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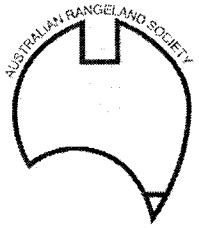

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IMPORTANCE OF FLOODS TO REGIONAL VIABILITY: STAKEHOLDER PERCEPTIONS

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ABSTRACT
This paper presents some of the results of a case study investigating stakeholder involvement in surface water planning processes in the joint catchment of the Diamantina and Georgina Rivers in central Queensland. Historic withdrawals and allocation arrangements with pastoralists and the mining industry have recently been formalised through the Water Resource (Georgina Diamantina) Plan 2004 and the draft Resource Operational Plan 2005.

This paper specifically investigates stakeholder perception of the role floods play in the viability of the region. The perceived importance of the floods to economic viability, ecological viability and social viability is discussed.

INTRODUCTION
Australia's 'Outback' regions have become the focus of renewed development interest from industry and political spheres. There is mounting pressure for outback regions to explore options for diversifying their use of natural resources and their portfolio of products. Diversifying into growing service industries such as tourism (Greiner and Larson, 2004; Greiner et al., 2004), more intensive agricultural and irrigation developments (Holmes, 1996), and potential new international markets for environmental services such as carbon sequestration and biodiversity credits (Williams et al. 2004; Faith et al., 2003), are seen as some options for growth in outback regions. These regions also face increasing demands by society for biodiversity conservation and by traditional owners for additional use and access rights (Jackson, 2004; Larson, 2006a).

The research project described in this paper is part of a larger project set up to investigate the impacts of institutional arrangements and property rights on water allocation and use in tropical savannas and desert regions of Australia. Interest in the Georgina and Diamantina catchments as the location for the case study was based on the water management related institutional change underway in the region (Larson, 2006b). As in many other countries (Saleth and Dinar 2004), this institutional change is more a result of purposive reform programs than natural institutional evolutionary processes.

The Diamantina and Georgina catchment is unique as it is a major tributary of the Lake Eyre Basin, the world's largest internally draining system covering an area of 1.2 million km^2, or about 18 per cent of the land area of Australia. The rivers of the Lake Eyre Basin have some of the most variable hydrological regimes in the world (Puckridge, 1998). The majority of rivers in Australian Outback are "dryland" rivers. Dryland rivers typically occur where annual rainfall is less than 500 mm and the annual evaporation rate exceeds rainfall (Sheldon et al, 2003). Both large floods, which breach the banks and cover vast tracts of land, and extensive droughts, where the water in the channel dries back to a few permanent waterholes, are features of Australian dryland rivers. Therefore, from a human perspective, dryland rivers are

often unreliable sources of water for development and water supply. However, the Diamantina and Georgina rivers do provide water for stock and domestic purposes in the region, while floods that inundate the floodplain provide essential grazing and nutrient movement for the pastoral industry (Larson, 2006b).

The key aim of the project was analysis of the Water Resource (Georgina and Diamantina) Plan 2004 and the Georgina and Diamantina Draft Resource Operations Plan using the Institutional Analysis and Development (IAD) framework (Ostrom et al, 1994; Ostrom, 2005; Ostrom, 2006), an internationally widely applied method for the analysis of common-pool resources. Findings of that part of the study are presented in Larson (2006b) and Larson (2006c). This paper specifically investigates stakeholder perception about the role floods play in the economic, ecological and social viability of the region.

METHODS

The first part of the research consisted of a desktop study of key documents related to water planning processes in the Georgina and Diamantina catchments, such as recently developed plans, information and background reports used to support decision-making during the planning process, documentation related to the consultation processes, the wider water and natural resources legislative framework and the strategic planning documents of regional natural resources management bodies and interface agencies.

The field research part of the study was designed to gain insights into the planning process underway. A total of 23 semi-structured interviews were conducted in 2005 with a variety of the water planning process participants; that is, representatives of government organisations, community groups and local stakeholders. Due to the large distance and sparse population of the area, the study concentrated on investigation of the local stakeholders in the Diamantina Shire only. The semi-structured interviews lasted around one hour and involved, firstly, the participant being introduced to the project by the researcher, followed by discussion on institutional arrangements for natural resources management in general. The interviews continued with discussions on planning processes. The reaction of the interviewee to the new rules proposed in draft resource operational plan and the likely future behaviour at the operating level were also discussed. Guiding questions for the semi-structured interviews are available in Larson (2006b).

RESULTS

Data collected during the field-work part of the analysis provides insights into the intrinsic valuation of water by the local stakeholders. This paper reports on the perceived importance local stakeholders assign to the periodic flooding by the Georgina and Diamantina rivers and the perceived potential for changes in flood regimes resulting from recent changes in allocation rules.

Economic viability

The grazing-based production system of the lower Diamantina and Georgina rivers is seen as dependent on floods as they revitalise the pastures by bringing both water and nutrients to the soils. Pastoralists in the region stressed the heavy reliance of their production cycles on natural floods of the Georgina and Diamantina rivers: "*Pastoralists depend on floods*"; "*Rivers feed us*"; "*Lower reaches of the rivers depend on nature; live with nature*". Therefore, the economic interest of the pastoralists in the area is to maintain the waters in the river - maintain the floods - rather than to extract it. The flood years are viewed as "good" ones, the years that allow for maximising profits. The floods are perceived as crucial for the continuation of farming and for wealth creation.

The perception of the tourist operators in the region was similar: "*If we lose floods we will lose tourists*". The perception is that what draws tourists into the region are the amazing dynamics of desert transformed by the floods and the ecosystems that develop around the floods, such as the proliferation of the bird life and flowers. Just like pastoralists, the tourist operators "*did very well*" during the flood years.

Ecological viability

The number, seriousness and variety of environmental concerns voiced by interviewees and related to changes in water allocation rules were overwhelming. Similar concerns were voiced by all sections of the community: town residents, Aboriginal people, pastoralists, tourism operators and service providers. The main concern of the interviewees was that the additional allocations of water in upper reaches of the rivers would have a negative effect on the ecosystem, in particular on the lower reaches. The link between 'ecosystems' and 'removal of water' was made by all interviewees and it was stressed by several that "*environmental values are important to people*".

An area of concern overwhelmingly expressed by stakeholders interviewed could best be grouped as 'Precautionary principle' concerns. The 'Precautionary Principle' is one of the key principles of sustainability: *"The precautionary principle permits a lower level of proof of harm to be used in policy-making whenever the consequences of waiting for higher levels of proof may be very costly and/or irreversible."* (EEA - European Environmental Agency, 1999, p278). Stakeholders were concerned about potential currently unforseen impacts that water withdrawals might cause in the future (*"Ecosystems here are very vulnerable, and very understudied"; "We do not know what is going to be affected")*, and particularly about a lack of catchment-specific baseline information upon which policy decisions were based ("*People do not know the science behind all this. Does the government?*"; *"This is a unique system and data translated (*from the coastal regions of Australia*) has little meaning in local conditions"; "We do not know enough about environment as it is.").*

Social viability

The floods are also perceived as important for the wellbeing of the regional population: "*Floods change everything and everyone, even people – everyone is happy*". The amenity value of wildlife was also noted as important and perceived as flood-dependent: *"Birds are important to people, just seeing them come with floods".*

The Aboriginal cultural value of the water was expressed as not restricted to specific geographical locations of spiritual significance, "*special places on the river*", but also encompassing the very presence of the water and floods. There was a concern that Aboriginal people appeared not to be recognised as using water: their stories, their culture and the important place water and floods play in those do not receive sufficient acknowledgment.

DISCUSSION AND CONCLUSIONS

The key concerns of stakeholders interviewed were in the area of economic benefits, environment, equity issues and monitoring. Stakeholders also appeared deeply concerned about the creation of a rule based on limited sets of baseline information available, particularly bearing in mind the fragility of the desert and semi-desert environments. Enforcement of the newly created allocation rules was seen as particularly difficult due to the extremely large area of the catchments and the properties, and poor to no accessibility to most parts of the properties. Concerns were voiced over monitoring of river flows and on-farm uses, ensuring accurate measurement of withdrawals, and monitoring signs of potential

negative ecological impacts. The feasibility of controlling and enforcing a complex system of allocations and trading in such a remote region was also questioned. Overall community perception of the planning proponent, the Department of Natural Resources, Mines and Water, is that the Department is "*strongly pro-development*" while "*community wants more natural processes to rule*".

As the region has extremely low rainfall, it depends on flood waters to bring seasonal changes in water flows and resulting changes in ecological and production systems. The sentiment therefore was that: *"The way river runs now should not change"; "Lower Diamantina needs floods"; "Floods feed the country"; "We want water in the river, we want floods"*; that *"Floods are not too often but they should flow"*; and that there *"Should be no water taken out in the first place"*.

One difficulty in performing state or nation-wide planning processes is that the resources tend to differ on key parameters from similar resources in the wider setting. In the case of expansive areas of Australian Outback, only limited sets of resource-specific knowledge and data are available and considerable uncertainties remain. Therefore, application of the precautionary principle and greater integration of local knowledge into overall knowledge systems have the potential to substantially improve outcomes.

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