Date: 12th August 2020

National Water Reform 2020
Productivity Commission
Locked Bag 2, Collins St East
Melbourne VIC 8003, Australia

Re: PC-NWR-NWI-2020 Submission: Supplementary Water Innovation

Dear Productivity Commission,

please find my submission to the 2020 National Water Reform Inquiry.

Summary:

The Inquiry into the reform of Australia's water resources sector will fulfil the statutory requirement for the second of the Commission's triennial assessments of progress towards achieving the objectives and outcomes of the NWI required by section 88 of the Water Act 2007.

Has the National Water Initiative (NWI) since its 2004 inception continually failed to deliver on its Key Element No-8 commitment[1] of Capacity Building? My submission asks the PC-National Water Reform-2020 (**NWR**) to assess and report the achievements of this intergovernmental agreed NWI capacity building commitment.

The NWI-2014 tenth anniversary assessment report could be interpreted as an excuse report on Capacity building failures in rural and Northern Australia.

The PC-NWR-NWI-2017 report makes "noise" about Capacity building but offers no tangible evidence this activity is being delivered in rural and Northern Australia.

In conjunction with the above perceived lack of Capacity Building, a new water thinking paradigm is presented here. It proposes a challenge to consider a scenario of having "supplementary water" made available through innovation. Such new water thinking may deliver not only genuine Capacity building but also provide a range of widespread water management relief solutions to the NWI.

This submission requests this 2020 NWR to assess NWI efforts to engage modern innovations to build Capacity such as this "supplementary water" in obtaining unallocated Northern Australian tropical/monsoonal run-off water to supplement southern basin water systems. The NWR should challenge the NWI ability to inspire and stimulate innovation to deliver new capacity building opportunities.

Below is a Burdekin to Echuca pipeline scenario to motivate such possible NWI new thinking. A national design competition could release multiple water innovation and capacity building solutions that could immensely NWI benefit eastern and southern Australia.

[1] Appendix-A

1.0: Introduction – NWI Views

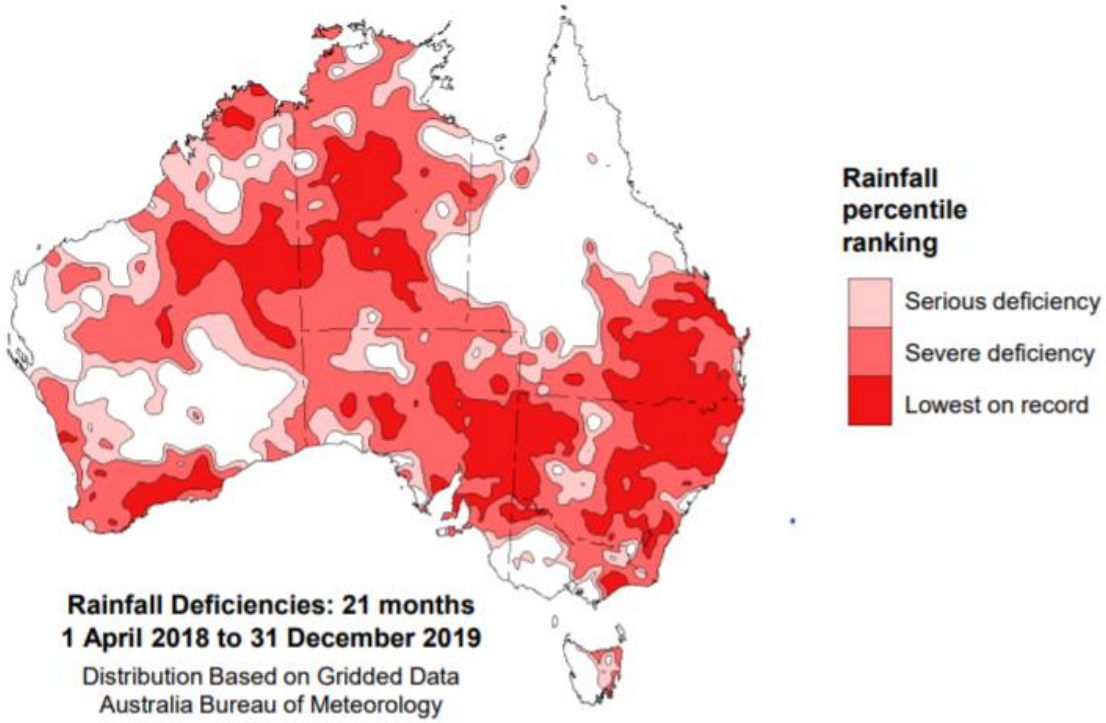
The PC-National Water Reform (**NWR**) Issues paper 2020 contains three items that this submission wishes to comment on. The items are,

1. that the National Water Initiative-2004 (NWI) has **unfinished business** that needs to be completed.
    a. The NWR should specify and document what "unfinished business" it is alluding to here.
2. that the commission should assess "the **outcomes to date** of the NWI and related water reform efforts, taking account of other drivers of reform".
    a. The NWR assessment of outcomes to date must be detailed and aligned and focused on the NWI ten Objectives. eight Key Elements and ten Outcomes. And hopefully create amended Objectives and Outcomes to accommodate new water thinking as a NWI stimulus for Capacity building to be truly innovative.
3. that the NWI contains eight key elements. Where I believe NWI Element-8 "Knowledges and Capacity Building" **is deficient**.
    a. Element-8 is not well addressed in the 2014 and 2017 NWI reviews, hopefully it now becomes a results scentre of attention at this NWR-2020

This BOM rainfall map demonstrates and reminds us all in a simple statement format why the NWI was created. The NWR-2020 now seeks to assess what the NWI has achieved.

Figure 1 **Australian rainfall deficiencies[a]**

1 April 2018 to 31 December 2019



[a] Rainfall deficiency defined as the average rainfall for an area minus the rainfall received. 'Lowest on Record' refers to records dating to 1900.

Source: BOM (2020a).

2.0: NWR Information requests:

Below find my listed NWR information request responses, these responses helped me compile background "as found" opinions and conditions of the NWI-Element-8 (Knowledge and Capacity Building)[2] status.

After my NWR NWI reads, chats to water participants and web-based studies. It becomes apparent to me that the NWI may not be working hard enough on Element-8 and if it did, many of the other NWI other seven key elements, ten objectives and ten outcomes as well as the 12 NWR information requests below could incur new water relief and be rewarded with numerous positive solutions for the current NWI predicaments and problems.

NWR Information-request-1: Jurisdictional progress

My submission seeks to highlight the NWR information reqiuest-1. "which elements of NWI have seen slow progress" Capacity building is not being achieved. See Appendix-B as a potential NWI KPI result to date.

NWR Information-request-2: NWI Adequacy

In my humble read, I take comfort in that the NWI appears as an excellent "tool box" to assist Governments to address the national water challenges. I believe an improved community communication mechanism of simplified KPIs to monitor and measure NWI performance needs to be developed, such as and not limited to.

- **KPI Storage**: Megalitres per population by state and nation
- **KPI Construction**: Cost Capacity KPI of $ cost per Megalitre to build
- **KPI Environment**: National water usage KPI per basin of available water vs used water pa

Doing so may help deliver simplified KPI clarity of NWI performance and therefore improves community partnerships and decision making. NWI Element-8 "Knowledge" objective improvement is achieved with KPI visible accountability of our NWI.

NWR Information-request-3: Future Reforms

The NWI should consider improving the public communication content, ie The NWI reporting obligations are a tad vague and evasive. How has the NWI National Guidelines on water reporting being concluded?

The NWI vague clauses 98 & 99[3] specify Knowledge yet do not influence how, this is still unfinished business on effective communicating of NWI Knowledges and Capacity building results. The NWI does not specify Capacity building targets.

The huge available online volume of sophisticated NWI and related reports are for dedicated industry readers. This tsunami of water reports could be deemed fatiguing and intimidating for the general reader and could form a means to disengage the community that should be informed.

The huge body of reports written on water issues in Australia, the NWI require a suite of dashboard items (KPI's?) to get achieve better public performance visibility.

[2] Appendix-A
[3] Appendix-C

NWI performance reports should be content specified to satisfy NWI element-8 on knowledge commitments. Consider adding relevant NWI KPI's to improve community engagement with simplified terms of conversation to help forge better understanding of the water challenges that the NWI is trying to address.

Indigenous and community water should be a priority delivery obligation. The NWI should not distinguish between the two on security, delivery, and quality. Future NWI reforms should amend for this.

NWR Information-request-4: Managing Extreme Events

NWI planning for future Climate change event risks can be mitigated in part if Capacity Building is achieved. New Capacity can contribute relief and some event shock protections. Was the intention of NWI-Element-8 crafted to address this type of scenario? As the solution on how to avoid or mitigate the "perfect storm" (no water) scenario. What assets need to be in place to achieve such precautions? Do we have unfinished business here?

NWR Information-request-5: Water Accounting and Compliance

- The NWR should assess the NWI water trading program if it is delivering true liveability outcomes.
- The NWI should consider water trading "abuse" scenarios and have in place correction mechanisms for future water trading and liveability induced stresses in the national water markets. Trading participants should be pre-qualified such as being a basin landowner could alleviate such stresses and loss of economic working water.
- Water accounting is currently constrained to be basin specific. New thinking is required, supplementary new water market opportunities should be encouraged and investigated.

NWR Information-request-6: Environmental Water Management

- Water Capacity building is specified by NWI element 8. The NWR should assess what results for Environmental Water has being achieved by the NWI delivering on this element-8 commitment.
- New water, supplementary water would help mitigate environmental water risks if relevant consequential cost of loss of water is computed and presented to NWI participants for resolve.
- An Australian Journal of Water resources published an ANU study where 3.6 billion of taxpayers money was spent on MDB infrastructure efficiency. Government claim 700GL was recovered. ($5,000 per megalitre). Investment is occurring here but poorly explained. We need value KPI's here to better communicate the needs and results of such spending and declare which NWI element justifies the spend.

NWR Information-request-7: Cultural Water

Indigenous and community water is a priority. The NWI should not distinguish between the two on security, delivery, and quality.

NWR Information-request-8: Water Services

No comment

NWR Information-request-9: Water Pricing

No comment

NWR Information-request-10: Water Safety and Supply

No comment

NWR Information-request-11: Supply Augmentation

Some water sensitive cities[4] have committed themselves to some water augmentation protection with desalination plants [5]. These supplementary water plants, the build costs are expensive in the order of thousands of dollars per megalitre of supply ability. The energy hungry operational and standby costs are predicted to be expensive augmentation. Desalination technology and corroded hardware is now a decade in age, and desalination replacement and future proofing considerations will require new Capacity Building thinking and planning. Desalination knowledge and learning has being done..

Innovative supplementary water options are required here to challenge "conventional" desalination water thinking and cost consequences. The NWI Element-8 should address this augmentation and futureproofing requirements with a supplementary water.

NWR Information-request-12: New Water Infrastructure

The NWR needs to have the NWI publish a new water infrastructure achievements list since its 2004 inception. Such a list will influence and scrutinise future NWI planning. I believe NWI element-8 Capacity Building is the most dismal performer of all NWI results to date, This NWR may confirm or correct this opinion.

It is believed the NWI may have delivered token Capacity building within various basins with a variety of water storage optimization programs where existing water volumes may have being shuffled, churned and traded about inside the same basin.[6] New water requires new infrastructure.

Establishing New Water Infrastructure should be an amended NWI Objective. Where new Capacity is be designed to satisfy sovereign security needs and be funded and value weighted like that of our national defence spend.

3.0: NWI Innovation and Capacity Building

The NWI is our modern government effort to address Australia's water resources management. In doing so many of the objectives and elements have been delivered, namely urban. The author believes Capacity Building is the most delayed component. New water capture has not been maximised. Figure-01 above indicates sample of our national rainfall plight. Figure-4 below indicates much new water opportunity exists. New Capacity building is always available if innovation is activated.

People have witnessed similar opportunistic water events of Figure-4. (below). There have been numerous innovative water capacity plans, such as:-

- 1946 Bradford Scheme to deliver Hells Gate water to the west Gulf country
- 1940 Reid Scheme to deliver Walsh, Gilbert, Einasleigh river water to the North West
- 2010 MacDonald – PNG water to be delivered south to Qld and MDB[7]
- 1987 Burdekin Dam [8] built with only 1860 GL storage capacity, short of the original design capacity for a 14.6-meter spillway wall with integrated Hydro power and 6840 GL of additional storage
    - The 1987 Dam build cost $125 million for 1860 GL capacity = $67 per megalitre

[4] Appendix-D: NWI Clause 92
[5] Appendix-E: Water sensitive cities desalination plant listing
[6] Appendix-J MDB Water Volumes
[7] Appendix-F PNG water endorsed by Senator MacDonald
[8] Appendix-G Burdekin Dam design build specifics 1987

- The 2020 Dam construction estimate for additional 6480 GL storage = $200 per megalitre[9])

These above listed historic water capacity innovative thinking all saw opportunity to deliver economic rewards with expanded water security. These schemes were not delivered or delivered in part (Burdekin). Water was jurisdictionally low valued back then, but now a modern NWI integrated approach could stimulate and activate and extract new economic value with new water availability. The NWR should assess how the NWI should stimulate Capacity building with innovation.

Figure-4 below illustrates an abundant rainfall event. The NWR should assess the NWI ability to develop feasibility plans for such rainfall events for possible economic and water security benefits.

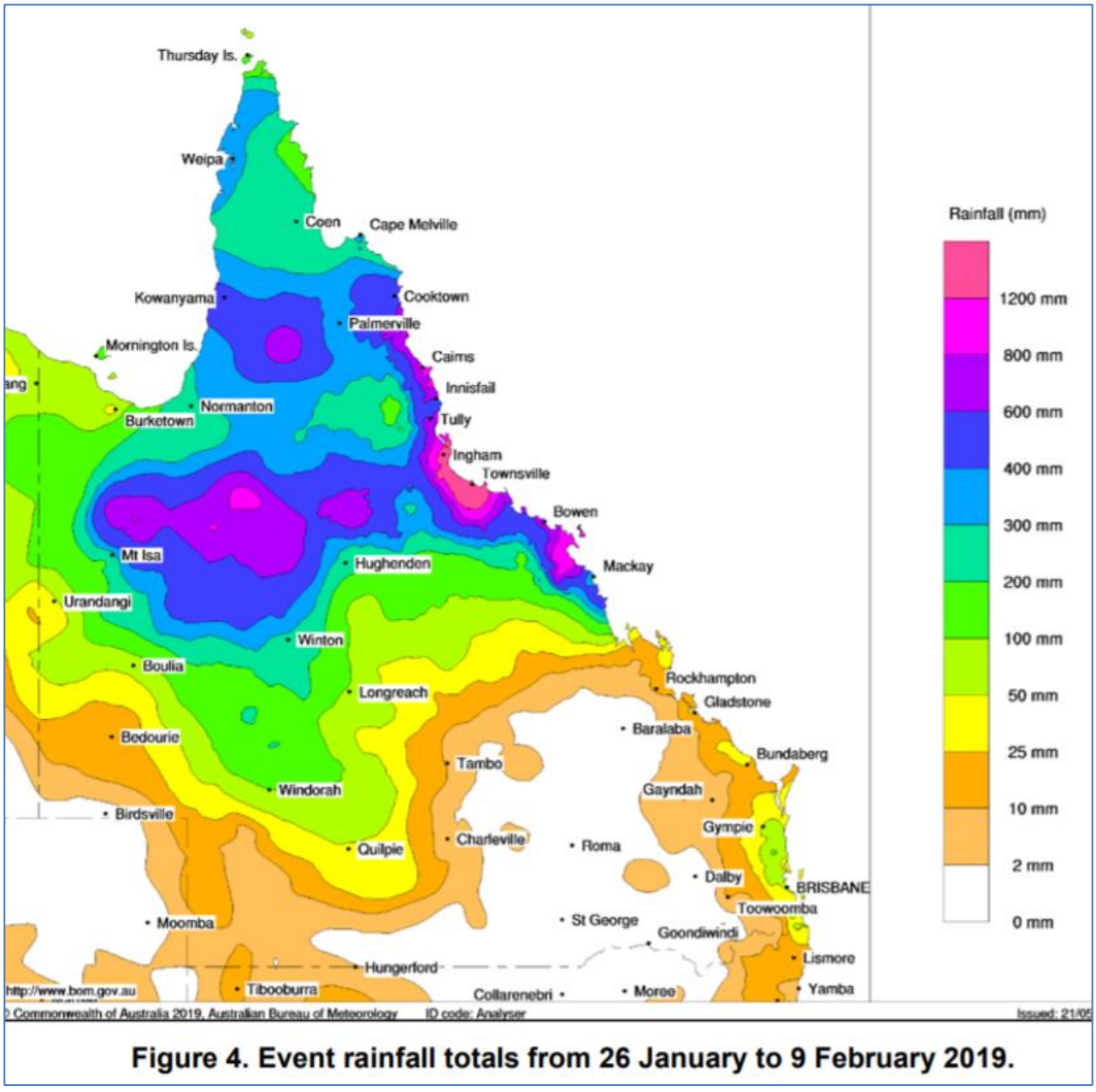


Figure 4. Event rainfall totals from 26 January to 9 February 2019.

[9] Tony Raggart "Dam Falls Short: Townsville Bulletin 8/8/2020

4.0: New Water: "Supplementary Water" Innovation

NWI clauses 98 & 99 Knowledge and Capacity Building identifies needs with academia. But in all, both items need to be revisited and redesigned to stimulate these two scopes to deliver evidence of relevant NWI results of Knowledge and Capacity.

Allow me to propose here an innovation example for "Supplementary Water". Such a creation would contribute significantly to NWI capacity building. Figure-1 above, presents our national rainfall plight, Figure-4 above, presents rainfall opportunity not yet harnessed. An "Innovation Challenge" would look at taking available unallocated run off water from one basin and redirecting some to another basin.

4.1: A Design Concept:

A supplementary water situation exists where the Burdekin dam has storage of 1860 GL and has average inflows of 8400 GL pa[10] where storage excess flows to the Barrier Reef. Can some of this run off be captured and put to higher value outcomes in another basin?

The NWI stimulates new capacity building programs with a national innovation design competition to secure and transport, consider say 1000[11] gigalitres of tropical/monsoonal unallocated run off water into the Murray Darling Basin system with a pipeline from Burdekin Dam Qld to the Murray River at Echuca, Victoria or similar. A viable business case for this type of scenario is now requested.

4.2: Outcomes Scenario:

With new storage capacity and pipeline what benefits could flow! In creating "Supplementary Water" most of the core NWI objectives, elements and outcomes would be delivered. Consider below some of these wide-ranging outcomes and consequential benefits.

- Queensland economy would have new economic contribution from new water sales
- Creates new supplementary water trading markets in QLD, NSW,VIC and SA
- Consider the scenario of 1000 GL sold at $250 per megalitre[12] has potential to deliver $250 million pa in new water sales to Queensland's Sunwater department without affecting existing customer obligations.
- Pipeline ensures product delivery, reduces pilfering, seepage, and evaporation.
- Pipelines ensures specific delivery to allocated customers
- Delivers improved water security precautions for numerous river, township and city systems
- Positions a possibility as an alternative supply resource to desalination to four capital cities.
- Incorporate and integrate pumped hydropower opportunities.
- Supplementary water provides risk mitigation and precaution support for
    - Aquifer distressed supply,
    - Contribute towards water quality and salinity control
    - Environmental flow support, procurement, and supply options.
    - Climatic change, extreme weather events, future proofing supply options
    - Barrier Reef run off sediment reduction assistance
    - Harvesting extreme rainfall events
- Additional outcomes benefits
    - Employment creator

[10] Appendix-H

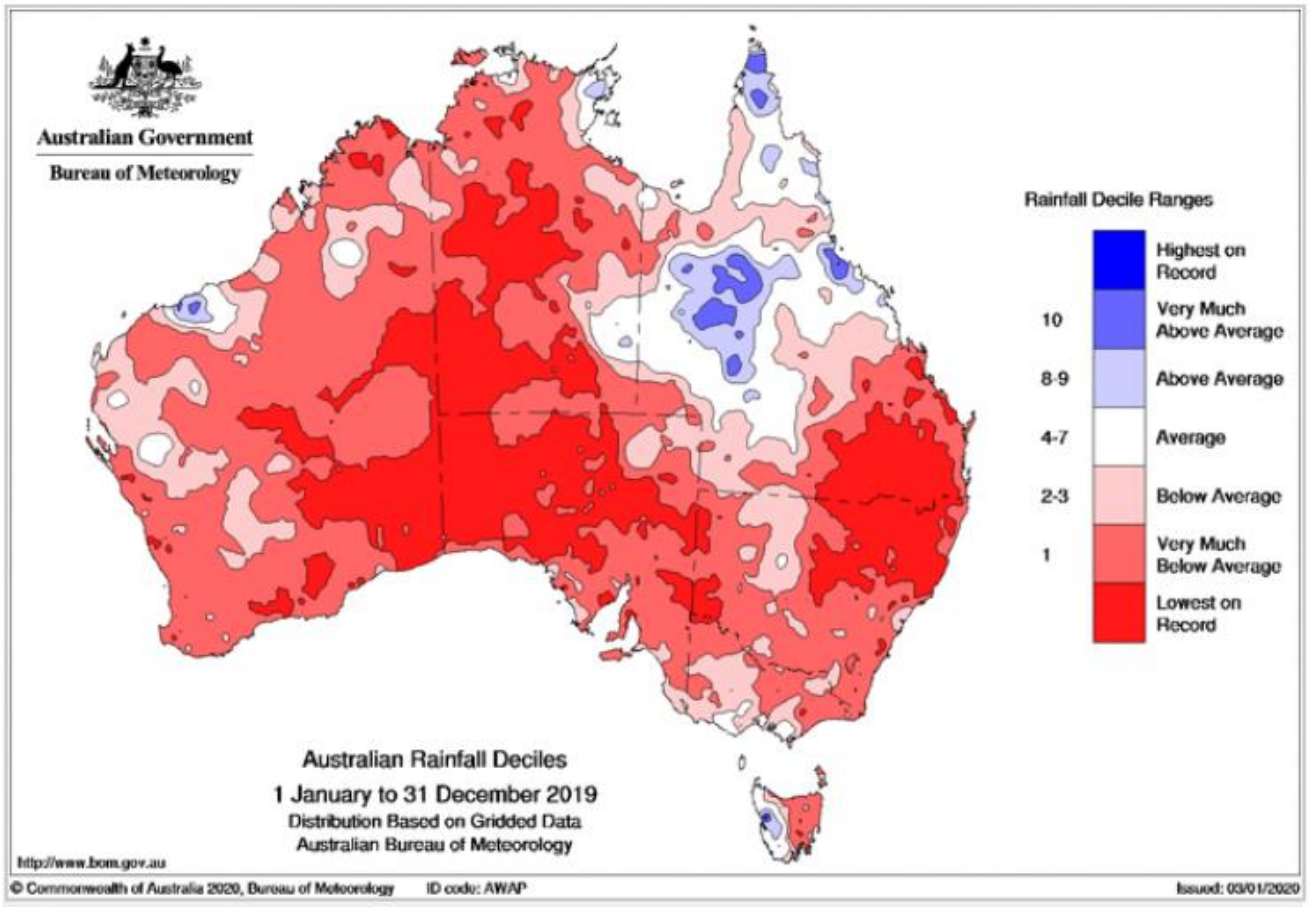
[11] Nominal volume obtainable with new storage capacity, conditional to monsoonal and environmental flow events in Burdekin catchment.

[12] Appendix-K nominal "allocated" water pricing

- 15% of the Australian work force is involved in food production[13]
- New $ billion-dollar water allocation industry for Qld

- Value realisations such as
  - Defence department spend 270 billion on national sovereign protection[14]
  - NWI new Capacity investments should have similar national defence valuation weighting.
  - Offer desalination redundancy and or future replacement with supplementary water entitlement and allocation transfers and piping.
  - Can provide the NWI with improved certainty of environment flows and resource security
  - The Snowy Mountains hydro provides empirical economic evidence of the value obtained in adding capacity and reversing water flows to other basins.

A BOM map of Australian Rainfall highlighting the distressed and excessive nature of our water resources. The NWI need to integrate both natures to a common beneficial water balance for the Australian water liveability. Stimulating Innovative thinking, new Capacity building and Knowledge development must be NWI encouraged to help deliver the NWI objectives in full to the Australian national water community.



2019 annual rainfall compared to historical rainfall observations. About deciles.

[13] 2013 National Food Plan Our food future Department of Agriculture, Fisheries and Forestry. Canberra.
[14] https://www.theaustralian.com.au/nation/politics/pm-shoulders-arms-to-china-in-10year-270bn-plan/news-story/1d130db628bde59abd6a02726bb94327 Simon Benson – 30th June 2020

5.0: Conclusion:

The NWR in its assessment of the NWI Capacity Building results to date, may again find it as “unfinished business” or raise it to “work in progress” status. Having new water is a “root cause” solution to most of the NWI objectives, elements and outcomes. Not having new water after 16 years indicates our NWI efforts are not good at problem solving, in that Capacity tinkering is not a substitute for courageous new water solutions thinking. Figure-4 confirms we do have available unused water. The NWI may not be using such to its optimum potential.

The Supplementary water innovation proposed here, requires new NWI paradigm thinking to contemplate the efforts and impacts. There have been numerous new water capacity projects proposed, North Queensland has a few and may have more if the NWR assesses how the NWI stimulates and delivers its Capacity building obligations

The design concept above is up for challenge, it is a stimulation proposal only. Its purpose is to demonstrate the outcome possibilities of having new water. The NWI, must challenge and stimulate innovative thinking to address deficient capacity building and activate additional water economic improvements in various water basins with “supplementary water” type thinking. This could become part of the NWI future relevance challenge.

Trust you find merit in this submission to look hard in your assessment at the NWI Element-8 specified Capacity Building outcomes.

Thanks for the opportunity to present my submission.

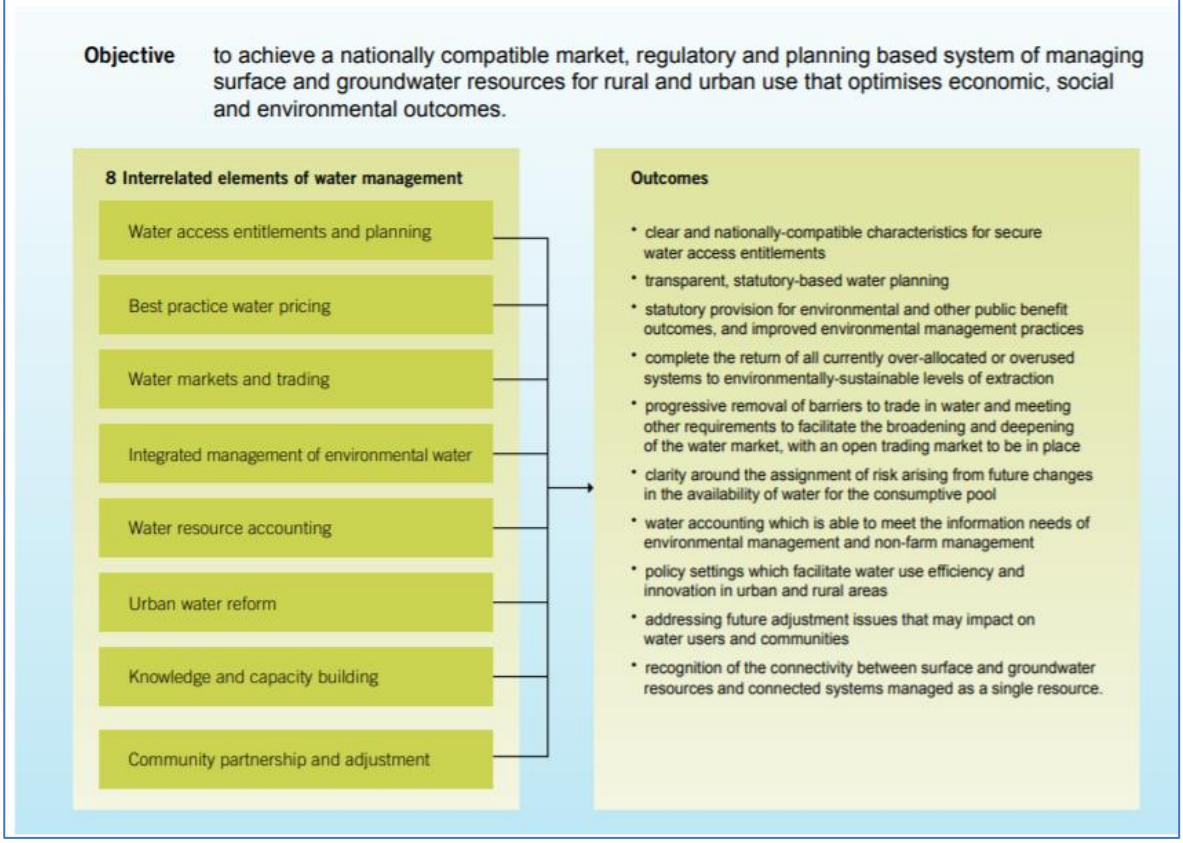
Keep up the good work.

Andrew Turnour
FIEAust.CPEng.NER.APEC Engineer IntPE(Aus).RPEQ.ASME-ret

Appendix-A: NWI Objective, 8 Elements and Outcomes

Figure-1: NWI objective, 8 elements and 10 outcomes

Figure 1: NWI objective, elements and outcomes



Box 1 **Agreed objectives and outcomes of the NWI**

Implementation of the National Water Initiative (NWI) was anticipated to:

> … result in a nationally-compatible, market, regulatory and planning based system of managing surface and groundwater resources for rural and urban use that optimises economic, social and environmental outcomes (paragraph 23)

There are ten specific objectives (paragraphs 23(i)-23(x)) underpinning this ambition.

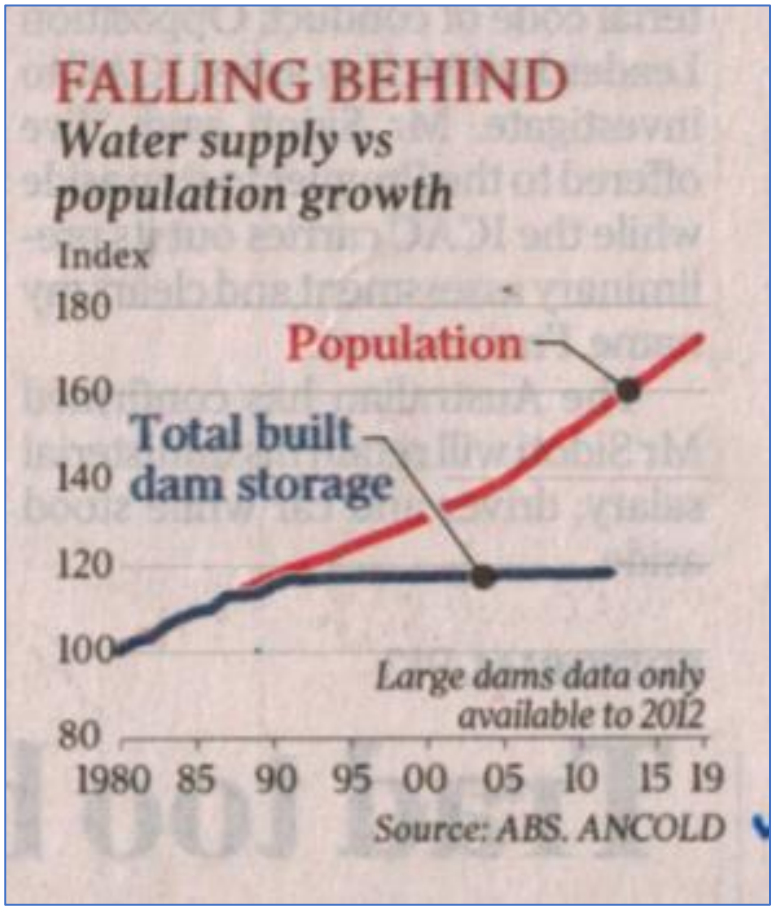
The NWI also establishes agreed outcomes, actions and implementation timelines for eight key elements:

1. Water Access Entitlements and Planning Framework
2. Water Markets and Trading
3. Best Practice Water Pricing and Institutional Arrangements
4. Integrated Management of Water for Environmental and Other Public Benefit Outcomes
5. Water Resource Accounting
6. Urban Water Reform
7. Community Partnerships and Adjustment.
8. Knowledge and Capacity Building

NWI schedules also specify principles for regulatory approvals for water use, guidelines for water plans and planning processes, guidelines for water registries, and principles for trading rules.

Source: COAG (2004).

Appendix-B: Water Storage versus Population data



RUNNING DRY

Water storage per person (megalitres)

	2000	2010	2019*	2030*+
Australia	**4.26**	**3.75**	**3.21**	**2.72**
NSW	3.33	3.08	2.63	2.25
VIC	2.77	2.39	1.96	1.6
QLD	2.78	2.38	2.08	1.75
WA	6.24	5.12	4.42	3.76
SA	1.55	1.41	1.35	1.24
TAS	48.46	44.58	41.54	38.98
ACT	0.66	0.57	0.65	0.54
NT	1.31	1.41	1.19	1.03

* Includes desalination, recycling
+ Assuming no new storages

Appendix-C: NWI Clause 98 & 99 Knowledge and Capacity Building.

Knowledge and Capacity Building

98. This Agreement identifies a number of areas where there are significant knowledge and capacity building needs for its ongoing implementation. These include: regional water accounts and assessment of availability through time and across catchments; changes to water availability from climate and land use change; interaction between surface and groundwater components of the water cycle; demonstrating ecological outcomes from environmental flow management; improvements in farm, irrigation system and catchment water use efficiency; catchment processes that impact on water quality; improvements in urban water use efficiency; and independent reviews of the knowledge base.

99. There are significant national investments in knowledge and capacity building in water, including through the Cooperative Research programme, CSIRO Water Flagship and Land and Water Australia, State agencies, local government and higher education institutions. Scientific, technical and social aspects of water management are multi-disciplinary and extend beyond the capacity of any single research institution.

Appendix-D: NWI Clause 92 Innovation and Capacity Building

Innovation and Capacity Building to Create Water Sensitive Australian Cities

92. The Parties agree to undertake the following actions in regard to innovation:

i) develop national health and environmental guidelines for priority elements of *water sensitive urban designs* (initially recycled water and stormwater) by 2005;

ii) develop national guidelines for evaluating options for water sensitive urban developments, both in new urban sub-divisions and high rise buildings by 2006;

iii) evaluate existing 'icon water sensitive urban developments' to identify gaps in knowledge and lessons for future strategically located developments by 2005;

iv) review the institutional and regulatory models for achieving integrated urban water cycle planning and management, followed by preparation of best practice guidelines by 2006; and

v) review of incentives to stimulate innovation by 2006.

Appendix-E: Water Sensitive Cities Desalination information

Plant	Capacity (per day)	Percent of water supply
Gold Coast Desalination Plant	125 megalitres	27% of South East Queensland
Perth Seawater Desalination Plant	130 megalitres	17% of Perth
Sydney Desalination Plant	250 megalitres	15% of Sydney
Victorian Desalination Plant	410 megalitres	33% of Melbourne
Southern Seawater Desalination Plant	270 megalitres	20% of Perth
Adelaide Desalination Plant	270 megalitres	50% of Adelaide

Desalination Plants in Australia[15]

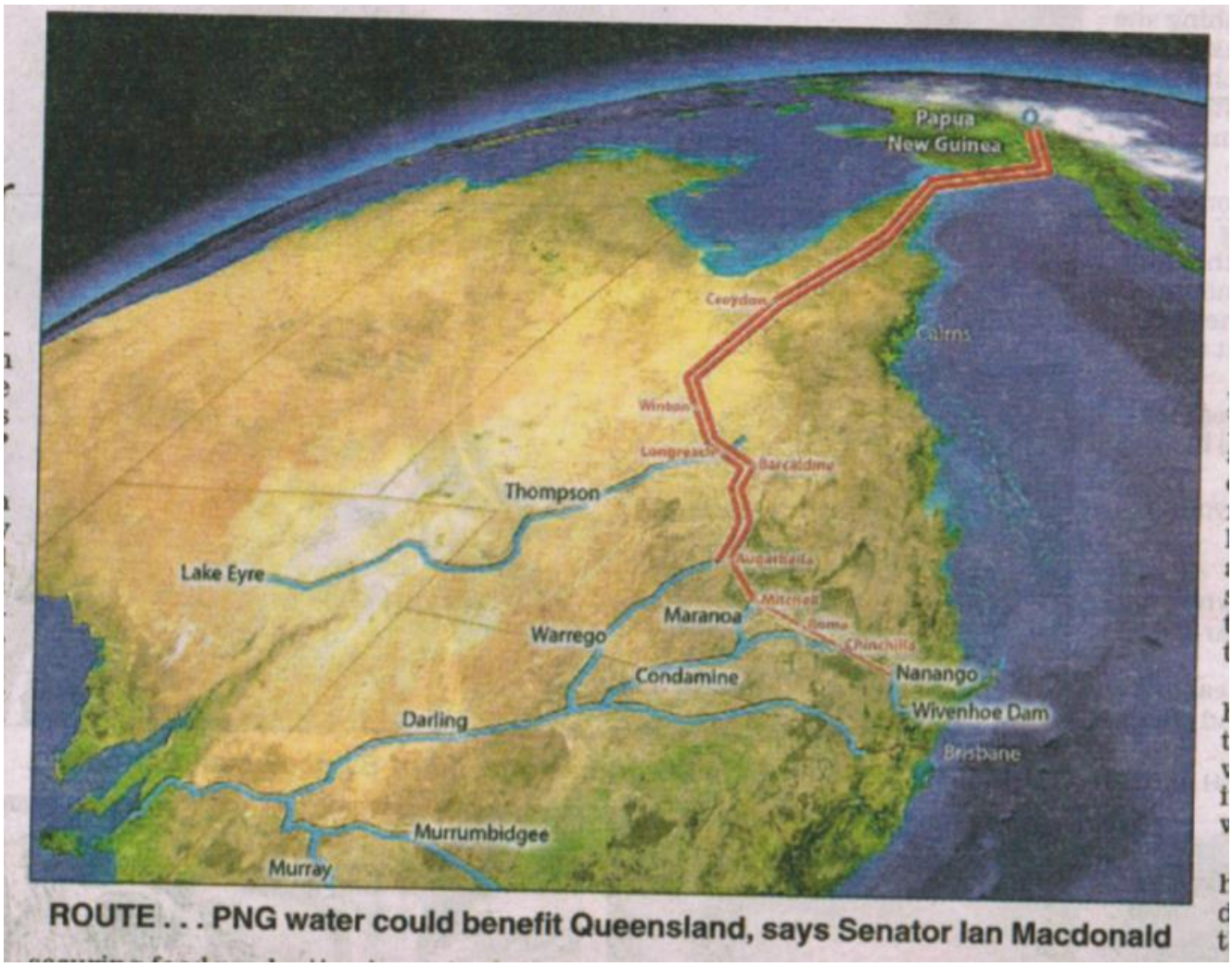
Desalination Construction Cost comparative

Location	Completion	Construction	Supply capacity	Construction KPI
	Date	Cost	Megalitres/pa	$/Ml capability
WA Perth	2006	$ 387,000,000	45,000	$ 8,600
WA Perth South	2012	$ 1,400,000,000	100,000	$ 14,000
Queensland Tugun	2009	$ 1,200,000,000	49,000	$ 24,490
SA Adelaide	2012	$ 1,830,000,000	100,000	$ 18,300
Victoria	2012	$ 3,500,000,000	150,000	$ 23,333
New South Wales	2010	$ 1,890,000,000	90,000	$ 21,000

http://www.awa.asn.au/AWA_MBRR/Publications/Fact_Sheets/Desalination_Fact_Sheet.aspx

[15] https://kids.kiddle.co/List_of_desalination_plants_in_Australia

Appendix-F: PNG Plan -Capacity Building and Innovation



ROUTE . . . PNG water could benefit Queensland, says Senator Ian Macdonald

Appendix-G: Burdekin Dam Details

Burdekin Dam

From Wikipedia, the free encyclopedia

The **Burdekin Dam**, officially the **Burdekin Falls Dam**, is a concrete gravity dam with an uncontrolled spillway across the Burdekin River, located south west of Ayr, and Home Hill in North Queensland, Australia. Built for the purpose of irrigation, the reservoir, called **Lake Dalrymple**. Burdekin Dam is managed by SunWater. Water from the reservoir is also used to replenish downstream aquifers.[2]

Reservoir	
Creates	Lake Dalrymple
Total capacity	1,860,000 ML (410×10^9 imp gal; 490×10^9 US gal)[1]
Catchment area	114,220 km^2 (44,100 sq mi)
Surface area	22,400 ha (55,000 acres)
Maximum water depth	40 m (130 ft)
Normal elevation	154 m (505 ft)

Australian Government
Bureau of Meteorology

North Queensland Monsoon Trough

Technical Flood Report

January and February 2019

OM

Appendix-H: Burdekin River Flow History

Figure-19 Below:

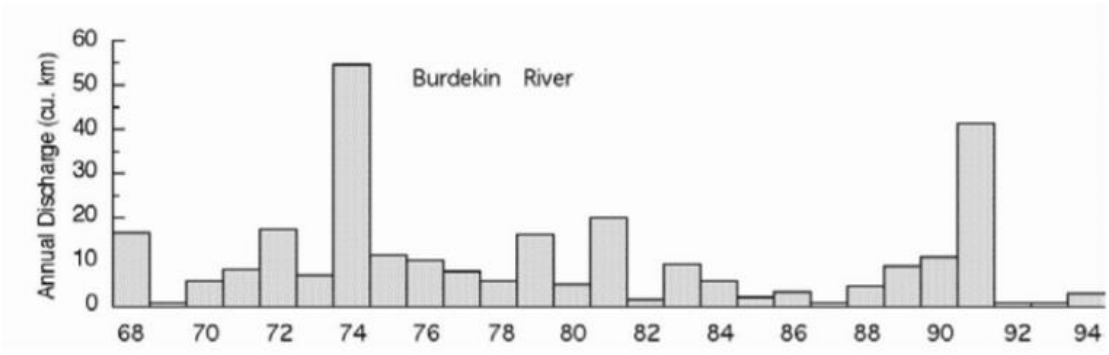


Figure 19. Water discharge patterns in the Burdekin River.

Burdekin flows

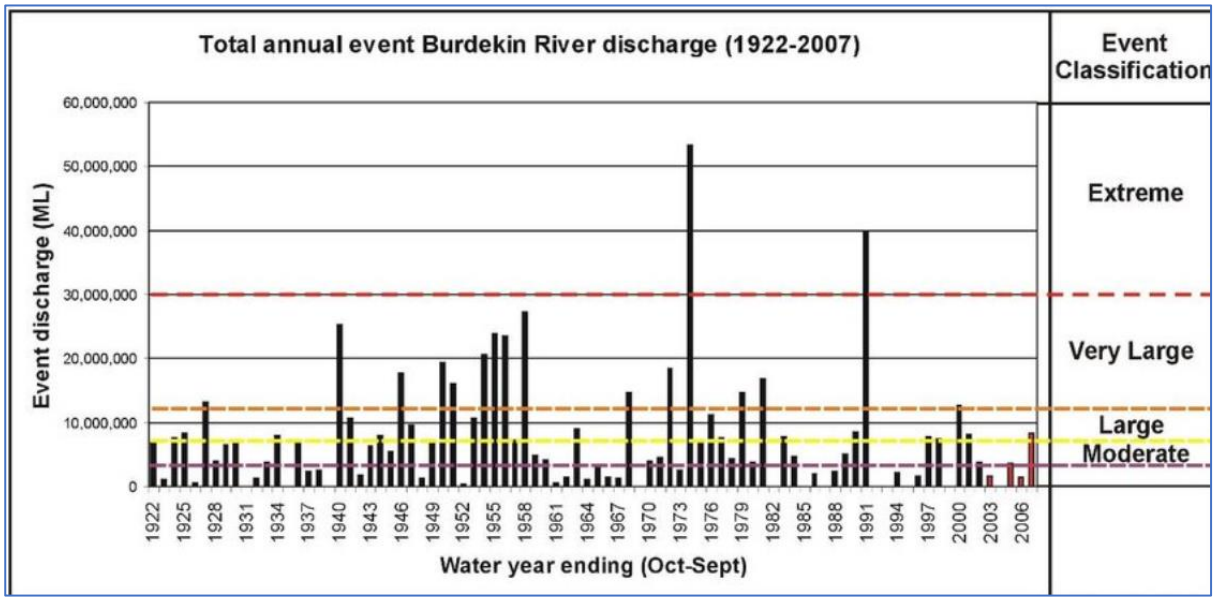
Current estimates of average annual TSS loads from the Burdekin River range between 3.5 million tonnes from modelling using SedNet (McKergow *et al.* 2005*a*; Fentie *et al.* 2006; Kinsey-Henderson *et al.* 2007) to 4.6 million tonnes estimated from monitoring (Mitchell *et al.* 2006; Bainbridge *et al.* 2007). However, the annual flow statistics of the Burdekin River demonstrate the extremely variable nature of this catchment, which influences TSS loads. The annual discharge for the Burdekin River has ranged from 250 (1930–31) to 54 000 (1973–74) GL, with a mean of 8400 GL over the period 1922–2005 (Bainbridge *et al.* 2007). Therefore, the sediment and nutrient loads exported from the catchment would also reflect this extreme variability. Assuming the event mean concentration (EMC) is consistent across flood events, our current best estimates of 'average' loads suggest an EMC for TSS lies between 420 and 550 mg L^{-1}. This equates to a range in the Burdekin River sediment load from 0.10 to 30 million tonnes per year in the period 1922–2005. This extreme range highlights the difficulty of applying 'averages' to the

Extract from CSIRO report [16]

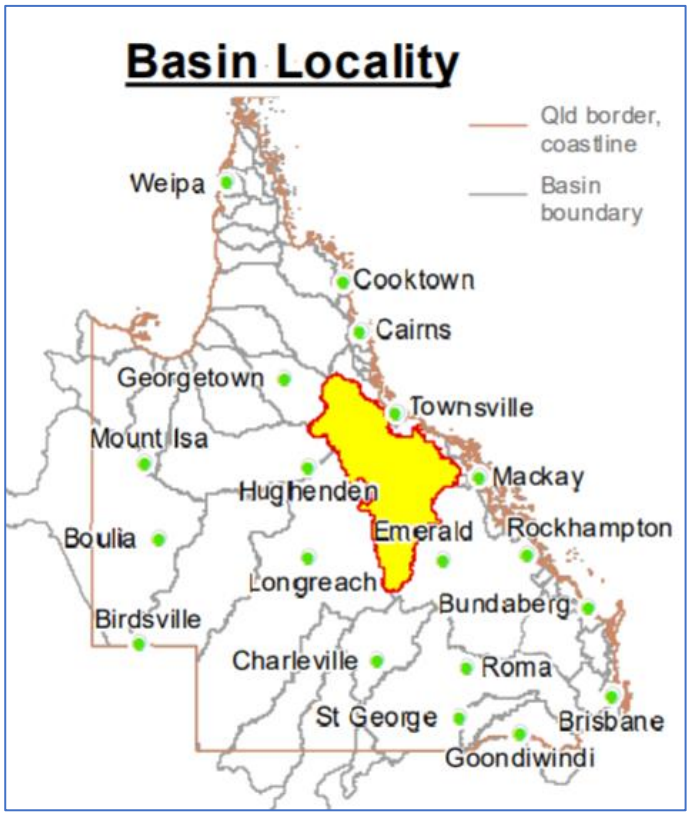
[16] https://www.publish.csiro.au/MF/fulltext/MF08339

Appendix-I: Burdekin Dam Capability

Water past the Dam flowing to the Barrier reef @ Inkerman Bridge Gauge



https://water-monitoring.information.qld.gov.au/



Burdekin Basin Map

Appendix-J: Murray Darlin Basin Water Storage Volumes

/www.mdba.gov.au/annual-reports/annual-report-2014-15

There is a total of 22,000 GL of publicly managed water storages in the Basin

Volume of water in Murray Darling Basin

ALL IMAGES VIDEOS MAPS NEWS SHOPPING

153,000 Results Date Language Region

Summary of Murray-Darling Basin Storages. Reduced rainfall over the last few weeks has resulted in a decline in the amount of unregulated inflows into Hume and Dartmouth Reservoirs and into the River Murray. The total volume of water currently in storage is about **1 835 GL** (20% capacity).

Reference:
www.waterconnect.sa.gov.au/Content/Flow%20Reports/DEW/RM-Flow-Report-20070817.pdf

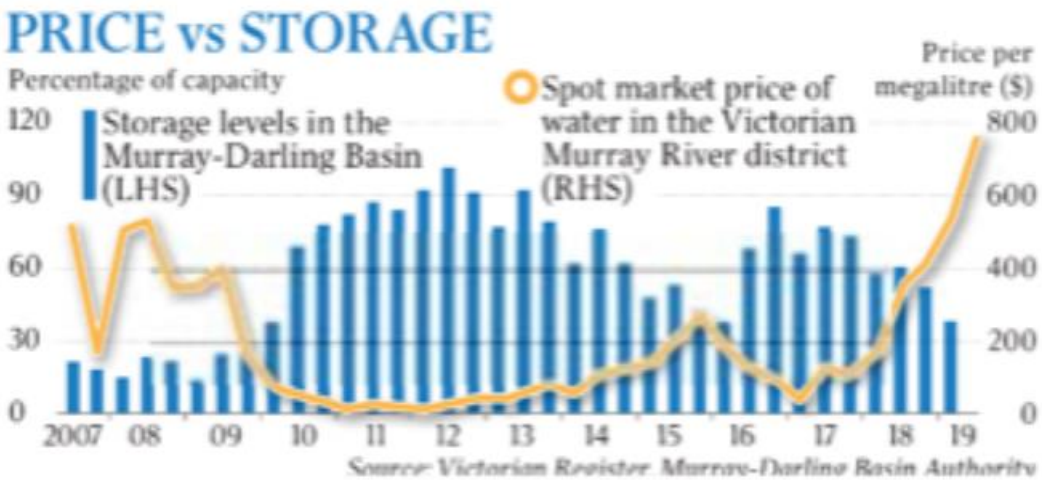
Was this helpful?

PEOPLE ALSO ASK

How much water does the Murray Darling basin have?

Total water flow in the Murray–Darling basin 1885 to the present has averaged around 24,000 gigalitres (24,000 hm 3 ; 19,000,000 acre·ft) per year. This is the lowest rate of the world's major river systems. About 6.0 percent of Australia's total rainwater falls into the basin.

Appendix-K: Water Pricing



"Once the water price increases up towards $800, it means that it is very hard to produce a crop that can be made into wine that can sell," he said.

It is understood that among other requests, the letter from the agricultural groups calls for a temporary ban on non-landowning water investors from buying

Appendix-L: Anecdotal information – Wall of Water

After the February 2019 monsoonal 1 in 100-year flood event in Townsville. With a fellow explorer we visited the historic township of Dalrymple which was sited at the junction of the Keelbottom creek and Burdekin river, upstream of the Burdekin Falls Dam. We witnessed flood debris material in trees four to five meters above our camping ground, which was some 25 meters above the low water level in the Burdekin river that day. What was most impressive is the river junction width at this point is about 300 meters wide. Such a unique volume of water, just staggering! and justifies why the Dalrymple township was not rebuilt a third time in the 1800's.

Appendix-J: Burdekin Water Allocations

Table 28: Current water allocations from Burdekin Falls Dam, by purpose

Source: adjusted from DNR 2004:32

	Allocation (ML/a)	Priority	Proportion of Total (%)
Agriculture	585,790	Medium	53%
Urban - existing	10,580	High	1%
Urban - future	110,000	High	10%
Distribution loss - initial	16,260		1%
Distribution loss - continuing	190,480		17%
Unallocated	184,200		17%
TOTAL	1,097,310		100%

Appendix-K: MDB Environmental Flows

Table 2: Volumes of environmental water delivery

Volumes of environmental water delivery	
Water Holders	**Volume of environmental water delivered (GL)***
Commonwealth Environmental Water Holder	1,142 GL
The Living Murray	170.5 GL
Victorian Environmental Water Holder	230.5 GL
New South Wales	406 GL
Queensland (PEW)	22 GL
South Australia	46 GL
Total	**2,019 GL**

* Volume includes Held Environmental Water Entitlements, Planned Environmental Water, and River Murray Increased Flows Project.

Appendix-L: Burdekin Dam Capacity Building

Queensland bulk water opportunities statement

Burdekin Delta

The raising of Burdekin Falls Dam is the Queensland Government's priority for further assessment as a potential means to augment and increase water supply in the Burdekin and surrounding regions. Sunwater is leading the State's planning and assessment for this proposal. Sunwater's work has concluded that there is a sufficient level of interest and forecast future demand from agricultural, urban and industrial users to warrant further investigation of a potential raising of Burdekin Falls Dam.

https://www.dnrme.qld.gov.au/__data/assets/pdf_file/0008/1470545/bulk-water-opportunities-strategic-framework.pdf