MURRAY-DARLING BASIN, AUSTRALIA: A SUCCESS STORY IN TRANS-BOUNDARY WATER MANAGEMENT

A. Prasad

Murray-Darling Basin Commission, GPO Box 409 Canberra 2601, Australia

Awadhesh.Prasad@mdbc.gov.au

Introduction

The Murray-Darling Basin (M-DB), Australia (Figure 1) covers 1 million (M) square kilometres spread over five states New South Wales (NSW), Victoria (VIC), Queensland (QLD), South Australia (SA) and the Australian Capital Territory (ACT). Though M-DB is only 14% of the land-size of Australia, 70% of irrigation occurs here and it is a major contributor to the Australian economy accounting for more than 40% of national agricultural produce. The average rainfall is 480 mm/year. Run-off is highly variable spatially and temporally. The northern basin generates 32% of the mean annual runoff of 24 billion (B) cubic meters (m^3) from 60% area; while the remaining 68% comes from 40% of the area in the southeast. Except during floods, 86% of the basin area generates no runoff. A recent estimate shows that during the period 1891-2000, the natural outflow to the sea varied from 1.4M m^3 to 50M m^3, with a mean of 13M m^3 and a median of 11M m^3. During this period, the current conditions outflow varied from 0.1M m^3 to 43M m^3, with a mean of 5.1M m^3 and a median of 3.1M m^3. The current drought has stopped the M-DB flowing to the sea in recent years.

Figure 1 Murray-Darling Basin

Governance and Institutional Arrangements

The M-DB is managed under the *Murray-Darling Basin Agreement* 1992, which is enshrined in mirror statues in the respective jurisdictions. The original agreement was signed between the three southern M-DB states, NSW, VIC and SA, and the federal government in 1915 for sharing of water of the main stem of the River Murray between these states Later, growing awareness of interconnectedness of environmental problems led to the expansion of the agreement and roles of the institutions created therein. QLD and ACT joined the agreement in 1986 and 1988 respectively. The purpose of the *Agreement* is "to promote and co-ordinate effective planning and management for the equitable efficient and sustainable use of the water, land and other environmental resources of the Murray-Darling Basin". The *Agreement* establishes the following institutions.

The **Murray-Darling Basin Ministerial Council** (Council) is the highest decision-making forum. It consists of up to three relevant ministers from each partner government.

The **Murray-Darling Basin Commission** (MDBC, Commission) is the executive arm of the Council, which advises the Council and carries out its decisions. The Commission consists of one independent President, and two Commissioners appointed by each partner government.

The **Community Advisory Committee** (CAC) is appointed by the Council. Its role is to advise the Council from a community viewpoint. It provides a two-way communication between the Council and the community.

The **Office of the Commission** functions as the technical and administrative secretariat for the Council and Commission and also supports the CAC. It supports the Commission initiatives through a system of inter-jurisdictional committees, where policies are debated and developed before being recommended to the Commission and Council.

All Council/Commission decisions are taken by consensus. The Council/Commission performs twin roles of a river system operator and policy maker. It operates the River Murray System in southeast of the Basin for water sharing between NSW, VIC and SA according to the *Agreement* and makes and implements policies for co-ordinating the management of natural resources including water throughout

the M-DB. During the 100 years of its history, the *Agreement* and associated institutions have evolved, but the water sharing rules remain in their original form in the current *Agreement*.

The success of M-DB institutional arrangements in trans-boundary water management has inspired the Mekong River Commission's institutions for international water sharing.

Cap on Water Diversions – a key Policy Initiative

The M-DB is currently facing many environmental problems including salinity, land degradation and loss of bio-diversity. The MDBC has taken several policy initiatives, such as Cap on surface water diversions, Salinity management strategy, Interstate water trading, and Environmental flows, to address these problems.

The Council in 1996 agreed to a Cap (upper limit) on the surface water diversions in response to an audit of water use that confirmed that increasing level of diversions that could further grow had caused decline in river health. The two objectives of the Cap were maintaining and, possibly, improving existing flow regimes and achieving sustainable consumptive use by developing and managing the water resources. The Cap was defined as "*The volume of water that would have been diverted under 1993/94 levels of development."* The Cap is managed on a valley basis according to formal rules set in Schedule F to the *Agreement*.

The annual Cap for a valley is not the volume of water that was used in 1993/94; rather is the volume that would have been used with the infrastructure/management rules existing in 1993/94 and climatic conditions experienced during the year in question. The annual Cap targets are calculated with the help of computer-based river models that are set to the 1993/94 level of development and take into account the climatic conditions experienced during the year. An Independent Audit Group annually audits the Cap in every valley of the M-DB, comparing observed diversions against annual Cap targets and determines if a valley has breached the Cap. In case a Cap breach is declared by the Commission, the concerned state government is required to report to every subsequent Council meeting and until the breach is revoked on: (a) the reasons why the breach occurred; (b) the actions taken, or proposed to be taken by the state to ensure that diversions are brought back into balance with the Cap; and (c) the period within which the diversions will be brought back into balance with the Cap.

A Cap is in place in the valleys of NSW, VIC, and SA since 1 July 1997. QLD (5% of total diversions) and the ACT (0.3% of total diversions) agreed to different levels of Cap in 2007 and 2008 respectively. Overall the Cap has been working very well. Over the ten-year period 1997/98-2006/07, since the Cap has been operating, the total M-DB diversions have been 4% below the Cap targets. A review of the Cap conclusions included that:

- the Cap has supported the Council's aim of achieving ecological sustainability of the basin's rivers;
- while the Cap does not guarantee a sustainable basin ecosystem, it has been an essential first step in achieving this outcome; and
- without the Cap there would have been a significantly increased risk of environmental degradation.

A new Cap and a new Institutional Arrangement for the M-DB

While the Cap has been working well, there is a growing realisation that several factors undermine the efficacy of the Cap in holding the diversions. These include external factors such as climate change and bushfires as well as internal factors such as increase in groundwater use and growth in farm dams. This realisation coupled with the worst drought in recorded history has led to an increased involvement of the federal government in the management of the M-DB. Following a national summit of water ministers on the southern M-DB, the federal government in November 2006, established a Senior Official Group for contingency planning for the drought and commissioned the national science agency, CSIRO to report by the end of 2007, on sustainable yields of surface and groundwater systems within the M-DB, taking into account changes in climate and other factors. In a surprise move, the Prime Minister in January 2007 announced a $10B National Plan for Water Security (NPWS), which was effectively a plan for the federal takeover of the M-DB.

The key elements of the NPWS included a new governance arrangement for the M-DB, a sustainable Cap on surface and groundwater use in the M-DB, a nationwide investment to improve on- and off-farm irrigation infrastructure, and addressing water over-allocation in the M-DB. As the Australian constitution vests the control over water in the states, the implementation of NPWS required referral of that power to the federal government. All M-DB states except Victoria, agreed to hand over their power to the federal government. Following the failure of a protracted and complex negotiation with Victoria,

the federal government using its other powers under the constitution enacted *Water Act* 2007. Implementing the NPWS in a limited way, the *Water Act* established an independent Murray-Darling Basin Authority (MDBA) to develop a Basin Plan, accredit the M-DB states' catchment plans, and to set new sustainable Caps on surface and ground water diversions; and an Environmental Water Holder to acquire and manage environmental water. The MDBA comprising one chair and four members to be appointed by the federal government would be an expertise-based body accountable to the federal government. The MDBC was left in place but made subservient to the MDBA.

Recently, the new federal government that assumed power after a general election in late 2007 succeeded in bringing Victoria on-board. Under an agreement reached in March 2008, the MDBC and MDBA would be merged into a single body known as MDBA. The new independent MDBA will be responsible for developing and implementing the new Basin Plan as envisaged in the *Water Act* as well as for all the current functions of the MDBC. The federal minister will approve the Basin Plan including a new Cap on surface and groundwater diversion in the M-DB based on the advice of the MDBA. The management of groundwater, currently outside the control of the MDBC, will be brought under the MDBA's control by way of the Basin Plan, which will determine the new Cap and have both surface and groundwater included in it. The new agreement will require amendments to the *Water Act.* Though details need to be worked out, it appears that the Ministerial Council, Commission and CAC will exist in some form to undertake the current functions of the MDBC, eg River Murray operations. However, unlike the current decision making role on the Cap, the new Ministerial Council will have only an advisory role.

Implementing a new Cap

The recently completed M-DB sustainable yield investigation estimates a 10% reduction in system inflows under the best 2030 climate change scenario. If the Cap is not changed, the impact of reduced inflows will be borne 86% by the environment and only 14% by the consumptive users, which is equivalent to a reduction in volumes currently available to environment by 34% and consumptive users by 4%. The new Cap may be worked out by adjusting the current Cap following the principles of the *National Water Initiative* that specifies that the risks of reduction in water availability due to natural events, such as climate change and bona fide improvements in the knowledge of water systems should generally be borne by water users. But this is open to interpretation even if one assumes that users bear 4% reduction in their volume without any compensation. Should the diversions be reduced by 10% (reduction in inflows) meaning water users and the environment share the pain proportionally or should the water users bear the full pain of the reduction in inflows and environment's current volumetric share is protected? The MDBA, in determining the new Cap, would need to weigh in these policy choices against their possible socio-economic costs to the community. Once the desired Cap reduction has been determined, this change could be gradually incorporated by 2030, by scaling down annual Cap targets. Whatever policy decision is taken, an enormous amount of technical development will be required to implement, monitor and report on the new Cap. For example, as the local inflows in different valleys change by different amounts, inflows to each valley Cap models will need adjustment by different amounts. All Cap models will need redevelopment and recalibration and new audit and reporting systems will need to be built.

Conclusion

The M-DB spread over five of its states is vital to the Australian economy. It has a century old record of best management practice for cooperation in trans-boundary management of water and other natural resources. The M-DB is currently governed by a multi-jurisdictional Commission/Council that makes decisions through consensus. In the face of environmental challenges, the Commission/Council has taken several innovative policy initiatives that include the 1996 historic decision to cap the surface diversions. While the Cap has halted the growth in diversions and is the essential first step in achieving sustainability, it needs further adjustments to incorporate groundwater and impacts of climate change.

Amid the enduring spirit of cooperation, the institutions for multi-jurisdiction cooperation have been evolving. In the latest proposed reform of the governance, a new federally-appointed independent Authority is proposed. The federal minister on the advice of the Authority would set a new sustainable Cap on both the surface and groundwater diversions in the M-DB. On other matters, the new Authority is likely to retain the current cooperative structure of decision making. A recent investigation shows a 10% reduction in water availability due to climate change. A new Cap decision will need to determine how the pain of the reduction is shared between water users and the environment considering its socio-economic cost. Implementing the new Cap will require enormous technical developments in addition to enduring partnerships between the basin states under the federal leadership.