Panel: Water allocation and management issues in outback Australia

Panel Summary Paper

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Panel presentations:

Ward, J.R, Tisdell, J.G., Straton A. and Capon T. (2006). An empirical comparison of behavioural responses from field and laboratory trials to institutions to manage water as a common pool resource. 11th Biennial Conference of the International Society for the Study of Common Property, June 19-23, 2006,

Straton, A. and Ward, J. (2006). Aligning policy and real world settings: A theoretical and empirical analysis of the effectiveness of market based and community governance instruments in managing commonly shared water quality resources. 11th Biennial Conference of the International Society for the Study of Common Property, June 19-23, 2006,

Smajgl, A. and Heckbert, S. (2006). Simulating institutional dynamics in the context of water in outback Australia. 11th Biennial Conference of the International Society for the Study of Common Property, June 19-23, 2006,

Larson, S. (2006). What happens when the rules change? Stakeholder response to the new water allocation arrangements in outback Australia. 11th Biennial Conference of the International Society for the Study of Common Property, June 19-23, 2006

Abstract:

This panel investigates several aspects of water allocation and management issues in relation to agricultural practices in the outback Australia. The papers presented will discuss empirical issues, such as comparison of behavioral responses of stakeholders to variable policy instruments and comparison of the effectiveness of market based instruments and community governance in managing commonly shared water resources; development of the analytical tool for simulation of institutional dynamics in the context of water use; and stakeholder reactions to the change in water allocation arrangements.

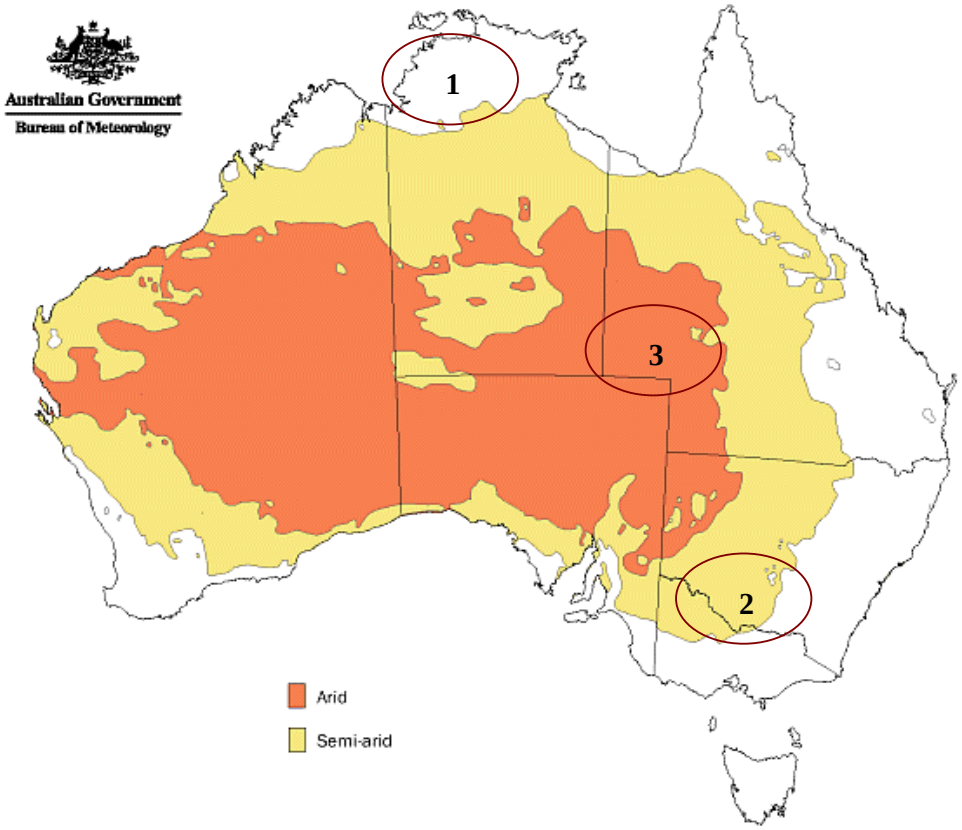
Keywords: water management policy, catchment management, Australia, IAD framework, experimental economics

Key characteristics of the Australian outback regions

The research projects presented in this panel investigate the impacts of institutional arrangements and property rights on water allocation and use in outback regions of Australia. The "Outback Australia" is a region hard to define, as it does not officially exist within any governmental frameworks or boundaries. The Australian Concise Oxford Dictionary (1992) defines "outback" as "*…remote and usually uninhabited inland districts, especially of Australia…*". The majority of Australians, however, simply associate outback with areas outside the major urban centers that have limited access (Herr, 2006), encompassing the majority of the Australian land mass. The outback is characterized by semi-arid and arid regions with erratic rainfalls, hot climate, savannah to desert landscapes, large distances between population centers and extremely small population density.

Both biological and socio-economic characteristics that define "outback" are closely correlated with the annual rainfalls. The ecological-climatic gradient in Australia is mainly associated with distance from the coast (Figure 1, from Herr, 2006). Coastal regions receive highest rainfalls, including the monsoon rains in tropical, northern regions of Australia, and have highest population and infrastructure density. Further from coast the landscape progresses from semi-arid to arid and the population density drops.

Figure 1. Australian arid and semi-arid regions and the panel presentations' locations



1 = Katherine - Daly river catchment, Northern Territory

2 = Coleambally irrigation area, New South Wales

3 = Georgina – Diamantina catchment, Queensland

Traditional key industries for the outback regions are grazing and mining. However, there is a mounting pressure for outback regions to explore options for diversifying the use of natural resources and the portfolio of products, in particular by diversifying into more intensive agricultural and irrigation developments (Holmes 1996). Growing national and international interest into the region is bringing the potential for the development of tourism, recreation and biodiversity conservation (Greiner and Larson 2004). The regions also face increasing demands by Traditional Owners for additional use and access rights (Jackson 2004, Larson, 2006a), and the potential new international markets for environmental services such as carbon sequestration and biodiversity credits are also being evaluated (Williams et al. 2004, Faith et al. 2003).

The institutional history of natural resources in Australia is closely linked to the colonisation. With the foundation of the Federal system of government in 1901, the constitutional division of power left most of the natural resources, including water, largely within the jurisdiction of the states. The ever-increasing demand for water in Australia from the start of the colonisation period in late 18th century to 1990-ties was met through growth in water supply through increased capture and development of water resources (McKay 2005), with no demand management. The growing concerns about rising scientific and anecdotal evidence of deterioration of the qualities and quantities of the waters in Australia gained the momentum in 1970-ties and eventuated in several key institutional developments in the early 1990-ties. The new era in water management approach was largely precipitated by shifts in paradigm offered by newly created institutional arrangements such as National strategy for the ecologically sustainable development (1992) and the Council of Australian Governments Water Reform (1994). The new frameworks promote markets for water entitlements to improve efficiency, but also promote allocation of water for environmental and social needs. Furthermore, since the Water Reform Agreement was signed in 1994, water institutions have evolved to include national and interstate concerns. The key goals of the Agreement are improving water quality and environment, refining water rights system and water allocation procedures, pricing water through independent review and promoting community participation (Department of Land and Water Conservation, 1997). The Water Reform Agreement serves as the constitutional-level federal framework for the development of State-specific frameworks directing the creation of choice-level rules.

This panel investigates several aspects of water allocation and management issues in relation to agricultural practices in the outback. The locations investigated in the papers vary from tropical-monsoon influenced northern regions of Daly River catchments in Northern Territory, to semi-arid regions of Coleambally Irrigation Area in New South Wales and the savannah and desert regions of western Queensland (Figure 1).

The papers investigate the varieties of issues, from the discussion on empirical issues, such as comparison of behavioural responses of stakeholders presented (Ward, Tisdell, Straton and Capon); to analysis of the effectiveness of market based and community governance instruments in managing commonly shared water quality resources (Straton, Ward and Connor); development of the analytical tool for simulation of institutional dynamics and ripple effects (Smajgl and Heckbert); and stakeholder reactions to the change in water allocation arrangements (Larson).

Summary of the panel presentations

The first paper to be offered in the panel investigates the validity of experimental results in the field compared to the laboratory trials with students. Ward, Tisdell, Straton and Capon use an experimental design that compares behavioural responses of irrigator and student participants to different institutions to manage water as common pool resource. The irrigators were drawn from land holders in the Katherine-Daly River Catchment in the Northern Territory of Australia (Figure 1). Participants in the experiments acted as farmers faced with monthly water demands, uncertain rainfall, possible crop loss and the possibility of trading in water entitlements. The design combines the use of an environmental levy with community involvement in the formation of group agreements and strategies to explore the impact of information and communication on water use in a complex heterogeneous environment.

The second paper in the panel, by Straton and Ward, also uses experimental economics, this time in the context of water use in the Coleambally Irrigation Area of New South Wales, Australia (Figure 1), to evaluate the durability and cost effectiveness of a novel set of formal rules and particularly their compatibility with existent informal rules. A rising saline aquifer in the Coleambally Irrigation Area, a corollary of water abstraction and irrigation application, constitutes a common pool resource, characterised by costly exclusion and rival utilisation for regional irrigators. The efficacy of both formal market institutions and group crafted voluntary social contracts to manage the common pool water resource are tested. The effectiveness and durability of a novel set of formal rules and entitlements will depend on the degree of integration with existing institutions and the capacity of mechanisms enabling people to adjust to new and changing circumstances.

Informal institutions are further evaluated and simulated in the third paper of the panel, by Smajgl and Heckbert. The paper investigates institutional dynamics and ripple effects of formal institutional changes using Katherine-Daly region (Figure 1) as the case study and translates field work results into an agent based model. In order to project ripple effects of institutional changes interventions in water access are assumed in an applied context. Core focus of the modelling exercise is the treatment of newcomers on a newly created trading scheme for water access rights. Simulations compare different options and how perceived risk of existing irrigators might change.

In the final paper of this panel Larson investigates the reaction of the stakeholders to the creation of a new set of arrangements for water allocation in Georgina-Diamantina catchment of Queensland, Australia (Figure 1). The paper presents a brief overview of the choice-level rule creation process followed by qualitative analysis of the stakeholders' reactions to the rule. As the outcomes on any action situation depend to the great extent on the evaluative criteria used by participants (Ostrom 2006), intrinsic valuation by stakeholders of interactions and the outcomes of the process are further discussed. The paper also presents potential outcomes of the application of the allocation rules at the operational level as a set of short narratives based of the filed work data collected during the study.

Conclusions

Commons of Australia are experiencing a rather dynamic phase, with several recent, current, or upcoming legislative, operational and management changes. The papers in this panel presented some of the issues being shaped by the changes. Both formal and informal arrangements are investigated, using various methodologies such as experimental economics, agent-based modeling and qualitative assessment techniques

We suggest that further investigation of institutional dynamics of Australian commons, and in particular the linking and relationships between within the system of institutions, ecosystems, society and economy, warrant further investigations.

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