

Comments on :

## **Water Resource Plan for Northern Victoria**

### The consultation process

The Plan was released on 28.1.2019 prior to a February 13 consultation meeting. This Plan appeared within a few days of other important water industry documents, e.g. S.A. Royal Commission into MDB, Productivity Commission Report, each containing many hundreds of pages. Reading, contemplating and analysing the Victorian Water Plan of some 1100 pages when accessing it within an internet service of exceptionally slow speed, and furthermore after typical 12 hour days running an irrigation farm, is almost impossible.

Once again this shows that agencies of the irrigation industry, which either regulate it or determine policy, show serious disregard for those expecting meaningful consultation.

The availability of the Plan on a “USB stick” was a great advance but regrettably it was not available until the actual consultation. I have been able to quickly read some chapters.

### The purpose of the Plan

The primary purpose seems to be to satisfy MDBA and Federal Dept.of Agric. & Water requirements. If so, it is of paramount importance that the efficiencies and comparative advantages of much of Victoria’s irrigation become apparent.

Another claim for the purpose of the Plan was to promote sustainable use of water for communities, agriculture, and industry. This is largely hollow rhetoric when this year in the GMID, with 100% water allocation, an exceedingly small proportion (perhaps 15%) of the land laid out for irrigation in our district, and serviced by a State owned distribution system, is being irrigated. Clearly delivery of such small volumes of water in a delivery network that has cost billions of public dollars is not sustainable. Furthermore the State appears to have no control over assuring how irrigated agriculture, together with its associated industries and communities will remain sustainable even with 100% water allocations.

A crucial part of the Plan should be for the State to show with some certainty how matters surrounding the management of its water at both the Federal, and separately, at the State level will indeed provide for sustainable irrigation.

If the Plan is to make this claim about sustainable use of water it must talk about the conditions which will enable this to be achieved. Extensive risk analysis (Table 1.2.2) does not explain the current predicament. Presently the numerous factors working against attainment of what was a once a sustainable, reliable and conservatively managed system are just evaded, forgotten or perhaps unrecognised in this Plan. This Plan should highlight risk factors outside Victoria’s ability to control.

### Population and towns

In a Victorian submission to Canberra this Plan must highlight the unique aspects of Northern Victoria. An area such as Shepparton Irrigation Region (SIR), which includes part of the Murray, Goulburn, Campaspe and Broken Basins, has attributes not found in other parts of the MDB. This needs to be discussed under a more regional heading (SIR) before describing each of the river basins.

Some of these attributes include:

#### 1. Rainfall

Most of the SIR's irrigated land is within 450 to 750mm rainfall districts. In these areas irrigation augments plant growth achieved with rainfall. This is distinct from the role of irrigation in plant production systems in the semi-arid or arid zones of the MDB.

#### 2. Evapotranspiration (Et)

Irrigation requirement is a function of Et and rainfall. Compared to the semi-arid zones of the MDB, the SIR has much less evapotranspiration. For instance in January 2019, Sunraysia compared to Numurkah, had about 20mm per week greater Et and over a month some 100mm (1 MI/ha) more. Discussion of Et must be part of the background to explaining demand for water.

#### 3. Irrigation requirement

Using actual data for the previous example, production systems that need to maintain adequate soil water for plant growth through a calendar year require at least 6.5 MI/ha more in the semi-arid zone.

If we are a society interested in maximising plant growth from scarce water resources, it would seem logical to have incentives to achieve a concentration of irrigation in districts with more rainfall.

The Plan needs to acknowledge that irrigation is an elixir for semi-arid zones that achieves its result with a significant opportunity cost. Most of Victoria's publicly owned irrigation infrastructure was established in districts that acknowledged this reality.

#### 4. Population and towns

Between Kerang and Yarrawonga there are at least 30 towns (dependent on population threshold) across Northern Victoria. This compares with some 8 between Moulamein and Mulwala in NSW. The Plan must take the opportunity to highlight these differences. These were just not a function of rainfall and initial settlement land parcels. Particular characteristics of irrigation shaped the development of population and towns.

In Victoria these included :

4.a Issue of irrigation entitlements; Water Rights were issued in most of the SIR with a formula 1 acre foot per acre through to 1 acre foot per 3 acres in specific districts, with characteristics such as soil type, drainage and proximity to channel network determining these.

4.b Irrigation allocations ; As storage capacity developed Victoria's annual allocations of irrigation water considered not just the current season, but also the next season. In fact the next season's

water had to be secure before 'over-allocation' (sales) or now LRWS, would be part of a seasonal allocation.

4.c Conservatism in the issue of entitlements and allocations ensured a reasonably reliable availability of irrigation water. This more predictable situation created much more attractive investment situations for farmers, secondary industries and support industries. Until recently a degree of permanency characterised these districts. Certainly some forms of primary industry went through difficult periods, but because there was such a diversity of production systems in the region, irrigated land soon found another use.

As a consequence of 4.a, 4.b, and 4.c above the towns across Northern Victoria had prospered until the difficulties associated with the MDB plan started to become evident about a decade ago.

Until Victoria is able to re-establish circumstances that provide for sustained reliable availability of realistically priced irrigation water the relative predictability is under threat. This threat impacts on the local towns and municipalities particularly in attempting to maintain often increasingly underutilised infrastructure.

Readers of the Plan need to be told the procedure issue of entitlements and annual allocations of water vary across MDB regions. Each has historical basis. Victoria's approach to ensuring year to year predictability was exceptional.

This section of the Plan could use some comparative indices to explain the nature of the SIR. Examples include people per MI irrigation water, dollars associated with support and secondary industries associated with irrigated primary production and community services (health, education) in more intensive reliable irrigation districts.

#### Energy considerations

This Water Plan does not seem to recognise that relationship exists between water and energy. My review of the energy dependence (fossil fuel) of irrigation systems around the world, done in 1976, indicated that Israel used one third of national energy use for irrigation and that about 80% of America's irrigation was dependent on pumped water requiring about 10 GJ/ha irrigated per year.

Northern Victoria, particularly the SIR, stood out in this international comparison. After allowing for energy needed to build, maintain and operate irrigation water storage and delivery in the SIR, this irrigation scheme had a net generation of energy (some 400 MJ/MI) for water delivered to farms. The original linkage between irrigation schemes and hydro-electricity seems to have been lost in a "compartmentalised" world that may make lip-service to environmental issues related to energy. However the increasingly 'silo' approach does not integrate systems then properly analyse resource costs and interactions.

The Plan makes no mention of the enormous energy savings that results from gravity flow systems that deliver water from river pondages at Nagambie and Yarrawonga. The alternative of pumping water from rivers would require in the region of 30 litres of fuel per MI of water. This assumption

when applied to GMID irrigation usage of about 1000 GJ suggests some 30 million litres of fuel would be needed.

The Plan fails to consider the major movement of water to districts downstream of gravity flow irrigation schemes. In the past decade over 500 GJ of such water is now pumped on the Victorian side of the Murray below Swan Hill with unmeasured but significant environmental consequences, and furthermore, these systems run the risk of a limited fuel supply held within Australia.

Hopefully the Plan can do much more to extol the inherent wisdom behind the design of our gravity flow irrigation schemes. Once we spoke of irrigation schemes. This approach captured the integrated nature of the parts of a system or scheme. This holistic view is lost when water is discussed in isolation.

#### Commercial plantations

The Plan seems to imply that commercial plantations are using the limit of their SDL. I suspect community expectation is that the area of plantation timber will increase to satisfy demand. This could create a ridiculous situation where plantation operators have to secure water entitlement in a market that places a far higher value on water than timber that could be generated by this water.

The Plan provides no analysis of this situation that has potential to interact with irrigation, timber supply, timber importation and policy for native forests. The magnitude of water attributed to plantation use makes it imperative that the Plan addresses this issue.

#### Water accountancy

The Plan does not seem to recognise that a megalitre may not be this volume somewhere else in the system. Conveyance seepage and evaporation losses must be part of an accountable picture of our water. If omitted, there must be clear indication of why such an approach is valid.

#### Climate change

This has several important implications including catchment behaviour, water losses in storage and conveyance, water demand and demand timing. All of these would be a logical part of a Plan. Perhaps the most obvious Climate Change issue not discussed concerns Environmental Entitlement. There seems to be a desire to allocate water volumes that may achieve environmental outcomes that existed in the 1950s. Our environment has to adapt to climate conditions as it has done most successfully for millennia.

The Plan needs to advance reasons as to why we should attempt to maintain environmental characteristics of another climate era.

#### Costs associated with environmental allocations

These include monetary, environmental and opportunity costs. The Plan seems to disregard these and most certainly not consider such costs in the same way as those associated with irrigation water.

Numerous examples could be given. Pumping of water for Hattah Lakes to achieve a more permanent water regime than existed a century ago needs to be recognised. We also need to be able to consider the opportunity cost of this water and contrast it with perceived value.

#### Water for delivery of water in irrigation schemes

The Plan does not analyse obvious trends associated with delivering irrigation and stock and domestic water in irrigation scheme channels such as those operated by Goulburn Murray Water.

Delivery volumes are now about half those achieved over a decade ago. More water is needed now to deliver water. This varies from channel to channel. The Plan does not seem to indicate how Victoria will deal with this increasingly greater loss of water. This loss cuts across claimed efficiencies with GMW's two billion dollar program. Many kilometres of reconfigured channel in our district have been unused for months in this 100% allocation season, yet continue to be serviced with water. Where do the extensive losses associated with these channels have recognition in the Plan, together with analysis of why they happen and how they are accounted for?

#### Water to provide water for recreational use

The management of water bodies provided for recreational use receives minimal recognition. Supervision requirements are obvious to most people and most cases are expected by the public. However the water needed to maintain such water bodies remains a fact kept from users of such facilities and, more importantly, is not evaluated against alternate uses.

#### Implications of soil type

Section 3.1.3 briefly mentions soil type but does not extrapolate on the many consequences it has for interactions with water.

One of the characteristics of N.Vic soils that deserve mention is the relatively high level of magnesium and sodium on cation exchange sites of clays. The hydrogen bonds between water and these cations make the soils dispersible. This is an obvious problem for maintenance of irrigation channels as banks fail when their constituent soils readily go into suspension. This is known and maintenance schedules address the problem.

What seems to be disregarded is that creeks and rivers in N.Vic experience the same conditions. In fact the dispersible soil is a much greater problem in these streams, which in comparison to irrigation channels, have numerous snags and meanderings. The energy level in water flowing in these streams is greater and becomes even more effective at bringing clay into suspension.

In the natural scheme of events there was period wetting of soil in the banks. This was much less damaging than the maintenance of high flow levels. Obviously bank vegetation also interacts with these considerations.

A comprehensive Plan must discuss the impact of new flow regimes on our streams and rivers and note the accelerated deterioration of banks, deep holes, silting and flow characteristics.

### Concluding comments

The Water Resource Plan is an enormous body of work. These comments have been presented by a reader only able to achieve partial familiarity with the document.

This reader has been fortunate enough to have been able to own, develop and expand an irrigated farming enterprise in an era with reasonable certainties over the past five decades. Concurrent work as a professional agricultural scientist during this time has provided a unique insight into the development of our irrigation schemes and the way in which they have potential to enhance agricultural productivity.

This new Plan, despite effort already expended, will need further attention to be given to risk factors such as the impact of the southern connective basin water trade and water ownership trends that threaten confident planning by irrigators and sound stewardship of extremely significant water infrastructure owned by the citizens of Victoria.

Barry Croke

B.Agr.Sci., M.Agr.Sci., Dip.Ed.

Naringaningalook, Vic.

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