters are farming most intensively. This study takes the case of HYV shrimp adoption in Indonesia. The objective is first to identify if farm households who are poor in land, capital, or public goods are excluded from adopting, and second is to identify if these poorer farms are constrained in intensifying their use of factor inputs. A system of factor demand equations for HYV adopters and non-adopters is estimated using a switching regression framework where the HYV adoption equation is used as the regime switching equation. Results from the study inform policymakers and donors regarding constraints to varietal shift, and also the constraints to intensification.

Zull, Andrew

IMPACT OF INCREASING CO₂ ON WHEAT PRODUCTION AND PROFITABILITY IN QUEENSLAND

GO1 - Thursday 3:00 pm - 4:30 pm

Increasing atmospheric CO₂ is linked to rising temperatures and changes in rainfall patterns; therefore affecting cropping profits and risk. We use APSIM (Agricultural Production Systems sIMulator) to compare

wheat production under current (1950-2010) and future (2050-70) climate scenarios, in five key regional cropping centres in southern Queensland (Emerald, Dalby, Roma, St George, and Goondiwindi). Future climate scenarios tended to increase wheat production and gross margins, and decrease the risk of negative returns. In St George (Qld), for example, the average crop yield increased by 8%, crop frequency increased by 4% and average annual gross margins improved by almost 50%, using current prices. Even with a 10% decrease in rainfall, crop production and economic returns tended to be better than under current climatic conditions.

Zull, Andrew

TOMATO PRODUCTION AND PROFITABILITY UNDER DIFFERENT CLIMATIC CONDITIONS

GO1 - Thursday 3:00 pm - 4:30 pm

Climate is a primary risk driver for horticultural production and profitability, which is likely to change with increased atmospheric CO₂ levels. Environmental conditions can directly (plant growth) or indirectly (pests or diseases) affect crop production. We conducted a survey of industry experts, to derive climate-production response functions for tomato growing in the Granite Belt, Qld. Nine response functions were derived: at planting, growing, and harvest stages with respect to rainfalls, min-, and max-temperatures. The response functions also allowed us to investigate current and future climate scenarios (proposed by CSIRO for 2050). Future production and gross margins (with current prices) for tomato growers in the Granite Belt are likely to increase by 18% and 37%, respectively, with little change to risk. This research can assist growers in current and future production decisions.

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