Submission

Victorian Government
Goulburn Murray Irrigation District Drainage Management Strategy

October 2021

Animal Justice Party

Animal Justice Party

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The Animal Justice Party 2021

Images
Front cover: Northern Victoria (Source: Goulburn Murray Irrigation District Drainage Management Strategy Consultation Page)
This Page: Mount Ash Forest, Kinglake, Dr Nadine Richings © 2020

The Animal Justice Party acknowledges the First Nations peoples as the custodians of the land on which we live and work.

About the Animal Justice Party

The Animal Justice Party (the AJP) is a political party established in 2009 to secure the interests of animals and nature through Australia's democratic institutions of government. Our vision is a planet on which animals and nature have the right to live and thrive free from negative human interference and a human society which functions with kindness and compassion within its ecological limits as a responsible member of the Earth community. The AJP seeks to foster respect, kindness, and compassion towards all species particularly in the way governments design and deliver initiatives, and the manner in which these initiatives function.

In New South Wales the AJP has two elected representatives in the Legislative Council of NSW, Mark Pearson MLC and Emma Hurst MLC. In Victoria, the AJP has an elected representative in the Legislative Council, Andy Meddick MLC, and two councillors in Local Government, Councillors Julie Sloan and Charlie Vincent.

This submission was prepared by the Victorian Submissions Working Group within the AJP. The working group makes this submission on behalf of the AJP with the approval and the endorsement of the Board of Directors.

Introduction

Water is necessary for all life on Earth and the right to clean water must be protected. The AJP supports water management, including irrigation and drainage, that is responsive to climate change and that prioritises animals, the environment and humans over commercial interests. When it comes to water, the best way to protect the rights of humans and other animals is to protect the environment which collects, holds and cleans the water.
Irrigation and drainage are inextricably linked, being the **artificial application of water to land and artificial removal of excess water from land**, respectively. Some land requires irrigation or drainage before it is possible to use it for any agricultural production; other land profits from these practices to increase production and profit to farmers.

The Goulburn-Murray Irrigation District (GMID) system is the largest irrigation system in Victoria. It covers 9,950 square kilometres (an area larger than France) and accounts for more than 70 percent of water stored in Victoria and almost 90 percent of water used in irrigation across the State[1]. The basin contains 60 percent of Victoria's farms and is Victoria's biggest river system. It is home to 5 Ramsar-listed wetlands[2] – areas of huge ecological significance over which Australia

[1] https://www.g-mwater.com.au/downloads/gmw/MTR/TATDOC-_4079268-v1-fact_sheet_-_GMID_-_november_2015.PDF
[2]https://www.awe.gov.au/water/wetlands/australian-wetlands-database/australian-ramsar-wetlands

has treaty obligations to protect. About 44 Aboriginal nations are the traditional owners of the basin[3].

The irrigated agriculture sector in northern Victoria alone generates more than $6 billion of production value annually and directly supports over 10,000 jobs in the Goulburn-Murray Irrigation District (GMID).

Goulburn Murray Water (GMW) is the northern Victorian Resource Manager appointed by the Minister for Water and is responsible for making the seasonal determination for all northern Victorian declared water systems. GMW is a partner in the Victorian Water Register which manages more than $7 billion of water entitlements and over $300 million in water share and allocation trade for Victoria[4]. They service and supply a diverse range of urban Water Authorities, Catchment Management Authorities (CMAs) and the Murray Darling Basin Authority (MDBA).

GMW manages water related services in a region of 68,000 square kilometres, bordered by the Great Dividing Range in the south and the River Murray in the north, stretching from Corryong in the east down river to Nyah. They have more than 20,000 customers using over 39,000 services in northern Victoria. They manage 24 water storages that can hold approximately 11 million ML of water and also have responsibility for managing more than 100,000 hectares of public land surrounding their storages.

The purpose of this inquiry is to examine whether the draft *Goulburn Murray Irrigation District Drainage Management Strategy* is fit for purpose as stated:

> *"It has been developed to provide a clear direction for the future management of irrigation in the region and is intended to be reviewed regularly.*
> *Effective, fit for purpose surface and subsurface drainage is essential for sustainable irrigated agriculture.*
> *Goulburn Broken Catchment Management Authority and North Central Catchment Management Authority have a lead role in identifying irrigation drainage and salinity mitigation needs across the Goulburn Murray Irrigation District through the development of Regional Catchment Strategies and Land and Water Management plans. The collaborative, partnership approach to drainage issues, and a positive approach to working with regulatory agencies has proven to be an effective way to manage drainage needs.*
> *Recently there has been a range of significant changes to irrigated agriculture in the Goulburn Murray Irrigation District and the external environment within which irrigation drainage service providers operate.*

[3] https://www.greatlakesadvocate.com.au/story/7441388/why-australians-should-care-about-the-murray-darling-basin/
[4] https://www.g-mwater.com.au/about

The draft Goulburn Murray Irrigation District Drainage Management Strategy (the draft Strategy) has been developed to provide a clear direction for the future management of irrigation drainage.
Importantly the draft Strategy recognises that the future is uncertain, and it has been developed using resilience principles. These principles aim to enable a more flexible approach to the way surface and subsurface drainage services are provided; as well as supporting a structured, continuous review, improvement, and adaptation process into irrigation drainage management.
The Goulburn Murray Irrigation District Drainage Management Strategy is intended to be an adaptive ongoing strategy. It is expected that the strategy will be reviewed and updated every four years unless it is identified that there has been significant change in the Goulburn Murray Irrigation District which requires the reviews to be brought forward".

This submission is guided by our mission and vision and underpinned by our policies. The AJP has policies on animals, environment and human issues[5]. Our policies on Environment[6], Climate Change[7], Health[8] and Land Clearing[9] are particularly relevant to this consultation.

Our submission tackles this critically important subject presenting our arguments for, or against, the themes developed by the *Goulburn Murray Irrigation District Drainage Management Strategy*; recommendations are provided throughout our submission. The AJP comments on some of the objectives of the Strategy as numbered 1 to 4 below.

Thank you for the opportunity to contribute to this consultation.

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1. Support productive and sustainable irrigation

Drainage is closely connected with irrigation which in turn is needed for sustainable irrigated agriculture. Drainage can become necessary if excess water is used for irrigation, or if flooding events occur. Drought and floods will occur more frequently as a result of climate change. It is absolutely critical, and life saving, that we use water more efficiently and that the need for drainage is reduced.

[5] Animal Justice Party *Policies* https://animaljusticeparty.org/policies/
[6] https://animaljusticeparty.org/policieslist/environment/environment/
[7] https://animaljusticeparty.org/wp-content/uploads/2021/08/ClimateChange.pdf
[8] http://animaljusticeparty.org/wp-content/uploads/2017/11/healthA4.pdf
[9] https://animaljusticeparty.org/wp-content/uploads/2017/11/land-clearingA4.pdf

As we progress further into the planet's climate emergency, we know that as the average daily temperature in the Goulburn Murray basin rises 1 degree Celsius, there will be a 15 per cent drop in run-off of water into its river system. Research published by the CSIRO in 2009 warned that the basin will get hotter and drier as a matter of certainty. Mr Gavin Walker, an award winning scientist with the CSIRO, told the Murray Darling Basin Authority that it would be "scientifically indefensible" for it not to include climate change projections in its calculation of how much water the environment needs returned to it in order to survive. Apparently the MDBA rejected this "best available scientific knowledge". This was a breach of the *Water Act 2007*, and Gavin Walker called it "incomprehensible", "nonsensical" and "negligent"[10].

Australia is a land "of drought and flooding rains" (Dorothea Mackellar)

Most Australians know all too well how precious water is. Between 2017 and 2019 severe drought developed across much of eastern and inland Australia including Queensland, New South Wales and Victoria, and approximately 55 towns ran out of water[11]. States and councils had to pay millions of dollars for emergency water infrastructure.

Under climate change, the situation will become more dire, and more common.

In 2004, federal, state and territory governments signed up to the National Water Initiative. It was meant to secure Australia's water supplies through better governance and plans for sustainable use across industry, environment and the community. But a report by the Productivity Commission in 2021 said the policy must be updated. It found the National Water Initiative is not fit for the challenges of climate change, a growing population or our changing perceptions of how we value water[12].

The report's findings matter to all Australians, whether they live in a city or a drought-ravaged town. If governments do not manage water better, on our behalf, then entire communities may disappear. Agriculture will suffer, nature will continue to degrade and biodiversity will be lost. The report acknowledges progress in national water reform, and says Australia's allocation of water resources has improved. But the commission makes clear there is still much to be done, including:

- making water infrastructure projects a critical part of the National Water Initiative
- explicitly recognising how climate change threatens water-sharing agreement between states, users, towns, agriculture and the environment
- recognising Indigenous rights to water

[10] https://www.greatlakesadvocate.com.au/story/7441388/why-australians-should-care-about-the-murray-darling-basin/
[11] https://www.abc.net.au/news/2020-01-27/how-long-until-drought-stricken-towns-run-out-of-water/11655124
[12] https://theconversation.com/our-national-water-policy-is-outdated-unfair-and-not-fit-for-climate-challenges-major-new-report-155116

- delivering adequate drinking water quality to all Australians, including those in regional and remote communities, especially during drought
- all states committing to drought management plans.

Why Australia needs National Water Reform.

> *"Victoria's water resources are under pressure from increasing demand and decreasing supply. As the fastest growing state in Australia , demand for water is growing while average annual rainfall across the state is projected to decline. Our catchments and much of our older infrastructure has not been built to withstand the increasing frequency and intensity of events under climate change, such as extreme rainfall, bushfires and heatwaves. This presents challenges as our water sector balances maintaining reliable services with affordability to customers."*
>
> **Draft Water Cycle Climate Change Adaptation Action Plan 2022-2026. DELWP, Victorian Government[13].**

There is an urgent need to investigate ways to reduce water consumption, in particular the massive amounts of water consumed by animal agriculture. To ignore the impact of animal agriculture on climate change and the significant impact of its water consumption on our future water security is negligent; it is impossible to write a meaningful plan for sustainable agriculture, including irrigation and drainage, without addressing this significant contributor to the issue. The AJP cannot fully support any plan if the plan does not include actions to reduce water use, to replace water-thirsty industries and to educate the public on this matter.

Water-wise diets

Western diets, which depend largely on meat, are not water-wise (see Figure 1) and they put great pressure on nature in particular with their water consumption. Meat-eaters consume the equivalent of about 5,000 litres of water a day compared to the 1,000-2,000 litres used by people on vegetarian diets. The consensus emerging among scientists is that it will be almost impossible to feed future generations the typical diet eaten in western Europe and North America without destroying the environment [14].

[13]https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.vic-engage.files/9516/2493/3338/Draft_Water_Cycle_Adaptation_Action_Plan_2022-26.pdf
[14] https://www.theguardian.com/environment/2004/aug/23/water.famine

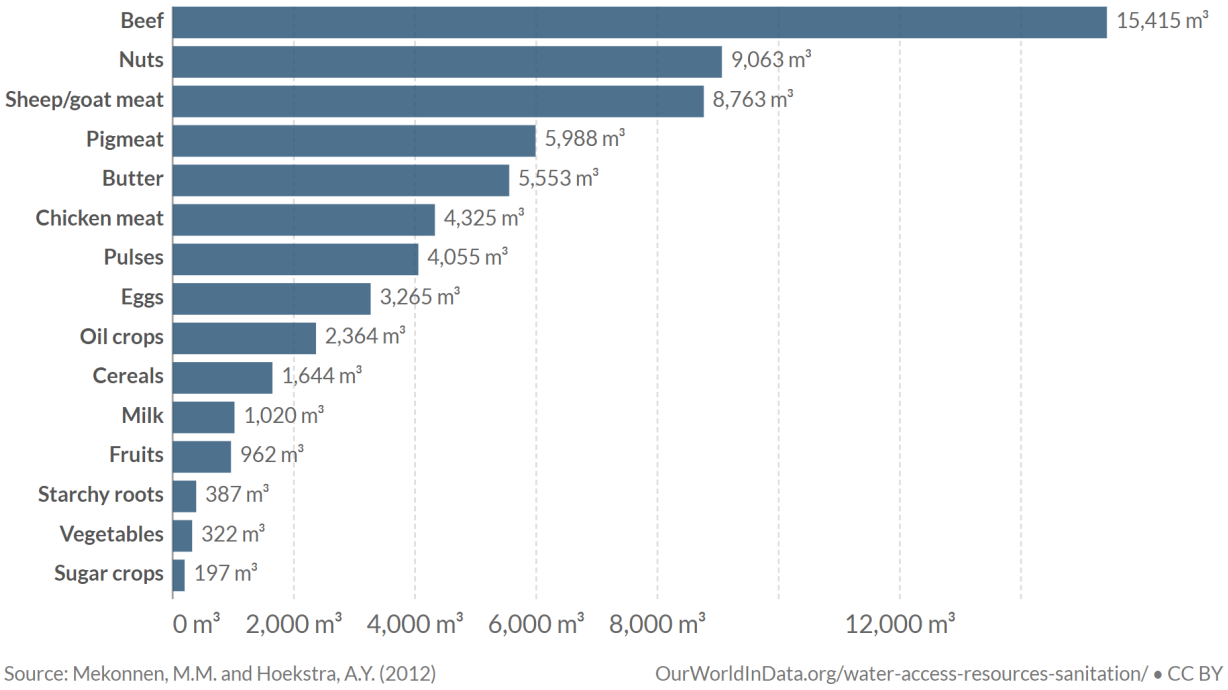

Figure 1 - The global average water footprint of food production (per tonne of food product), including water requirements across its full supply chain and the quantity of freshwater pollution as a result of production.
Source: Our World in Data

Animals used for human food require crops as food. "Growing beef", in particular, takes an enormous amount of food – 25 kilograms of fodder to produce one kilogram of beef (see Figure 2). Growing grain to feed farm animals is a significant contributor to water consumption.

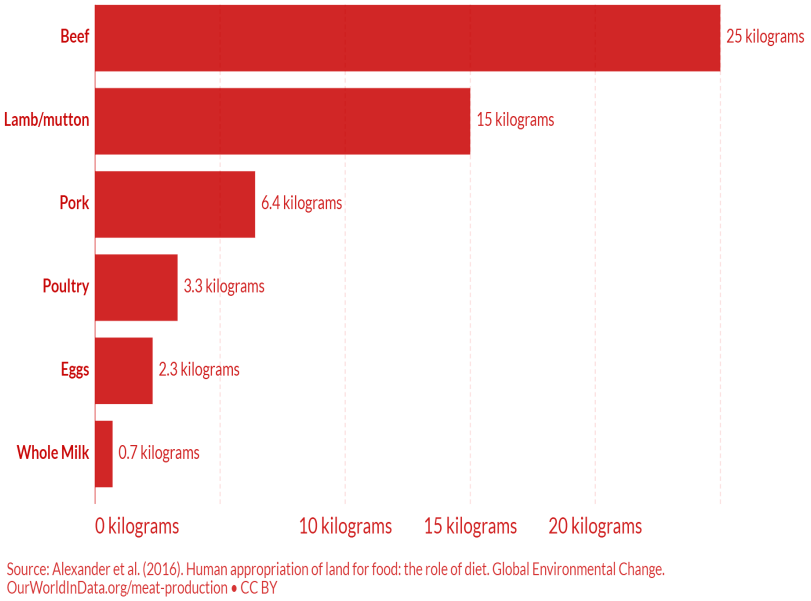

Figure 2 - The quantity of animal feed required to produce one kilogram of animal-based food; measured as dry matter feed in kilograms per kilogram of edible weight output.
Source: Our World in Data
(https://ourworldindata.org/grapher/feed-required-to-produce-one-kilogram-of-meat-or-dairy-product)

Recommendations:

1. Educate and support the community to shift to a predominantly plant-based diet *e.g.*, Meat-Free Mondays[15] and provide more plant-based food in schools, aged care facilities, hospitals and prisons.
2. Allocate less water to irrigators and more to the environment.
3. Increase the cost of water used for irrigation to limit use to the amount really necessary.
4. Reduce the need for drainage by limiting the amount allocated to irrigators.
5. Keep detailed records of water allocated to irrigators and compare them yearly.
6. Make water infrastructure projects a critical part of the National Water Initiative.
7. Recognise how climate change threatens water-sharing agreement between states, users, towns, agriculture and the environment.
8. Modify the dietary guidelines to encourage a plant-based diet and limited, or preferably no, meat and dairy.
9. Deliver adequate drinking water quality to all Australians, including those in regional and remote communities, especially during drought.
10. Liaise with water management companies throughout Australia to commit to drought management plans.

2. GMID is an attractive and affordable place to farm

"We must ensure that we have adequate water to meet the goal of GMID being an attractive and affordable place to farm which makes it imperative that we change our practices to adapt to climate change".

Globally 2.1 billion people live without safe water and around four billion people – nearly two-thirds of the world's population – experience severe water scarcity during at least one month of the year[16]. According to the United Nations, 700 million people worldwide could be displaced by intense water scarcity by 2030[17].

Animal Agriculture

More than 83 billion land animals are reared and slaughtered globally for the food industry every year, and industrial scale animal agriculture impacts our environment in enormously detrimental ways (Figure 3). It is not only one of the leading contributors to climate change and deforestation, but it also uses vast quantities of water. Research shows that switching to more plant-based diets could cut our water footprint in half. By changing our diet to reduce or replace

[15] https://meatfreemondays.com/
[16] https://www.unwater.org/publications/summary-progress-update-2021-sdg-6-water-and-sanitation-for-all/
[17] https://www.unwater.org/water-facts/scarcity/

meat, dairy and eggs with more water-friendly, plant-based foods, we can all help to preserve the world's water.

Agriculture (animals and plants) accounts for about 70 percent of water used in the world today (Figure 3). Most of the total volume of water used for animal agriculture (98 percent) is used for the feed for the animals[18]. Humans eat less than half of the world's cereal and about 40 percent of cereal is fed to animals.[19]

On average it takes about 15,000 litres of water to produce one kilogram of beef[20].

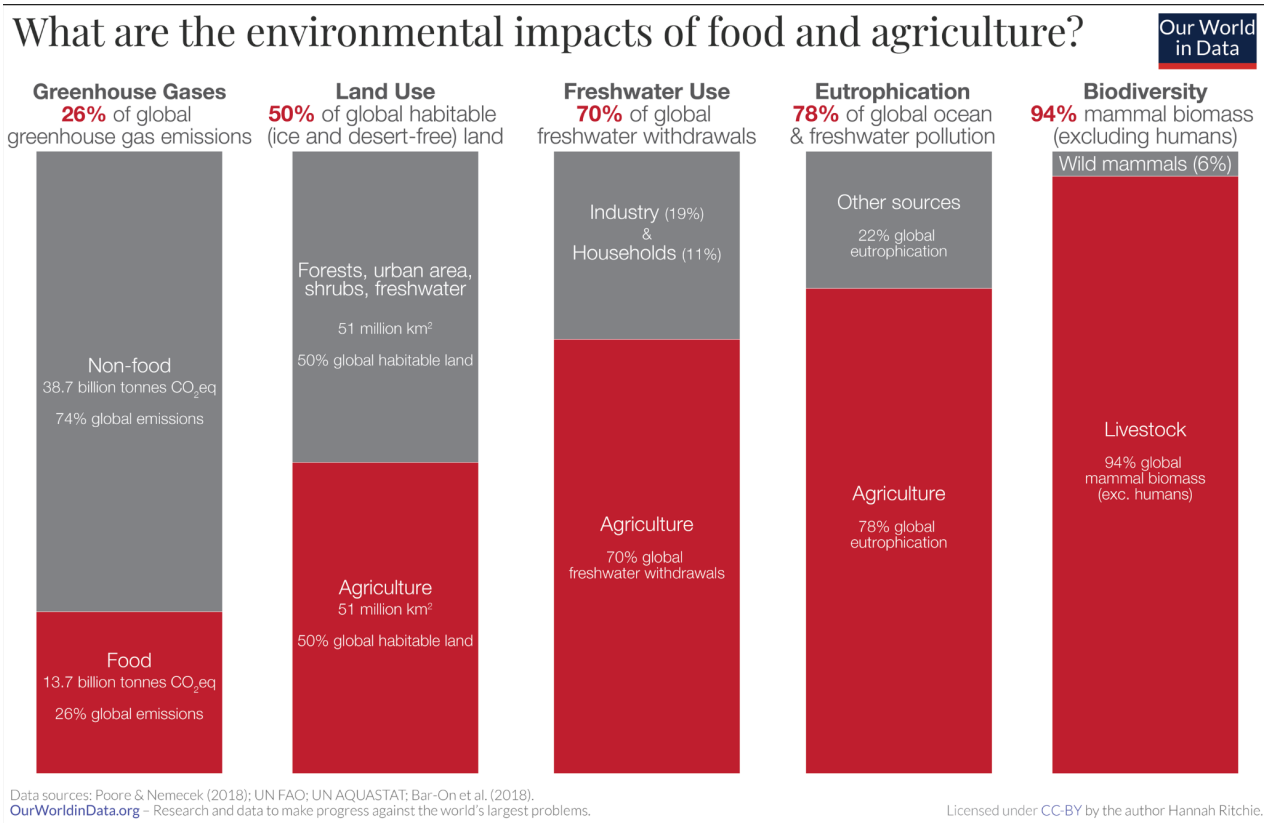

Figure 3 - The environmental impacts of food and agriculture
Source: Our World in Data (https://ourworldindata.org/environmental-impacts-of-food)

In Australia, agriculture is the major user of water (approximately 70 percent, as opposed to 20 percent for urban use and 10 percent for industry)[21]. Compared to plant-based agriculture generally, animal agriculture has an enormous water footprint, both globally[22] and in Australia[23]. For instance, to produce a kilogram of meat from cattle typically uses 10-15 times more water than the production of a kilogram of soybean in Australia. For this reason, plant-based diets help reduce excessive water use.

[18] https://waterfootprint.org/en/water-footprint/product-water-footprint/water-footprint-crop-and-animal-products/
[19] https://ourworldindata.org/land-use-diets
[20] https://waterfootprint.org/en/water-footprint/product-water-footprint/water-footprint-crop-and-animal-products/
[21] Bureau of Meteorology. Water in Australia. http://www.bom.gov.au/water/waterinaustralia/
[22] https://waterfootprint.org/en/water-footprint/product-water-footprint/water-footprint-crop-and-animal-products/
[23] Meyer, WS (2004) Water for food - the continuing debate. https://www.researchgate.net/publication/269396797_Water_for_Food_-_the_continuing_debate

Dairy production

The scale and intensity of dairy production and grazing in Victoria places pressure on our freshwater resources and degrades our environment. The area of grazing land operated by beef cattle/sheep businesses in 2005–06 was estimated to be almost 8.4 million hectares; more than 37 percent of the total area of Victoria.[24] Dairy production and grazing activities led to an over-abundance of nitrogen in the environment, resulting in huge negative effects on ecosystems and human health.

It is also important to note that Victoria is the nation's largest dairy producing and exporting state (by volume and value), accounting for 79 percent of Australia's dairy exports.[25] Considering the concept of 'Virtual Water' [26], it becomes even more important that we try to reduce and replace these water-thirsty industries. This can happen through providing incentives to producers for transitioning to plant-based farming, instead of animal agriculture, which includes meat, eggs and the dairy industry. The move to plant-based products has already started[27] and Victorian organisations should support producers to transition to plant agriculture, not risk falling behind.

The Department of Agriculture's report, "Water use on Australian farms'[28], completely ignores the water used by the animal agriculture sector. It concentrates on the water used to grow crops, whereas our submission wishes to highlight the enormous contribution that animal agriculture makes to water usage in the Goulburn Murray catchment area. Such denial is counterproductive and certainly not in our best interest. Taking action to transition animal agriculture to plant agriculture is as important as transitioning fossil fuels to renewable energy. A plethora of reports point to the need for humans to eat much less meat and move to a plant-based diet.

The Dairy industry in the Goulburn Murray region

The Goulburn Murray dairy region includes all dairy production in Northern Victoria and Southern NSW. It is Australia's largest dairying region, producing more than 25 percent of Australian animal-based milk. The region has approximately 2441 dairy production facilities that produce nearly 2.56 billion litres of milk per annum. It is highly dependent on irrigation with 95 percent of facilities using irrigation and 72 percent of dairy land under irrigation.

The total area under irrigation in the Murray region is 234, 000 ha. Irrigated pasture (mainly for dairy production) makes up 65 percent of the region's total irrigated area. Data taken from the 'Dairying for Tomorrow' dairy farm survey and extrapolated to the region, has been used to quantify irrigated and dryland dairy pasture areas and irrigation water sourced.

[24]https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/natural-resources/soils/trends-factsheets/vic-grazing-factsheet.doc
[25] https://global.vic.gov.au/victorias-capabilities/industry-sectors/food-and-fibre/dairy
[26] https://www.frontier-economics.com.au/documents/2014/06/concept-virtual-water-critical-review.pdf/
[27]https://www.theguardian.com/news/2019/jan/29/white-gold-the-unstoppable-rise-of-alternative-milks-oat-soy-rice-coconut-plant
[28] https://www.abs.gov.au/statistics/industry/agriculture/water-use-australian-farms/latest-release

Dairy region figures based on a national dairy farm survey in 2005/6[29]:

- Number of dairy production facilities 2, 441
- Total grazed area (ha) 354, 637
- Irrigated pasture (ha) 234, 073
- Number of milking cows 536, 772
- Mean milking herd size 222
- Water sourced (GL) average rainfall year 1,392 Gigalitres
- Water sources (GL) in 05/06 1,349 Gigalitres

To put the water used in the dairy industry in the Goulburn Murray region into perspective: One Gigalitre equals 1,000,000,000 litres. Sydney harbour holds 500 Gigalitres.

The dairy industry alone is using the equivalent of nearly three times the volume of Sydney harbour per year.

This amount of water used for the dairy industry is totally unsustainable.

Recommendations:

11. Encourage a transition from animal to plant-based agriculture in the region.
12. Develop initiatives to reward efficient water use in farming, rather than subsidising bad water use in farming.
13. Urgently encourage a transition from the water-intensive dairy industry to plant-based milk.
14. Phase out intensive animal agriculture to reduce greenhouse gas emissions, reduce water usage and stop the majority of grain production being used to feed animals.
15. Remove water subsidies for animal agriculture and transition towards water-efficient plant-based agriculture.
16. Research plants which have lower water needs to reduce the need for water used as irrigation and subsequent drainage requirements.
17. Encourage the use of subsidies, education and support for producers engaged in animal agriculture to transition to other forms of farming or to use their land for eco-tourism.
18. Discourage subsidies to intensive animal industries because they are both cruel and provide a breeding ground for new diseases which pose large public health risks, such as SARS-related epidemics and the current COVID-19 pandemic.

[29]https://www.researchgate.net/publication/271770101_Dairy_water_use_in_Australian_dairy_farms_past_trends_and_future_prospects

19. Ensure that the regulation of Victoria's water, via market-based mechanisms or otherwise, is independent, fair and transparent and that water allocations prioritise environmental health as well as animal and human wellbeing over commercial interests.
20. Critically assess development and infrastructure projects against their water usage and cumulative impact on local waterways, ecosystems and communities.
21. Rapidly transform Australian agriculture to allow reforestation by reducing grazing and supporting biodiversity-sensitive farming practices.
22. Rewild degraded waterways and increase the number of protected water systems that are important for biodiversity and ecosystems services.
23. Consider options for encouraging tree planting on farms to assist with positive carbon effects and to provide shade and shelter for farmed animals during the process of transitioning away from animal agriculture. This may include providing trees or subsidies to encourage tree planting initiatives. Tree cover would also reduce evaporation of water from the land.

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3. Protect and enhance the environment

We cannot protect and enhance our environment without taking into consideration the enormous effects that climate change is going to have on the agricultural sector now and in the future.

The effects of Climate Change on irrigation and drainage.

The *United Nations Intergovernmental Panel on Climate Change (IPCC)* released the 6th assessment report on the 9th August 2021[30]. Every region on the planet is affected by anthropogenic-climate change, and extreme droughts, floods, wildfires, heatwaves and storms are all set to increase in frequency and severity if global heating continues. If drastic and immediate action is taken we may prevent a global temperature rise above 1.5°C. Even in the best-case scenarios, some of the changes are irreversible for millennia, including rises in sea-levels. The World Alliance of Scientists published their 2021 review of the planet's health, based on vital signs on 28 Jul 2021[31], which has worsened since their first report in Jan 2020[32]. The 2021 review poses a 6-point plan for climate action. However, given the extent of damage and expected ongoing climate damage, we cannot act too extremely, or too urgently; nothing will be an over-reaction. We must act with urgency and extreme responses to have any impact on the extent of climate damage.

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[30] IPCC (2021) Sixth Assessment Report - AR6 Climate Change 2021: The Physical Science Basis. ttps://www.ipcc.ch/report/ar6/wg1/
[31] Ripple WJ, *et al.* (2021) World Scientists' Warning of a Climate Emergency 2021, *BioScience*, 2021;,biab079, https://doi.org/10.1093/biosci/biab079
[32] Ripple WJ, et al. (2020) World Scientists' Warning of a Climate Emergency, *BioScience*, 70(1): 8-12, https://doi.org/10.1093/biosci/biz088

The AJP acknowledges climate science and is concerned about the impact of a hotter and less stable climate, with more extreme events, on both human, and non-human, animals. Climate change is a global emergency requiring immediate and substantial action across all sectors of society including all levels of government. We must act before we cross "tipping points" that will make further climate deterioration unstoppable and irreversible. Even when we stop emitting greenhouse gases, warming will continue for some decades[33]. The AJP is the only political party with a science-based climate policy. No other political party has policies which demonstrate a clear understanding of the rapid impact of methane and land clearing on the global climate.

The Goulburn Murray Irrigation District Drainage Management Strategy has a unique opportunity to recognise that the future is uncertain and that there is an urgent need to address climate change and be flexible and adaptable in the future.

Another critical factor is the excrement from animal agriculture entering our waterways[34].

Many potential pathogens for "livestock" as well as humans, can be found in manure of farmed animals. These pathogens include bacteria, protozoa and viruses[35].

Pathogens such as *E.Coli* can cause serious outbreaks of human disease. Treating drinking water does not eliminate the risk. Therefore, reducing grazing upstream of drinking water off-takes is a priority for riparian management programs in Victoria.

Heavy rains can generate runoff containing manure from grazing lands and pastures into nearby water bodies[36]. Excess nitrogen found in manure can cause excessive growth of aquatic plants and algae. This in turn, reduces the dissolved oxygen level in water as they decompose and create algae on the water surface. This can occasionally result in the death of many fish in lakes and waterways. The respiration efficiency of fish and aquatic invertebrates can deteriorate, leading to a decrease in animal and plant diversity in our water bodies.

Irrigation channels

Rivers and the adjacent ecosystems are very sensitive to damage by animal agriculture. Intensive animal production can cause serious water pollution such as eutrophication – an excessive amount of algae in the water caused by run-off of animal faeces and leftover feed – often leading to loss of fish and other aquatic wildlife.

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[33] http://science.sciencemag.org/content/307/5716/1766

[34] Kelly M (2020) Farmers fence out livestock to clean up rivers, using New Zealand as a cautionary tale. ABC News Online 29 May 2020.https://www.abc.net.au/news/rural/2020-05-29/farmers-fence-river-water-quality-new-zealand-dairy-warning/12293304

[35] http://lshs.tamu.edu/docs/lshs/end-notes/uc%20davis%20pathogens%20in%20manure-2636453403/uc%20davis%20pathogens%20in%20manure.pdf

[36] https://www.usgs.gov/special-topic/water-science-school/science/rain-and-precipitation?qt-science_center_objects=0#qt-science_center_objects

The Goulburn Murray Basin (GMB) is the most extensively-managed water basin in Australia, and is subject to a market-based system of water allocation aimed at optimising economic, social and environmental outcomes for the GMB. Current water management system has not been kind to the environment and communities. Environmental flows are still insufficient and put at risk various species and the ecology of the rivers[37]. The use of herbicides is also having a dramatic effect.

Figure 4 - Aquatic wildlife and plants killed after Acrolein, a toxic herbicide, was injected into a northern Victoria irrigation channel.(ABC: Eden Hynninen)

An ecologist , Mr Cook, reported that a herbicide used in northern Victoria to treat weeds in irrigation channels would turn these channels into "biological deserts"[38]. Goulburn Murray Water used an outdated herbicide from the 1960s, “Acrolein” to clear Torrumbarry channels near Cohuna, and aquatic plants and animals were killed (Figure 4). Mr Cook stated "*I know it's used to kill submerged aquatic plants … but I also know that it's quite toxic to aquatic life — it can kill fish and yabbies. Ecologically it's not a great solution to the problem of trying to clear the channels and a lot of the stuff they are killing is actually indigenous wetlands vegetation*." Mr Cook said the channels provided "*an important habitat for the Murray-Darling Basin's struggling ecosystem. A lot of the wetlands along the Murray Darling Basin have had their hydrology modified, so they don't flood nearly as often as they used to,*" he said. "*So those artificial wetlands – like irrigation channels – are an important habitat. It is killing endangered species like the growling grass frog. It was once described as the most common species of frog — now*

[37] Sheldon F (2019) The Darling River is simply not supposed to dry out, even in drought. The Conversation. 16 Jan 2019. https://theconversation.com/the-darling-river-is-simply-not-supposed-to-dry-out-even-in-drought-109880

[38] https://www.abc.net.au/news/2021-01-13/acrolein-treatment-of-torrumbarry-channels-worries-ecologist/13053590

there's only one population that we know of in the area. The frog has gone from being one of the most common species to now being endangered."
Mr Cook said although the Torrumbarry Channel was an artificially constructed irrigation network, the channels remained an important habitat for aquatic life along the Murray-Darling Basin[39].

Recommendations:

24. Investigate the impacts of climate change on water-borne diseases.
25. Investigate the impacts of climate change on vector-borne diseases.
26. Compile our current knowledge status on the impacts of climate change on disease states.
27. Investigate the effects of climate change on the incidence and transmission of diseases, both currently known and emerging.
28. Investigate the emergence and spread of zoonotic diseases.
29. Investigate non-chemical methods of 'weed' control.

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4. Establish effective partnerships with First Nations People

"We've been managing the river as custodians from the beginning of time, but governments are not asking us how we did that".

'Cultural flows' are water entitlements owned and managed by First Nations to improve their spiritual, cultural, environmental, social and economic conditions.
While there have been research and pilot projects, cultural flows have not yet been granted for the Murray–Darling Basin river system".[40]

One of the stated aims of the proposed strategy as stated above is to establish effective relationships with First Nations People, however the opposite is occurring. First Nations people are being locked out of water rights in favour of farmers.

A matter of great concern is that a gift of valuable irrigation water made exclusively to farmers by the Victorian Government ignored the claims of traditional owners and has sparked calls for an urgent review[41].

[39] https://www.abc.net.au/news/2021-01-23/dead-fish-after-herbicide-acrolein-used-in-irrigation-channel/13084030
[40] https://www.mdba.gov.au/about-basin/water-for-first-nations-people
[41] https://www.theage.com.au/national/victoria/first-nations-slam-secretive-victorian-government-water-grant-20210524-p57ury.html

Murray Lower Darling Rivers Indigenous Nations director Grant Rigney said:

Traditional owners were locked out of accessing 2 gigalitres,
or two billion litres of water, a year "without any consultation".

"This secretive decision brings us right back to the bad old days of policy driven by vested interests. We demand a review of this decision to ensure full transparency and consistency with the Victorian Government's commitments[40]"

Effective partnerships that genuinely respect First Nations people and their connection to country must be created.

The AJP supports self-determination and empowering First Nations communities.

Recommendations:

30. Involve First Nations communities in developing water plans and account fairly for First Nations' knowledge, values, self determination and sovereign rights.
31. Recognise Indigenous rights to cultural flows.
32. Allow First Nations people to care for Country and generate wealth from agricultural production.

Conclusion:

Drainage and irrigation are intrinsically linked. Irrigated agriculture is expected to play a major role in reaching the broader development objectives of achieving food security and improvements in the quality of life, while conserving the environment, in both the developed and developing countries.

The failing of present systems and the inability to sustainably use surface and ground water resources can be attributed essentially to poor planning, design, system management and development. The infrastructure in most irrigated and drained areas needs to be renewed or even replaced and thus redesigned and rebuilt, in order to achieve improved sustainable production. This process depends on a number of common and well-coordinated factors such as new and advanced technology, but more importantly, a recognition that we cannot continue as before but that it is imperative that we move to growing crops which require less water and critically transitioning from animal to planet-based agriculture as an absolute imperative.

The Aboriginal people have their own water plan:
'Don't be greedy. Don't take more than you need and respect everything around you'.[42]

[42] https://www.mdba.gov.au/sites/default/files/pubs/D17-6996-WRP-requirements-Part-14-Aboriginal.pdf