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## **The Politics of Model Maintenance: The Murray Darling and Brantas River Basins Compared**

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**ABSTRACT:** This paper explores river basin management in two highly developed basins whose basin governance arrangements are currently undergoing transition: the Murray-Darling basin of Australia and the Brantas basin of Indonesia. Though basin-scale management has been longstanding in both of these cases and the respective models for carrying out integrated river basin management have been considered noteworthy for other countries looking to develop basin institutions, these basin-level arrangements are under flux. This paper indicates some of the difficulties that exist for even widely favoured 'textbook' cases to maintain institutional efficacy within their given shifting contexts. This paper explores drivers behind policy reform and change in scale at which authority is held, concluding with a discussion of the nature of institutional transition given political realities in these basins.

**KEYWORDS:** River basin management, governance transition, Brantas, Murray-Darling, Indonesia, Australia

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### **INTRODUCTION**

Water has a fundamental role in sustaining human and ecosystem health, livelihoods, agricultural and industrial production, and recreation. Allocating and managing limited quantities of water resources among competing interests are thus inherently an issue of key relevance in public policy. The development and management of water resources at the river basin scale has been historically connected with supply-side infrastructure development projects in support of regional economic development objectives, carried out through centralised arrangements (Molle, 2006).

However, more recently, in response to failures of sectoral approaches in addressing global water supply and quality issues (Lundqvist, 2000), integrated water resources management (IWRM) has been promoted as a prime objective in international dialogues, such as the United Nations Water Conference in Mar del Plata (1977), the International Conference on Water and Environment in Dublin (1992), and the Earth Summit in Rio de Janeiro (1992). IWRM is defined by the Global Water Partnership as "a process which promotes the co-ordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems" (GWP, 2000) and integrated river basin management (IRBM) has been widely accepted as the means for achieving these challenging objectives.

Among understood benefits of integrated river basin management are adjustable allocation, ability to conjunctively manage groundwater and surface water, comprehensive data collection, monitoring, and enforcement; accounting for social and environmental values within water allocation and management; greater participation; and reduced conflict. Consequently, the development of national and transnational basin institutions is being promoted worldwide to achieve IWRM objectives.

In Australia, the Murray-Darling basin's inter-jurisdictional governance arrangement, while complex, has received international attention as a coordinative and participatory model for river basin management. Aspects of the Murray-Darling basin's management features have also been a focus of comparative study for considering transposition in other country contexts. Notably, Shah et al. (2002), in an analytical review of many of these studies, expressed concern for the 'growth industry' that has

emerged from transferring lessons of success in IRBM from such 'textbook' cases of institutional reform as offered by the Murray-Darling basin case. They argued that there are inherent differences in the realities of hydrology, hydrogeology, demography, socio-economics, and the way in which the water sector is organised between developed and developing countries.

However, even within developing countries, there exists an industry of model transfer. In Indonesia, the Brantas basin's management features are a combination of a number of observed models in the West and some key management models found in other domestic sectors, so as to adjust to the Indonesian context. Its management model is expected to be duplicated in other 'strategic' basins in Indonesia. *Perum Jasa Tirta I*, the Brantas basin's river basin corporation, is furthermore an active participant in the Network of Asian River Basin Organisations (NARBO) through which information exchange, basin twinning, and benchmarking activities are undertaken to promote IWRM.

Molle (2008) providing his reflections on the workings of the water sector, cogently discusses the process of model promotion within the development industry. He sees models as directly reflecting underpinning paradigms in the field of development that are actively promoted and maintained through the use of policy narratives for purposes that serve powerful interests. This paper looks at the level of the models themselves, and considers how, once established, they must actively adapt to political realities on the ground, resembling a form of maintenance.

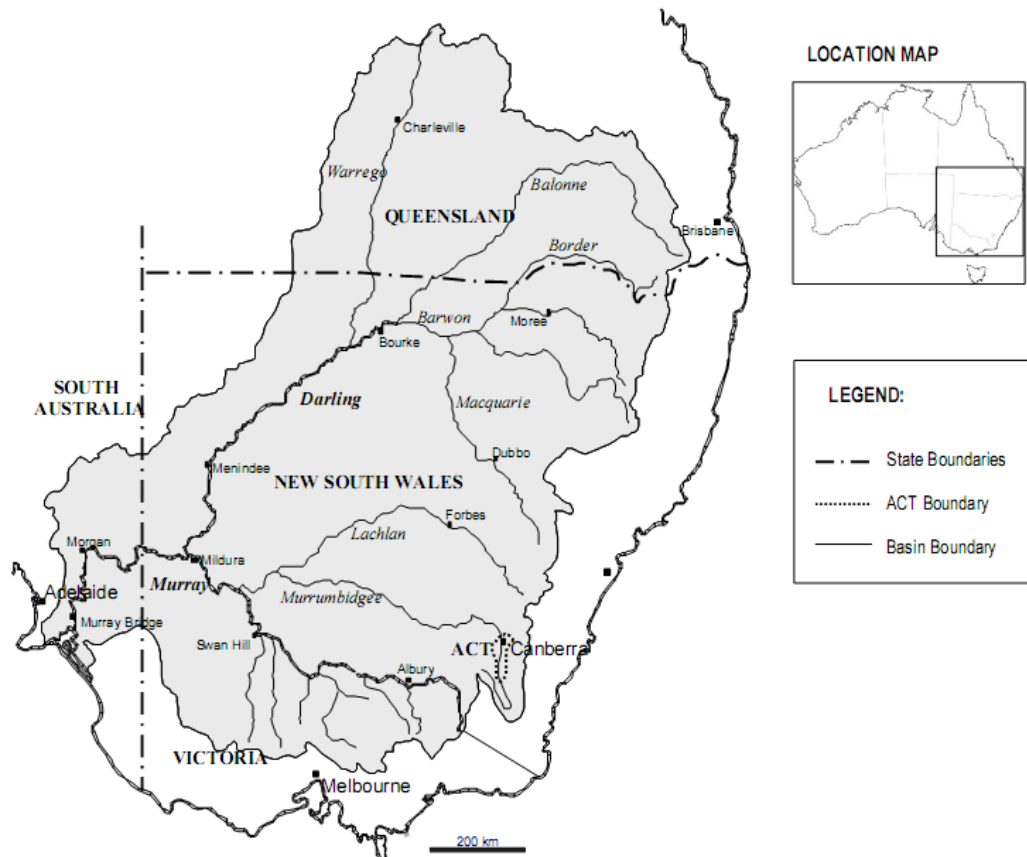
Though the governance models in the Brantas and Murray Darling river basins are highly developed, relatively long-standing, and have been considered noteworthy for other countries looking to craft basin institutions, they are being revisited and decisions have been made to bring control closer to the Central Government. This paper discusses the water resources governance structures in these basins as they had existed prior to the current reform processes and the features and priorities behind their development. The reform efforts currently underway are then discussed in terms of the circumstances under which they have arisen, illustrating the dynamism inherent in maintaining governance models.

## **BASIN MANAGEMENT**

### **Murray-Darling river basin**

The Murray-Darling basin in Australia covers an area of over one million square miles, divided between the states of New South Wales, Victoria, South Australia, Queensland, and the Australian Capital Territory (figure 1). This basin's name is taken from its two dominant rivers: the Murray river, which is 2,530 km long, and the Darling river, which is about 2,740 km long from its source to its confluence with the Murray river, making it the longest river in Australia. Though a vast basin, run-off is very limited and extremely variable. The Darling river, for instance, has total annual flows which range from 0% to 911% of the mean annual flow, or 2272 million cubic metres (Mm<sup>3</sup>) per year under current regulated conditions (MDBMC, 1987, 1995). Much of the basin is less than 200 metres above sea level (masl), making for extremely flat gradients. Rainfall varies, from 1200 mm/year at the top of the Great Dividing Range, to less than 200 mm/year in the western boundaries. There is a high level of evaporation in the largely semi-arid environment of the basin, varying from 1000 mm/year in the heights of the eastern mountain ranges to 2000 mm/year in the west. Rainfall exceeds evaporation in a very small area of the basin. With the flat gradients and high evaporation levels, several westward flowing rivers in the basin's centre end in deltaic wetlands systems, which have environmental management significance (Haisman, 2004).

Figure 1. Murray-Darling river basin, Australia (Source: MDBC).



To improve flow reliability for municipal and irrigation development, governments of the basin undertook dam construction, so that storage basins total some 34,500 Mm<sup>3</sup>, with usage averaging 10,684 Mm<sup>3</sup>/year (Haisman, 2004).

The basin's population of almost 2 million comprises 11% of Australia's total population. Its GDP is A\$23 billion, with A\$4.5 billion generated by irrigated agriculture. Around 40% of Australia's farm production and 85% of its irrigated agriculture originate from this basin.

Just prior to Australia's federation, the need to coordinate across competing interests in river navigation, rail, and diversions of newly emerging commercially based irrigation in the Murray river was sorely evident. These resulted in discussions between the then-colonies of New South Wales, Victoria, and South Australia to come to an agreement. The Commonwealth of Australia was constitutionally established in 1901, in the midst of a severe drought that lasted from 1894 to 1902, further prompting a greater level of coordinated action. The responsibility for managing water resources was assigned by the Australian Constitution to the states. The 1902 Corowa conference eventually led to a workable agreement between the three states and the Commonwealth in 1915 – the River Murray Waters Agreement – which entailed a package of water-sharing rules, jointly funded water development infrastructure, and cost-sharing rules.

In 1917, the River Murray Commission was created among North South Wales, Victoria, South Australia, and the Commonwealth to ensure that these riparian states received shares of the Murray river's water through the provision of capital funds for water development. It had representatives from each jurisdiction, usually the head of the relevant water agency. Initially, state agencies with construction responsibilities – which were not necessarily water agencies – carried out works assigned

to the state through the Agreement and were responsible for operation and maintenance of the structures under programmes and budgets approved by the River Murray Commission. The River Murray Commission was in operation for 70 years, with the River Murray Waters Agreement amended as needed to adapt to changing values and economic conditions. The powers of the River Murray Commission remained, nonetheless, focused on managing bulk water supplies for the main stem of the Murray river.

In the 1960s, problems related to land degradation and salinity became apparent. In the late 1960s, the River Murray Commission commissioned a study of salinity in the Murray river valley, and recognised the need to focus on issues of water quality. Each of the states attempted to resolve problems within their own jurisdictions. However, when this proved unsuccessful in addressing the problem (ABC, 2007), amendments were passed in 1982 and 1984 to change the focus of the River Murray Commission to incorporate issues related to coordination of water quality and limited land use in its water management responsibilities, while the states maintained their sovereign responsibilities within their tributary valleys in water resources development and water allocation. However, it was recognised that the River Murray Waters Agreement and Commission were insufficient to meet the basin's governance needs concerning issues such as expanding irrigation development in the upper states and consequential downstream flow impacts, especially on South Australia. In 1985, the governments of New South Wales, Victoria, South Australia and the Commonwealth met to discuss how best to address the basin's growing resource and environmental problems, resulting in the Murray-Darling Basin Agreement, and the Murray-Darling Basin Commission (MDBC) in 1988.

The MDBC took on the River Murray Commission's responsibility for trans-boundary water management, as well as new, but limited, responsibilities for coordinating catchment management across the whole basin. The new governance arrangements of the Murray-Darling basin included the Murray-Darling Basin Ministerial Council (MDBMC), the MDBC, and the Community Advisory Committee (CAC). Queensland and the Australian Capital Territory (ACT) governments were subsequently included within the Agreement provisions, albeit with different obligations than the initial partner governments. The MDBMC comprises three Ministers representing land, water, and environmental management from each jurisdiction, and is chaired by the Commonwealth, serving as the basin's policy-making body. The logic in creating the MDBMC was to provide a direct political link that could mobilise power and management to be able to achieve change quickly (ABC, 2007). The MDBC comprises two representatives from each jurisdiction to represent water, land and environmental resource management; and to serve as the executing body. The President of the Commission is appointed by the Council on the advice of the Commission, and serves as an independent Chair. The 28-person CAC was added, comprising 23 members from Catchment Management bodies and representatives chosen by each of five special interest organisations, who are appointed by, and report directly to, the Ministerial Council.

The MDBC office comprises the River Murray Water division and the Natural Resource Management division. The River Murray Water division has assimilated the role of the River Murray Commission, is a ring-fenced internal business unit handling bulk water sharing and operational control, and is also asset management coordinator as a sort of water wholesaler for the three riparian states of the Murray river. It has no say over how the states allocate their share, or of their operations or pricing, which are considered to be sovereign matters. The budget of the MDBC is shared through a formula by the states and the Commonwealth. The capital-funded projects of NSW, Victoria, South Australia, and the Commonwealth meet these costs equally, while the states handle costs for operations and maintenance according to a cost-sharing formula through which users of higher volumes pay a larger percentage. This is a dynamic policy through which use variation modifies shares. Funds are also contributed to particular programmes prioritised by the MDBC, which are then allocated to states and catchment bodies in accordance with agreed-upon strategies and plans. Both divisions outsource their work to state and catchment entities.

In Australia, the state governments hold sovereign powers over land, water and natural resources. State Ministries have authority for control and use of water, building, owning, and operating major dams on the rivers. They originally built the irrigation schemes of the states, but most of these schemes are now operated by state-owned corporations, with the government maintaining shareholder ownership. Assets are owned and operated by these corporations through operating licenses/plans. New South Wales, on the other hand, has privatised its previously government-owned irrigation schemes, all of which are situated within the Murray Darling basin. These schemes represent the major water users in New South Wales, and about 50% of total water use. The Commonwealth, as a signatory to international agreements on the environment, can use its external affairs powers for decision making on environmental matters, such as the Ramsar Treaty on Wetlands. It also holds powers for navigation as part of interstate commerce from the time of the River Murray Agreement's initiation, when the Murray river was largely used for navigation. During World War II, the states gave up their income taxing powers to the Commonwealth, and since then, the Commonwealth has collected income taxes nationally, distributing the revenue back to the states and territories in the form of grants and loans with general financial incentives to comply with national policy strategies. Through the Council of Australian Governments (COAG), in partnership with the states, the Commonwealth has policy development and coordinative functions with such influential policies as the National Water Policy Reform (1994). This water reform framework, formulated in response to rising concern over the state of Australia's river systems, sought an integrated approach through such strategies as water allocation to the environment, groundwater protection, institutional reform, and integrated catchment approach, among others.

The National Water Initiative (NWI), launched in 2004 with a schedule of implementation to 2014, extends the framework of the 1994 Council of Australian Governments, addressing and delivering the more difficult COAG water reform commitments where little progress has previously been made and instigating new commitments. The NWI has been agreed to by the Commonwealth and all state and territory governments, serving as an overarching policy framework to guide Australian water management. The NWI incorporates, among other things, integrated catchment management, tradable water rights, full accounting of resources and use, regional water planning, and environmental allocations (Hussey and Dovers, 2007; Stoeckel and Abrahams, 2007).

Other initiatives of relevance to the Murray Darling basin are the Cap and the Living Murray Initiative. In 1993, the MDBMC undertook an audit of the basin and found that the increasing rate of water diversions would lead to the decline of the river health and reduced security of water supply for irrigators within the basin. A cap on extractions of surface water was introduced in 1995 to prevent further growth in water diversions for consumptive uses. Caps have been established for New South Wales, Victoria, and South Australia. The Living Murray Initiative was established by the MDBMC in 2002 to help improve the health of the Murray river through recovering 500 Mm<sup>3</sup> of water for environmental use at six sites of high ecological value.

Local government in Australia within the basin is established and authorised by the state legislation.<sup>1</sup> Local government provides and operates water supply and sanitation infrastructure, often assisted by state funds, and provides for flood protection through local councils, according to regional plans, compliant with state standards, and with state financial assistance.

As each state and territory issues water use and discharge licenses and creates and authorises all forms of sub-basin organisations, each state has a different combination of water management organisations and roles. Generally, at the sub-basin level, catchment management bodies serve as coordinative entities, with responsibility for protection of both water quality and riparian and floodplain conditions. Although they have had a purely advisory role in the past, they now have formal statutory responsibilities, as well as funds to support the implementation of action plans. Meanwhile, the states

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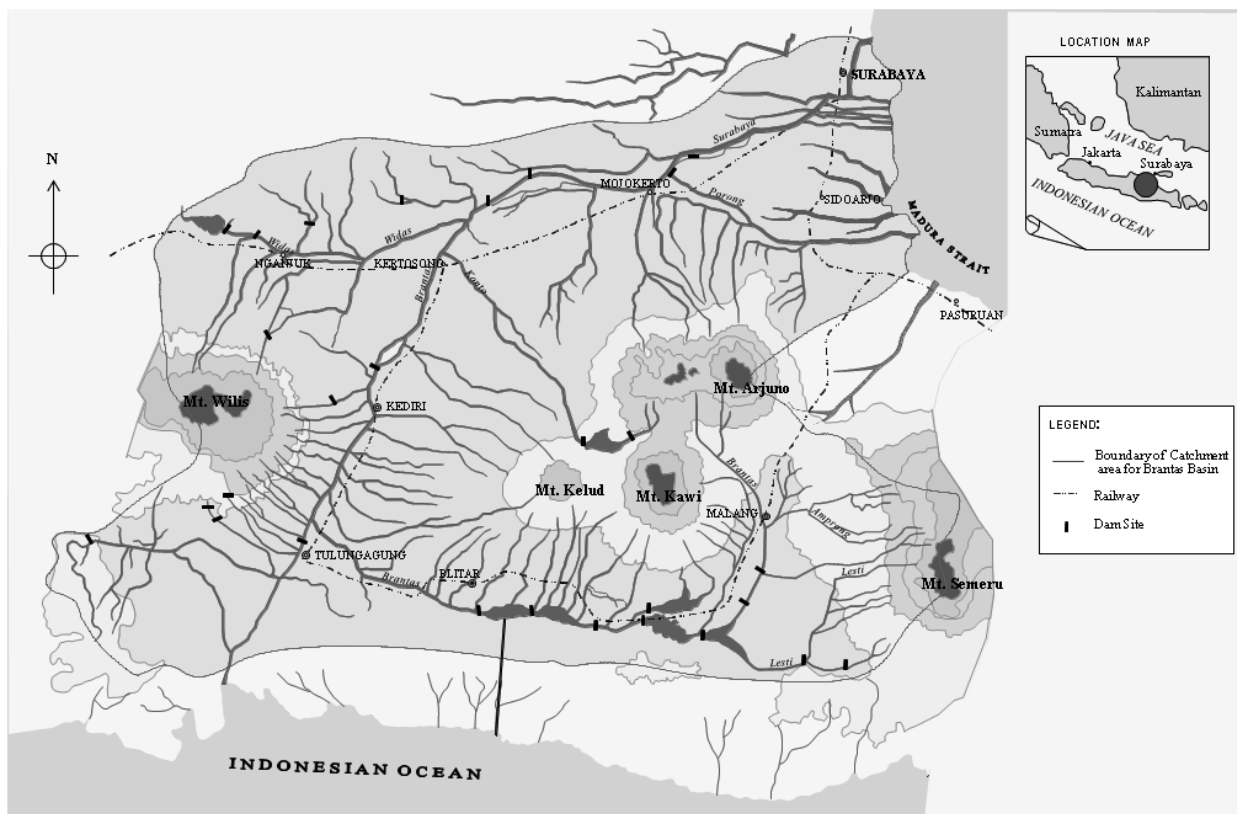
<sup>1</sup> With the exception of the Australian Capital Territory (ACT), where an ACT government body has responsibilities for water supply and sanitation infrastructure.

have specific legislation for riparian zone and flood plain-protection in addition to their respective Water Management Acts, and use these responsibilities to apply sanctions to catchment management bodies. Water Management Committees serve as advisory committees, providing a community perspective on water allocations and environmental flows, as well as flood protection, and river facility operations. Most states have provisions to serve as independent arbiters in setting water prices. Water user groups also play a community participation role, with financial assistance from the state, though they are generally more oriented toward the interests of their members and industry.

**Brantas river basin**

The Brantas river basin is located within the Province of East Java in Indonesia (see figure 2). With an area of approximately 11,800 km<sup>2</sup>, it makes up 25% of East Java’s land area. The Brantas river is 320 km long, with its headwaters located in the Arjuno volcanic massif, flowing clockwise through the Malang plateau, then through a major dam and reservoir complex before turning northward into agricultural plains and eastward to the delta.

Figure 2. Brantas river basin, East Java, Indonesia (Source: PJT I).



The basin’s tropical rainy season is from November to April, and its dry season is from May to October, with rainfall averaging 2000 mm, with over 80% occurring in the rainy season. Average rainfall in higher elevations is between 3000 and 4000 mm. There is a high level of rainfall variation from year to year, with rainfall averaging 2960 in wet years and 1370 mm in dry years, which take place once every 3 years, on average. The rainy season provides an abundant water supply for the river basin but water availability during the dry season is often barely sufficient to meet existing demand when instream water quality objectives are taken into account. In the high-consumption region below New Lengkong Barrage, including the delta irrigation system, the Greater Surabaya municipal area and a high

concentration of industries are particularly affected. Operations of sugar cane factories, which make up 33% of industrial water demand, take place in the dry season, leading to diversion of irrigation supplies to meet industrial demand during low-flow years, contributing to crop losses.

The average annual flow is 823 m<sup>3</sup>/s in the upstream reaches, 3859 m<sup>3</sup>/s in the midstream, and 5300 m<sup>3</sup>/s in the downstream area. In the basin, 447 deep wells irrigate 25,730 ha. There are 38 deep wells for raw water, supplying large municipalities with a significant portion of raw water. Rural water supply is mainly from nearly 27,600 shallow wells (Ramu, 2004).

The Brantas basin experiences flooding in its lower reaches due to flat slopes, encroachment of flood plains in rural and urban areas, as well as sedimentation. Flood-control infrastructure has been constructed to provide protection for return periods of 10 to 25 years. Prior to the development of flood-control mechanisms, nearly 60,000 ha of land used to be flooded annually.

A prominent source of sedimentation in the basin is the volcanic activity of Mt. Semeru and Mt. Kelud, which results in large quantities of volcanic ash. Mt. Kelud's eruptions every 15 years on average result in high sediment yields in the middle reaches of the Brantas river, adversely affecting the Wlingi and Lodoyo reservoirs. Mt. Semeru's continuous deposits affect the Sengguru and Sutami reservoirs.

In addition, a growing contributing source for erosion/sedimentation is wide-scale deforestation in the upper reaches of the basin to expand agricultural land use. This has subjected an estimated 18% of the basin's upper reaches to erosion, with detrimental impacts on reservoir infrastructure, water storage and power generation. The sediment depositions have decreased river discharge capacity for carrying high flows, requiring intervention measures to prevent yearly floods.

The Brantas basin is considered a strategic basin<sup>2</sup> of Indonesia and East Java. Comprising 24.6% of East Java's land area, it has 23% of the province's forest land and 55.8% of its arable land (Ramu, 2004). Of the arable land in the basin 38% is used for productive farming, while the rest is used for forest, settlement, and non-agricultural activities (Usman, 2000). The agricultural economy centres on paddy cultivation, nearly all of which is irrigated. In 2000, the Brantas basin made up 32% of East Java's total rice production and 5% of that of Indonesia. Aside from rice, important food and cash crops include maize, cassava, soybean, peanuts, tobacco, coffee, and sugar cane. The basin's population of nearly 15 million makes up 42.4% of East Java's population (2000). Surabaya, as a major industrial city and port in the basin, itself has a population of 2.5 million. Given Surabaya's economic relevance, the basin's industrial production comprises 77% of East Java's industrial production. With the GDP having grown 225-fold in the past 30 years, there are consequential increases in water demand (Ramu, 2004). Due to its importance to the national and regional economy, the Brantas basin has been subject to the Central Government's attention for decades. The Brantas River Basin Development Project was created in 1961, focusing on infrastructure solutions for water resources management challenges encountered in the basin. The Brantas Project existed until recently, funded fully by the Central Government for infrastructural development, rehabilitation, and maintenance.

With flooding being such a devastating problem in the basin, flood prevention was given first priority in the initial stages of the Brantas basin's development. Prepared and implemented using Japanese post-war reparation funds, the Brantas basin's first master plan, prepared in 1961, promoted the concept of "one river, one plan, one coordinated management". It consisted of large technical developments, such as dam structures, flood diversions, retarding basins, and river-bed channels. The Brantas Project, a basin-scale agency for infrastructure development was established by the Ministry of Public Works to carry out these efforts in the ensuing decades.

It was not until the 1990s that the sustainability of infrastructure investments was fully acknowledged as having fallen short due to a lack of incentives for the Brantas Project to carry out

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<sup>2</sup> A basin is considered 'strategic' by the Ministry of Public Works on the basis of such general factors as its potential for water resources, inter-sectoral uses, basin population, environmental and social impacts of management, and disaster-related issues. However, the specific criteria are not clear, and are anticipated to be elucidated in the forthcoming implementing regulation on Water Resources.

maintenance activities. A different approach was sought, leading to the establishment of the *Perum Jasa Tirta I and II* (PJT I and PJT II), State-owned companies (BUMN) responsible for carrying out operation and maintenance of river infrastructure.<sup>3</sup> These two companies embodied different models. PJT I was established as a concession for bulk water supply, as well as to operate and maintain key infrastructure in the Brantas river. PJT II was established in West Java's Citarum basin as an authority responsible for 240,000 ha of irrigation networks down to the tertiary outlets.<sup>4</sup>

In the Brantas basin, PJT I functioned independently of the Brantas Project. The establishment of basin institutions reflected a national interest in integrated development and management of water resources, including a shift in the mindsets of Indonesian administrators embodied in Indonesia's second long-term development plan (1994-2019), endorsing a multi-sector approach. This plan also promoted the transfer of authority and responsibility for irrigation management to district and provincial levels as part of the government policy to increase regional autonomy, while water allocation among irrigation and other uses serves as the primary function of basin management (Ramu, 1999). It was at this point that Indonesia began setting up national policies towards organising institutions with integrative functions along hydrological boundaries.

In 1993, at the national level, a Ministerial Decree was passed to form the Basin Water Regulation Committee (PPTPA). In 1996, the Provincial Basin Water Resources Management Units, or Balai PSDA, were established as technical implementation units of the Provincial Water Resources Development Service. They had responsibility for schemes crossing district boundaries; water allocation for various needs; rivers, lakes, dams; flood control and drought mitigation; swamp scheme operation and maintenance; water pollution control monitoring; and coastal protection, estuaries, and delta management. It was also to undertake basic hydrological data collection, water quality sampling, maintenance of river infrastructure, and operational aspects of water allocation and abstraction compliance as determined by the Governor. All river basin territories in Indonesia (90 at the time) were to have a Water Resources Management Unit (*Balai PSDA*) established, as well as a PPTPA.

PJT I manages water supply allocation, water quality, flood control, river environmental management, and water resource infrastructure for 40 rivers, constituting the majority of significant water resources in the basin. The remaining secondary, tertiary and quaternary rivers are maintained by the province through the Balai PSDA if they are cross-district, and by the District Water Resources Service Office if they are within the district boundary. PJT I serves as a bulk water supplier and allocator to the irrigation systems served by the basin rivers under its mandate; the rest are served by the Balai PSDA or the District Water Resources Service Office. PJT I is responsible for operating, maintaining, and managing hydraulic works, flood control infrastructure and the flood- warning system for rivers under its mandate. It also takes care of dam safety assurance for particular reservoirs. PJT I additionally participates in the management of catchments, though not in a substantial way.

PJT I is expected to turn in a profit to the Ministry of Finance, while supporting its operations through water supply fees from industry, through hydro-power units through the river's dams, and through municipal suppliers (but does not have to repay or account for depreciation on the capital cost of infrastructure). Farmers, the largest water user group and largest consumer of developed water supplies, are exempt from paying for irrigation water delivery.

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<sup>3</sup> PJT I was originally established as *Perum Jasa Tirta* ("PJT") in 1990 by governmental regulation. PJT II was established in 1976 as the Jatiluhur Authority Corporation ("POJ"), modelled after the Tennessee Valley Authority, but evolved into the Jatiluhur Water Management Corporation by 1990, a basin operating agency with a large irrigation system, combining both water resources management and water use management. (Ramu 1999) In 1999, the legislation for both the PJT and POJ were revised to bring them under the Finance Ministry, and their names were changed to PJT I and II, respectively.

<sup>4</sup> PJT II has historically had a different structure as its multipurpose canals supply irrigation, industry, and Jakarta water supplies, making separating water use management and water resources management difficult. Irrigation in the Brantas is not directly from the river, making it possible to simply manage water resources, leaving irrigation management to be handled by Provincial- and District-level Governments.



Macro-level planning, programming, and budgeting for water resources management take place through the National, Provincial, and District Planning Boards. The Ministry of Public Works, with its Directorate General of Water Resources, has supervised PJT I's management and functions, and has provided PJT I with technical guidance concerning aspects of river basin management. District-level government provides support for operational matters, providing enabling conditions at the local level for PJT I. The Ministry of Finance sets tariffs for hydro-power users, while the Governor, who serves as the President's representative in the region, sets tariffs for municipal and industrial users, and the Minister ultimately proposes the rate by regulation, further signifying the Central Government's continued influence on fiscal aspects of basin management. PJT I thus has no control over the tariff of its bulk water supply services and its revenue is controlled by water rates fixed by political-economic considerations.

Management of PJT I is through a Supervisory Board with a President Director assisted by three Directors. Its structure indicates ministerial authority over its affairs, which is typical of Indonesian State-owned corporations. The President Director and Director positions are appointed by the President on the recommendation of the Ministry of Public Works. The Supervisory Board, which is answerable to the Ministry of Finance and Ministry of Public Works, carries out the general supervision of the corporation, including implementation of its work plan and annual budget. Every 3 years, two to five members are chosen to sit on the board from the Ministry of Public Works, Ministry of Finance and agencies whose activities are related to the corporation. The Supervisory Board is appointed by the President on a proposal from the Ministry of Public Works, cleared by the Ministry of Finance. The Governor of East Java also sits on the Board. The power of the Supervisory Board as stipulated in the regulation ensures a degree of management autonomy to the basin agency. Nonetheless, it is apparent that given the Supervisory Board's structure and the fact that PJT I's infrastructure O&M costs are subsidised by the Ministry of Public Works, that this ministry has wielded considerable influence over its operation.

The economic crisis of 1997 and the collapse of the New Order Government shortly thereafter led to the expedited development of two key laws in 1999, promoting the devolution of authority and finances from the Central to the District-level Government. The Central Government also launched a strategy of policy and institutional reform based on macro-economic management, financial and corporate restructuring, protection for the poor and preservation of human assets, and reform of economic institutions (Ramu, 2004). The International Monetary Fund restructuring programme had the participation of numerous donor institutions. To continue to improve water-sector performance, a major sector-reform programme was initiated under the Water Sector Structural Adjustment Loan (WATSAL) project supported by the World Bank. Its objectives were improved policy, legal and institutional approach and an MIS/Database framework; improved river basin management institutions; improved water quality management institutions; and improved irrigation management institutions based on farmer participatory approach. As a three-tranche, \$300 million loan at a critical time, WATSAL had the potential to greatly influence policy formulation. Its reform agenda was supportive of the notion of river basin corporations that are run in the manner of PJT I, and plans were underway to create river basin organisations as State-owned public corporations or branches of PJT I in Serayu Bogowonto (Central Java), Jratunseluna (Central Java), and Jeneberang (South Sulawesi). With strong performance, it was expected that *Balai PSDA* could become province-owned corporations, and that PJT I could be upgraded from *Perum* to *Persero* status.<sup>5</sup> The Water Law, passed in 2004, was supportive of many of the WATSAL reform ideas.<sup>6</sup>

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<sup>5</sup> *Perum* organizations (State-owned companies) manage public goods, while *Persero* organizations (limited liability companies) manage economic goods. *Persero* are permitted to generate profits to use for capital improvements, and to establish joint ventures with the private sector.

<sup>6</sup> The Water Law and associated regulations did not support some key aspects of WATSAL, including irrigation management transfer, having a sector apex body not under the control of the Ministry of Public Works, nor a solid legal basis for dealing

## POLICY REFORMS TO CENTRALISE AUTHORITY

### Murray-Darling

The series of reforms undertaken since the creation of the MDBC to change water resources management has resulted in gains in terms of salinity reduction, biodiversity, and importantly, controls over extraction levels. A combination of hydrological conditions and the initiation of salinity abatement projects led to a decrease by over 20% in average salinity levels in the river in South Australia by 1999 (The Economist, 2007). Fish ladders around dams and, to a greater extent, weirs, and the release of water into breeding grounds have allowed for the recovery of some native species. The MDBC is spending A\$650 million to increase environmental flows, largely by addressing losses from irrigation. Water trade is well underway in the basin, with markets in several states maturing and interstate pilots initiated. Though there have been successes, progress to fully achieve the objectives of key MDB programmes, including the Living Murray Initiative, the Cap and the National Water Initiative, collectively among basin partners has been slow.

Changes to the hydrologic flow regime through conservation of water in headwater dams and then the regulation of flows, coupled with over-extraction in the basin are key causes of environmental degradation in the basin, and have created threshold situations at which the health of ecosystems has declined. Dry-land- and irrigation-induced salinity continue to be problems despite gains, as does over-allocation and underpricing of water, and inefficient water use (Scanlon, 2006). In a system that has lower quantities of water flowing through it due to long-term drought – considered to be the worst in recorded history – these problems are exacerbated. Inflows to the Murray river have fallen to less than half of their long-term average over the past 6 years (The Economist, 2007).

A number of problems with the current structure of the MDBC and MDBMC have been recognised. The unanimous decision-making structure of these bodies is understood to be ineffective for times when hard decisions must be made, as any decision perceived as going against a particular state's interests can be vetoed. The original intention of creating a Ministerial Council with authoritative ties to the political structure was to assist in expediting significant political decisions. However, it is not implicit that members are willing and able to place the basin's interests over that of their own jurisdiction in making hard decisions (Connell, as cited in ABC, 2007).

Also problematic has been that state non-compliance on policies set by the MDBC, particularly policies as serious as the National Water Initiative, are effectively unenforced as the MDBC, an advisory body, cannot withhold water to offending states, relegating it to 'naming and shaming' due to the relative independence of the River Murray agreement and agency. The power to take action rests with the respective states that are expected to report on action taken to address the problem. However, if there is an attitude of shared non-compliance among the states, this nullifies the objectives of the MDB Agreement.

Another issue often discussed to be of concern regarding the MDBC and MDBMC are the high turnover rates of leadership. Basin states have a fragmented electoral cycle, with South Australia, Queensland, and the Federal governments not having fixed election terms, while New South Wales and Victoria have four-year terms. With an election taking place at least every 12-18 months, there is high turnover among Ministers and Commissioners, making sustained leadership on issues a challenge. The issue of high turnover rates is also of recent concern within the states' agencies, which have had a revolving door to the private sector under restructuring.

Don Blackmore, a former Chief Executive of the MDBC, while still serving in this function in 2001, pointed out that the MDB Initiative requires strong political support from the states to refrain from reverting to the narrow focus of its predecessor, the River Murray Initiative. Without strong political

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with environmental water needs. The reform conditions for the third tranche of WATSAL were not fulfilled, and the tranche was not paid.

support for the protection of natural resources at the basin scale, given the unanimity decision-making structure, high turnover rates, and its mere advisory role, the MDB's only real role becomes that of a bulk water operator. Though major gains have been achieved through bipartisan support for the activities it has undertaken to date, Blackmore points out that it will not be possible to continue to deliver 'win-win' outcomes for all states in the future, and a drastic change in the understanding of gains at hand will be needed to address the serious problems of drought, salinisation, and environmental degradation in the basin (Connell, 2007).

Peter Cullen, a member of the MDB CAC and a Commissioner of the National Water Commission, in a 2004 review of the MDB's inter-jurisdictional institutions assessed that from early on in the MDB's history, the Commonwealth has had the view that the MDB usurped its role to coordinate and lead change within the basin, and that at a critical juncture in the development of the MDB's programming, the Commonwealth undermined it by channelling new funds for natural resources programming directly to state agencies, and sometimes directly to community groups, rather than through the Commission's multi-government processes, instigating an 'unholy alliance' between the states and Commonwealth, whereby their bilateral deals served to disempower the Commission's coordinative, oversight, and quality-control roles (Connell, 2007).

With wide recognition of the list of problems, as part of an A\$500 million funding by the Commonwealth to the MDB to ensure that current initiatives could be completed, a review of the MDB Agreement was required and undertaken in 2006 to evaluate how best to make the MDB Agreement compliant with the NWI, and what governance models would be better suited to meeting the basin's future challenges. The conclusions indicate that the NWI actions could have been implemented under the Agreement with some modifications to the Murray Darling Agreement, which was a view supported by the majority of the states (Dyson and Martin, 2006). However, given an upcoming election in late 2007-early 2008, the Prime Minister eventually considered these conclusions to involve too modest an approach, and preferred to introduce a much more major reform, the National Water Security Plan.

In January 25, 2007, Prime Minister John W. Howard announced a 10-point, A\$10 billion plan at the National Press Club. Among outlined objectives, the new National Water Security Plan will involve the creation of a new institution, the Murray-Darling Basin Authority, with comprehensive responsibilities over water resources management in the basin. These include investment in more efficient irrigation technologies, creating a unified database to access more locally specified data to set a new cap on extractions, and purchasing water rights from irrigators willing to sell. As initially announced, for the Commonwealth to take on these tasks, the funding package would be conditional on the states referring their authority for water resources management to the Commonwealth.

The imminent election served as a political window for proposing a bold policy reform package to "fix a great national problem" (Howard, 2007), urgently seeking to address the very palpable long-term drought facing the country. The Commonwealth's preference to serve as coordinator and leader of basin water resources management over the MDB is bolstered by claims that its comprehensive approach will better serve the objectives of IWRM, overriding competing interests and the piecemeal approach to management that characterised the inter-jurisdictional model. It is posed as a solution to solve over-allocation "once and for all".

However, given the level of variation among the states in irrigation activities, usage, and water management regimes this comprehensive approach was not uniformly embraced. Victoria's irrigation is based on horticulture and dairy; thus, it has a conservative approach to allocations, requiring higher security allocations<sup>7</sup> than irrigators in New South Wales, who farm more opportunistic annual crops, such as rice and cotton, which can bear a loss in a given year. To supplement their high-security water, Victoria uses a water market system that allows for sales of water over and above the use right, providing an extra source of less reliable water. With their more conservative position on water

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<sup>7</sup> Victorian irrigators expect full allocations 96 years out of 100, and the worst rainfall modelled at 40% (Haisman, 2004).

allocation, Victorian irrigators and government were fearful that a water allocation system managed by the Commonwealth would disturb their particular institutional arrangements for water sharing and operational and planning decisions.

With political pressure to move a major reform forward, the Commonwealth drafted a new Bill that would allow for the creation of the MDB Authority under the auspices of its existing responsibilities to uphold international treaties, such as the Ramsar Treaty for Wetlands Protection. Thus with the new proposed Bill, they did not have to seek referral from all the states and, in turn, without this referral, they would not have comprehensive authority over basin water resources. The Commonwealth's previous negotiations with New South Wales, South Australia, and Queensland to provide financial compensation to their states for impacts of the new policies were altered to merely comply with the terms of the National Water Initiative. The Commonwealth administration indicated that *all* of the states would have to sign an intergovernmental agreement referring their powers to the Commonwealth in order to receive the compensatory terms.

### **Brantas**

In late 2006, the Ministry of Public Works (MPW) passed a series of implementing regulations in support of the new Water Law. Among these was a Ministerial Regulation creating a new governmental institution within an MPW line agency to be established in all river basins of Central Government jurisdiction, called the Balai Wilayah Sungai (BWS) or the Balai Besar Wilayah Sungai (BBWS), depending on its size and strategic importance. It would manage water resources within an administrative jurisdiction comprising a main river basin and any smaller surrounding ones. These are legislated to hold a comprehensive range of responsibilities for water resources management, and provided some level of confusion towards the previous notions and plans for developing of water services provision through a public corporation.

Another implementing regulation classified irrigation areas in a manner that gave the Central Government authority of those larger than 3000 ha, while provinces would have responsibility for those about 1000-3000 ha, and districts would have responsibility for those less than 1000 ha. This new regulation ran counter to efforts promoted by WATSAL to devolve responsibility for irrigation areas to water user associations that are now considered to be 'participating' in irrigation management, as opposed to being responsible for it and its possible transfer.

A third reform that came forward in the form of an implementing regulation was the redrawing of basin-level jurisdictions. Previously, Indonesia's 5590 rivers were grouped into 90 river territories by Ministry Regulation in 1969 for purposes of river-basin planning, management, and development. Of these 90 territories, 17 were considered to be under national jurisdiction for being cross-provincial (15) or 'strategic' (2). Since the new Ministry Regulation passed in 2006, there are now 133 territories, of which 69 are under the jurisdiction of the Central Government for being cross-national (5), cross-provincial (27), or strategic (37). Meanwhile, 51 of these are now under provincial jurisdiction, and 13 belong to the district.<sup>8</sup> This means that provinces that had previously managed water resources within basins in their provinces have had their authority suddenly transferred to the Central Government. A number of provinces are not happy with the new categorisation scheme for its 're-centralisation' of authority under the auspices of the 'strategic' definition.

The implementing regulations reflect bureaucratic interest in maintaining and expanding budgets in the face of the decentralisation actions since Indonesia's economic, political and administrative reforms, including both the Decentralisation Laws and WATSAL.

Additionally, in 2003, the Finance Ministry passed legislation requiring that projects be folded into a permanent body within institutions for budget management purposes. Thus, Ministries with projects

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<sup>8</sup> It can be noted that the classifications put forward in the new regulation had been included in the Elucidation to the 2004 Water Law, but without detailed definition of 'responsibility', leaving the implications for financing, ownership of assets and operation and maintenance to be worked out.

had to develop new bodies to fold them into. The MPW thus developed BWS/BBWS in response to this. The MPW also wanted to exercise greater control over water resources management than is possible by giving the PJT I institution new policy developments. A 2003 law on State-owned enterprises cut off the technical ministry supervision role of the Ministry of Public Works from PJT I's operations.<sup>9</sup> It is seeking to have the new financial instrument of the *Badan Layanan Umum* (BLU), which will allow for Central Government institution to charge water users and be able to use that money to cover operational costs.

However, in a basin like the Brantas, with a standing management organisation, this new institutional development created confusion. The Directorate General of Water Resources at the time of the BBWS's development was not in favour of the *Perum Jasa Tirta* model of management, and sought to have the BBWS replace it on the grounds that PJT I has a low operation and maintenance cost recovery (about 50% at present) meaning that it was not a sound business. The BLU model differs vastly from that of the PJT I, which, as a State-owned company, has to show a budget surplus to be a healthy corporation. Prior to 2005, part of this surplus went to the Central Government development funds (55%), the corporation's general fund (20%), its benefit fund (20%) and its reserves (5%) (Ramu, 2004). However, more recently, State-owned enterprises collectively requested a change in order to be able to access more funds for operational and maintenance costs. Revised legislation as of 2005 requires only 10% of after-tax profit to go to Central Government development funds, while 90% could go to PJT I reserves, 80% of which was to go to investments. PJT I's annual budget is approved by the Ministry of Finance ensuring government oversight over its finances.

The BBWS Brantas and its possible BLU financing mechanism were being considered as a competing model to the PJT I in the Brantas basin, causing great confusion for PJT I, which had to actively promote its institutional features and accomplishments, as well as ensure that strategies which ensured its competitiveness as a model were pursued. However, once the Director General of Water Resources had retired and a new one came on board, the negative perspective toward the PJT I model has changed. PJT I is expected to continue to manage water resources in the Brantas basin, though there continue to be overlaps between the PJT I, the BBWS, and the province with respect to roles and responsibilities, yet to be sorted out.

Though many provincial- and district-level governments are not necessarily displeased with the funds promised from the Central Government via the BBWS to carry out operation and maintenance work in their regions, their work has been severely curtailed by the new definition of responsibility that has come out in the implementing regulation on irrigation, which will have an impact on local staffing. There are struggles on the part of District and Provincial Water Resources Departments that have developed capacity and programming through decentralisation reforms; they take the actions of the Central Government as a threat to their new authority, and are actively communicating their discontent and seeking to regain authority in the implementation phase.

## DISCUSSION

The two cases of the Murray-Darling and Brantas basins illustrate the struggles inherent in institutional development for water resources governance. The reforms to develop comprehensive basin management under the Central Government purview relate to broader policy trends and responses within those countries, but nonetheless suggest a bold new approach that reflects Central Government frustration with a decentralised status quo.

In Australia, reforms to centralise basin management reflected Federal-State tensions that have grown with the Commonwealth's growing influence in policy making. The seven-year drought and a

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<sup>9</sup> PJT I has sought to have a clarification made to UU 19/2003 to allow for sectoral oversight, as this law was intended for *Persero* organizations to make them more competitive, and applied generally to *Perum* organizations, though they have the fundamentally different role of public service provision.

national election provided a political window through which to introduce a bold reform. Policy was initiated with the expedited passing of the Water Act, with the expectation that the details of the Inter-Governmental Agreement and parallel statutes at the state level would take time to hammer out through more negotiation beyond the strict time-line of the federal election.

The short time frame in which the policies to create a comprehensive authority were introduced contributed to resistance among actors at other levels in Australia. Victoria's response to the National Water Security Plan reflected its specific interests given its catchment hydrology and irrigation settlement history. Experienced water managers in the basin have long understood that massive differences in catchment hydrology and economic and social values make any 'one-size-fits-all' policy between countries problematic, and that a better approach would be to adopt policies that account for local circumstances.

In November 2007, John Howard, leading the Liberal/National coalition, lost his bid for re-election to the Australian Labor Party, headed by Kevin Rudd. At the recent Council of Australian Governments meeting on March, 26 2008, Mr. Rudd used the meeting to declare the 'blame game' between Canberra and the states dead under the banner of party unity. The Commonwealth, state, and territories, in an unprecedented situation for any party in Australia are all currently headed by the Australian Labor Party. At the COAG meeting, he opened up negotiations with the Victorian government that, in turn, agreed to sign on to the Murray Darling basin water plan, with the Commonwealth's commitment to invest an extra A\$1 billion to upgrade ageing and inefficient irrigation infrastructure in Northern Victoria, which will, in turn, help capture 200 billion litres of additional water to be shared equally between Victorian irrigators and the Murray river. This would be in addition to the A\$1 billion the Victorian Government's own Water Plan has committed to infrastructure modernisation to reclaim and deliver 225 billion litres of water to be equally shared among local irrigators, rivers, and the city of Melbourne. The new Murray Darling Basin Authority will be responsible for management of the basin, and will give the Commonwealth Minister the power to approve a basin-wide plan.

Victoria was, however, able to negotiate a provision that would give all state Water Ministers the right to disagree with the Murray Darling Basin Plan and to have it sent back for reassessment, which the previous administration had not permitted. Furthermore, the states will maintain a decision-making role on setting annual water allocations and natural resources management through the new Water Authority's Ministerial Council, subject to caps set by the Authority's Federal Water Minister. The Commonwealth also agreed to honour Victoria's current water plans until 2019 (Brumby, 2008). Meanwhile, South Australia was able to negotiate a guarantee of access to upstream storages when water supply would fall short of 'critical human needs' requirements.

Comprehensive approaches to water resources management in the Murray-Darling basin have been attempted in the past with outcomes favouring an incremental, interstate approach to issues in the basin. While there is general consensus that reform of the Murray-Darling basin governance arrangements is necessary, and that Commonwealth leadership is necessary, the shape of the new arrangement will require careful construction, hand-in-hand with the states and other parties as partners to ensure a robust new institutional arrangement.

Shortcomings that will have to be dealt with largely stem from a lack of expertise held by the Commonwealth Government. To date, the Commonwealth has contracted out work requiring expertise and skill, and thus building the capacity in-house to dynamically and effectively manage a very institutionally complex basin will be a tremendous challenge. Many details related to how the new Authority will be managed will be in the hands of those who will be brought in to direct the organisation's course. The roles of the state agencies will also be critical with respect to their capabilities and capacity to deal with changes. The pool for human resources with genuine experience is insufficient for tackling the problems at hand. This is particularly relevant in New South Wales, where water management expertise has been eroded over recent time, posing a problem for the state in meeting its own priorities. Competition between the Commonwealth agencies for new staff and state agencies to retain their expertise will surely exacerbate resourcing issues.

In the Brantas basin case, recent Indonesian reforms are indicative of Central-Local tensions that have existed since the undertaking of dramatic decentralisation reforms within Indonesia. As would be expected, decentralisation has winners and losers with the shifting balance of power. Implementing regulations that came out of the Ministry of Public Works in 2006 to support the new Water Law reflected a strong perception of threat to the general loss of authority, and indicated the MPW's strategy to regain that authority. The pendulum policy response to decentralisation nicely illustrates ideas of Grindle (1980) and Grindle and Thomas (1991) that in developing-country contexts, policy-formulation processes tend to be centralised and relatively closed, thus policy-making processes have limited scope for input except at the implementation stage. It is therefore the implementation stage that becomes crucial to the policy-making process. The formulation of the implementing regulations has been a very closed affair, but it is at the implementation stage that the uniform policies are being tested and reformed on a case-by-case basis to suit political, social, environmental, and management realities on the ground.

The PJT I model was developed using lessons drawn from a number of organisational models in its design at a time when donor agencies began to question the incentives of developing-country governments to effectively carry out infrastructure operation and maintenance in the face of competing economic development interests. The PJT I model was promoted within Indonesia for basins where payment from industrial, hydro-power, and municipal water users has potential to cover operational costs. Prior to the development of the BBWS, river basin public corporations were being planned for a number of basins, with an expectation that, with good economic performance, they could use their profits towards capital improvements and developing public-private partnerships. The new, more comprehensive BBWS model is more directly connected to the MPW, and has responsibility primarily for infrastructure development, having assimilated the Project objectives. Policies favouring the BBWS model reflect the concern that too much authority for management was going to the Ministry of State-Owned Enterprises rather than to the Ministry of Public Works. The new vision being developed was that all river basin organisations would be governmental agencies, and that these could utilise the BLU means of financing. If it is successful in recovering operational costs, a BLU institution can be upgraded to the *Perum* status. Thus two models affiliated with the Central Government are competing in the policy arena of river basin management – one reflecting a conservative management paradigm, bringing it in closer to the responsible Ministry, distrusting the incentives of an institution not directly under its control; the other reflecting a more liberal economic management paradigm, assuming that public corporations have greater incentives to manage more effectively.

To address serious shortcomings in staffing in the BBWS offices,<sup>10</sup> instruments like Task Assistance and De-concentration are used.<sup>11</sup> These instruments decentralise responsibility downward in a contractual manner, justified by the new Decentralisation Law that has replaced the original one passed in 1999,<sup>12</sup> and consequently leave programme planning and design in the hands of the Central Government. This risks making the line of accountability unclear for those carrying out the tasks as well as for water users.

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<sup>10</sup> A significant number of staff from Projects had been transferred to provincial and district offices as required by the decentralization reforms of 1999 to developing capacity at more localized levels.

<sup>11</sup> According to Law 32 of 2004, Task Assistance (or *Tugas Pembantuan*) provides funds from the Central Government to provincial-, district-, or village-level government for them to carry out earmarked tasks related to physical aspects, such as irrigation maintenance – and not planning, capacity building, etc. De-concentrations (or *Dekonsentrasi*) are funds provided from the Central Government to the Governor, serving as a regional representative to carry out activities. This can be used for design, planning, and capacity building.

<sup>12</sup> Decentralization Laws 22 and 25 of 1999 devolved power and finances from the Central Government directly to district-level governments, so that they were no longer under the hierarchical authority of the provincial government. Given the observed lack of coordination between the objectives of the different levels of government, the Central Government passed Laws 32 and 33 in 2004 to replace the previous decentralization laws. These acknowledge the coordinative role of the province and re-established a hierarchical relationship between the central-, provincial-, and district-level governments, and required legislation from other levels of government to conform to Central Government objectives.

Both the Murray Darling and Brantas cases well illustrate Molle's (2008) idea of paradigm maintenance through the advocacy, development, and maintenance of specific management models. Particular actors, ideas, and assumptions promote the decentralised and centralised models under contention.

## CONCLUSION

While transposing management models is not inherently problematic given that careful attention can be paid to local contextual variables, it is important to understand that river-basin governance is a dynamic process in itself. The cases presented in this paper illustrate the issues related to maintaining particular management models that, though advocated in the international expert arena, must nonetheless morph to adjust to new political, economic, social, and environmental developments to feasibly carry out objectives of integrated water resources management. The development and perpetuation of a particular institutional form is a process embedded in political, social, economic, and environmental realities, and as such, management models for such critical resources as water will be revisited and reconstituted in order to successfully adapt to new circumstances. In both of these cases, political concerns served to create windows to swiftly forward bold policies promoting the centralisation of authority, which in turn have been met with negotiated solutions at the implementation level. The comprehensive approach, while politically alluring in moments of crisis, has its own set of shortcomings. The final form of these initial reforms is likely to differ to address historical, institutional, and ecological differences at more localised levels.

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