

### Research Focus

## Federal hydrological systems at risk: the costs of diffused responsibility.

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Many major hydrological systems – Australia's Murray-Darling rivers and the Great Artesian Basin, the Colorado River and high plains aquifer in the United States, the Rhine River in Central Europe, the Ganges River system in India and the Yangtze in China – are totally or mainly contained within a single political unit. However, management responsibility for the various sections or sub-basins lies not with the central government but is divided for most purposes between the internal state, provincial and (in the case of the European Union) national governments. Uncoordinated roles and responsibilities, ongoing environmental decline and the erosion of resource security is the common result.

### Water – an open access resource

A major current research project at the Australian National University focuses on federal hydrological systems. Typically, the management of large cross-border rivers and groundwater aquifers in federal political systems is characterised by considerable intergovernmental and interagency conflict, low decision-making transparency and accountability, high transaction costs and ad hoc deals between competing sub-national

governments that undermine best-practice water management. When water managers are responsible for only part of a catchment, they are under pressure to favour the section for which they are accountable. This encourages them to export the costs of pollution or water shortages across borders wherever possible.

Cost benefit analyses are almost invariably conducted from the perspective of each sub-basin and not that of the whole biophysical region. Polluting industries are placed near downstream borders, economic activities of marginal benefit within borders are given preference over economic activities of much greater overall benefit on the other side of borders, and so on. Within each sub-basin, costs and benefits are highlighted but usually minimal information for the overall basin is collected. In these decentralised systems, data collection is usually organised by sub-basins, often with different units of measurement and auditing approaches. This makes comparisons and whole-of-basin aggregations to compare different approaches very difficult.

As a result, large hydrological systems which cross borders are highly exposed to the risks attached to what are known

as open resources. In 1968 Garrett Hardin published a short paper titled 'The Tragedy of the Commons' in which he argued that it was difficult to restrain over exploitation of common resources such as shared pastures, fish and water<sup>1</sup>. Critics subsequently nominated many examples of successful management of natural resource systems owned in common, and suggested that his thesis was more applicable to open access resources which lack any effective overarching institutional framework able to control and regulate the behaviour of would-be users as a group. In the case of an open access resource, it is in the interests of each individual user to expand their own consumption indefinitely because any restraint will only increase the volume available for their competitors. The eventual result is the complete destruction of the resource to the disadvantage of everybody.

That is the fate currently being experienced by most large international hydrological systems. Those within single federations, however, while they share many of the risk characteristics of international systems, have structures in place which could make it possible to avoid that fate. Although success has been limited so far, they still provide one of the most promising arenas for water management reform.

## The potential of a federal focus

Water is at the centre of many of the international debates about sustainability issues. To contribute to that discourse, this project will focus on a major element of that debate – the conflict between the competing pressures and arguments for centralised coordination and devolution. This tension will be investigated within the context of five federal systems, specifically the United States of America, Australia, Europe, India and China. This research will build on the investigation of the changing relationship between the Australian national government and the state governments over 150 years which was the subject of the author's *Water politics in the Murray-Darling Basin* published in 2007 by Federation Press. The management of cross-border hydrological systems within federations has some similarities with hydrological systems shared by two or more nations – such as the Nile, Tigris/Euphrates, Mekong, and Indus rivers. They are different, however, in that the existence of a federal system provides a strong framework with the potential to promote significant cooperation. (Unfortunately for the people who live in them – 40 per cent of the world's population – lack such a structure for coordination.)

Cross-border rivers and groundwater systems

provide the essential water supply for much of the population living in major federations such as Australia, the United States, Europe, China and India (For the purposes of water management, Europe now operates as a single united federation with the links between the central and national governments at least as strong as in any of the other federations under discussion.) In all of these federations, most large hydrological systems face declining environmental conditions and supply security according to a wide range of criteria. A major cause is incomplete institutional coverage of key issues, in part due to the arbitrary division of catchments into competing jurisdictions within these federations.

In most federations, water management has traditionally been a local or state function with central governments only becoming involved in response to increasing conflict. Even in China, a nation famous for highly centralised water management, the trend until very recently has been to decentralisation. However, there are many water management functions which require central coordination. In all the federations under consideration, there has been a struggle in recent years to get the balance right. The first task is to define the principles

that should apply. Second is the need to design institutions that can implement those principles. How can an effective system of devolution based on the principle of subsidiarity be implemented? The challenge is that the geographical and organisational division of roles and responsibilities needed to manage water effectively frequently does not match the division of roles and responsibilities existing within federal systems. This tension does not result in a stable ongoing cost. Because it remains unresolved, it causes increasing costs and the danger of eventual ecosystem collapse.

1 Hardin, G., 1968, 'The Tragedy of the Commons'.

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### Events

27-30 January, *Asia-Pacific Week* (with components on China, Japan, South Asia, Indonesia, Timor Leste and South Pacific)

10 February, *Environmental Economics Research Hub Annual Workshop* (Cairns, QLD)

### Publications

*Asian-Pacific Economic Literature*, Volume 22 Issue 2 (November 2008)

### Asia Pacific Economic Papers

No 374, *Competition policy in ASEAN: Case Studies*, Johannah Branson (December 2008)

No 375, *Will new trends in foreign direct investment change the structure of industry trade between Japan and China?* Tao Tao (December 2008)

No 376, *Should Australian Encourage Developing Countries to Adopt Competition Laws?* Henry Ergas (December 2008)

No 377, *Expansion Abroad and Jobs at Home: Evidence from Japanese Multinational Enterprises*, Nobuaki Yamashita and Kyoji Fukao (forthcoming)

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