Submission to a Senate inquiry into water management in the Coorong and Lower Lakes

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I am best informed about (a) and (b) in the terms of reference, and this submission will mainly address those points.

The volume of water which could be provided into the Murray-Darling system to replenish the Lower Lakes and Coorong

Water allocation within a catchment is a trade-off between the different competing needs, be those human or environmental. While I am a strong believer in the need for improved environmental outcomes and increased environmental flows, I would like to caution the Senate in terms of making rapid decisions. The question about freeing up water from other uses is the most important component of the inquiry as it has the largest impact on the current activities in the Murray Darling Basin (MDB). There are two matters of immediate concern.

1. Up to recently the cost of freeing up such water has concentrated on the direct costs of purchasing the water (or licences) and the socio-economic restructuring needed for irrigator from which the water was bought. The money from a buyback will not necessarily flow back to the rural community, but only to the seller. An irrigation business has many flow-on effects into the rural community and rural economy. The sad thing is that the capital (the buy out money) is very mobile, but much of the rural local community is not, either due to lack of skill or due to lack of money or simply because they like it out there. So some consideration of structural adjustment of rural communities as a result of buyout of water rights is very important and this seems to be ignored in most of the current policy. And this will come at an additional cost.
2. Currently most of the major dams in the Murray Darling system are between 15 and 30% full. The total NSW system has about 25% or a little less than 5500 GL in storage in all dams across the state in the Murray Darling system. Last year there was debate about the amount of water needed to restore the river health and the estimates ranged from 500 – 1500 GL per year, with 1500 GL the optimal. However, quite some water needs to be reserved for consumption in towns down the rivers, such as Adelaide, because if it stops raining from now on, what are they going to drink? Similarly, water needs to be reserved for future environmental flows (or trickles). Part of the storage is dead storage and cannot be released at all and finally some is indeed tied up with high security irrigation licences, which could be bought at a significant price (see above). However the main point is: There isn't that much extra water available to release (maybe 1000 GL). So even if we wanted, we might not be able to sustain a good flow given the significant transmission losses (see below).

Options for sourcing and delivering this water

In this I will mainly comment on subpoint (ii) and (iii).

Alternative ways of acquiring sufficient water

I strongly believe that there is insufficient water available in the whole MDB to provide water for the Lower Lakes. Dam inflows have been only very minimal over winter and spring is not looking any more promising. I therefore strongly believe that a program leading to removal of the barrages in the lower Lakes should be the top priority. The lakes were estuaries, which have only become fresh water lakes since construction of the barrages. Any investment in

keeping these lakes as fresh water lakes is artificial and not good environmental management, even beside the problem of acquiring sufficient fresh water. Developing a program to slowly convert the lake systems from a fresh water system to a brackish and salt water system should be the only possibility to counter any developing problems with acid sulfate soils. Of course removal of the barrages cannot be rapid process, but can be guided with good ecological knowledge. As an example, the Netherlands are currently contemplating a similar transition for one of their (developed) fresh water lakes in Zeeland.

Transmission losses
Some quick review of the hydrological research indicates that transmission losses are around 80%, particularly over long distances (i.e. moving water from Queensland). Lange et al. (2005) on a river in Namibia, similar to the Darling found between 30 and 90% transmission losses, somewhat dependent on the flow, basically the higher the flow, the lower the losses. This seems a little counter intuitive, but it probably has to do with the depth to width ratio, or the velocity of the water. However his findings are backed up by work on the Diamantina river in Queensland by Costelloe et al. (2003). They found 70 - 98% transmission losses for floods < 2300 GL. Note the magnitude of that number in relation to my point about available water in the system, those are “small floods” in the Cooper creek system. Larger floods had lower losses. In the same area, Nanson and Knighton (1994) estimated 75% transmission losses on Cooper Creek, but argued losses were higher for higher flows and less for smaller flows which stayed within the stream channel. However, on a smaller stream (Alkali Creek) in Western NSW Dunkerley and Brown (1999) estimated losses of 13.2% per km! Clearly, transmission losses are high to very high in any semi-arid to arid system such as the Darling river. Therefore releasing 1000 GL in northern NSW will only bring a maximum of 200 GL to the lower lakes, if we are lucky! Apart from some massive amount of rainfall, the lower lakes cannot be saved. I believe the barrages should go and we should spend our money on alternative water sources for people relying on fresh water near the Lower Lakes.
That doesn’t say that purchasing and releasing water from storages in any part of the basin will not do any good. It will do a great deal of good for the local ecosystems, due to transmission losses but it is wrong to think that it would have any impact on the lower Lakes 1500 km downstream.

References

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