

**Standing Committee on Agriculture and Water Resources
Inquiry into Water Use Efficiency – Goulburn Broken CMA Submission**

Summary of main points

- The Goulburn Broken Catchment Management Authority (CMA) and in recent times, the Farm Water Program which it leads (with funding from the Commonwealth Government's water use efficiency programs, Victorian State Government and irrigators) has a proven track record in achieving significant water savings on irrigated properties throughout the Goulburn Murray Irrigation District since 2010.
 - Irrigators participating in the Farm Water Program have been able to take advantage of modernised regional delivery systems to improve technology on their properties, resulting in water savings, increased productivity and labour reduction.
 - Broader public benefits from increased water efficiency on farms include improved water quality, reduced salinity, reduced waterlogging and increased river health outcomes within the catchment, as well as downstream.
 - Ultimately the Farm Water Program has given a greater sense of confidence in the future for the region's irrigators and broader community.
 - Water savings have been achieved on farms through the development of trust-based relationships between irrigators and the local delivery partners as well as working in collaboration with the State and Commonwealth governments.
 - The Goulburn Broken CMA, on behalf of the regional Farm Water Program partners, believes that it is critical that the Commonwealth Government continue to co-invest in improved water use efficiency on farms to ensure that irrigators can adapt to the negative impacts from implementation of the Murray Darling Basin Plan (particularly the buybacks) as well as other future shocks, such as a changing climate.
 - A new program needs to be established to continue the investment (on a reasonable private-public cost share basis) to irrigators to increase water use efficiency and productivity on farms, without a transfer of water share.
- **THE ADEQUACY AND EFFICACY OF CURRENT PROGRAMS IN ACHIEVING IRRIGATION WATER USE EFFICIENCIES**

The Goulburn Broken Catchment Management Authority (CMA) has a long history of promoting and encouraging irrigators of irrigated properties to adopt irrigation management systems and practices that improve water use efficiency on their properties. The Goulburn Broken CMA area includes the irrigated land of the Shepparton Irrigation Region (SIR) of northern Victoria and makes up part of the Goulburn Murray Irrigation District (GMID).

A Land and Water Management Plan was first developed for the SIR in the late 1980s and included a range of actions that irrigators were encouraged to take up to improve irrigation systems and management. While salinity control was the focus of the Land and Water Management Plan in order to combat high watertables in the SIR, improving irrigation management for salinity control

incorporates the use of improved systems to control and manage irrigation water and increases water use efficiency of the property.

Irrigators have been encouraged and supported to develop Whole Farm Plans for their properties which include the natural features of the property together with details of the improvements planned for their irrigation systems. This ensures the efficient application and movement of water across the land, meeting the required crop water use. These improvements include sprinkler and microdrip systems, laser grading, improved water delivery and drainage systems together with the capture and use of runoff water, as key components of sustainable, irrigated agriculture.

Planning for these changes provides an opportunity for irrigators to take advantage of advice and recommendations from irrigation designers and Government extension officers through incentive programs to encourage the adoption of planning and best practice.

An important part of this planning process has been to assist irrigators to understand their place in their local catchment, the region and the Murray Darling Basin. Planning helped them appreciate the potential impact of their actions on their own properties, the local catchment and the wider region (particularly downstream).

The implementation of these plans, improvements to irrigation systems and the adoption of improved irrigation management practices results in better growing conditions for pasture and crop plants. The application of irrigation water can be better managed to meet the needs of the plants with minimal losses to groundwater and runoff from the property.

The SIR Land and Water Management Plan has been regularly updated and forms part of the Goulburn Broken CMA's Regional Catchment Strategy, with improving water use efficiency remaining a key component of the actions for irrigated agriculture.

Since the mid-2000s, the irrigation systems across the GMID have been undergoing massive change with the regional delivery system upgraded to minimise inefficiencies, eliminate unrequired infrastructure and modernise with automated remote controlled structures. This has resulted in improved service delivery of irrigation water to irrigators across the region with water available on-demand, together with consistent and larger flows being available.

The Goulburn Broken CMA has been keen to assist irrigators in the SIR (and broader GMID) to make changes to their farm irrigation systems to take advantage of the improved service delivery available by the modernised regional delivery system.

In response to a call by Commonwealth Government in 2009 for projects to improve water use efficiency through the On-Farm Irrigation Efficiency Program (OFIEP), the Goulburn Broken CMA together with State and regional groups formed a consortium to bid for funding and subsequently deliver projects across the GMID.

The Farm Water Program (FWP) was developed with a partnership approach to work with irrigators in the GMID to develop and implement water use efficiency projects. The broad range of FWP consortium partners allows for policy and program design input, on-farm extension and education and ensures the program achieves catchment, regional, state and national water and environmental policy objectives.

The Consortium Partners include:

- Goulburn Broken Catchment Management Authority (Program lead).
- North Central Catchment Management Authority.

- North East Catchment Management Authority.
- Goulburn-Murray Water (GMW).
- Murray Dairy.
- Dairy Australia.
- Department of Economic Development, Jobs, Transport and Resources.
- Department of Environment, Land, Water and Planning.
- Northern Victorian irrigators.

The FWP works with irrigators through one-on-one discussions to ensure the best possible projects are developed to improve irrigation water use efficiency. The projects include improvements to existing irrigation systems and introduction of new technologies for their properties, allowing irrigators to improve water use efficiency.

The FWP has developed a water savings calculator, based on the best available research across the GMID over the last 20 years, to calculate the water savings to be generated from the implementation of the proposed changes.

FWP projects are selected based on a set of eligibility criteria including:

- Project area needs to be connected to the modernised GMW channel system.
- The landowner owns the land where the project is proposed.
- A Whole Farm Plan prepared for the property/project area including the proposed activities.
- The Whole Farm Plan meets agreed irrigation design standards, which ensures the irrigation improvement works being implemented, are to best practice.

To the end of 2016, the FWP has secured over \$200 million in Commonwealth and Victorian Government investment to deliver over 100 GL in on-farm water savings. Most of the funds have sourced from the Commonwealth Government through the OFIEP (\$45m), Victorian On-farm State Priority Project (VOSP) (\$43m) and the Victorian Farm Modernisation Project (VFMP) (\$100m), plus \$16m was also funded through the State Government’s Northern Victorian Irrigation Renewal Project (NVIRP). For a summary of funding and deliverables please see https://www.gbcm.vic.gov.au/sustainable_irrigation/farm_water/funding-sources .

The FWP Rounds 1-4 of projects have successfully delivered farm upgrades to 524 irrigator projects, resulting in over 69 GL in water savings, over half of those water savings transferred for environmental purposes, and the remaining water savings retained for productive use on farms in the region.

ACHIEVEMENTS TO 2016 (FWP Rounds 1 - 4)		Total	Units
Total Projects Funded		524	Projects
Total Value Funded		125	\$ million
Water Savings		69.2	Gigalitres
Improved surface irrigation	Laser Grading	14,613	hectares
	Drainage Reuse	12,175	hectares
	Gravity Channel Surface Irrigation	12,600	hectares
	Pipe and Risers	14,266	hectares
	Irrigation Scheduling	1318	hectares
Improved pressurised irrigation	Sprinklers/micro/drip	2023	hectares

FWP Round 5 projects (VFMP funding) have now been contracted with a further 98 projects across 6000 ha works saving 13.5 Gigalitres with \$35 million of funding.

As projects are finalised, irrigators are required to complete a report for their project. In each round of projects, a series of detailed case studies are prepared. Irrigators reported improved confidence in the future, such as increased farm succession, business expansion, improved farm business resilience and the ability to take advantage of higher service levels from the GMW Connections Program.

Many farmers have indicated that they would not be able to do the works without the funding assistance. It is important to note that irrigators provide significant funding to the projects (greater than half of the initial capital costs). Cost benefit analyses have been done on each of the funding rounds, with a reasonable cost-share between the public and private benefits/costs a key consideration for the program. An (internal and external) audit program of most aspects of the Farm Water Program has been undertaken over the last seven years. A summary of the final report comments and the summary of detailed case studies are on the GB CMA website- www.gbcma.vic.gov.au.

The FWP also provided improved farmer productivity through less time spent irrigating. For example, the introduction of automation of irrigation meant some farmers no longer had to manage water at night. This provided time to volunteer with community activities and delivered positive roll-on benefits to local communities and individual work/life balances.

As irrigators themselves usually conduct their own irrigation operations, the labour savings associated with upgrades also generally reduce their workloads rather than reducing jobs. The upgrades allow them to concentrate on other activities, including sleeping at night. Farms with improved irrigation systems are also more attractive places to work for farm employees.

A significant proportion of project participants represent the dairy industry (55%) and the FWP is assisting them to maintain and grow milk production to meet increasing demand, despite the challenges of climate variability. In turn, a strong dairy sector maintains and creates regional employment both directly through farm roles, and indirectly through associated industries.

The results of the implementation of FWP projects has included:

- Water savings at a property level (2.25 ML/ha).
- A significant boost to farm productivity and the regional economy.
- The creation of short- and long-term jobs through farm infrastructure upgrades.
- Improved water quality and salinity management.
- Increased labour efficiencies for farmers.
- Increased resilience of the regional economy to socio-economic and environmental pressures (including reduced water availability).

The detailed case studies have indicated that a modernised property connected to the modernised supply system can achieve 2.25 ML per hectare water saving, as well as increase pasture yield by between 0.6 to 2 tonnes of dry matter per hectare, while improving farm labour efficiency.

In VFMP and VOSP programs, the FWP has managed all aspects of the projects including water transfers and this has been conducted much more efficiently. As the FWP was responsible for all aspects of conduct of projects, the FWP has been able to advise irrigators directly of their project including progress of their water transfer and any requirements of the landowner.

The OFIEP program had a greater direct involvement and management of individual projects by the Commonwealth Government and was significantly less efficient and effective in our experience.

The Goulburn Broken CMA estimates that there is still more than 50,000 hectares of irrigated land across the Goulburn Murray Irrigation District of Northern Victoria where farm infrastructure to be modernised, as part of facilitating a resilient and sustainable sector.

Recent concerns around the water availability post-MDB Plan buybacks, has resulted in the Goulburn Broken CMA proposing that a new program needs to be urgently funded. The program should provided incentives (with a reasonable cost share between irrigator and government) to improve water use efficiency. This proposed improvement is covered in more detail below.

In conclusion, the VFMP and VOSP funded programs (project managed through the Goulburn Broken CMA) have efficiently delivered irrigation water use efficiency projects across the GMID. The OFIEP program also achieved improved water use efficiency, but much less efficiently and effectively than VFMP and VOSP.

- **HOW EXISTING EXPENDITURE PROVIDES VALUE FOR MONEY FOR THE COMMONWEALTH**

The Goulburn Broken CMA considers that water use efficiency programs have provided excellent value for money for the Commonwealth, State and the regional community across the GMID, from a balanced social, economic and environmental perspective.

In addition to the Commonwealth funding for the program, there has been significant investment by the Victorian Government and irrigators in the planning of the works (in the form of more than \$100/ha as part of this Whole Farm Plan development). Irrigators have also made significant contributions to their project works, both cash costs and in-kind contributions.

The FWP has prepared 56 detailed case studies of projects from FWP Rounds 1 - 3, and this shows that projects have a range Benefit/Cost ratio of 0.6 to 3.5 with a typical value of 1.5 across all projects. Water savings range from 0.5 to 3.6 ML/ha with a typical value of 1.8 ML/ha. Crop and pasture production has increased by up to 0.4 tonnes dry matter/ML.

It is important to note that an important measure of improved productivity and water efficiency is the tonnes of production or value produced per megalitre. Some studies (including our own) have shown that a simple measure of water use on a farm such as ML/ha/year may increase following upgrades in some situations. This is due to irrigators gaining additional labour and water use efficiency from the new system, which enables the adoption of crops that have higher water use; for example, producing two crops per year, rather than one or growing longer season annual pastures, when previously only short season annuals were grown. In these cases, the water use per ha may have increased, but the new system has significantly lower water use (ML/ha and t/ML) than if the old system had been employed to grow the new crops.

There are other irrigators who after upgrading have kept identical crops and with the new system they have generally experienced both a reduction in water use (ML/ha) and an increase in production (t/ha and t/ML) when compared with the old system.

Funding from the water use efficiency program is directly used by irrigators to fund their projects and to pay suppliers and contractors who have been engaged by the irrigators. All of the activity

generated by the FWP has provided a significant economic boost to these local businesses and regional communities.

Many of the businesses have expanded their operation, creating employment and buying equipment to undertake the work. Businesses have provided the opportunity for staff to learn new skills.

Many innovative solutions have been developed as projects have been implemented to ensure that the best possible and most effective systems are prepared to meet the conditions of individual properties.

Across all FWP projects, irrigators have contributed an equivalent of 15% of the funding received, as part of their contribution to the project. The detailed case studies prepared by the FWP show that these additional contributions are higher than those reported to the FWP. The case studies show that irrigators often under report and underestimate their contribution and they continue to make cash and in-kind contributions to the projects after the water savings works have been completed. Irrigators also make contributions for operation and maintenance of the project works to ensure the project benefits are ongoing.

While for most projects, the amount of funding available for the project closely matched the cost of the works, many projects have required further funding provided by irrigators. These projects provide examples of where irrigators have recognised the benefits of doing these works and have decided to self-fund them. The project funding can be considered to be for the public benefit of the project and the landowner's contribution is considered to be for private benefit.

While doing project works, many irrigators also took the opportunity to do additional unfunded works to enhance the project. These additional works are often suggested by suppliers and contractors as the projects are implemented.

These additional works have often resulted in other parts of the property being able to benefit from the changes being made in the project area. These additions have also generally resulted in labour and vehicle use savings for the landowner to manage the irrigation system and property management.

The increased productivity of the GMID resulting from the improvements made to irrigation systems has been estimated by the FWP to be \$1.6 billion at the farm gate and \$6.5 billion with processing and other value adding.

The Goulburn Broken CMA also considers that water use efficiency programs provide much better value for money for the Commonwealth, State and the community compared to direct purchase or buy back of water for the environment. A key difference is that the payments made to sellers through buy back are often used to retire debt, to fund retirement and often leave the region - not necessarily used to make changes on the property to improve productivity.

Buy back of water often leads to declined productivity on properties with reduced water available leading to reduced production and a greater chance that irrigation ceases on the property. Whereas the water use efficiency programs link the funding available to make water use efficiency improvements leading to productivity increases across the region. The water use efficiency projects and productivity benefits provide an economic stimulus, increased employment and population growth improvements across the region and beyond.

In short, buy-back costs are not fully identified and accounted for, and the benefits from the water use efficiency programs are often under estimated (especially the public good benefits of water quality, salinity and river health improvements).

- **POSSIBLE IMPROVEMENTS TO PROGRAMS, THEIR ADMINISTRATION AND DELIVERY**

The Goulburn Broken CMA considers that water use efficiency programs should be modified to encourage irrigators to consider a mix of water products used to meet their commitments of transferring some the water savings to the Commonwealth.

In all the FWP funding rounds conducted so far, Victoria High Reliability Water Shares have been transferred to the Commonwealth from irrigators. While the FWP has had a significantly positive impact on the prosperity of the GMID, there are many community concerns across the GMID regarding the volume of Victorian High Reliability Water Shares leaving the GMID and the impact that is having on future water availability.

There is evidence that irrigators in the GMID are increasingly concerned about the impact of reducing their volume of Victorian High Reliability Water Shares through being involved with a FWP project (a minimum of 55 % of agreed water savings are to be transferred as part of the offer under the FWP for Round 5, and this has ranged from 50-60% depending on what was negotiated for each Round).

Some irrigators have decided that the value of the water is greater than the benefits and have decided not to submit or proceed with projects.

Two regional socio-economic reports of the impacts of the Murray Darling Basin Authority (MBDA), Basin Plan, show that water availability in a dry year could result in significant negative impacts to industry and the community in the GMID.

To offset negative impacts from the Basin Plan (which are primarily as a result of the buybacks ie accounting for more than 50% of the water recovery volumes), a modification of the water use efficiency program is strongly recommended. The new program would provide funding to improve farm irrigation water use and allow the irrigator to retain all of the water savings on the farm. This type of program would see benefits from better use of irrigation water, improved productivity, improved socio-economic conditions for the region, without the impact of irrigation water leaving the region. The value of the funding to be made available to such a program would need to be determined according to a reasonable cost share. **This is the Goulburn Broken CMA's preferred approach to achieving farm water savings, but would need a new program of Commonwealth funding to achieve this.**

Consideration should also be given to another modified program option, which includes activities that improve water use efficiency but not limited to activities that improve irrigation systems. This could include changes to enterprise operations that lead to improved water use efficiency.

Other options are also being considered to ensure the best delivery of improved water use efficiency on farm whilst building on the advantages of connection to the modernised public irrigation system and ensure flexibility for irrigation famers with new markets and technology continually coming on line.

Many irrigators have been involved in FWP projects and have improved their irrigation systems, and they consider their next opportunity to improve water use efficiency will be achieved through change in the management of their enterprise.

For example, most dairy farms across the GMID operate using a system of cows grazing perennial pastures as the feed base of their operation.

There is scope to change the operation by using a feedlot to house and feed the cows, and changing the perennial pastures to more water use efficient annual pastures or summer crops. It is possible to produce more feed and use less water with these crops and pastures but it requires considerable changes to farm infrastructure and operational systems to ensure this is effective.

Projects that included the costs of changing the farming system, including building the feedlots, construction of silage and feed storage areas, crop harvesting and feeding machinery could possibly be included. Water savings from these changes would need to be determined and the GMID has some opportunities and advantages for investment leverage in these areas.

The Goulburn Broken CMA considers that the approach of the proposed Commonwealth On-Farm Further Irrigation Efficiency (COFFIE) Program is overly complicated and believes that the VFMP provides a much more efficient and effective program structure. Another major concern with the OFIEP / COFFIE model is that Delivery Partners from private and / or for-profit organisations may have significant conflict of interest issues, or focus on narrow objectives that do not consider triple bottom line outcomes.

In summary, the GB CMA believes there is strong support in the local community for continued investment in water use efficiency works in farms in the GMID (see the priorities from the Regional Assemblies conducted in the Goulburn and Loddon / Campaspe areas over the last few months).

- **OTHER MATTERS, INCLUDING, BUT NOT LIMITED TO, MAINTAINING OR INCREASING AGRICULTURAL PRODUCTION, CONSIDERATION OF ENVIRONMENTAL FLOWS AND ADOPTION OF WORLD'S BEST PRACTICE.**

Environmental Water Management

It is widely acknowledged that environmental water is required to improve the health and functioning of rivers, wetlands and floodplains affected by regulated systems.

Environmental water holders, waterway managers and water authorities seek to maximise environmental water use outcomes through:

- Environmental water planning and prioritisation processes;
- Carry-over and trade of entitlements;
- Co-ordination of environmental water releases to achieve outcomes at multiple waterways;
- The use of consumptive water en route to achieving environmental outcomes;
- Monitoring to inform and refine environmental water use.

To date environmental water use across Victoria and the Murray Darling Basin has:

- Reduced the impacts of poor water quality and salinity on the environment;
- Led to the successful breeding of native fish, waterbirds and frogs;

- Increased the cover and condition of wetland and floodplain vegetation;
- Supported recreational activities such as boating, fishing, bushwalking and birdwatching;
- Protected Aboriginal cultural values important to local Indigenous people who have a continuing connection to rivers, wetlands and floodplains.

However, environmental water management is an evolving practice and its efficiency and outcomes can be improved through:

- Continued support of works (e.g. building of regulators and lowering sills) to facilitate the delivery of environmental water to increasing numbers of wetlands, floodplains and rivers.
- Implementing projects that address physical and policy constraints to the delivery of higher environmental flows.
- Expansion and continued support of monitoring programs evaluating the ecological outcomes of environmental water use (e.g. Victorian Environmental Flow Monitoring and Assessment Program, Victorian Wetland Monitoring and Assessment Program and the Commonwealth Long-Term Intervention Monitoring Project).
- Technical investigations to address knowledge gaps associated with key environmental water management objectives and targets (e.g. the flow cues required to stimulate breeding and dispersal of golden perch to increase populations).
- The development and implementation of operational tools and models to better forecast river inflows and improve the use of unregulated flows to meet environmental flow requirements. The tools and models will also improve river operation efficiencies.
- Implementing complementary projects to protect and improve the condition of wetlands, rivers and floodplains (e.g. fencing and revegetating, re-snagging to improve instream habitat for native fish and invertebrates, restocking native fish, removing barriers to fish movement and controlling pest plants and animals).

Sale of Environmental Water Allocation by CEWH

The Commonwealth Environmental Water Holder (CEWH) has sold some of the environmental water on the water market in the last year or so (i.e. 20 GL from the Goulburn system).

The Goulburn Broken CMA would also like to see the proceeds from the sale directed back to river health works through the local relevant Catchment Management Authorities, which are well placed to deliver these works under their river health programs. This ensures that this water provides benefits directly to the region where it has come out of.