Droplet No. 12 **15th June 2008**

Droplets explore ideas and propositions, which, if developed further, might improve water use. They develop ideas and search for the fundamental concepts and building blocks that one might consider if not constrained by prior decisions.

A sustainable cap: What might it look like?

"Zap the Cap" 1990s bumper sticker

Recognising the need to stop expansion of water use in the Murray Darling Basin, in 1994 Basin States agreed, as an interim measure, to a volumetric cap on surface water diversions. This cap was set at the volume of water that would have been diverted under 1993/94 levels assuming similar climatic and hydrologic conditions and using the infrastructure in place at that time. Although it had no basis in science, several years later, it was decided to agree to this limit.

In unregulated rivers with no storage capacity to dampen flow variability, States recognised that a volumetric limit on diversions might not achieve a sustainable outcome. Basin States agreed that "this cap may be expressed as an end of valley flow regime."

Acting in the national interest, the main object of the Water Act 2007 is to optimise the allocation, use and management of the Murray Darling Basin water resources. CoAG has now agreed and Commonwealth legislation requires that a "Sustainable Cap" be set for each part of the Murray Darling Basin.

In regulated systems, recent experience has shown that a volumetric cap is not sufficient to ensure both river system health and community well being. Both outcomes need a regime that can cope with **all** climatic futures. This droplet asks how a "sustainable cap", or, in effect, a sustainable allocation regime might be set in a regulated river system with lots of dams, weirs and locks. It addresses a question that is fundamental to the future of the Basin.

What would a sustainable water allocation regime look like? What principles need to be considered?

Focus on inflows

In a system that might be getting drier, a volumetric limit on the maximum amount of water that may be diverted in a wet year serves little purpose.

Under the current MDB Agreement, NSW and Victoria share inflows whilst South Australia is given access to guaranteed volume, when it can be supplied. Because of this guarantee, South Australian irrigators cannot carry forward unused water. As we showed in *Droplet 6*, when unused water cannot be carried forward and saved, too much water is used. Dams are depleted more quickly and, as a result, the impact of droughts is more severe than otherwise would be the case. This year, as an emergency measure, South Australian irrigators have been allowed to carry forward water. If water storage and use is to be optimised, SA irrigators should always be allowed to do this.

With a focus on inflows rather than diversions, all users are exposed to the nature of the risks they face. With access to an efficient water market and the capacity to determine how much water is left in storage, users have a much better capacity to cope with climatic variability, the emergence of long dry periods and adverse climate change.

Principle 1 *When designing a sustainable water allocation regime, the focus should be on the development of inflow sharing rules and the role of the market in optimising storage (carry forward) rather than on setting a volumetric limit on diversions. Unless all States operate under the same rules, storage management and use will be sub-optimal.*

Allocation priorities

With a focus on inflows, the next step is to work out the order in which allocations should be made. If one is to have a river, then the first priority is to put aside sufficient water to maintain system function and ensure that water can be delivered throughout the system. Where one or more systems are connected, sufficient water should also be put aside for transfers between systems. In our report on future-proofing the MDB, we call the water needed to meet all these requirements, **maintenance water**.

Principle 2 *As the first allocation priority, any sustainable allocation regime should begin by setting aside sufficient water to enable conveyance and delivery throughout the system, to provide for intersystem transfers, to cover evaporative losses and to flush pollutants to the sea.*

As the amount needed for river maintenance varies and, as this is a critical system wide need, decisions about the required volume of maintenance water needs to be taken centrally. Once this has been done, the remaining water that flows into the system, including that held in storage, can be allocated.

Giving the environment an entitlement

After providing maintenance water, it is the sharing rules that determine how the remaining non-flood water should be allocated between environmental and consumptive users. There are two ways to do this. One way is to use catchment water sharing plans to determine how much water should be allocated to the environment. As the National Water Initiative recommends, the other way is to define the environment's entitlement in exactly the same way as all other entitlements are defined.

Recent research commissioned by the National Water Commission has found that communities and many governments have great difficulty in preparing water-sharing plans that work in long dry periods. As result, a significant number of water sharing plans are currently in suspension! If the alternative, equivalent entitlement approach is taken, then the role of catchment water sharing plans can be more strategic and less rule-based.

One of the strengths of the National Water Initiative equivalent-entitlement approach is that consumptive users and the environment face the same risks and have the same opportunities to decide how much water to save, use or sell. Both have an equal degree of security. Neither can impose costs on the other.

Principle 3 *Define environmental and consumptive entitlements in the same manner and place them under a regime that empowers all entitlement holders to manage their own supply risk.*

Managing environmental water

If the environment is given an entitlement and defined differently from maintenance water, then we may need to rethink the need for a volumetric cap on diversions. Environmental managers are searching for ways to replicate the small to medium size floods that no longer occur. One of the simplest ways to do this is to hold water in storage and then release it quickly when river flow circumstances are advantageous. But, with a cap on diversions, this could result either in a breach of the cap; or impose a cost on irrigators by reducing the amount of water that irrigators may divert later in the season.

Once a significant proportion of the entitlements on issue are held in the environment's interest, a volumetric cap could prove to be a barrier to the efficient realisation of environmental outcomes. A way to allow the environment to carry forward unused water allocations and arrange for minor floods without limiting irrigation opportunities will need to be found. Replacement of the current volumetric cap on diversions with a sharing regime that defines all entitlements in the same way solves this problem.

Accounting for all uses

As pointed out in Droplet 3, the viability of any water allocation regime is determined by its coverage and completeness in water accounting. Unfortunately, if there is an increase in the number of small farm dams, if the area under forestry increases, and as water use efficiency increases, the amount of water available for allocation decreases. When ground and surface water systems are connected, increases in groundwater use have the same adverse effect.

Unless all water supply affecting activities are included, no water allocation regime can be defined as sustainable. As is currently planned, it is critical that connected ground and surface water systems are managed as one system and all uses are fully accounted for – even if they are unmeterable.

Principle 4 *Include all activities that affect water supply in the allocation regime. Meter the meterable and off-set the unmeterable.*

Where to from here?

CoAG recently agreed to the development of a "Basin Plan, which will include a sustainable cap on surface and groundwater diversions across the Basin." CoAG's intention clearly is to try to fix MDB problems once and for all – to put a sustainable management regime in place.

CoAG will be meeting in early July to finalise an Inter-Government Agreement (IGA) that will further the journey towards development of a sustainable management regime for the MDB. It is also expected that the new MDB Authority will be established in the near future and be given a significant role in the implementation of the IGA and developing a new Basin Plan.

In view of the critical state of the River Murray System, we consider that the IGA should give maximum flexibility to those given the responsibility for developing the new plan. To this end, the concept of a sustainable cap should be interpreted widely and that the principles set out in this droplet given the fullest consideration. The allocation regime's structure ideally should be finalised before development of plan detail. The challenge of moving from the current regime to one designed to cope with extreme climatic variation, the re-emergence of long dry periods and, worse still, a shift to a drier climate should not be underestimated.

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References (Access them by clicking on the links embedded in this droplet.)

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