INDEPENDENT ASSESSMENT OF SOCIAL AND ECONOMIC CONDITIONS IN THE BASIN

Final Report: Independent assessment of social and economic conditions in the Murray–Darling Basin

Final Report prepared for The Hon. Keith Pitt MP, Minister for Resources, Water and Northern Australia

April 2020

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Panel for Independent Assessment of Social and Economic Conditions in the Murray–Darling Basin

Email: IndependentPanel@mdba.gov.au

General Enquiries Phone: 1800 314 557

Website: https://www.basin-socio-economic.com.au/

Panel Chair: Robbie Sefton

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Abbreviations

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
AIHW	Australian Institute of Health and Welfare
BBRF	Building Better Regions Fund
CHWN	critical human water needs
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSO	community service obligation
GL	gigalitres
GVIAP	gross value of irrigated agricultural production
IIO	irrigation infrastructure operator
IVT	Inter Valley Trade
LGA	Local Government Area
LTAAY	long term average annual yield
MDB	Murray–Darling Basin
MDBA	Murray–Darling Basin Authority
MDBEDP	Murray–Darling Basin Economic Diversification Program
ML	megalitres
MLDRIN	Murray Lower Darling Rivers Indigenous Nations
NBAC	Northern Basin Advisory Committee
NBAN	Northern Basin Aboriginal Nations
NGO	Non-Government Organisation
NRM	natural resource management
NWGA	National Water Grid Authority
PC	Productivity Commission
RDC	Research and Development Corporation
R&I	research and innovation
RWS	Regional Wellbeing Survey
SBC	Strengthening Basin Communities
SDLAM	Sustainable Diversion Limit Adjustment Mechanism
SRDCP	Stronger Regional Digital Connectivity Package
WERP	Water and Environment Research Program
WESA	Water for Environment Special Account

Acknowledgement

We acknowledge that First Nations peoples are the traditional owners of the land and water, and pay respect to Elders past, present and future. We also recognise the unique, diverse and enduring Culture of First Nations peoples, and the wisdom that comes from such a long connection and respect for Country that can inform today's decisions.

The Independent Panel for the Assessment of Social and Economic Conditions in the Murray–Darling Basin (the Panel) recognises the pressures that many people in Basin rural and regional communities are under. We are in awe of their resilience and persistence under testing conditions, their willingness to innovate and adapt, and their desire to make a future in the Basin.

We are indebted to all the people, organisations and government agencies who participated in this Review, and appreciate their generous contributions of time, ideas and insights.

Caption: Telephone Bank Gayini Nimmie Caira. Photo credit to Jamie Woods, Land Manager Gayini Nimmie Caira for Eulimbah Gayini Nimmie Caira

Foreword

As someone who grew up on an irrigation farm in southern New South Wales and now runs a dryland farm in northern New South Wales, I have always been proud to live and work in rural and regional Australia, and to call the Basin home.

It was an honour to be appointed Chair of the independent Panel assessing the social and economic impacts of water reform on Basin communities, joining six other respected individuals from across the Basin. As a Panel, we bring diverse skills and experience to the task, united in our commitment to understand the needs of people living and working in Basin communities.

There are more than two million Australians who live in the Murray–Darling Basin. Whole communities have been built on generations of hard work to create a prosperous and vibrant life, with a commitment to ensuring a sustainable environment.

Through the course of the review, we have seen communities experiencing challenges around water reform, as well as hardship from the drought and more recently the fires and spread of COVID-19. We also looked carefully at big long-run drivers of change, such as new technology, swings in commodity prices, and movements in the Australian dollar.

After visiting Basin communities and reviewing expert analysis, we found many communities struggling, including some in dire circumstances. We saw a complex array of factors are contributing to this distress. Seeking to blame circumstances on one factor or another is not going to solve things. Given the scale and depth of concern, we need to get the diagnoses and responses right—quickly—across all levels of government.

As a Panel, we were disheartened to see communities at a crossroads despite countless studies, reviews and inquiries. Visions and policies in our irrigated communities focusing on overall gains have not dealt fairly with those left behind, nor worked hard enough to be fully inclusive.

Our Basin communities are changing. The pace has been rapid and the impacts profound. The future is no longer secure or certain for some people and regions, despite their hard work. Morale has eroded, and a sense of hopelessness is spreading; in many cases, people no longer feel confident in their future. These impacts are not only being felt in the 'back pocket', but witnessed in the main streets of towns, and in the prospects for our next generation.

We heard from people caught in a one-way conversation—over-consulted and under-listened to. They were frustrated that decisions are being made 'for' them, often with short term objectives as the predominant driver. They want to be part of a conversation that sets a coherent vision and drives sound policy that deals them in again. First Nations communities have also expressed deficiencies in current and future water planning, management and access arrangements.

Despite this despair, we witnessed industries and businesses defying these outlooks. They are predominately in larger Basin communities with more diverse economies, in communities where irrigation has expanded, water has moved into districts following unbundling and water market reforms and where buoyant commodity prices have shored up confidence.

Above all, many Basin communities remain open to supporting Basin water reform. It was clear that people recognise the importance of enhanced environmental outcomes in maintaining healthy working rivers, supporting important ecosystems, and improving conditions for Basin communities. They need confidence that the Plan is fair and equitable for all and managed soundly. For this outcome to occur, all affected communities must be at the heart of decisions deciding their future.

Communities are calling for courageous leadership. They want greater involvement in decisions that impact them—not via ad-hoc town hall meetings—but by helping to shape a long term vision for rural and regional Australia and their Basin. This requires both governments and our community leaders moving forward together, rebuilding trust and goodwill.

The Panel hopes this report not only captures what communities have told us, but also highlights where critical information or data is missing. Sound judgements cannot be achieved when data is outdated, incomplete or inaccurate.

This report presents our key findings and recommendations. The Panel is grateful for the large number of considered and thoughtful submissions that have helped shape and sharpen them.

We see it as vital that governments adjust their approach and our communities engage positively as they do so. Our leaders need to give more attention to the uneven and indirect impact of their action or inaction, provide greater policy clarity and inclusiveness, and improve information for decision making. This requires genuine engagement and supporting communities as they determine their futures and work together to achieve a more prosperous and vibrant future for all.

Robbie Sefton

Chair, Independent Panel for the Assessment of Social and Economic Conditions in the Murray–Darling Basin

A change of approach

The Panel engaged extensively over the course of our review, visiting communities and meeting with many groups and individuals. We value the thoughtful and constructive input we received from a wide range of stakeholders across all areas of the Basin, including individual irrigators, farmer and irrigator representative bodies, local business owners, First Nations groups, water utilities, councils, NGOs, community service providers, and academic experts.

We were heartened by the depth of engagement with the Panel's review and appreciate the many helpful submissions and comments we have received on our draft report. There were deeply held and diverse views on the current state of play and what is required going forward. The diversity of views reflects the complexity of the issues and the differences in lived experiences in the Basin. All were considered in preparing this final report.

We made important changes in this final report, to sharpen our recommendations, particularly those that focus on minimising the harms that could come from a business as usual approach to water reform and the insufficient attention to distributional impacts particularly on those most vulnerable in our Basin. Our intent is to shift the lay of the land to focus on outcomes and to move to more adaptive management where communities have a greater say in matters affecting their future. This is different from the current approach of working to immutable water recovery timelines.

We anticipate some people will be dissatisfied with some areas of this report and the Panel's final recommendations. Given the diversity and strength of views across Basin regions and peoples, this is unavoidable. Some submissions, for example, called for changes to the Basin Plan that were outside the scope of our Review—this is not a review of the Basin Plan nor a referendum on water reform. The Panel acknowledges the overall gains Basin Plan reforms have brought our nation. We are not about turning back the clock.

Our focus is to the future and our recommendations call for significant and sustained investment by successive governments. We highlight a compelling and urgent case for investment in rural and regional communities now—working towards rebuilding resilience and more diverse economies. At the same time, we urge a slowing of the pace of planned water recovery expenditure. This dual approach gives communities both the space and opportunity to address pressing instances of distress, to find and embed positive strategies for economic development, and to take stock of the ecological responses given their lags and the impact of drought in many parts of the Basin.

The need for change is pressing. Analyses the Panel commissioned and our consultations with rural and regional communities demonstrate the significant risk for some regions and industries if further recovery from the consumptive pool were to occur at the current planned pace and extended drought and climate change induced drying followed. Drought is the king tide in the Basin; it has the greatest effect on water availability and on prosperity in water dependent communities. Commodity prices, trade barriers, and exchange rates are the other key determinants for dryland and irrigated agriculture and their communities. Basin water recovery and policies incrementally add pain where drought leaves the primary wound. But now, given the level of irrigation development, the scale and frequency of recurring drought and the level of past recovery, further recovery will incrementally add more pain than in the past.

A wide array of current factors and historical circumstances intertwine to shape Basin socioeconomic outcomes. Critical among them are the amount of water available and used in any one year, patterns of historical development and allocation, carry over arrangements, and water recovery decisions. While their relative influence is hotly contested, we recognise the intersection of drought and further water recovery as major future risks. We note there is currently much debate on extent and causes of the declining trend of reliability for general security entitlement holders. While this is not within the scope of our Review to resolve, we acknowledge this increased risk as a factor increasing vulnerability we observe in some

communities in the southern and northern Basins and the enhanced risks to them under further recovery and drier conditions.

Underlying commodity trends, irrigation development, and technology change have foundationally reshaped where and how the consumptive pool is used and where it will be used in the future. Water use will continue to shift between regions and locations, even with no further changes in land use or expansion of horticulture plantings. Almond water use, for example, could increase in the future by around 180 GL even without further expansion of plantations as existing developments mature, and this would result in an equivalent fall in water use across all other sectors as a result—with most of this occurring in rice and dairy.

Recognising movements in water use will occur regardless of seasonal conditions, the most significant pressures will occur in drier years when there is less water generally available across the board—whether it be general periods of drying or exacerbated by climate change. In those years, traditional water users (rice growing and many dairying enterprises, particularly those more dependent on pasture based systems and temporary water markets, and small to medium scale farms not contracted to drinking milk markets) will struggle to compete for available water. Further recovery at a pace will simply add to this difficulty in spades. Under current levels of horticultural development assuming acceleration of climate change and the planned recovery of 450 GL, modelling by ABARES suggests that water use by the dairy and rice sectors could decline by as much as 55% and 32% respectively in the very dry years. This would mean further water recovery would be particularly risky for those communities dependent on these irrigation enterprises in the central River Murray region. As such, our concern for these areas is elevated given the recent drying trends experienced in the Basin over the past two decades. As a Basin we also then face the prospect of a more risky irrigation sector in future—one where there is less diversity of farm systems and a greater proportion of them geared to intensive irrigation and dependent on highly reliable water supplies.

We know that there are areas where further recovery would inevitably impact communities currently under considerable stress and we urge the pace of further recovery be matched to communities' capacity to cope with more change. Acknowledging the substantial work done to date, we also need to intensify efforts to demonstrate and maximise the environmental benefits from water recovery and ensure our rivers have the capacity to achieve them.

The effects of COVID-19 and its aftermath also present risks to rural and regional communities in the Basin, but our assessment is they are likely to be mixed and relatively less significant given policies and programs already in place. In this regard, our concerns lie with the capacity of communities to cope with the risk of localised infection hotspots and the medium term risk of depressed demand and weaker commodity prices as world economies slowly recover. We are confident our supply chains are robust and claims of dire risks to food security are misleading and unhelpful.

We found many people have diminished trust in federal and state governments to deliver good long term policy and support rural and regional Basin communities. There have been over 40 reviews into the Basin Plan or Basin water management since the Plan was legislated in 2012 and we heard frustration over perceived lack of action in response to these reviews. People in Basin communities repeatedly said they had lost trust because they feel over-consulted and under-listened to. We heard strong messages that successive governments have hollowed out their local and regional capability and knowledge and have not provided clear leadership or a compelling vision. We heard this especially from those who have not been on the upside of change.

Our hearts sink when we observe the current circumstances of First Nations peoples in the Basin and we call for urgent change to improve their social and economic circumstances. Both policy reform and additional resourcing are needed to support First Nations' access to water for Cultural, environmental and economic outcomes. First Nations leaders have pointed to the need to build principles of justice and equity into decisions about how Basin water resources are allocated.

Governments and community leaders need to put in considerable effort, to build a culture of genuine engagement and trust to implement our recommendations. This responsibility rests with us all: governments need to listen more to communities and be called out when they get things wrong, and people in communities need to be responsible and avoid misinformation or contributing to alarmism that undermines credible voices. Further conversation is needed to help pave the way for trust. This involves moving from defensiveness and blame to developing positive initiatives that can be practically implemented. We are not about going back; we all must look to the future.

Throughout our consultations we heard that people in Basin communities want to be part of decisions that make their communities better places to live. We heard people want engagement that empowers communities to determine their own future and keeps governments accountable.

The Panel also heard clearly from governments and agencies implementing policy and reforms about the challenges of engaging with Basin communities in ways that are meaningful and allow all voices to be fairly heard. We heard that engagement has been particularly challenging in communities where debate has become toxic and divisive. In some communities, people who support Basin reforms are intimidated and are unwilling to speak up. Some people who have found a way to prosper in the current environment are reluctant to share their success because others are doing it tough.

Things cannot continue this way. A reset is needed. Our recommendations contribute to an emerging pathway forward.

We acknowledge that governments have been taking steps to increase confidence and trust in institutions and governance. This work includes establishing the Interim Inspector-General of Murray–Darling Basin Water Resources to provide independent assurance on Basin Plan implementation, and NSW's Natural Resources Access Regulator in 2018. We also see signs of communities cooperatively engaging in these initiatives. But more effort and goodwill are required from our governments, our communities, and their leaders. There is a risk that a growing toxicity infecting our Basin conversations will set back our capacity to understand and cope with future change and make the best of it.

Governments and Basin communities must continue to strive to find better ways to engage about Basin and broader reforms. Our recommendations are practical and require rapid implementation:

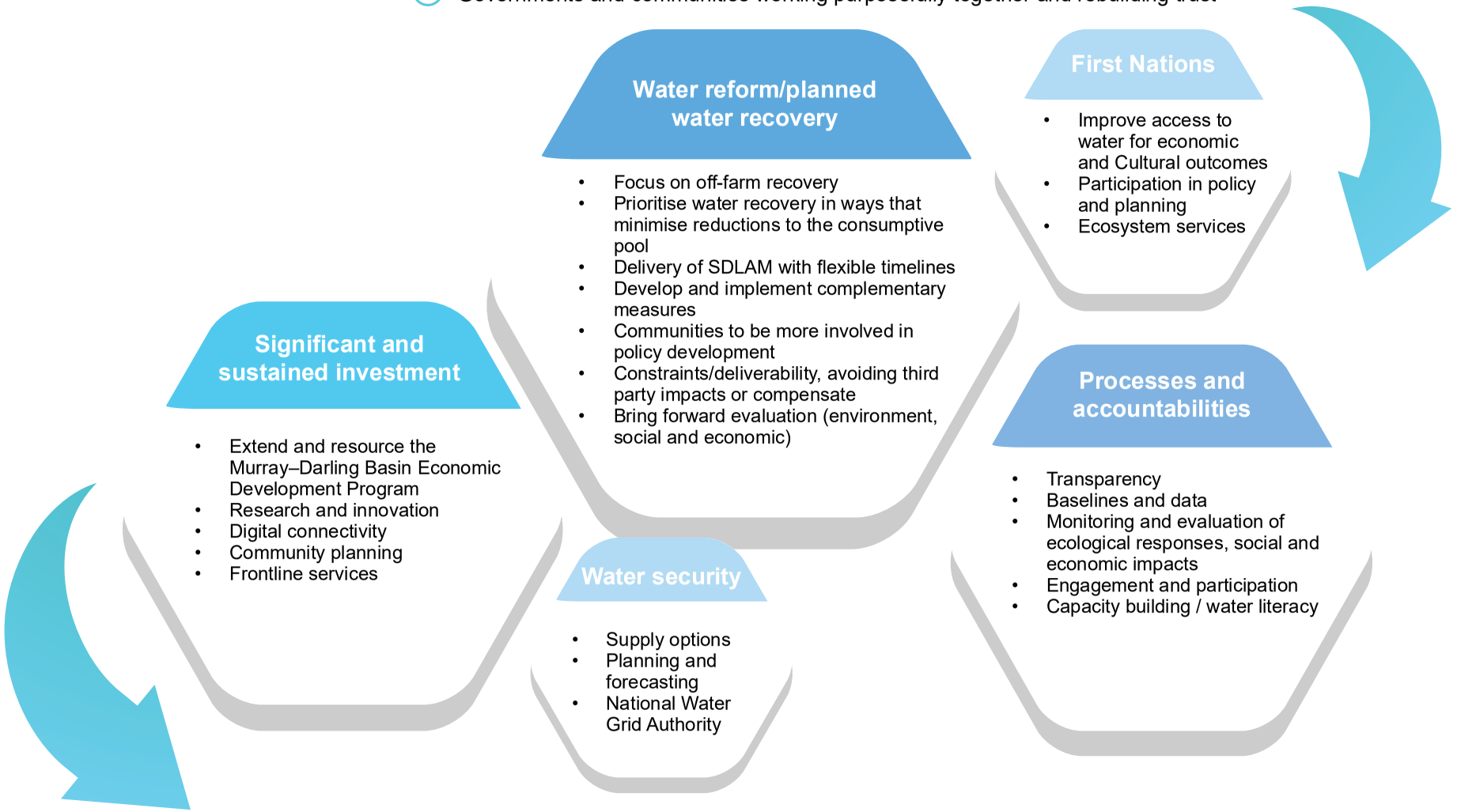
- Rebuild trust and accountability between governments and communities. Put communities at the centre of conversations about matters affecting their future.
- Invest in regional communities in ways that will stimulate long term sustainable economic growth and activity.
- Prioritise water recovery in ways that minimise reductions to the consumptive pool with an initial focus on building robust frameworks to implement efficient and effective complementary measures.
- Allow more time and flexibility for Sustainable Diversion Limit Adjustment Mechanisms to be achieved.
- Minimise harms and slow planned future water recovery to match the capacity of communities and river systems to cope and adjust.
- Guarantee just access for First Nations to water for Cultural and economic needs.
- Prioritise spending on essential services to address pressing household distress and build more diverse rural and regional economies.
- Embed a culture and practice of continuous evaluation and adaptive management and accelerate 'doable' data collection and analysis now to prepare for the Basin Review that is due to commence in 2026.
- Address gaps in urban water security that undermine health and economic development.
- Invest in Research and Innovation (R&I) and regional strategies that build resilience and more diverse farm systems and rural and regional businesses.
- Improve data, analysis and literacy on water resources in the Basin.

The Panel firmly believes that these recommendations require implementation as a package. This is a key route to rebuilding trust.

Caption: © Murray Irrigation

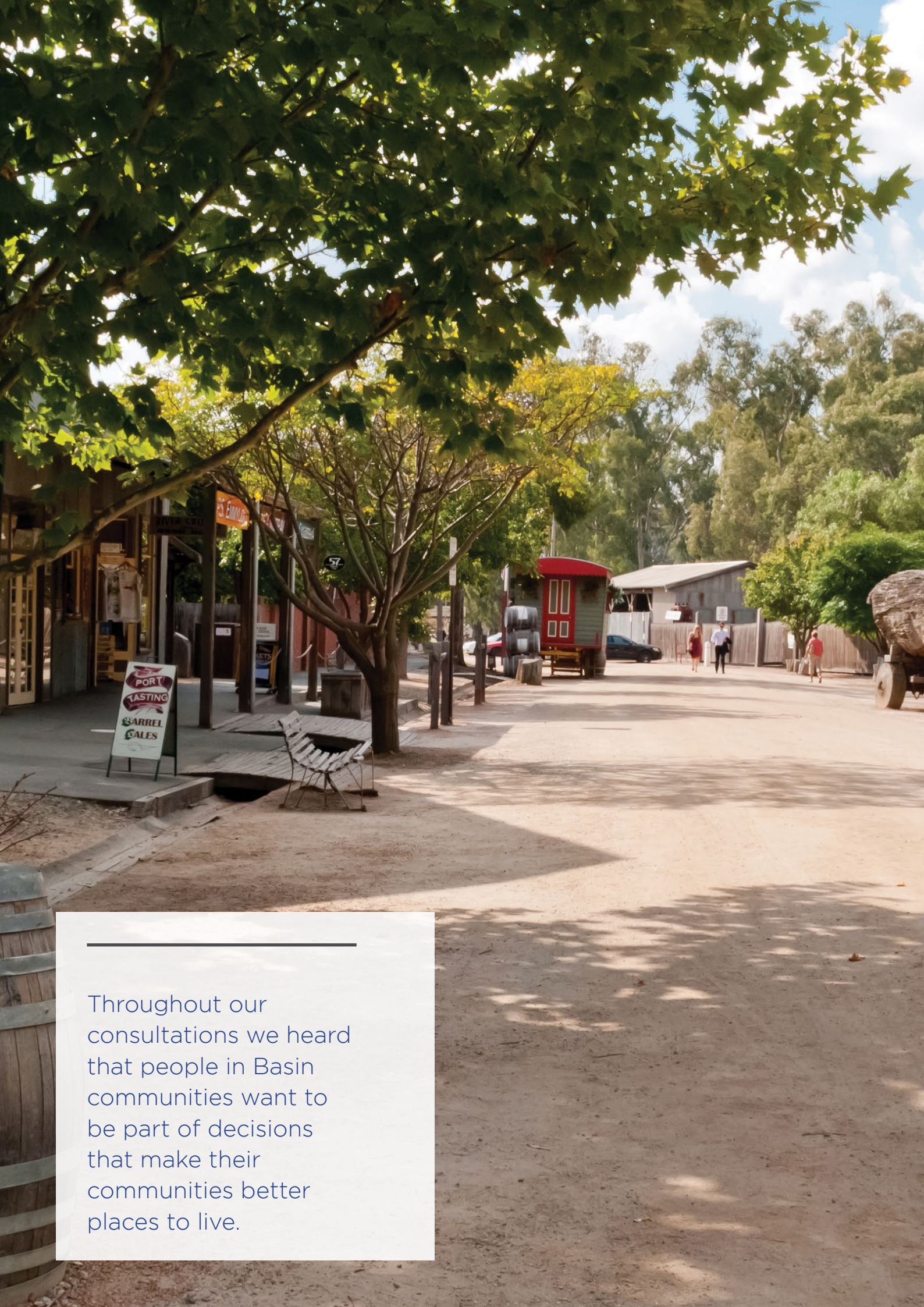
A change of approach to support Basin communities

- Pay attention to distributional impacts of reforms, particularly on those most vulnerable in our Basin
- Reduce risks of impacts that could be exacerbated under planned further recovery scenarios and timelines
- Match pace of water reform to the capacity of communities to adapt and capacity of systems to deliver water to where it is needed
- Governments and communities working purposefully together and rebuilding trust



Outcomes

- Increased accountability and trust
- Working towards rebuilding resilience and more diverse economies
- Focusing on outcomes
- More adaptive management
- Communities have more control over their own futures and non-irrigator community members included fairly into reforms



Throughout our consultations we heard that people in Basin communities want to be part of decisions that make their communities better places to live.

Panel recommendations

Improve the way we work together

Governments and Basin communities need to work together to rebuild trust, and communities need to be put at the centre of conversations about their future. Being clearer about decision making expectations and the allocation of responsibilities and building our capacity to work together are steps towards this.

All Basin governments and relevant authorities need to work together cooperatively, to deliver the Basin Plan in the nation's interests. This may require adapting to changing circumstances and new information. The Murray–Darling Basin Ministerial Council should demonstrate a shared vision and clear objectives, showing it can articulate what it sees as common goals with clear roles, accountabilities and actions, that provide long term policy certainty.

Recommendation 1

Basin governments and communities must find better ways to engage about Basin and broader reforms and strengthen leadership capacity of regional communities and government agencies. Specific actions to improve the way we work together may include:

- building local leadership capacity to work with governments to design policies and programs that are tailored to community needs. Programs such as the Basin Communities Leadership Program could be scaled up and/or the Murray–Darling Basin Leadership Program reinstated to support local capacity development
- building community and catchment involvement by engaging with local communities, landholders and Catchment Management Authorities to support coordination of environmental watering and investments in complementary measures
- strengthening community consultation approaches so that consultation on issues with potentially material social, economic and/or environmental implications are not rushed or superficial. This applies to initiatives including, but not limited to, Sustainable Diversion Limit Adjustment Mechanism (SDLAM) projects, the remaining Water Resource Plans, and river operation decisions
- further strengthening the capacity and capability of the Australian Government Department of Agriculture, Water and the Environment, the Murray–Darling Basin Authority (MDBA) and Basin states to engage regionally and implement the Panel's recommendations.

Recommendation 2

All parties involved in designing, developing, implementing, monitoring and evaluating water policy and reform must recognise the importance of transparency and accountability in providing certainty and confidence to communities. Actions to achieve this include:

- investing in an easily accessible, Basin-wide water resource information platform. The platform should provide timely information and simple description and definitions of water terms, policies, operational settings, rules and their implementation, and changes (or those proposed) to them. It could also provide easily understandable indicators of water supply and demand and enable rapid understanding of the composition of, and changes in, river flows and storages, both temporally and spatially, as well as access and release triggers. It should also track how governments have assessed, consolidated and implemented recommendations from reviews on issues relating to the Basin

- having the Basin Officials Committee publicly report advice provided to the Ministerial Council and advice provided for implementing policy and decisions of the Council on matters such as state water shares and the funding and delivery of natural resource management programs

- investing in water literacy in communities, media organisations and local government to support informed dialogue and rebuild trust

- improving data and information about social and economic conditions in rural and regional Basin communities, the drivers, and dynamics of change.

Appendix B.1 has specific areas where Panel inquiries indicate information and data needs to be improved.

Pace further planned water recovery to capacity to adjust

The Panel's commissioned work (section 4.2) clearly shows that recovering more consumptive irrigation water will have significant negative impacts for some regional Basin communities, including NSW Murray and northern Victoria. It may also have significant negative impacts in the northern Basin communities where water recovery is likely to be targeted. These impacts will be additional to those that these communities have already incurred.

While we acknowledge benefits from past recovery (sections 3.2.2 and 3.4), the Panel has significant concerns about the depth and distribution of past impacts in rural and regional Basin communities and considers that the pace of water reform needs to be changed. Further planned water recovery at the current pace raises a red flag given:

- the current low levels of resilience and capacity to adapt within smaller irrigated agriculture communities and other vulnerable communities (section 2.2)
- evidence that there is no longer low hanging fruit in terms of programs for recovering water from the consumptive pool (section 3.2.2)
- growing recognition that, under current policy settings, the overall target for water recovery of 2,750 GL per year plus 450 GL per year of efficiency measures cannot be achieved by 2024, and also cannot be achieved within the funds available through the Water for Environment Special Account
- the lack of clarity around what the enhanced environmental, working river and social wellbeing outcomes of additional water recovery will be (section 3.4). The evidence of heightened costs of recovery mean it is incumbent on governments to address the uncertainties and gaps in knowledge about the incremental environmental benefits of additional water recovery.

If a decision is made to slow the pace of planned further water recovery to beyond 2024, all Basin governments must recommit to the shared vision of achieving recovery targets over the longer term and put in place achievable milestones and trigger points for action. Care must be taken with messaging so as not to undermine community confidence and support for the Basin Plan.

Recommendation 3

From this point on, the Australian Government should time planned further water recovery in the northern and southern Basins to match the capacity of systems to deliver water to where it is needed, to achieve enhanced environmental, social and working river outcomes without detrimental uncompensated third party impacts.

From this point on, the Australian Government should also match the pace of all planned further water recovery to the capacity of communities to absorb and adjust to change, based on community scale social and economic assessment of anticipated impacts and engagement with affected communities.

Consider recovery that reduces the impact on the consumptive pool

Recognising the types and levels of water recovery that have occurred to date, the Panel acknowledges the water available for consumptive use in the southern and northern Basins is highly valuable. With future climate change, this water will be even more valuable.

The Panel recognises that many strongly support off-farm recovery measures because they do not directly reduce consumptive water (section 3.2.2). As discussed above, our commissioned work (section 4.2) demonstrates that recovering more consumptive water for irrigation will have significant negative impacts for some regional Basin communities, including NSW Murray and northern Victoria. It may also have significant negative impacts in the northern Basin communities where water recovery is likely to be targeted. We believe that planned future water recovery should avoid reducing consumptive water wherever possible.

Recommendation 4

Where possible, off-farm recovery should be a preferred approach for recovering water when it reduces the impact on the consumptive pool. Where off-farm recovery occurs, it should be cost-effective and underpinned by appropriate and transparent infrastructure pricing and service provision frameworks that align the long term needs of users and their capacity to maintain the off-farm infrastructure.

Allow more time and flexibility to progress the SDLAM

The SDLAM is a key adaptive mechanism for reducing the amount of water needed for the environment, while also improving environmental outcomes in the Basin (section 3.2.3).

The Panel supports SDLAM. Delivering SDLAM measures with equivalent value of 605 GL is critical. Basin communities cannot afford additional water recovery from the consumptive pool if the SDLAM projects are not delivered.

The Panel is concerned that SDLAM will not be achieved by the 2024 legislative deadline given the current lack of progress and COVID-19 causing delays to consultation around SDLAM projects (section 3.2.3). We are also concerned that the SDLAM projects may not recover the full 605 GL.

Recommendation 5

If the existing SDLAM projects do not deliver the anticipated 605 GL, there should be flexibility to allow new or other existing projects to close the SDLAM gap. The 605 GL must be achieved through SDLAM.

Given COVID-19, the progress status of key SDLAM projects, and the need for community consultation to not be rushed or superficial, timeframes for SDLAM measures should be extended to deliver an equivalent value of 605 GL.

Progress complementary measures

Complementary measures are widely supported on a 'more than water' approach to environmental management (section 3.2.3), reflecting that more than just environmental watering is needed to deliver environmental outcomes. The Panel notes complementary measures can include non-flow and flow-based measures (section 3.2.3).

Complementary measures need to progress from concept stage to practical plans for implementation and measurement as a priority. This work is currently progressing too slowly (section 3.2.3).

The Panel considers the MDBA, working with Australian and state governments and Basin communities, should develop an agreed method to determine the impact of local complementary measures on supporting or making progress towards Basin Plan objectives.

The Panel considers complementary measures should count towards Basin outcomes and reduce water recovery targets where the complementary measure delivers equivalent or better target environmental outcomes than water recovery.

The method should be appropriate to the northern and southern Basins, and:

- consider the potential for local complementary measures to offset further water recovery (extended complementary measures)
- map out the implementation pathway for complementary actions for the future. It may identify low regret measures, and complementary measures that should be delivered now and in the next two years. It may build on the preliminary list of complementary measures proposed by jurisdictions in the CSIRO complementary measures report
- account for impacts that may result from future regional climate changes
- include non-flow and flow measures
- explore using flexible market-based mechanisms for environmental watering (e-water leasing/options).

Recommendation 6

The MDBA, working with Australian and state governments and Basin communities, should develop an agreed method to determine the impact of local complementary measures on supporting or making progress towards Basin Plan objectives. The method should be appropriate to the northern and southern Basins.

The draft method should be developed for consultation by October 2020.

Recommendation 7

Commonwealth and Basin State governments should invest in complementary measures across the northern and southern Basins to contribute to the outcomes in recommendation 6.

Accelerate preparation for the Basin Plan review

The Basin Plan will be reviewed in 2026. The Productivity Commission recommended early preparations for this review. The Panel supports this recommendation and believes there are important opportunities to bring forward aspects of the planned review to align with adaptive management objectives, and to improve the timeliness and robustness of data for the review proper. There are opportunities to progress the framework for evaluating Basin reforms and move to a rolling reporting against some of the matters for evaluation and reporting in 2026 set out in Schedule 12 of the Basin Plan, including:

- progressing the framework and bringing forward reporting on Schedule 12 item (3)—the extent to which the Basin Plan has affected social, economic and environmental outcomes in the Murray–Darling Basin
- establishing a framework and bringing forward reporting on Schedule 12 item (6)—the extent to which local knowledge and solutions inform the implementation of the Basin Plan
- finalising the framework and bringing forward reporting on Schedule 12 item (16)—implementation of water trading rules
- enhancing small area socioeconomic time series and Panel data that can be used to build a body of evidence of socioeconomic conditions and impacts over time.

Recommendation 8

To support adaptive management and better prepare for scheduled formal reviews, the MDBA should bring forward a program of continuous evaluation, including the development of timely and relevant social and economic indicators (Schedule 12, item 3).

This program should build on the MDBA's 2020 evaluation of the effectiveness of the Basin Plan. It should establish a clear framework and approach for information sourcing so that social and economic condition and change information is directly comparable, and reports at the appropriate spatial scale. Information should be sourced and reported as it becomes available.

Support community led transitions

Our investigations have found that the suite of Basin water reforms is delivering uneven outcomes across the Basin, with some communities doing well and others faring very badly. Research we commissioned shows (section 3.2.2):

- Farms, farming regions and towns that have more water recovered through on-farm irrigation infrastructure upgrades have gained a competitive advantage compared with farms, farming regions and towns that have sold more of their water to the Australian Government through open tender buybacks.
- Dairy, rice and annual cropping regions and regional communities that heavily rely on these industries have benefited less from past water reforms and, based on current settings, will also benefit less in the future.
- Reforms have disrupted smaller, outer regional and remote communities that heavily rely on irrigated agriculture and irrigated agricultural value chains, particularly when water recovery reforms have been fast.

Our view is that current funding falls well short of being enough to address the significant community impacts of Basin water reform or to drive effective economic development and community transitions. More funding is warranted. But we are concerned that much of the past funding to support Basin regions and towns impacted by Basin water reforms has not been effective or well targeted (section 3.5). That said, current funding through the Murray–Darling Basin Economic Development Program is better targeted and may be more effective at supporting transitioning regions and communities.

Funding to support Basin regions and towns impacted by Basin water reforms must be used to build industries that provide long term jobs and income for communities. Regional development or adjustment programs must be community driven, long term and consistently supported over several terms of governments. The Panel also recognises that the economic development programs may have limited scope, especially in small towns. Some towns exist almost solely for irrigation and lack other competitive advantages to make them attractive.

Recommendation 9

To empower communities to make longer term investments in their future, the Australian Government should increase the scale of the Murray–Darling Basin Economic Development Program and extend it to 2030. It should also prioritise the program towards more vulnerable and disadvantaged communities most negatively impacted by Basin water reforms. Funding programs must be community driven and focused on reforms and investments that build industries that provide long term jobs and income for communities.

Recommendation 10

The Australian Government should increase the Murray–Darling Basin Economic Development Program Round 2 budget.

Further empower communities in decisions about their future

The Panel recognises that the recently agreed socioeconomic neutrality criteria provide important protections for irrigators and others. The criteria say programs or projects cannot have negative third party impacts on the irrigation system, water market or regional communities or jobs. They also say programs or projects in an irrigation district cannot reduce the overall productive capacity of the relevant region.

But the Panel finds the criteria may also limit the ability of a local community to transition effectively to a less water dependant future, where they want to do this. We consider that the criteria should be less prescriptive, and more outcomes focused. Communities, regions and irrigation infrastructure operators (IIOs) should be empowered to engage with government where they wish to transition effectively to a less water dependant future.

The Panel considers proposals that fail to meet the established neutrality criteria should trigger a formal conversation around whether and how third party impacts could be offset in a way that is acceptable to those negatively affected by the change. The community must lead these proposals and discussions. This process would likely stimulate a more diverse range of community led recovery proposals, which may alleviate an otherwise protracted and even more painful and unmanaged transition for regions.

Recommendation 11

Where an upwater recovery proposal fails to meet established neutrality criteria, this should trigger an option by the local communities to have a formal process to consider and agree on whether and how third party impacts could be offset in a way that is acceptable to those negatively affected by the change. These processes must be community led.

If accepted, the Panel's additional process should also be applied to any further northern Basin future water recovery.

Give greater transparency around river operations

The December 2019 Commonwealth and state water ministers meeting in Brisbane agreed there are real delivery risks in the southern Basin. The recent Keelty report highlighted the need for improved transparency on river operations and established governance arrangements across the Basin. We consider there remains an urgent requirement to not worsen binding river constraints that impact upstream and downstream irrigators, the environment and third parties (section 3.2.1) and to improve transparency around river operations.

Recommendation 12

Reflecting community concerns, all Basin governments should continue addressing consumptive and environmental water river operation issues. This work includes, but is not limited to:

- Commonwealth and state water ministers developing an aligned multi-state approach to development below the Barmah Choke
- developing efficient and effective longer term responses to deliverability issues that impact on consumptive and environmental water and third parties. This work may involve exploring new water market products such as capacity shares to help manage consumptive and environmental water delivery issues
- better incorporating local and regional information and decision making into water recovery and river operations planning
- improving the transparency of river operations and governance arrangements.

Improve urban water security

Town water security is the fundamental building block of socioeconomic outcomes in the Basin. More needs to be done to ensure adequate security is in place.

The prolonged and deep drought has left urban water supply for many town communities under threat of critical failures (section 2.3). If the future sees a warmer, drier climate, regional Basin communities will have less water flowing into their dams. They will potentially need more water for essential use and to keep cities and towns sustainable. Extreme weather events and a greater risk of fire in water supply catchments will increase risks to conventional supply reliability. As a result, the costs of servicing towns and other water users, while maintaining service standards, may increase.

The Panel notes Infrastructure Australia's February 2020 infrastructure priority list has specifically identified town and city water security as a new High Priority Initiative. The Panel also recognises the National Water Grid Authority (NWGA) and the National Water Infrastructure Development Fund could be instrumental in securing town and regional centre water supply in the future, if their remit is explicitly extended.

Consistent with the Productivity Commission findings, the Panel believes we need to be clearer about critical human water needs in Water Resource Plans during extreme events, and how the MDBA will assess the adequacy of critical human water needs during extreme events.

Recommendation 13

The Australian, state and local governments should improve the water security of Basin towns and cities (including First Nations communities) by focusing on better supply and demand forecasting and planning; non-rainfall based supply options; a full assessment of costs, benefits, risks and uncertainties; and adequate provision of required water supply.

As part of this effort, the Australian, state and local governments should work with town water suppliers to develop regional pilot programs for alternative urban supply sources, including indirect potable reuse.

Recommendation 14

Consideration should be given to extending the National Water Grid Authority's remit to include securing town and regional centre water supply. This is consistent with National Water Grid Authority objectives of planning the next generation of water infrastructure to support thriving regions by growing our agricultural sector, increasing water security, and building resilience to a changing climate.

Improve First Nations' outcomes

Some water reforms and government decisions have improved First Nations' participation in water planning and access to water, in principle. In practice, improved outcomes for First Nations peoples are yet to materialise, and some jurisdictions have made more progress than others (section 3.2.1). More needs to be done to ensure social and economic outcomes for and by First Nations communities in the Basin improve. There are significant opportunities for substantive improvements.

First Nations groups that we consulted emphasised the need for efforts to build knowledge and improve understanding, and for First Nations peoples to lead those efforts with appropriate support. These First Nations groups also called for review of the condition of water licences allocated for First Nations Cultural purposes. Currently, water on these licences is limited to its Cultural purpose and cannot be traded or used to make money (section 2.2).

Recommendation 15

As a priority, governments should increase First Nations peoples' access to water for economic and social purposes by:

- working with First Nations groups to define levels of access required to support improved outcomes for First Nations peoples across the Basin
- recognising the relationship between, and benefits from, First Nations' increasing access to water and land, and working on approaches that provide for both
- purchasing water entitlements for First Nations' needs, as described in the Echuca Declaration
- reviewing the condition of water licences allocated for First Nations Cultural purposes. Currently, water on these licences is limited to its Cultural purpose and cannot be traded or used for economic activities and outcomes.

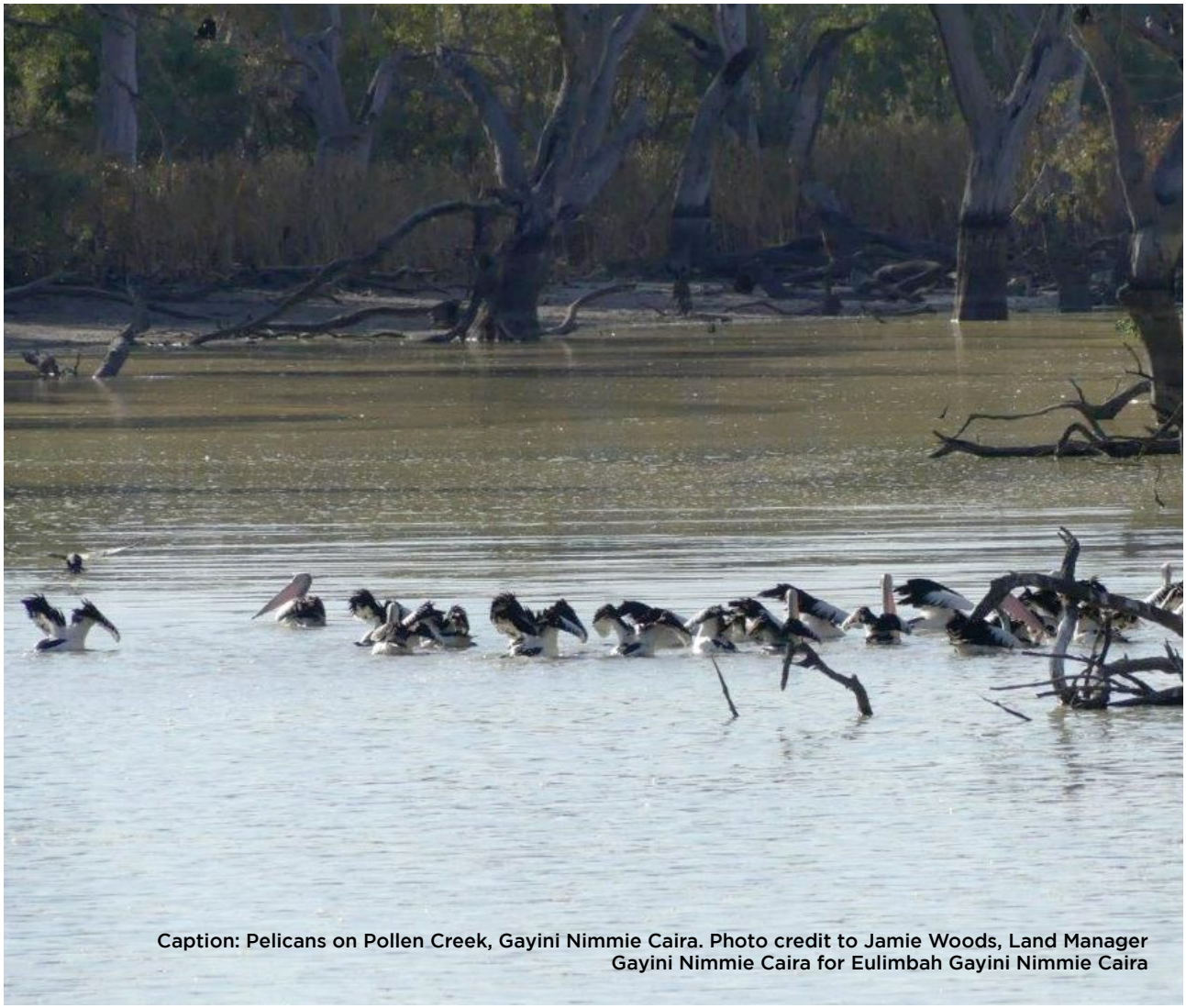
Recommendation 16

The Australian and Basin state governments should fund First Nations groups to work with experts in valuing ecosystem services provided by, and the benefits arising from, Culturally significant sites (including, but not limited to, the 16 Ramsar sites in the Basin). The goal should be to better understand the Cultural and economic benefits of improving First Nations groups' access to water, and environmental outcomes.

Funding should also be provided to support Aboriginal enterprise development in associated First Nations communities that use (or could use) ecosystem services.

Recommendation 17

First Nations' participation should be embedded in water policy and strategy development at all levels of government. Basin-wide processes have provided for greater First Nations involvement, but involvement in state and local decision making and planning varies and should be increased.



Caption: Pelicans on Pollen Creek, Gayini Nimmie Caira. Photo credit to Jamie Woods, Land Manager Gayini Nimmie Caira for Eulimbah Gayini Nimmie Caira

Pursue more flexible farm systems through research and innovation

Australia's Rural Research and Development Corporations (RDCs) have been investing in agriculture in the Basin for more than 30 years. RDCs are accountable to industry and government, and they fill a key gap in research and innovation (R&I) and practice change that enables farm system diversification to address emerging risks and opportunities. Public expenditure on this R&I will be essential to prevent the well-recognised problem in agriculture of under investment in private R&I.

Current R&I efforts are often focused at an industry scale, so farm businesses have limited information on how to transition to more flexible farming systems that are not industry focused. We observed gaps in help for farmers to translate R&I knowledge into on-ground application through training. Therefore, there may be opportunities to provide resources that enable this translation.

Recommendation 18

In response to the emerging climate and other risks in the Basin, Commonwealth and Basin state governments should increase the focus of, and funding for, research and innovation in these key areas:

- enabling the diversification of farm systems across industries, and adaptation to climate change, natural hazards and other risks
- translating research and innovation knowledge into on-ground application, particularly through greater in-region capacity to demonstrate the practical value of adopting research and innovation.

Caption: Dairy Australia

Improve measurement and evaluation of social and economic impacts of environmental outcomes

The Intergovernmental Agreement on Basin water reform committed governments to, among other things, the goal of improving river and wetland health. The Panel wholeheartedly supports this objective. We believe that healthy, resilient rivers, wetlands and floodplains can deliver significant benefits to Basin regions and communities, and to people living outside the Basin, over time.

Environmental benefits of Basin water reforms are becoming evident, and there is some evidence that these enhanced environmental outcomes may contribute to better liveability, human health and wellbeing, and cultural values in the Basin (section 3.4). Evidencing environmental benefits will take time, and drought has slowed benefit realisation.

The Panel considers there is an urgent need to better establish links between water recovery, flow regimes, enhanced environmental and working river outcomes, and benefits for rural and regional communities (section 3.4). Stronger evidence will help improve confidence that the costs of environmental water recovery to communities are worthwhile.

Improvements in monitoring and evaluation measures should include, but not be limited to, demonstrating how enhanced environmental outcomes of water reform affect tourism, recreation, liveability, human health and wellbeing, and cultural values. This tracking is a critical need, and communities should have the opportunity to be more involved in designing this program compared with previous efforts.

Recommendation 19

To improve decision making and enable well focused and timely responses to wellbeing concerns, governments should agree on a framework that creates a solid baseline and tracks environmental outcomes from water reform, and how these impact Basin communities' social and economic wellbeing. Improvements in monitoring and evaluation measures should include, but not be limited to, demonstrating how enhanced environmental outcomes of water reform affect tourism, recreation, liveability, human health and wellbeing, and cultural values.

Governments should ensure there is adequate resourcing of agencies and organisations involved in monitoring, evaluating and reporting all baseline environmental, social and economic conditions that Basin reforms are being evaluated against.

Move towards more sustainable irrigation infrastructure

After receiving submissions in response to our draft report, we remain concerned that off-farm irrigation infrastructure investment and higher running and renewal costs may be creating a medium to long term financial challenge for some Basin IIOs (section 3.2.2). The financial challenges could have significant pricing implications for irrigators supplied by some IIOs, which will have flow-on impacts in regions and towns.

Further water recovery through off-farm infrastructure should clarify future service requirements and how costs are shared. A legislated Community Service Obligation (CSO) mechanism could help in some circumstances. This mechanism could set out the Australian Government's longer term expectations for service provision.

Recommendation 20

IIOs should not accept infrastructure for water recovery without involving their customers in the process, and without customers having a clear understanding of the potential pricing implications of new infrastructure. As part of their investment business cases IIOs should demonstrate that customers have willingly accepted the pricing implications of taking on new infrastructure.

IIOs should provide irrigators with more information about the potential medium (five or more years) to long term (10 or more years) pricing implications of IIO capital investments.

Invest in regional connectivity

Our commissioned work shows many rural and regional communities in the Basin, including most of the 600,000 people (approximately 28% of the Basin population) living in outer regional and remote Basin regions and towns, say they have poorer access to essential services and infrastructure than the rest of regional Australia. Basin communities with poor access to infrastructure and essential services are at a competitive disadvantage. Not addressing these disadvantages will lock in the decline underway in many of the outer regional and remote Basin regions and towns, and limit future development.

Our commissioned research shows people across the Basin communities say they have less access to high speed reliable internet and mobile phone reception, relative to communities outside the Basin (section 2.2). The Panel notes economic modelling from the Accelerating Precision Agriculture to Decision Agriculture project indicates digital agriculture could increase the gross value of Australian agricultural production by $20.3 billion (a 25% increase on 2014–15 levels). Regional tourism in the Basin would also benefit from greater connectivity.

We acknowledge the Australian Government's $220 million Stronger Regional Digital Connectivity Package (SRDCP) (announced in the government's response to the 2018 Regional Telecommunications Review) aims to improve connectivity across the Basin. We also acknowledge the Australian Government has released draft grant opportunity guidelines for public consultation for the SRDCP.

Recommendation 21

Commonwealth and Basin state governments should invest to improve essential infrastructure in Basin communities that are at a relative disadvantage and consider developing a Basin-specific infrastructure fund focusing on digital connectivity.

Give immediate support to Basin regions and towns facing acute social and economic issues

We identified Basin regions with acute social issues, including poor mental health, household distress and financial hardship (section 2.2).

The Basin is home to regions and towns with higher community vulnerability and lower adaptive capacity. Many of the 600,000 people (approximately 28% of the Basin population) in outer regional and remote Basin regions and towns live in higher vulnerability areas. We found these communities (section 2.2), compared with similar areas outside the Basin, score relatively worse in terms of:

- their overall community wellbeing
- the pace at which populations are falling and ageing, and their health outcomes
- their economic performance and standards of living
- their access to essential services and infrastructure.

Recommendation 22

Basin governments and public and private agencies should:

- work with communities in the Basin with acute social and economic issues to develop action and outcome plans that will address these issues over the next three years

- direct resources to attract and retain frontline service providers that specialise in addressing household distress, mental health issues, and financial hardship, in Basin locations experiencing acute social or economic issues.

In addition:

- To ensure early progress in meeting the unmet need for mental health support, Basin governments should support organisations with existing and proven delivery capability to deliver online and telephone support services. These programs should be targeted to those most in need: Basin communities in greatest need, young people, and priority populations, particularly Aboriginal and Torres Strait Islander communities.

- To plan for the medium and longer term, the Australian Government, in collaboration with Primary Health Networks, leading mental health organisations, and state and territory governments should develop a mental health plan for the Murray–Darling Basin. This plan may include identifying the level of need in the Basin, establishing an action plan and resourcing to better meet the need, and prioritising support for those most in need.

Section 1

About this Review

Caption: © Murray Irrigation

1. About this Review

In June 2019, the Hon. David Littleproud MP, then Minister for Water Resources, Drought, Rural Finance, Natural Disaster and Emergency Management, appointed a seven-member independent Panel to investigate social and economic conditions affecting rural and regional communities across the Murray–Darling Basin (the Basin). He also asked the Panel to look at the impacts of water reform on those communities.

The Panel members are Robbie Sefton (Chairperson), Andrew Kassebaum, David McKenzie, Dr Deborah Peterson, Michelle Ramsay, Bruce Simpson and Rene Woods. This report provides our final findings and recommendations to stimulate, support and promote healthy and sustainable rural and regional communities in the Basin in the longer term.

1.1 What the Panel was asked to do

We developed our Terms of Reference (Box 1) following broad public consultation and engagement with people in Basin communities and other stakeholders.

Box 1: Terms of Reference

A. The Panel will provide an independent assessment of social and economic conditions in rural and regional communities across the Murray–Darling Basin.

B. The Review will assess impacts (positive and negative) of water reforms including the Basin Plan on the vulnerability, resilience and adaptive capacity of Murray–Darling Basin communities and their development potential. This will include consideration of social and economic impacts of the environmental effects of water reforms.

C. The Review will consider ongoing structural changes influencing different communities in the Murray–Darling Basin, and seek to separate the effects of these trends, and events such as drought, from the effects of water reform, including the Basin Plan.

D. The Review will support longer term efforts to monitor and understand social and economic conditions in the Basin, and the impact (positive and negative) of water reform on different communities in the Murray–Darling Basin. This will be used by governments and leaders to help understand the outcomes of water reform, including the Basin Plan. However, this is not a review of the Basin Plan.

E. The work of the Panel will explore a range of options that stimulate, support and promote healthy and sustainable rural and regional communities in the Basin.

Following our Terms of Reference, we focused on effects of water reforms on people living in rural and regional Basin communities. We define Basin communities broadly, but we are particularly concerned with the people whose lives, livelihoods and future are most connected to and impacted by water and by Basin water reform (Box 2).

Box 2: Basin rural and regional communities in focus

- Communities heavily dependent on irrigation and irrigators
- First Nations groups and communities
- Businesses operating in local economies that are deeply connected to the rivers
- Recreational and commercial users of rivers and riverine environments
- Other groups who have clear local, cultural and other connections to the Basin's rivers and water management

At the same time as this Review, many other reviews and inquiries were also underway. The Panel has deliberately not focused on the issues that these reviews and inquiries are looking at. We list these reviews and inquiries in Appendix A. In particular, this Review does not address in substantial detail:

- how lower in-flows may have impacted on state shares under the Murray–Darling Basin Agreement. This was the focus of the review by the Interim Inspector General. This report was provided to the Minister for Resources, Water and Northern Australia, the Hon. Keith Pitt MP, on 30 March 2020

- how carryover and other changes to water use and management have impacted on water allocations to different water securities in the southern Basin. This is included in the Australian Competition & Consumer Commission (ACCC) water market inquiry terms of reference. The ACCC interim report is due to the Treasurer, the Hon. Josh Frydenberg MP, by 31 May 2020.

The Panel also recognises many reports and inquiries in recent years have looked at water policy in the Murray–Darling Basin. They include the Productivity Commission's Five-year assessment of Basin Plan implementation (2018) and the National Water Reform Inquiry (2017), the Northern Basin Review (2016) and many more. There has also been a lot of work on profiling social and economic conditions in southern and northern Basin communities. The Panel considered these reports, government responses, and other supporting work.

1.2 Our approach to this Review

To inform our findings and recommendations, we engaged with stakeholders across the Basin in late 2019 and again in March–April 2020. In late 2019 we met face to face with more than 750 people across Queensland, NSW, Victoria and South Australia. We received over 100 written submissions that contributed to shaping the Terms of Reference and 600 survey responses between July and November 2019. Plus, we received over 70 submissions in response to our draft report released in March 2020. Our engagement coincided with a time of severe drought, bushfires and flooding in many parts of the Basin, and the emergence of COVID-19.

Alongside our consultation, we commissioned new research looking at:

- a summary of the existing literature and knowledge on the impacts of reforms, government spending in the Basin, existing data and knowledge of social and economic conditions in the Basin, and strategies for building community resilience, adaptability and wellbeing
- social and economic metrics, to help understand conditions in different Basin communities, based on six recognised dimensions of a thriving community
- what might happen when 497 GL of future water recovery occurs, especially given the likelihood of more frequent droughts and a drying climate
- case studies on recreational fishing; recreational boating; the rice industry; cotton industry; dairy industry; and horticulture below the Barmah Choke.

We also drew on the latest available research and information, such as analysis of trends and drivers shaping water markets, water availability and agricultural production in the northern and southern Basins.

Valuable community input

750+
people at face to face meetings across **QLD, NSW, VIC** and **SA**

100+
written submissions that contributed to shaping the Terms of Reference

600
survey responses

70+
submissions in response to our draft report

Our engagement coincided with a time of severe drought, bushfires and flooding in many parts of the Basin, and the emergence of COVID-19.

1.3 This final report

This final report builds on the draft findings and recommendations in the draft report. It reflects new material and understanding developed through additional consultations and submissions the Panel received on the draft report. We have valued the constructive input and conversations.

Submissions on the draft report highlighted to the Panel that Basin communities and sectors have different views on many of the issues and recommendations in the draft report. Submissions reinforce that some views are deeply entrenched for some people and are unlikely to change.

This Review seeks to upholds the foundations of good public policy (transparency, rigorous evidence based analysis, and open debate) and ensure that these remain embedded in our national discourse on the Basin.

Reflecting feedback on the draft report and additional inquiry, this final report:

- makes new recommendations on options to stimulate, support and promote healthy and sustainable rural and regional communities in the Basin (Terms of Reference Item E). New recommendations cover the SDLAM (Recommendation 5), complementary measures (Recommendation 6 and Recommendation 7) and adaptive management (Recommendation 8)

- modifies some existing recommendations on options to stimulate, support and promote healthy and sustainable rural and regional communities in the Basin (Terms of Reference Item E). Modified recommendations include how governments and communities work together going forward (Recommendation 1), forms of recovery (Recommendation 4), transparency around river operations (Recommendation 12), off-farm water recovery (Recommendation 4), upwater recovery (Recommendation 11), funding for the Murray–Darling Basin Economic Development Fund (Recommendation 9 and Recommendation 10), urban water and critical human water needs (Recommendation 13 and Recommendation 14), separation of Cultural and economic First Nations water (Recommendation 15), and mental health (Recommendation 22)

- streamlines the main body of the report. We have done this by moving more technical material to supporting annexes and incorporating findings into the main report body.

- adds links to supporting documents, work the Panel commissioned, and submissions to the draft report.

The Panel re-emphasises that this Review and its recommendations is not a review of the Basin Plan, nor a referendum on water reform. The final report is, however, a call to address what the Panel sees as some glaring socioeconomic challenges for rural and regional Basin communities, and aims to refocus government effort in ways that restore trust and build prosperous, healthy and sustainable rural and regional Basin communities.

Section 2

Social and economic conditions in rural and regional communities across the Murray–Darling Basin

Caption: © Murray Irrigation

2. Social and economic conditions in rural and regional communities across the Murray–Darling Basin

The Panel's Terms of Reference A (Box 1) asked the Panel to provide an independent assessment of social and economic conditions in rural and regional communities across the Murray–Darling Basin. We were also asked to consider how ongoing structural changes and things like drought are influencing Basin communities, and to separate these trends from water reform impacts (Terms of Reference C).

This chapter describes what we found about Basin communities' social and economic conditions, based on what we understand is the best available evidence. But there are gaps, and conditions are constantly changing. More and better evidence is needed to accurately reflect the current social and economic conditions and trends of Basin communities, and this evidence must be at a very local scale.

2.1 What we heard from people in rural and regional communities

During our consultations between July and November 2019, many people told us their communities were under immense pressure. Many submissions received responding to the draft report reinforced these views. People told us they considered themselves and their communities to be in crisis, with physical and mental health and overall wellbeing in severe decline. They see their communities are being damaged, dismantled, and even potentially destroyed. Many people in smaller northern Basin communities are observing rapid population decline, and people in southern parts felt social cohesion is crumbling.

Community decline was a common theme in communities in northern Victoria and southern NSW that traditionally relied on dairy and cropping. It was also common in some northern Basin communities where, at the time of engagement, there was little water for agricultural production or for critical human needs and recreational uses.

Many First Nations communities in the Basin are experiencing poor social and economic conditions, both over the longer term and more recently caused by the drought and environmental decline. Their health and wellbeing are suffering, and so are their identity and Culture. They also feel they are being marginalised and excluded from the benefits of water reform.

Further, data and information on the social and economic conditions of First Nations communities are often non-existent or incomplete, with many community members being missed in major surveys (including the census). We heard this situation is often also the case for non-Indigenous people living in remote areas or 'off-the-grid'.

Many people we spoke with in northern Basin communities, where the length and extent of the drought have been most severe, are under immense pressure. Many people spoke of making serious decisions about having to reduce staff hours and lay off workers in town and farm businesses. People told us about how the associated rapid population declines are impacting schools, the volunteering base, capacity for businesses to rebound when the season turns, and the social demographic of both larger and small communities. Declining access to essential services, particularly health services, was raised as a serious problem, particularly in more remote areas. Despite great community pride, the stresses of living through the drought—combined with concern about the lack of rebound capacity due to water reforms and climate change reducing

available consumptive water—were adding to uncertainty in the future.

But not all communities are faring badly. We heard of areas of optimism and regions experiencing growth. Industries and businesses are expanding, some niche industries are doing well, and economic benefits are flowing to some sectors and regions. These positive stories come from many of the Basin's larger towns, and areas with expanding irrigation opportunities.

Some participants in southern Basin communities are optimistic about the future. They see opportunity in the agricultural sector, with favourable commodity prices and modernised farms ready to take advantage when water becomes available. The growth in cotton production further south, around Hay for example, has helped underpin the local economy and provide new farming opportunities into the future. Large corporate developments have brought new investment, industry and jobs, although we heard from people who believe this wealth is not being kept in the region.

Some people in bigger southern zone centres such as Swan Hill and Shepparton consider they are in a better position than many others in the Basin. They have more diverse economies and opportunities outside of irrigated agriculture, and more stable or even growing populations (sometimes absorbing people from surrounding towns). They are not immune from social and economic challenges, but they are more hopeful for the future than elsewhere in the Basin.

The views of people we spoke with in the western communities varied. Some people in towns such as Mildura, Wentworth and Murray Bridge feel they are being negatively impacted by drought, but not as badly as the surrounding smaller communities (or remote communities like Menindee, Walgett and Bourke), which are declining much faster. By contrast, other people in Mildura, Wentworth and Barmera noted irrigated agriculture in their regions has expanded considerably in recent years.

2.2 What we found about the social and economic conditions

The Panel used commissioned research and existing literature and data to better understand Basin social and economic conditions. The commissioned research focused on the non-ACT Basin population—that is, 2.2 million of the nearly 2.8 million people who call the Basin home.* Headline findings from this research are summarised in this section.

> Commissioned social and economic condition research and our consultations highlighted that (a) there are significant gaps in information on the current social and economic conditions of Basin communities, and (b) Basin reporting is often based on out of date data. More and better information is needed, at a more local scale. These data limitations should be kept in mind when interpreting social and economic condition measures discussed in this section.

* In this report, we call this group 'the Basin communities' or 'the Basin population'.

Social and economic conditions vary widely across the Basin

Figure 1 to Figure 4 show how Basin communities are broadly faring by comparing Basin communities to the average for all regional Australia (defined as all areas outside Australia's major cities). The commissioned research shows that social and economic conditions vary considerably across the Basin for different measures and indicators. For example:

Around 1.38 million people (64%) live in regions with **economic, employment and standard of living conditions** in line with the regional Australia average. Nearly a third live in regions below that average, while only 6% live in regions above the average (Figure 1).

Around 1.29 million people (60%) live in regions with **population, health and ageing conditions** in line with the regional Australia average. A quarter live in regions below that average, while 15% live in regions above the average (Figure 2).

Around 910,000 people (42%) live in regions with higher **overall community wellbeing** than the regional Australia average. Just over a third live in regions in line with that average, and 12% live in regions below the average (Figure 3).

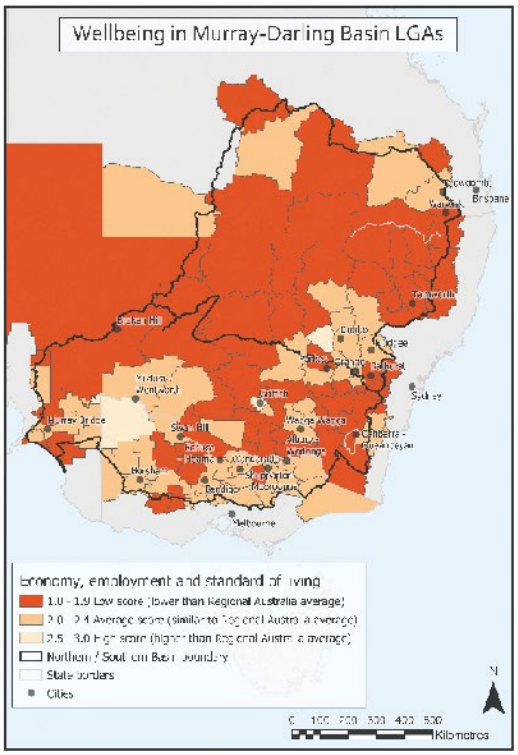
Around 900,000 people (41%) live in regions with better **infrastructure and services** than the regional Australia average. Nearly a quarter live in regions in line with that average, while just over a third live in regions below the average (Figure 4).

Many smaller communities in outer regional and remote areas are declining in population while regional centres are growing

The commissioned research highlights that many smaller communities in outer regional and remote Basin communities have declining populations, while larger populations in inner regional areas are growing. These trends pre-date water reform.

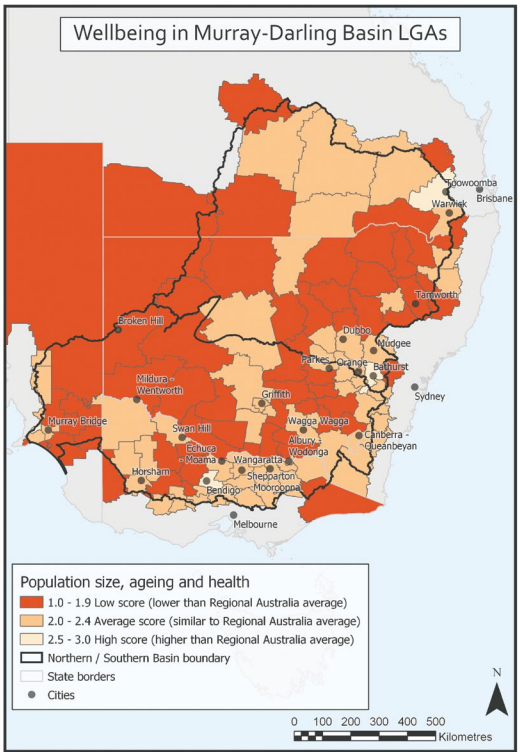
This pattern of population decline in smaller towns is happening across most of rural and regional Australia, not just in the Basin (Productivity Commission 2017). Many Australians are moving from smaller towns to larger regional towns and metropolitan cities, because larger centres offer things they want and larger communities are more economically diverse. Often, it is younger families with children who are moving, and they move for many different reasons.

Figure 1: Economy, employment and standard of living in Murray–Darling Basin LGAs



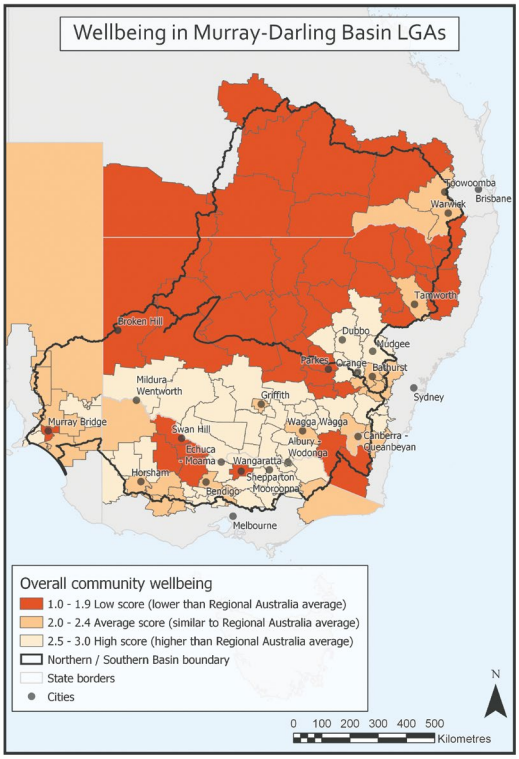
Source: Schirmer et al.

Figure 2: Population size, ageing and health in Murray–Darling Basin LGAs



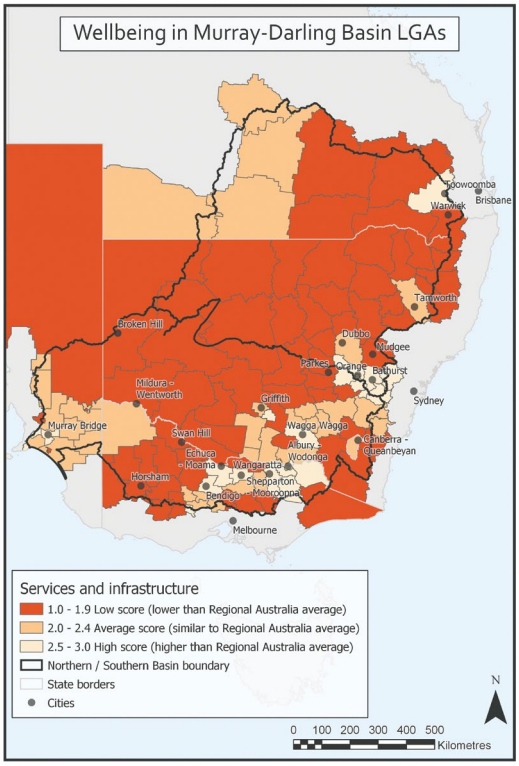
Source: Schirmer et al.

Figure 3: Overall community wellbeing in Murray–Darling Basin LGAs



Source: Schirmer et al.

Figure 4: Services and infrastructure in Murray–Darling Basin LGAs



Source: Schirmer et al.

Figure 5 shows this trend for 60 Basin community Statistical Area 2 (SA2) regions.** Figure 5 shows many Basin communities maintained a similar trajectory over the past decade as before 2006. In other words, communities were on the trajectories they are now before Basin water reforms commenced in earnest:

- **Regions with more than 14,000 people in 1996 have generally grown (shown in the top right quadrant).** These regional centres were growing before 2006, and they have continued to grow and become more diversified over the past decade. Most growth regions are in inner regional areas.
- **Regions with 8,000–14,000 people in 1996 were often not economically diverse and were based around agriculture and agricultural value chains** (for example, Leeton SA2 region). Since 1996, these regions have experienced mixed population results. Some are growing; most others are shrinking. Most of the regions in this band are towns in outer regional areas.
- **Regions with fewer than 8,000 people in 1996 were often experiencing population decline and were declining over decades before water reform.** Regions where populations declined over 1996–2006 and 2006–16 are in the bottom left quadrant.

Outer regional and remote communities, and smaller communities, often have less economic diversity and rely more on agriculture for jobs

Our commissioned work suggests low economic diversity, high dependence on agriculture, and remoteness are associated with poorer social and economic outcomes in the Basin than in areas outside the Basin. This suggests a need to focus attention on the social and economic trajectory and condition of outer regional Basin communities.

The Panel's commissioned research shows the general relationship between population size, remoteness and economic diversity, by Basin region and state. Broadly, smaller and more remote community regions rely more on agriculture for employment and economic activity. Smaller communities with higher reliance on agriculture are more susceptible to agricultural shocks (such as drought). On the other hand, they can likely take advantage of upswings in the limited number of industries on which their local economy depends.

Outer regional and remote communities typically have less access to infrastructure and services

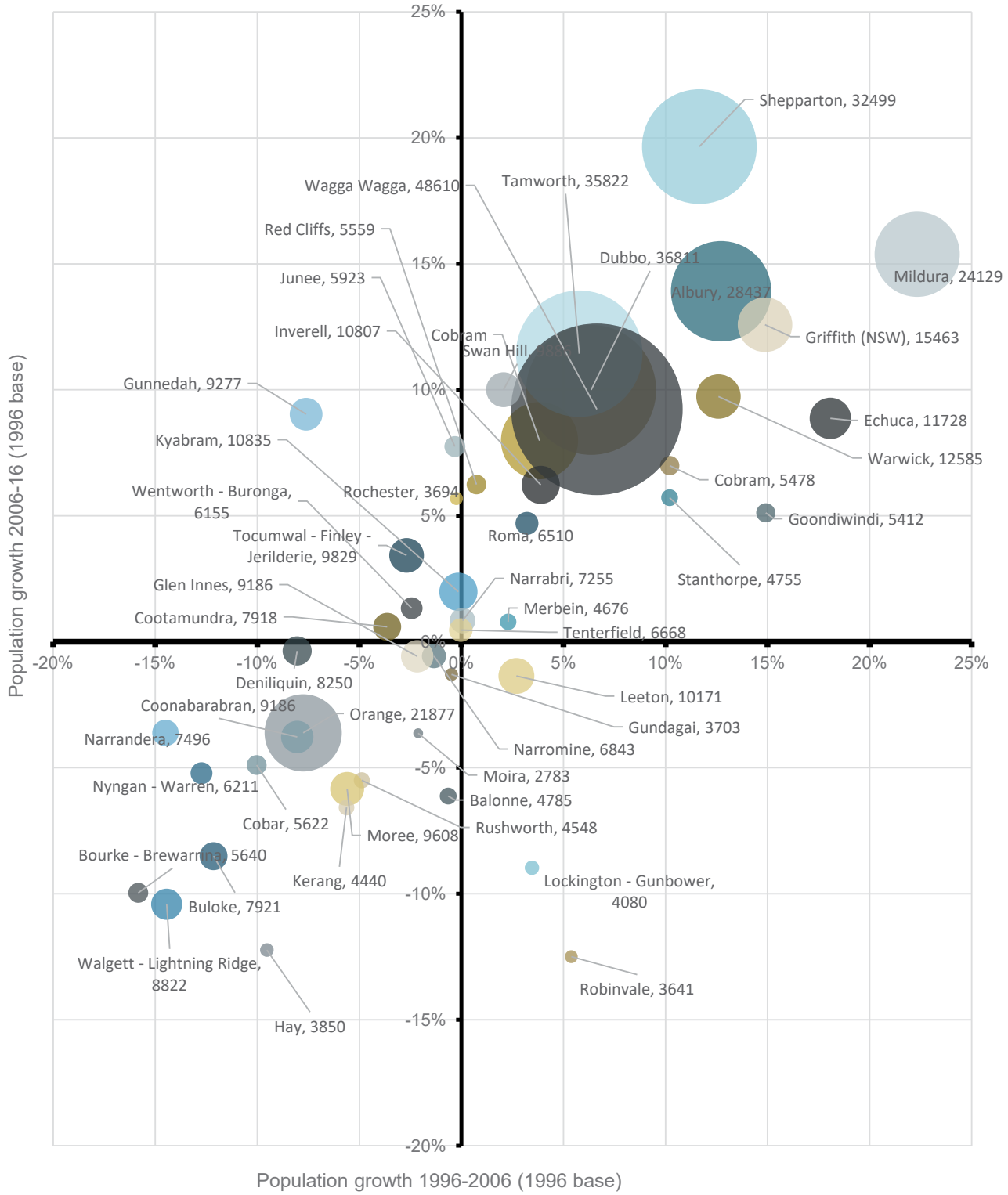
Our commissioned work shows communities in the Basin typically say they have poorer infrastructure and services compared with larger regional centres and inner regional areas.*** This is particularly true for outer regional and remote communities. In addition, rural and regional communities in the Basin say they have less access to high speed reliable internet and mobile phone reception relative to communities outside the Basin.

Healthy, thriving communities that are resilient to change have good access to key services, including health, education, shops, professional services such as accountancies and banks, transport, and telecommunications.

** This data comes from the MDBA southern Basin community profile series.

*** This fact has been well established in other Basin reviews. See Appendix A of the commissioned work for detailed data (by Basin region and LGA) on access to different types of services and infrastructure.

Figure 5: Population change in 60 Basin SA2 regions, 1996–2016



The bubble size shows the population in 1996. The horizontal axis measures the percentage change in population in the decade between 1996 and 2006. The vertical axis measures the percentage change in population in the decade between 2006 and 2016, when Basin reforms and environmental water recovery peaked.

Source: Data from MDBA community profiles for the southern and northern Basins.

Table 1: Local Government Areas (LGAs) with infrastructure and services above and below the regional Australia average^

	Higher than average	Lower than average
Inner regional areas	Ballarat, Greater Bendigo, Orange, Cabonne, Toowoomba, Murray Bridge, Wodonga, Wangaratta, Indigo, Blayney, Bathurst Regional, Oberon, Lithgow, and Greater Shepparton	Yass Valley, Barossa, Snowy Valleys, Mitchell, Armidale Regional, Pyrenees, Ararat, and Northern Grampians
Outer regional areas	Leeton and Towong	All 50 other outer regional LGAs other than Temora, Murrumbidgee, Riverland, Murraylands, Griffith and Mildura, of which 27 of these 44 LGAs are in the southern Basin
Remote and very remote areas	None	All 16 remote and very remote LGAs, of which 11 are in the northern Basin

^ Based on five subjective measures of infrastructure and services condition from the 2018 Regional Wellbeing Survey.

Across the Basin there are differences in confidence in community ability to cope with challenges

Our commissioned work shows inner regional Basin communities tend to be more confident in their ability to cope with challenges than outer regional and remote communities. They are also more likely to recommend their community to others as a great place to live. Confidence in ability to adapt is fundamental to adaptive capacity.

Our commissioned work shows confidence in outer regional communities is similar to that in the Basin and outside, with one key exception: Basin outer regional communities are less confident that their community has a bright future. But people living in these Basin communities also said they would be less likely to wish they could live elsewhere, reflecting a strong commitment and connection to their communities.

This finding resonates strongly with what we heard from many of the people we spoke with.

More work is needed to understand social and economic conditions of First Nations communities

The Panel's inquiry highlighted many gaps in information on the social and economic conditions of First Nations communities. Based on lived experience and the limited evidence that is available, First Nations communities appear to be experiencing poorer and sometimes worsening social and economic conditions. In these communities, the gap is widening, not closing.

First Nations communities are represented across the Basin in remote, outer regional and inner regional areas. There are 75,000 First Nations peoples living in the Basin—about 15% of the national First Nations population.

Available information points to poor social and economic outcomes for First Nations peoples. For example, unemployment across the Basin is 3.2%, compared with 11.2% for First Nations peoples. The Australia-wide Close the Gap initiative's 2020 progress report noted most targets to close the gap (including life expectancy, child mortality and school attendance) are not on track or being met.

Some Basin communities have acutely poor social and economic conditions

During consultations, we identified regions and towns where social and economic conditions are poor and trending markedly downward. Many people we spoke with in these communities consider themselves to be in crisis. Confidence is low, resilience is poor, and anxiety levels are high.

Regions with acute social and economic conditions included areas in northern Victoria and southern NSW, and remote areas across the northern Basin. The Panel is concerned about what we heard in places such as Balranald, Bourke, Cohuna, Barooga (Cobram), Wakool, Finley, Deniliquin, Coonamble, Dirranbandi, Menindee, Walgett and Warren. The commissioned research also highlights areas where social and economic conditions are well below regional Australia averages, and provides more interpretation of the LGA results.

Caption: Jamie and Damien. Photo credit to Rene Woods, Project Manager, The Nature Conservancy

COVID-19 is exerting additional pressures on rural and regional communities

> At the time of our draft report, COVID-19 was beginning to emerge as an issue affecting current and future socioeconomic conditions in the Basin. Our evaluation indicates that the impacts of COVID-19 on rural and regional Basin communities are likely to be mixed. We are primarily concerned about the capacity of local essential services to manage if localised infection outbreaks were to occur, and the medium term outlook for commodity prices under a weak world economic recovery.

We have seen a conflation of COVID-19 and food security which is misleading and unhelpful. It is very clear that food security is not presently a concern in Australia. Australian food security ranks among the highest in the world.

The COVID-19 pandemic is expected to have a range of short and potentially longer term consequences for communities in the Murray–Darling Basin. The situation is continuing to evolve, but some likelihoods are beginning to emerge. These include impacts on:

- the health and social capital of the Basin communities
- markets and the demand for food and fibre
- supply chains that underpin the food and fibre sectors
- other service businesses.

The speed and scale of the pandemic's spread from urban to rural and regional areas and how government, industries and communities work together in response, will influence the scale and scope of the impacts.

Basin communities generally have older populations with more limited health facilities than communities outside the Basin. This makes the spread of COVID-19 into rural and remote communities a significant concern. The Panel supports the joined up government responses to improve rural and remote communities' capacity to respond to the pandemic and to ensure they have enough health facilities and health service providers. Rural and remote communities have traditionally relied on close community networks to support one another and their vulnerable people, and these networks are vital to support at-risk individuals.

Basin communities are part of the lifeblood of domestic food and fibre supplies. The pandemic has changed consumers' purchasing behaviour both domestically and internationally. In the short term, this was evidenced in panic buying and household stockpiling of food staples, many of which are produced in the Basin. In Australia, shortages of staples in retail outlets are the result of supply chain bottlenecks rather than underlying changes in their production due to COVID-19.

In many instances, food and fibre production (such as dairy and many horticulture products) significantly exceeds domestic consumption and much of the Basin produce is exported. For some commodities, such as rice (in some years of low domestic production) and some specific horticulture products (such as tomatoes), imports help underpin domestic consumption. In these cases, international COVID-19 responses that limit trade are likely to be important for domestic consumers.

Panic buying and domestic stockpiling that drives short term increases in domestic demand is expected to have depressing medium term effects on the demand for food and fibre as those household stockpiles are drawn down. This will be more of an issue for long shelf life staples such as grain products than for perishables. In the short term, there are likely to be higher prices for domestic food, but this is expected to be driven less by COVID-19 and more by existing factors including drought and bushfires impacts.

Of deeper concern to the Panel are the longer term risks to international demand for domestic food and fibre that may result from COVID-19. We note that COVID-19 is expected to lead to a period of weaker global economic activity in response to falling household incomes and the weakening of discretionary spending. It is important that our producers can boost their competitiveness by continuing to innovate and find new efficiencies.

We also believe it will be important for our governments to work closely with producers to improve market access and ensure COVID-19 responses internationally do not weaken international trade liberalisation.

COVID-19 is affecting how supply chains operate. Positive innovations are occurring in food and fibre supply chains to reduce risks of the virus spreading and to avoid the disruption it causes. We also note the positive developments to keep open and reopen supply chains, especially for highly perishable products, to international markets. These developments are important for Basin communities' confidence and vital to longer term prosperity.

There are emerging risks to the supply of key inputs (such as machinery parts and fertiliser) for producing food and fibre. It is critical that governments work with industry bodies to keep international supply chains of essential inputs functioning.

Throughout this report, we draw attention to the flow-on effects on communities of losing rural service businesses. The Panel is deeply concerned that, over time, these businesses' general resilience has been weakened. There is heightened risk that some businesses will cease all together, as a result of short term closure or weak trading due to COVID-19.

There are emerging risks to the supply of key inputs (such as machinery parts and fertiliser) for producing food and fibre.

Caption: © Murray Irrigation

2.3 What's shaping social and economic conditions in the Basin

The Panel's inquiries highlight that social and economic conditions in rural and regional communities are constantly changing in response to, or anticipation of, multiple pressures or events. It is difficult to unpick and separate out drivers and their consequences. This section covers some of the key matters shaping social and economic conditions in the Basin. We note the recent Productivity Commission's Transitioning regional economies and MDBA social and economic analyses include comprehensive reviews of factors shaping regional and remote Basin communities, regions and sectors. Our commissioned work also more closely examines the issues summarised here.

Many national and international forces are behind the changes in Basin communities

The Panel has found that many significant external influences change Basin communities' fortunes. These factors have been shaping our nation and the Basin for decades. The effects are difficult to disentangle from each other and from other influences, such as policy changes and government responses. Current evidence also shows that supply is the biggest driver of water allocation prices in the Murray–Darling Basin, and that lack of rainfall (drought) is the most significant factor influencing supply and water market prices.

Other than water reform, key drivers shaping social and economic conditions include:

- **Globalisation, commodity prices, exchange rates and changing terms of trade across different sectors** – These factors have implications across the economy. Within farming, everything from trade agreements to exchange rates and international commodity prices feeds back into the profitability and viability of different products for both domestic consumption and export. This impact leads to changes in industry composition—some industries contract while others expand or new industries emerge—which in turn affects communities. Our commissioned work looked closely at these impacts for dairy, rice, horticulture and other sectors in the Basin.
- **Changing structure of the Australian economy** – Over time, Australia's economy has gradually shifted away from agriculture and manufacturing towards services, education, and even tourism. Figure 6 shows the long term shift from agriculture and manufacturing employment to service sector employment. In the 1950s, agriculture's share of GDP in Australia was around 20%. Now, its share is less than 3%. In the Murray–Darling Basin, agriculture's share of regional income in 2015–16 was less than 18%.
- **Rising demand for services, the industrialisation of east Asia, economic reform and technical change driving changes in the structure of the Basin economy** – The changing structure of the Australian economy has contributed to declining employment and population in many agricultural regions, and growth in regional centres that support these regions.
- **Technology and innovation** – Improved technology plays a key role in increasing productivity, which helps to improve profitability, income and economic growth. But technological advances can also result in lower labour needs (that is, reduced employment). This trend is particularly evident in agriculture all over the world, where technology is replacing labour intensive farming.

- **Farm consolidation and commercialisation** – The shift towards larger and commercial farming is well documented in the Basin. Larger farms often have greater farm productivity, but employ less permanent labour and use more technology. Similar trends are also occurring up and down the agricultural supply chain, with the consolidation of processing centres and distribution hubs reducing labour needs.

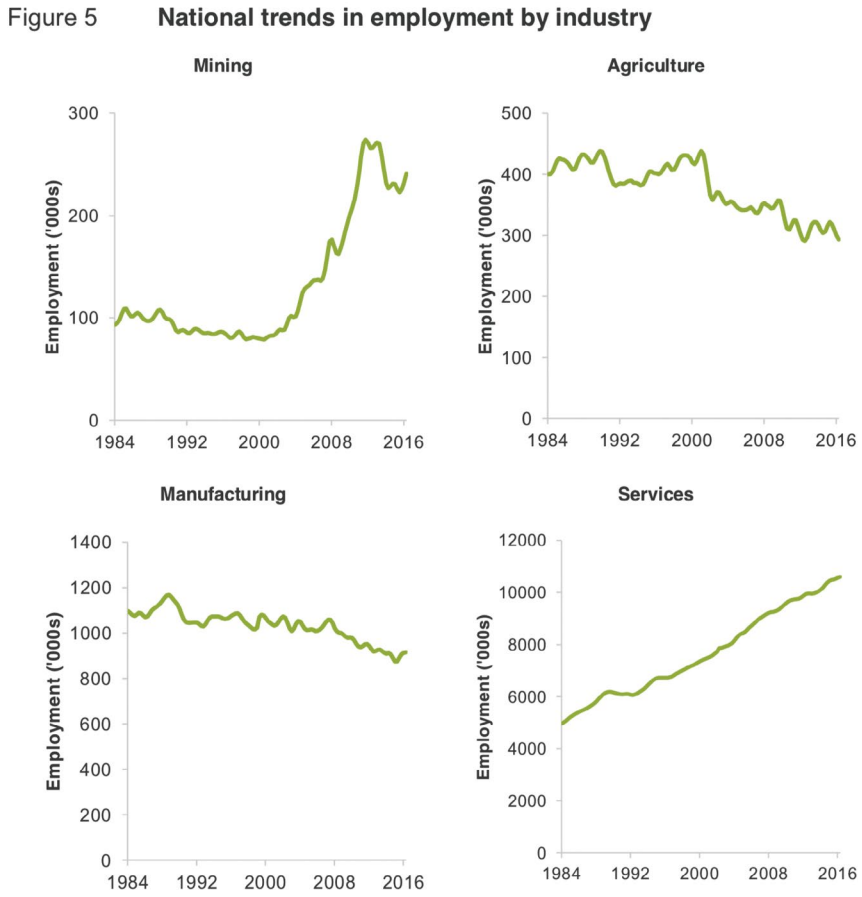
Changing climate, drought, and natural disasters – Australia's weather and climate continue to change in response to a warming global climate. Australia has warmed by just over 1° C since 1910, with most warming occurring since 1950. Increases in the frequency of extreme heat events, drought and periods of below average rainfall are well evidenced.

ABARES has estimated farm production in the Basin declined by around 12% from 2016–17 to 2018–19, largely as a result of drought. During the 2006–09 drought, real GDP in some small regions in the Basin fell by up to 20%. Changing climate and natural disasters have already had, and will continue to have, a significant impact on agricultural production and other sectors and communities, which affects quality of life and health.

Appendix B.2 has more detail on how drought has amplified existing pressures and created challenges for many Basin communities.

- **Changes in community expectations and preferences** – Over time, expectations and preferences change, which changes social and economic conditions. Many younger people, for example, may seek higher levels of education, or want to pursue different lifestyles found in larger cities, or seek career opportunities that are only available in other areas. At the same time, many 'city changers' have been pursuing lifestyle opportunities in peri urban or semi-rural areas. Another example is the changing preferences and demands for different agricultural products (and methods and standards of production) over time.

Figure 6: Changing regional employment, 1984–2016



Source: Productivity Commission (2017).

Governments' economic, spending and taxation policies needs to be better focused

The Panel commissioned work looking at how key economic, spending and taxation policies impact Basin communities. The commissioned work showed, among other things, that:

- **Governments are heavily investing in Basin regions.** This investment stimulates and supports regional economic activity and communities. Boxes 3 and 4 show some examples of Australian and state government funding commitments to Basin regions.

- The commissioned research also found that grant programs, such as the Building Better Regions Fund (BBRF), disproportionately benefit regional areas in the Murray–Darling Basin. That is, the amounts going into Basin areas are greater than one would expect on an equal per capita allocation.

- **Government programs are shifting towards more place based approaches and the long term sustainability of regions.** The Panel supports this general policy shift. The National Drought Agreement signed by COAG in December 2018 and Regional Deals (Box 5) focus on long term sustainability of regions, rather than short term financial support. This reflects the need to respond to drought and other external factors affecting regional communities in a sustainable way, enhancing the resilience of the community rather than providing a short term funding injection to prop up an industry in a town.

- **States should support regional development more.** The Panel considers more could be done to support place based approaches. We support recommendations made in the Independent Review of the Regional Development Australia Programme. These include developing a network of directors of regional development to enhance community collaboration and linkages to deliver on established regional visions and, in consultation with the states and territories, embedding the program's network of directors of regional development in established state based regional development bodies aligned to the functional economic regions of jurisdictions.
- We also note that Victoria's nine Regional Partnerships bring together representatives from all levels of government, business, education and community groups and provide a mechanism for regional leaders to advise the government on priorities identified through regional plans.

- **To maximise the contribution of government policy and infrastructure spending in regional areas, public policy needs to embrace reform and continue a transition away from market-distorting subsidies to policies that unlock the potential of regions and support long term economic, social and environmental objectives.** This requires a shift away from short term support and inclusion of place based funding aimed at long term sustainability.

The Panel supports recommendations made in the Independent Review of the Regional Development Australia Programme to:

- establish a Regional Collaboration Fund, drawing on established funding within the current RDA program (as a minimum), to enable investment in human capital, regional leadership and collaboration, and fund regional development activities

- appoint a Regional Investment Commissioner located within Austrade.

Box 3: Examples of major federal regional development, drought and water reform assistance streams

- **Regional development** – A range of regional development funds and programs are open to Basin communities. At May 2017, the Australian Government committed an estimated $20.9 billion in expenditure on regional programs. This funding excludes concessional loan schemes and programs with significant but unspecified regional components. Examples of major national programs include:
    - the Building Better Regions Fund, worth $842 million over four rounds (with $200 million committed to round four funding, which closed to application in December 2019)
    - the Community Development Grants Programme, which allocated $980 million in funding from 2013 to 2016
    - the National Stronger Regions Fund, worth $1 billion over 2015 to 2020
    - the Bridges Renewal Program, worth $640 million over 2015 to 2023.
- **Drought and farm support** – Australian Government initiatives target drought affected farmers and communities, with funding commitments well over $100 million a year. In addition, many other programs offer support to farmers, including Farm Management Deposits, free financial counselling, funding for open access mental health and emotional support services, rebates for on-farm infrastructure, and subsidised water for fodder. The recently announced Future Drought Fund will provide continuous funding to drought initiatives (including some of those listed above). This fund begins with an initial credit of $3.9 billion, with earnings reinvested until the fund reaches $5 billion. From July 2020, $100 million will be made available each year.
- **Water reform** – Examples of support for water reform include Commonwealth and state recovery of environmental water above market rates. This policy was intended to support Basin communities by investing in irrigation infrastructure and on-farm works (which can increase water use efficiency and productivity, and in turn help commercial viability). Maintaining or increasing the commercial viability of farms helps communities that are impacted by water reform and environmental water recovery. The Australian Government has committed more than $13 billion to implement Basin water reforms. Around $6 billion has been invested in water recovery through on- and off-farm infrastructure. This total includes $60 million committed to improving outcomes for First Nations communities and addressing the social and economic impacts of the Basin Plan, under the Basin Plan Commitments Package. Programs such as the Murray–Darling Basin Regional Economic Diversification Program, the Strengthening Basin Communities program, and the economic development component of the South Australia River Murray Sustainability Program have contributed another $189 million of investment.
- **Concessional loans for farmers** – These loans are delivered through the Regional Investment Corporation. The Regional Investment Corporation offers two loan products for Basin farm businesses: Farm Investment Loans and Drought Loans. These loans are for farmers who want to diversify markets and/or prepare for, manage or recover from drought.

Box 4: Examples of major state regional development, drought and water reform assistance streams

- **NSW** – The NSW Government allocated $1.7 billion through the Regional Growth Fund for infrastructure in regional areas, with an additional commitment of $1.3 billion to be allocated by 2021. The Regional Growth Fund aims to fund infrastructure to support growing regional centres, activate local economies and improve services.

- **Victoria** – The Victorian Government has allocated more than $500 million through the Regional Jobs and Infrastructure fund, administered by Regional Development Victoria. This fund has three programs: the Regional Infrastructure Fund, the Regional Jobs Fund, and the Stronger Regional Communities Plan. The fund's objective is to grow jobs, build infrastructure and strengthen communities in regional Victoria.

- **Queensland** – The main government grant in Queensland is the $175 million Jobs and Regional Growth Fund. The program aims to stimulate private sector investment and create jobs across the state. The fund primarily focuses on regions outside south east Queensland but may consider projects located in all areas with higher than average unemployment.

- **South Australia** – The SA Regional Growth Fund was established to unlock new economic activity in regional South Australia, to deliver critical economic infrastructure to create direct benefit across regional industries, and to strengthen regional communities. The SA Government has committed $150 million over 10 years, starting in 2018–19.

Box 5: Regional Deals

The Department of Prime Minister and Cabinet established principles to guide the development, consideration and selection of City Deals and Regional Deals.

A shared vision for growth, reform and improvement

The commitment to a Deal reflects a serious and shared ambition from federal, state or territory and local leaders to improve their city or region. The process of agreeing and implementing the Deal provides an impetus for major reforms and co-investments that can jump start economic growth and improve liveability.

A negotiated and customised approach, across the whole of government

Deals focus on leveraging cities' and regions' unique strengths and responding to their specific needs. Instead of national and state policies and programs delivered locally by different departments, working with local governments and stakeholders produces a unified Deal that addresses a city's priorities.

Transformative investment

Investment delivered as part of a Deal is focused on a long term vision for the city or region, not immediate business-as-usual needs. This longer term and broader approach makes Deal investment transformative, rather than reactive.

Institutional and governance reforms for sustained improvement

For sustained improvement, institutional reforms and investments may also be necessary to improve local capacity for whole of region governance and reform. This could include creating new bodies for planning, collaboration, governance and investment to ensure progressive improvement.

Innovative financing and value capture

Deals should, where possible, use innovative financing and funding methods to deliver greater investment than could otherwise be provided. Since the Deals aim to integrate transport, housing and land use policies, they create the opportunity for coordinated action to maximise and capture the value of investment.

The Panel acknowledges the significant work that government and non-government agencies are doing towards regional economic development in the Basin, but there are clear opportunities to better coordinate services and service delivery, including:

- having greater coordination between government agencies. Consistent with other inquiries, the Panel believes there is substantial scope for better coordination and cooperation between federal, state and local governments, and between government departments. In part this can be achieved by the Commonwealth leaving regional development policies to the Basin States, and by focusing on national policy settings. Better coordination may also be achieved through government reorganisation

- continuing the shift towards more place based approaches and the long term sustainability of regions, by implementing programs such as Regional Deals

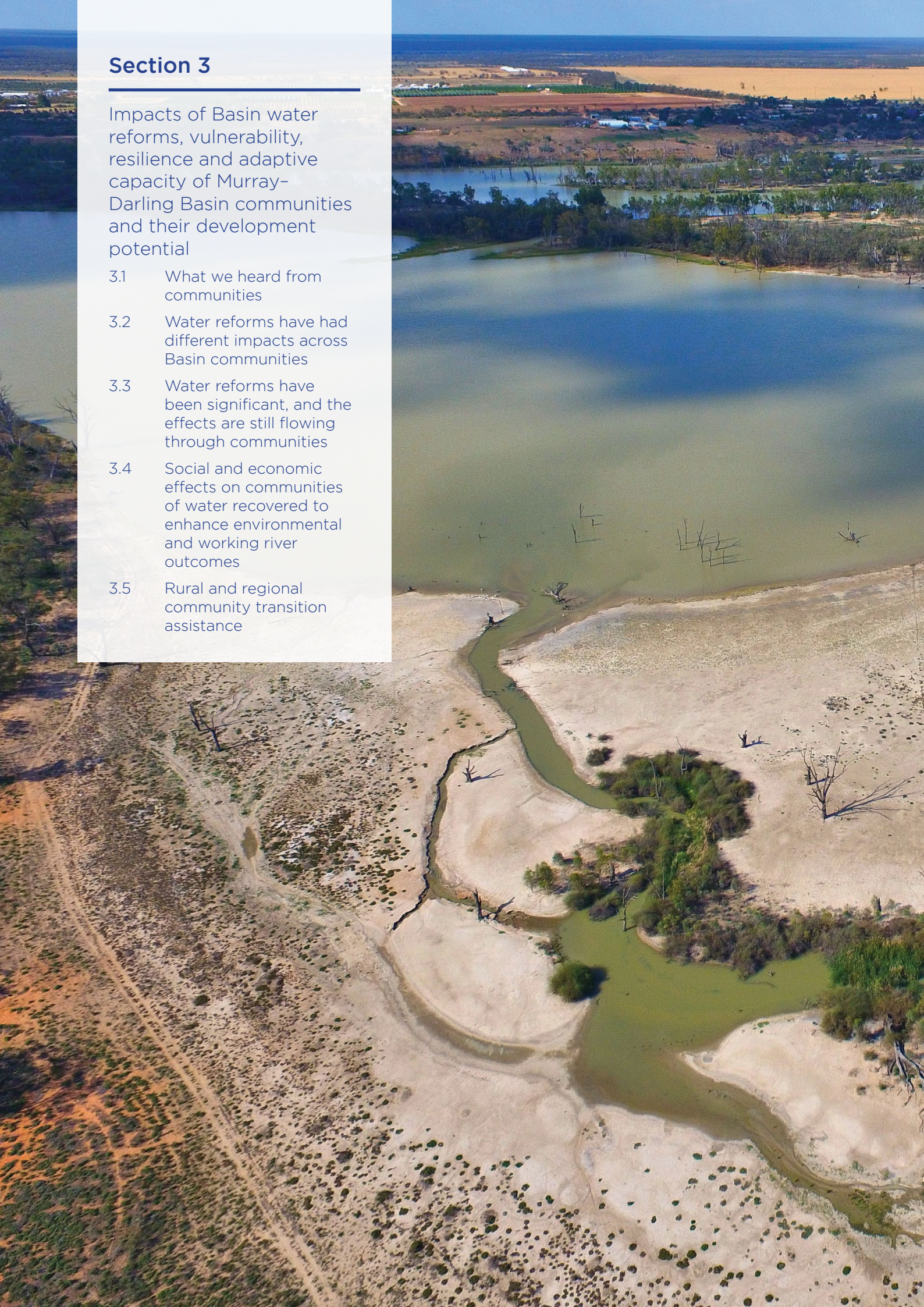
- improving the targeting and coordination of government regional expenditure through more rigorous planning

- making platforms such as Grant Connect more accessible. From our discussions with communities and regional development bodies, we found some were unaware of Grant Connect and those who were aware of it often said it was not easy to use.

Caption: © Murray Irrigation

Section 3

Impacts of Basin water reforms, vulnerability, resilience and adaptive capacity of Murray–Darling Basin communities and their development potential



3. Impacts of Basin water reforms, vulnerability, resilience and adaptive capacity of Murray–Darling Basin communities and their development potential

The Terms of Reference B (Box 1) asked the Panel to provide an independent assessment of how Basin water reforms are impacting vulnerability, resilience and adaptive capacity of Basin communities and their development potential. This chapter summarises what we found.

Our findings in this chapter are supported by commissioned research, including industry case studies that looked at how sectors such as rice, dairy, cotton, horticulture and recreation have been impacted by Basin water reforms, and how they are positioning for the future, and commissioned work that summarised and evaluated the extensive literature and points of debate on Basin water reform impacts, and resilience and adaptive capacity of Basin communities.

The Panel finds that water reforms over the past few decades have transformed how Basin water resources are managed and used. The reforms over the past 25 years aimed to address challenges largely created by the Australian and state government focus (until the 1980s) on expanding irrigated agriculture and available water use. In many ways, Basin water reforms since 1994 have aimed to address earlier government policy of expanding irrigation and available water use which led to overallocation and over investment in the Basin.

The Panel has focused on Basin water reforms over the past two decades. A timeline and background of Basin water reforms is provided in Figure 3 in the Basin water reform impacts commissioned review. We have focused on the impacts of entitlement, market and planning reforms, and the impacts of water recovery. Our assessment attempts to separate reforms (and associated impacts and outcomes) related to entitlement frameworks, planning and water markets, and water recovery.

3.1 What we heard from communities

When speaking about Basin water recovery, many people told us the reduction in the available water in the consumptive pool exacerbates the effects of drought and climate change. They noted recovery removes a buffer to drought conditions, increases vulnerability, and reduces the scope for post-drought recovery. Many believe future climate change will worsen the cumulative impacts of water recovery and further erode resilience. We heard significant community concerns too about the distributional impacts of water recovery, which people believe have advantaged some communities and disadvantaged others.

People told us water markets had led to a transfer of wealth between regions, and this transfer is leading to growth in some regions and decline in others. They said while irrigators can often buy and sell assets (including their water entitlements), those providing services to irrigators and people living in irrigation dependent communities are less able to adapt.

Stakeholders noted concerns too about the social and economic impacts from the pace of change. They said the speed of change is caused by the pace of water recovery

reducing the consumptive pool since the late 2000s, and by water markets accelerating the movement of water to different regions. This is increasing vulnerability for some and creating opportunities for others.

Beyond community or other impacts, community members we spoke with questioned whether off-farm programs are valid or effective in achieving their aim to recover water for the environment. Some stakeholders suggested some off-farm infrastructure programs do not generate real water savings because they take water from (for example) return flows to groundwater aquifers and rivers. Here, the Panel notes the evidence from recent independent reviews shows that off-farm programs do generally reduce return flows, but they also do deliver real water recovery.

People also spoke of how irrigation channels and irrigated farmland support fish, birds and other environmental goods and services. People talked about programs such as the bitterns in rice initiative, and how less rice production could risk the environmental benefits of this type of work.

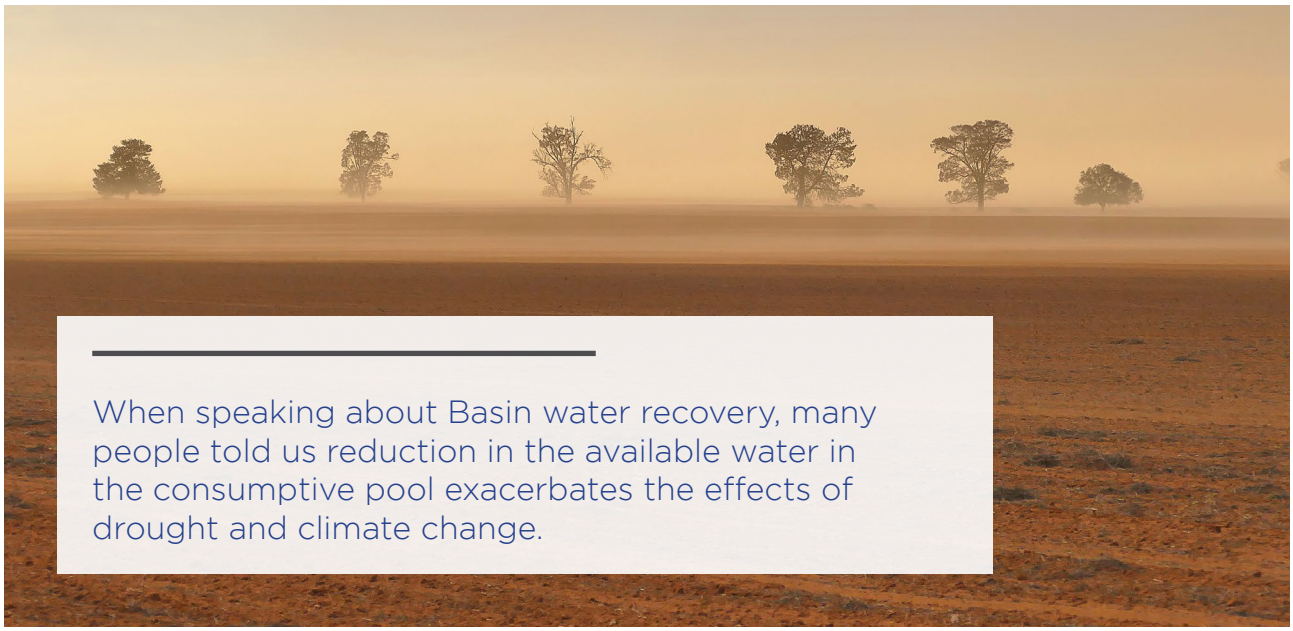
We spoke with people who were fearful for their town water supplies and for the security of water for critical human needs. There were (before the February 2020 rain) communities that had run out of water and needed to truck in water supplies, while others had issues with water quality and were on water use restrictions. Some communities are still experiencing these challenges. People noted the flow-on impacts on amenity, health, wellbeing, tourism and investment.

Communities recognise the importance of environmental flows, but many people are struggling to see the intended benefits and are concerned about the declining health of rivers, floodplains, and wetlands. We heard this view from environmental groups, First Nations groups, dryland farmers and irrigators, and recreational users. On the other hand, there are many people and groups who say they have seen improved environmental outcomes, and feel the improvements are contributing to better social and economic outcomes for communities. This feedback was particularly true in South Australia.

First Nations stakeholders participating in this Review felt their needs are not being met, and the ability of First Nations peoples to participate in water access, planning and management decisions is inadequate. Reforms focused on First Nations' water are generally considered a positive step forward by these stakeholders but are viewed as not having yet translated into improved outcomes.

3.2 Water reforms have had different impacts across Basin communities

The Panel has focused on the following when considering impacts of water reforms on rural and regional Basin communities: (1) entitlement, market and planning reforms; (2) water recovery programs; and (3) adaptive measures. Key findings are summarised in 3.2.1 – 3.2.3.



When speaking about Basin water recovery, many people told us reduction in the available water in the consumptive pool exacerbates the effects of drought and climate change.

3.2.1. Entitlement, market and planning reforms

The Panel has found that, overall, the Basin has benefited from water entitlement, market and planning reforms. Importantly, the Panel also found that the benefits of water entitlement, market and planning reforms have not been even across regions and sectors. For some, reforms have improved adaptive capacity and resilience. For others, reforms have increased vulnerability through increased competition for scarce water. In short, there have been winners and losers.

Irrigated agriculture has benefited from entitlement, market and planning reforms …

Previous Basin water reform evaluations concluded that, overall, water entitlement, market and planning reforms have improved water resource security, management and efficiency of use in the Basin. These reforms have improved communities' resilience and adaptive capacity and provided certainty for development and investment.

While water sharing plans are still being developed and are subject to ongoing debate about how water is allocated between competing uses, the Panel considers statutory water sharing plans have generally led to more public confidence in planning decisions and resource allocations. This confidence has provided certainty for development and investment. Having clear rules for suspending water sharing plans has also given people confidence. We note the unfinished business of NSW water sharing plans needs to be finalised as a priority, to provide rural and regional communities with confidence.

Markets and trade have allowed growth and investment in higher value enterprises over time. They have increased the resilience, adaptive capacity and development potential in many regions where they operate. In some cases, they have allowed water owners to sell water and achieve higher financial returns, particularly during drought. In 2008–09 at the height of the Millennium Drought, the National Water Commission estimated the ability to trade had substantial net benefits to society and generated an additional $220 million that would otherwise not have been realised.

… but there have been distributional impacts and changes

While recognising these benefits, the Panel is concerned with how certain reforms have negatively affected Basin communities and thus increased communities' vulnerability and reduced their adaptive capacity and development potential. There is clear evidence that market reforms have had uneven impacts, with some communities feeling like the collateral damage of improved outcomes in another region. We consider these negative impacts are underacknowledged and often overlooked, including in Basin water reform evaluations.

Sustained trading of water out of a region can and has reduced economic activity in Basin communities and reduced these regions' development potential. Irrigation generates more economic activity in regions than does selling water and either leaving land fallow or using the land for dryland operations. The work that we commissioned for this assessment (section 4.2) backs up this finding.

Water markets and trade have led to changing patterns of water use in Basin communities, such as water moving to different crop types and locations (predominantly in the southern Basin, where water trade is widespread).

Sustained trading of water into a region increases economic activity in that region and leads to reductions in economic activity in regions from which the water is traded. Water entitlement owners that sell allocations are exposed to the upside risk of rising allocation prices. Irrigators relying on allocation markets to meet their water needs are the most exposed to downside risk. A shrinking consumptive pool is elevating these risks over time.

We heard from stakeholders that water being traded in and out of regions influences social and economic outcomes, and development potential. People noted this fact is significant and often overlooked. In regions where water is being sold, many irrigators who own water entitlements and farmland have some capacity to adapt or exit, but dependent businesses (such as local irrigation hardware suppliers) and workforces (such as farm labourers) are often less able to adapt to change.

Similarly, irrigators and irrigation regions that rely on the temporary market for water are more exposed to market dynamics than are entitlement holders (particularly those with higher security entitlements). Water recovery is reducing water availability, which is creating more risk for these irrigators.

We believe businesses are responsible for their choices about owning entitlements or sourcing water through temporary markets. This choice is a normal commercial decision, just like a decision to own or lease farmland. The Australian Government should not be held responsible for farmers who are caught on the wrong side of the market when prices rise or fall, except when government actions in the market cause the price change.

Better information about environmental management is essential

The Panel is concerned stakeholders remain inadequately informed about environmental conditions, management objectives, and the results of environmental flows at the catchment level. Building and communicating the evidence base for the scientific link between environmental flow regimes and ecological outcomes—along with the limitations, uncertainties and complementary natural resource management considerations—is a key factor in improving community support for, and trust in, the ongoing implementation of reforms.

We heard concerns from community members about degradation of waterways. In the southern Basin, we heard from people who believe degradation is being caused by increased water demand downstream, and delivery or system management issues. They are concerned about environmental damage and erosion, and that the system is not being managed effectively. Other reviews also identified the emerging risks of third party impacts (including environmental impacts) from increased trade, including whether water sold downstream can be delivered. We understand work is occurring to address these issues (see, for example, Water Delivery Assurances for Victorian Irrigators).

In the northern Basin, people raised the need for transparency and evidence based management of environmental flows, and for consideration of broader natural resource management objectives in delivering environmental outcomes. People spoke of benefits of the 2019 northern fish flow, and emphasised the benefit to communities of this flow, but many raised concerns about environmental flow criteria and management decisions.

Many concerns were raised about market manipulation, compliance and enforcement

We spoke with many people who were also worried about the potential for market manipulation, and many raised concerns about compliance and enforcement. Until resolved, these concerns will undermine confidence in markets and water reform more generally. These issues are beyond the scope of this Review, but the ACCC's inquiry into water markets in the Murray–Darling Basin and the appointed of the Interim Independent Inspector General of Murray–Darling Basin Water Resources should help improve understanding of these areas.

First Nations communities are still waiting for improved outcomes from water reforms

> The Panel finds that First Nations peoples in the Basin are yet to experience substantively improved outcomes from water entitlement, planning and market reforms. First Nations' access to Basin water for economic and Cultural uses remains minimal, and slow moving in South Australia, NSW and Queensland. Participation in planning processes and decision making has increased but remains patchy across different jurisdictions, and it is not yet embedded in water resource policy and management across the Basin.

The National Water Initiative and the Water Act 2007 sought to capture the needs of, and secure the participation of, First Nations peoples in water access, planning and management. These reforms have increased awareness of, and participation in, First Nations water programs by government and non-government organisations.

But, in the 15 years since the National Water Initiative, not all jurisdictions have fully committed to advancing their recognition of First Nations' water needs. And only more recently has this recognition translated into First Nations' representation in water plans. The volume of water held by First Nations peoples remains relatively small.

Planning processes have ostensibly supported increased participation of First Nations groups, but the extent to which First Nations' objectives and needs are embedded and mainstreamed in government policies and legislation should be bolstered. Additionally, there are concerns that First Nations' participation in water planning processes will wane following the completion of Water Resource Plans, and there is not a clear pathway beyond.

The commitment of $40 million under the Basin Commitments Package is an important step. The funding can support investment in Cultural and economic water entitlements consistent with the Echuca Declaration, and increase the First Nations' resilience, adaptive capacity and development potential. But First Nations groups indicated in submissions that this is an arbitrary number and will not provide desired outcomes. There are also concerns about the delineation between water entitlements for Cultural use and economic use, and the potential limitations that this delineation places on First Nations' values, interests and rights in caring for Country.

Caption: Photo credit to Jamie Woods, Land Manager, Gayini Nimmie Caira for Eulimbah Gayini Nimmie Caira

An advantage of recovering water by enhancing off-farm infrastructure is that this approach does not directly diminish the consumptive pool.

Caption: © Murray Irrigation

Securing safe and reliable town supplies requires more attention

Secure, safe and reliable town water supplies are a fundamental building block of rural and regional communities' development potential.

The Panel's inquiry highlights some Basin communities facing critical urban water supply and quality issues, as well as restrictions on water use. This situation has significant social and economic impacts, including costs from having water restrictions and accessing alternative supplies, reduced amenity and green open space, and poorer health and wellbeing outcomes from quality issues.

The Panel sees scope to improve investment in urban water infrastructure, including opportunities to secure town water supplies by investigating non-rainfall dependent sources, as well as investigating increases to the existing capacity of water infrastructure and alternative supply options.

The NWGA and the National Water Infrastructure Development Fund could be instrumental in working with state governments to secure town and regional centre water supply in the future, if their role was clearly extended to include town water supply.

Total urban water consumption across the Basin is small relative to agricultural use of water: it is less than 4% of total water consumption (a total including agricultural consumption). But urban supplies are critical for the 2.8 million people who call the Basin home, and for lower Murray communities.

Water reforms have sought to enhance arrangements for human needs, including town supply. Work that we commissioned summarises these reforms and some of their impacts. For example, the Water Act 2007 requires consideration and prioritisation of critical human water needs. Other reviews found provisions for critical human water needs are supporting Basin communities well, and Water Resource Plans should help to resolve issues and alleviate concerns (particularly in the Lower Darling region).

Despite planning and management requirements to prioritise water for critical human water needs, there are communities that face water shortages and, in severe cases, that have run out of water due to extreme dry conditions across much of the Basin. These water shortages have significant social and economic consequences, and limit communities' development potential.

Beyond supply volumes, regional town water suppliers also face other challenges, including often small and dispersed customer bases. Compared with other urban water suppliers, they have fewer customers to pay for the infrastructure required to deliver services. Where it is unfeasible for users to fund services, the Australian and state governments have often provided funding support (usually through grants) to support investment in infrastructure. Governments took this step recently in both Queensland and NSW. However, the funding is often done poorly, and previous reviews found scope to make investments in a manner that is more consistent with the National Water Initiative, and to promote more efficient investment decisions. Such change would improve water security for remote and regional communities across the Basin.

The Panel notes Infrastructure Australia's February 2020 infrastructure priority list specifically identifies town and city water security as a new High Priority Initiative.

3.2.2. Water recovery programs

Water recovery is a key Basin water reform, and it has occurred in different ways. The Panel found the ways in which water is recovered have had significant and varied implications for Basin communities, their competitive advantages, their long term resilience, adaptive capacity and development potential.

This section covers the three different types of water recovery under the Basin Plan: on-farm and off-farm infrastructure, and buybacks.

Investments into Basin regions to restore the balance have acted as a regional economic stimulus

The Australian Government has committed more than $13 billion to implement the Basin Plan and associated water reform activities in the Basin. Around $8 billion of this investment is committed to on-farm and off-farm irrigation investments to achieve water efficiency improvements. At December 2019, approximately 2,100 GL has been recovered under the updated NSW, Victorian, South Australian accredited water resource plan long term average annual yield (LTAAY) factors.

These infrastructure and water efficiency investments have created regional economic stimulus during the construction stage. This stimulus means jobs, salaries and local business profits for Basin communities. Estimates for the southern Basin suggest around 40–50% of infrastructure construction expenditure remains in local economies as 'first round' local value added (that is, the estimate excludes dynamic flow-on effects through the economy). The remaining half of goods and services are sourced from outside the investment area.

Using this rule of thumb, first round impacts of on- and off-farm infrastructure investment (approximately $6 billion has been spent to date) has resulted in $1.6–2 billion of regional economic stimulus during the infrastructure construction stage of water recovery projects.

There have been impacts associated with the total volume of water recovered on Basin communities

The MDBA reports that, combined, the different forms of water recovery have reduced the consumptive pool by around 20% across the Basin. Along with drought, water recovery has compounded impacts of other trends and drivers.

The combined overall water reduction, and some specific types of water recovery, have put upward pressure on water prices. This pressure benefits people who own water rights and trade in the market but creates additional costs for irrigators and others who purchase temporary water.

On-farm infrastructure programs have improved the productivity and viability of most participants but left non-participants at a competitive disadvantage

Our commissioned research shows that water recovery through on-farm infrastructure has generally helped participating farmers and given them a competitive advantage. This has been particularly evident for mixed broadacre on-farm grant recipients. On-farm infrastructure investment has resulted in less water available for irrigation and higher water prices (benefiting owners of water entitlements and sellers of allocations, but hurting those buying allocations), and reduced output by farmers who have sold permanent or temporary water, with consequences for local economies.

This outcome resulted for several reasons:

- Infrastructure programs (both on- and off-farm) have typically paid multiples higher than the market value of the water recovered, whereas buybacks were at market rates. So, irrigation regions participating in upgrades received a larger economic stimulus than did communities where buybacks dominated.

- The latest ABARES analysis provided to the Panel shows southern Basin farms that have received on-farm upgrades perform significantly better than the same types of farm that do not receive upgrades. This disparity is particularly true for mixed broadacre farms, where upgrades result in farm gate production increasing by 40% on average, irrigated area increasing by more than 20% on average, and water use increasing by more than 40% on average. Grant recipients improve irrigation productivity and efficiency and do other things that lead to higher incomes and profits, and that put the farms at a competitive advantage. They also are more likely to purchase more water than farmers not receiving upgrades, including during drier years. The communities around these farms benefit from this increase in agricultural activity. On the other hand, irrigators and communities that have not received upgrades are at a relative disadvantage.

- Water demand on Basin farms receiving on-farm upgrades increases after the upgrade, as noted above. This demand change has been observed in other work, and often happens because farms use on-farm infrastructure grants to increase their irrigation area. This increased water demand can lead to increasing water market prices. The Panel understands this price pressure can potentially have negative impacts on both program participants (who, because they gave up a portion of entitlement in return for the infrastructure, now rely more on allocation markets), and non-participants (who did not achieve any productivity improvements from upgrades, so may be relatively more affected by price increases).

These upgrade investments can be considered as a form of offset or adjustment assistance, and even as an attempt to address the negative consequences of water recovery reducing the consumptive pool. But the benefits of this expenditure seem to have largely accrued to participating irrigators and their local communities rather than all irrigators and Basin communities more generally.

Off-farm infrastructure programs have recovered water without taking from the consumptive pool

> Impacts from off-farm water recovery can differ from those of on-farm recovery and buyback, mainly because the off-farm programs do not require the handover of entitlements from the consumptive pool, and do not involve individual irrigators. An advantage of recovering water by enhancing off-farm infrastructure is that this approach does not directly diminish the consumptive pool. Off-farm recovery can also improve on-farm productivity; for example, by reducing ordering times and making flow rates more controllable.

Under the Australian Government programs, more than 1,000 kilometres of irrigation network delivery channels have been upgraded. Off-farm programs preceded on-farm programs in some systems such as the Goulburn Murray Irrigation District. In other systems, off-farm and on-farm programs ran in parallel.

The Panel recognises that off-farm recovery measures are supported by many because they do not take water from the consumptive pool. The Panel supports off-farm recovery, noting that:

- Off-farm projects are typically more expensive per megalitre and more complex than on-farm works. This will become increasingly the case in future, given that much of the 'low hanging' off-farm recovery has already happened.

- While upgrades can reduce water utility labour force requirements, they may also increase operating costs (for example, when gravity channel systems are converted to pumped delivery) and create future depreciation and maintenance liabilities that need to be funded through IIO fees and charges.

- The Panel's experience is that irrigators and irrigation communities are generally not aware of the medium (five-plus year) and longer term (10-plus year) implications of off-farm infrastructure investments for future IIO fees and charges. Our view is that IIOs need to be more transparent with irrigators around potential implications for fees and charges when off-farm investments are being assessed. IIOs should only proceed with off-farm recovery if there is clear evidence that irrigator customers are willing and able to pay the full cost of the future off-farm investments, including additional operating, maintenance and administrative costs, and asset refurbishment and replacement.

- The impact of off-farm recovery on return flows should be accounted for, using an approach consistent with the independent review by experts from the University of Melbourne into impacts of groundwater sustainable diversion limits and irrigation efficiency projects on river flow volume under the Murray–Darling Basin Plan.

The Panel also considers that where IIOs provide services to government through their assets, these services should be stated, together with the expectations of the level of service and the government's contribution to the maintenance of those services. Setting out this information each year in a transparent community service obligation statement that is subject to performance evaluation would provide greater clarity. In this way, it would improve longer term decision making on asset renewal and price determinations.

Buybacks have had mixed impacts on Basin irrigators and communities

Buybacks have had mixed impacts on irrigators and communities heavily dependent on irrigation. Those impacts have been more clearly observed during drought. The impacts depend on when the buybacks occurred, and whether the buybacks were large strategic purchases or part of a buyback round of the Restoring the Balance program. Annual variations in water allocations and prolonged droughts are the most significant drivers of changes in the consumptive pool. Buybacks have also exacerbated the reductions in drier years, and this effect worsens the price impacts on irrigators and irrigator communities.

The difficulty for local communities is where buyback leads to the long term loss of economic resources and community wherewithal and increased exposure to risks that are not offset by other compensatory gains. This has been a common lived experience of most forms of buyback, and why the Panel often heard people in rural and regional Basin communities say buybacks were the least preferred recovery mechanism. If buybacks are to be used in the future, the challenge will be to address these concerns so the program has community support.

While buybacks have reduced the consumptive pool, we also reviewed evidence that buyback participants have benefited from funds that were used to improve farm efficiency, pay down debt, transition from a sector, exit or retire. Most of this evidence is from work looking at buyback impacts before the drought and hence many key findings and conclusions in this work are now outdated, particularly given that droughts will likely increase in the future with climate change. Ongoing evaluation is critical, and long term policy should be evaluated against longer term outcomes.

Few studies have looked at the delayed impacts on irrigators and their communities of selling water entitlements. The few studies that examined this issue found, at best, weak evidence of delayed negative impacts from selling water entitlements on net farm income. Most studies of the individual benefits of buyback occurred relatively soon after the trades but determining the true net benefits requires a long term perspective and an eye to long term water prices, alternative investment returns and the time value of money.

Many farms that sold water to the Australian Government have continued to irrigate and have made a business decision to rely more heavily on the allocation market. The risks of these positions were smaller when water was more abundant. But in the dry period to the end of 2019, many irrigators were effectively priced out of the allocation market. While having the upside at the time of providing new capital to the farm business and income to the household, a new business risk has come about as the general consumptive pool has fallen, and generally drier conditions have prevailed.

Buybacks have been implemented in a variety of ways, including as broad scale open tender, targeted buyback at a trade zone level in concert with other policy tools, and as part of a package of localised water exit and infrastructure reconfiguration.

While buybacks have enjoyed support by voluntary participants on the upside of the trade, concerns have emerged from other people indirectly and directly affected by them.

The primary concern has been the third party impacts on those remaining in the irrigation district including:

- other irrigators who then shoulder greater burden of infrastructure maintenance and renewal
- service industries and businesses negatively affected by flow-on changes in the supply chain demand
- loss of community wherewithal where there is also a loss of human capital and where liquid assets exit the region
- those who wish to remain irrigators in certain locations but through circumstance find they are a focus of localised targeted exit programs in order to facilitate infrastructure renewal.

The scale of buyback in a local region has also been a concern. Previous work and experience show that large 'strategic' purchases can have significant negative impacts on communities around the irrigation area. The Productivity Commission cited Collarenebri as an example of where this happened: the largest employer sold all its water holdings and moved to dryland farming, which contributed to falling agricultural employment in the community and other negative social impacts.

The longer term strategic farm risks of participating in buyback for short term tactical farm management reasons has also been raised as a concern. We have seen this problem most clearly in northern Victoria. There, large numbers of dairy farmers took these positions in the water market, and water trade constraints are leading to further water price differentials across regions, helping create significant regional adjustment pressures. While this situation is difficult for those affected, farm business choices always have upsides and downsides, and responsibility for the farm level outcomes lies with those making decisions on the farm. The problem of tactical decisions shaping long term strategic options is not unique to buyback; they are also of concern in on-farm and off-farm programs where change in farm systems, for example, leads to new input cost risks or uncertainties over long term utility charges. The Panel's concern is with the scale of these phenomena across the northern and southern Basins.

3.2.3. Adaptive measures

The Panel considers adaptive management is fundamental to effective delivery of Basin water reforms, and healthy working Basin outcomes. We find that rural and regional communities broadly support adaptive measures, particularly where the adaptive mechanism reduces the amount of water needed for the environment.

SDLAM projects may not achieve their deadline or target

The Sustainable Diversion Limit Adjustment Mechanism (SDLAM) was included in the Basin Plan so that the water recovery target could be adjusted if projects were identified that could achieve equivalent environmental outcomes using less water. The Panel has heard that the southern Basin SDLAMs are widely supported in principle.

Under current settings, all the SDLAM projects must be completed by 30 June 2024. If projects are not completed, a reconciliation will assess whether changes are required to Sustainable Diversion Limits. We note:

- The Panel supports the SDLAM. Delivering SDLAM measures with equivalent value of 605 GL is critical. Basin communities cannot afford additional water recovery from the consumptive pool if the SDLAM projects are not delivered.
- We are concerned the SDLAM projects will not be achieved by the 2024 legislative deadline. Many of the key SDLAM projects are still in concept design stage, are complex, will require extensive consultation with landholders, and have material issues that still need to be addressed. The Panel understands COVID-19 has delayed consultation around key SDLAM projects.
- We are also concerned the SDLAM projects may not recover the full 605 GL. Industry groups and government representatives we met and received submissions from agreed. This concern is also consistent with the Productivity Commission's 2018 findings.

More needs to be done to progress complementary measures

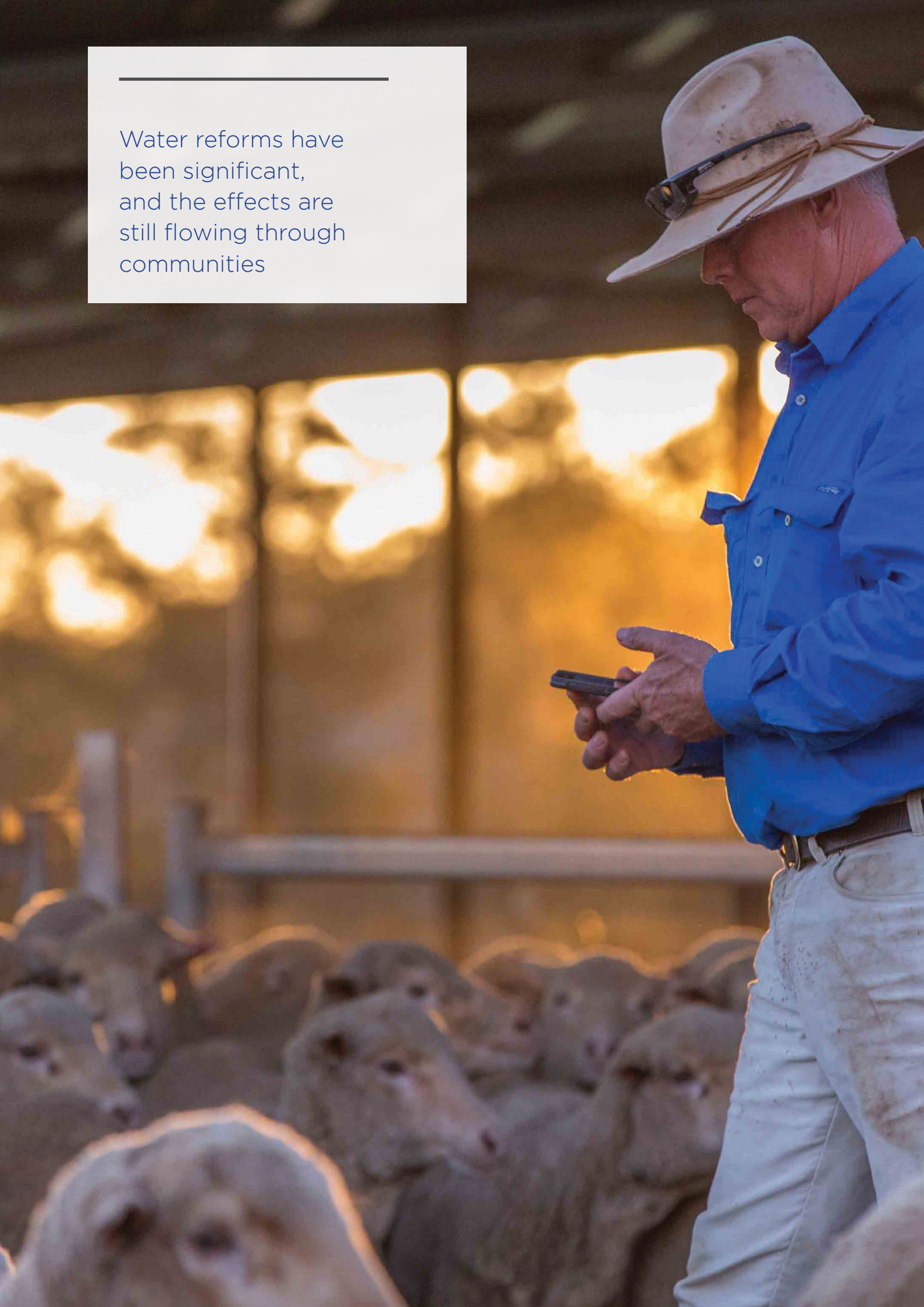
Complementary measures (known as toolkit measures in the northern Basin) are widely supported on a 'more than water' approach to environmental management. The measures reflect that more than just environmental watering is needed to deliver environmental outcomes.

The Panel notes complementary measures include flow and non-flow related measures. For example, flow based complementary measures were part of the northern Basin toolkit. Most of the complementary measures are local in scale, such as:

- integrating fish and environmentally friendly designs into irrigation infrastructure investments
- installing fishways and fish diversion screens
- investing in and building infrastructure to manage local cold water pollution
- using flexible flow related market based mechanisms for environmental watering in lieu of recovering water from the consumptive pool (such as e-water leasing)
- using riparian management to improve sediment transport.

The Panel understands complementary measures are state governments' responsibility, and projects are typically at the conceptual phase. We also recognise that the complementary measure framework developed by CSIRO for the MDBA needs more work before it is ready for use.

The Panel considers that more needs to be done to progress complementary measures. This should be a priority. In particular, the complementary measure framework developed by CSIRO for the MDBA should be extended to provide a framework for evaluating how complementary measures can offset environmental water recovery targets. At this point, it is not clear what quantum of environmental water recovery volume reduction could be achieved from complementary measures. It may be very small. This needs to be explored more as an opportunity in the southern and northern Basins.



Water reforms have been significant, and the effects are still flowing through communities

3.3 Water reforms have been significant, and the effects are still flowing through communities

The cumulative effects of water reforms have flowed, and will continue to flow, through communities. In aggregate, the reforms outlined in this chapter have been significant and have considerably changed the operating environment since the 1990s. Further, the effects of these reforms are still playing out across the Basin.

Water reforms have changed the operating environment and expedited change. The outcomes of the current suite of reforms are yet to fully materialise

Water reforms have paved the way for more efficient allocation of scarce water resources to higher value uses. But they have also led to significant changes in how, where and for what irrigation water is used. In many cases, these changes have exposed previously more protected and stable areas or regions of production (such as dairy in the Goulburn Murray Irrigation District) to competition with other agricultural sectors. Water trade has accelerated farming and structural changes that would likely have occurred anyway, but not with the same speed or regional intensity. Further, water recovery has added extra pressure to this transition, by making less water available.

Stakeholders we met often discussed the pace of change and the volatility as major challenges. In the space of 10–15 years, they have experienced drastic changes. Many feel there has not been sufficient time, support or systems for them to deal with this significant change and adapt.

While the pace and scale of change have been significant, the Panel believes impacts of current reforms are yet to play out in full across the Basin. Reforms are still being implemented, and there will continue to be lagged effects from reforms already implemented.

Going forward, the Panel believes that off-farm recovery will be the preferred option for many rural and regional Basin communities because it does not directly reduce the consumptive pool. On-farm recovery is potentially their next preferred option in many cases.

If followed, there will still be risks involved with these recovery approaches. Water recovery through infrastructure will create increasing risk as water prices rise and farms intensify. This is because on- and off-farm investments in recovery are generally resulting in greater asset fixity and exposure to risk, particularly when their costs rise, commodity prices fall, exchange rates rise, and water availability shrinks in very dry years. How these risks play out over time will determine the long term value of these investments, and whether they make rural and regional economies more or less resilient and increase or constrain development potential.

3.4 Social and economic effects on communities of water recovered to enhance environmental and working river outcomes

The positive impacts of environmental water recovery for Basin communities are not clearly evidenced or communicated, which is in part because environmental change takes time

> Basin water reforms aim to enhance environmental outcomes, working river systems and social outcomes. The Panel wholeheartedly agrees with these objectives. The Panel also believes that healthy, resilient rivers, wetlands and floodplains can deliver significant benefits to Basin regions and communities and to people living outside the Basin over time.

Potential benefits of environmental watering (and complementary measures) include:

- healthy ecosystems that can bring economic and health benefits to local communities from recreation, tourism, fishing and education. They also reduce algae blooms and other water pollution (including salinity) that undermine the productive base and affect human health
- better water quality in a working river, which can reduce costs, improve production for agricultural uses, and reduce the costs of importing water and treating polluted water
- increasing Cultural strength and economic wellbeing for First Nations communities, which can help address Australia's Closing the Gap commitment
- improved soil fertility and pasture grazing for farmers (including floodplain graziers)
- conserved biodiversity, to give future generations the same opportunities as the present and to underpin the productive base of the Australian economy in general, and of tourism in particular
- the upholding of our national and international obligations to preserve high value ecosystems (Ramsar sites) for system and species preservation.

The Productivity Commission's review of national water reform concluded that although ecological restoration is a long term process, the benefits of having more water available for the environment are already being realised. There is evidence, for example, that Basin water reforms and environmental water have:

- improved water quality by, for example, helping export around 1 million tonnes of salt per year in the Basin. This improvement reduces the costs of salt interception works
- improved ecosystem health in many Ramsar wetlands, including the Coorong and Lower Lakes. These sites support a vibrant tourism industry
- reduced the environmental degradation in the Basin that would have otherwise occurred during the Millennium Drought.

The Productivity Commission also provides examples of where active management of environmental water is also yielding economic, social and cultural benefits, but the Commission calls for greater effort in this area, and for:

- public reporting on outcomes that are not achieved, in addition to those that are, and the reasons why
- independent auditing (at least triennially) of environmental water outcomes and supporting management arrangements
- using results of monitoring, evaluation and research to improve water use as part of an adaptive management cycle
- clear allocation of responsibility for adaptive management and adequate resourcing for the tasks.

The Panel strongly supports these recommendations. We also note that the MDBA's 2017 assessment of the social and economic benefits of environmental watering found:

- The ecological condition of many Basin rivers and wetlands had improved over the last five or so years in response to a general improvement in Basin rainfall and an increase in flows associated with environment watering
- But these changes were likely to have generated at best modest benefits for communities, visitors and key industries such as tourism and recreational fishing.

Others have also pointed to the urgency of better establishing links between water recovery, flow regimes and enhanced ecological outcomes. The Northern Basin Advisory Committee (NBAC) report, for example, concluded that the then current scientific evidence did not convincingly support a direct relationship between flows and enhanced ecological, working river or social benefit outcomes, and that uncertainties and limitations needed to be explained. As noted in the NBAC report, this relationship is a fundamental underpinning of the Basin Plan, and the most common science related question communities ask.

As discussed earlier in this chapter, our commissioned case studies looked at the benefits of environmental water for recreation and tourism in the Basin. The studies found evidence of environmental water improving the condition of ecosystems, and of these improved conditions being likely to have positive economic flow-on effects on tourism and recreational fishing and boating, in principle. But these case studies concluded there is not enough evidence to say Basin water reforms are leading to increased tourism or much better recreation outcomes. They suggest things other than Basin water reforms are driving most tourism and recreational activity.

The fish death events in December 2018 and January 2019 led the Australian Government to establish the Water and Environment Research Program (WERP), which is a $20 million commitment to new applied research to support Basin Plan implementation. It is important that WERP includes research that clearly demonstrates how enhanced environmental and working river outcomes impact on social and economic conditions in Basin communities, now and in the future. This demonstration is critical, and communities should be more involved in designing the WERP than they were in previous efforts.

Recovery of large volumes of water for the environment in overallocated systems has occurred only in recent years and it will take some time for the full benefits of having more water available for the environment to be realised. Having recognised this, the Panel believes significantly more effort is needed to demonstrate the social and economic benefits of additional water for the environment to give communities confidence that the costs incurred from reducing the consumptive pool are worthwhile.

Commonwealth and Basin State governments must collectively do more to make credible information available and accessible to Basin communities about the beneficial impacts of enhanced environmental and working river outcomes. A lack of credible evidence showing how these enhanced outcomes benefit Basin communities reduces confidence that the costs of environmental water recovery are worthwhile.

Caption: Sherwood Estates, Loxton North, Riverland, South Australia.

3.5 Rural and regional community transition assistance

Community transition assistance has been partial and has not supported those impacted

> Based on available evidence and community consultation, the Panel is concerned that much, and probably most, past funding to support Basin communities impacted by water reform, was not effectively targeted. We are concerned that current funding is not enough to support communities to transition through water reforms in ways that will help sustain and develop those communities.

In addition to the direct investments on- and off-farm through infrastructure and buybacks (section 3.2.2), governments have committed more than $260 million since around 2008 to support Basin communities to adapt to futures with less water, and to undertake Basin water reforms. This commitment is additional to the approximately $6 billion that governments have invested in water through on- and off-farm infrastructure (section 2.3). Core programs include:

- the Strengthening Basin Communities program (2009–11), which provided grants to local governments for urban water saving initiatives, and to help communities plan for reduced water availability ($64 million spent)
- the South Australia River Murray Sustainability Program (2013–unknown), which supports regional economic development ($25 million allocated)
- the Murray–Darling Basin Regional Economic Diversification Fund (2013–19), which assisted Basin communities to increase their economic diversification and adjust to a more water constrained environment ($73 million spent)
- the Murray-Darling Basin Economic Development Program (2019–23), which provided up to $24.4 million (round 1) to 42 projects over four years. Round 2 will provide up to $15 million to support 31 communities impacted by water recovery
- the Basin Plan Commitments Package (2019–ongoing), which allocated $40 million to support investment by Basin First Nations peoples in Cultural and economic water entitlement and planning activities, and $20 million for economic development projects for First Nations communities most impacted by the Basin Plan.

The Panel notes the Strengthening Basin Communities program has supported regional communities and towns through capital investment, but investment to deliver safe, reliable and fit for purpose town water supply is part of the fundamental right to an adequate standard of living, to which Australia is a signatory. The Panel's view is that it is not appropriate to consider this program funding as transition support for Basin water reforms. Rather, the program simply meets an obligation of government to maintain safe and affordable town water supply as Australia moves towards a drier future.

The Productivity Commission's five-year assessment of the Basin Plan found little evidence that the $100 million of transition assistance provided through the Murray–Darling Basin Regional Economic Diversification Fund and the South Australia River Murray Sustainability Program were well targeted to communities deserving the funding. The Productivity Commission also found little evidence that the programs were effective in supporting regional communities to transition through Basin water reforms. Programs believed to have provided community assistance have not done so.

The Panel is very concerned about Australian taxpayers having funded $100 million in poorly targeted and ineffective investment.

The design of the $40 million Murray–Darling Basin Economic Development Program may address problems with earlier programs, but the Panel considers:

- $40 million is not enough support for communities transitioning through Basin water reform impacts.
- The program should be extended beyond 2023, given the impacts of Basin water reform will continue in rural and regional Basin communities past this date.
- Investment prioritiy should be given to communities that have more water recovered through open tender buybacks, or that did not receive on-farm irrigation upgrades, given evidence that these communities have been competitively disadvantaged.

Some communities we spoke with agreed with our view, citing examples of grants that had been spent in their region which they felt provided little support for communities. Many said projects would have benefited from greater community input early on. Others said government delivered programs did not involve consulting with potential applicants to help affected parties meet the requirements of the relevant funding programs.

Section 4

Future conditions and how these could impact Basin communities' development potential

4. Future conditions, and how these could impact Basin communities' development potential

A core part of our work was to improve understanding of social and economic conditions in the Basin. We also needed to look at how water reform could impact different Basin communities (positively and negatively) into the future (Terms of Reference D, Box 1).

To help us identify ways to stimulate, support and promote healthy and sustainable Basin communities, we commissioned work to assess economic development outcomes under a range of water availability scenarios. We also commissioned case studies to help inform our findings and recommendations. These case studies looked at how communities and agricultural value chains may respond to changing water availability, and a drier climate.

The Panel recognises further on-farm water efficiency measures are not supported by everyone and the Victorian Government has said it will not further pursue such measures because they are seen to have a negative economic impact. The Panel also recognises the December 2019 neutrality criteria agreed for efficiency measures tightly limit the types of investment that may occur to recover water in the future.

While the consultations, modelling results, case studies and literature discussed in this chapter helped shape our findings and recommendations on how to stimulate, support and promote healthy and sustainable Basin communities, they have not determined them. And they do not reflect Australian Government policy. No simulation, case study or consultation can fully and accurately reflect communities, their social and economic conditions, or their possible futures. For this reason, the material in this chapter shows what could occur in the future if certain things happen. It is not a forecast or a reflection of what will happen.

4.1 What we heard from communities

Many people we met, particularly in outer regional parts of southern NSW, northern Victoria, and smaller communities in the northern Basin, are highly stressed and worried about the future. While we did hear from communities that are more optimistic, there was often a shared sense of mounting pressure and growing uncertainty.

People are worried about the impacts of future water recovery, and the pace of change in rural and regional towns. These worries include changing sectors, demographics and populations, climate change, and whether the next generation will have opportunities. They are concerned about withdrawing services and declining infrastructure. Often, people we met said they had not been listened to and expressed little trust or faith in politicians and government to deliver.

While many communities we spoke with share challenges, their ability to cope with and adapt to these challenges varies greatly. We heard local leadership and empowerment are key ingredients if communities want to secure more positive futures. We also heard communities want greater policy certainty, and

to better understand the likely scenarios and challenges that they face, so they can take charge of their futures. Understanding the potential impacts of reform, and of trends such as agricultural sector change and climate change, is critical for communities to thrive and adapt.

This same information is also needed to show governments and politicians the challenges facing Basin communities, and to highlight where support and assistance are needed. To build understanding of the impacts of reform, we commissioned modelling of the impacts of different future water availability scenarios. The impacts include those of water reform, climate change, and changes in irrigated agricultural production.

4.2 Insights from scenario studies of future water use

To inform our work, we commissioned new scenario studies to explore potential implications of different challenges that Basin communities face, including the implications of further water recovery. The analyses use recognised model based scenario approaches, based on the best available data. The frameworks underpinning the evaluations are summarised in Appendix B.3, and in detail in the technical reports by ABARES and Wittwer. The scenario modelling:

- **assessed the implications of implementing the committed water recovery in full,** including water not yet delivered and the further 450 GL required under the Basin Plan, and explored the effects of achieving this recovery by 2024 in the Basin
- **assessed the implications of recent perennial plantings**, particularly almonds, which will require more water as these plantings come to maturity
- **explored the implications of potential drier seasonal conditions over the period to 2035.**

The Panel believes the commissioned work discussed in this chapter provides robust and reliable insights. But we repeat: the scenario analyses are not predictions of the future, and do not explore all possible—or likely—future developments, such as shifts in relative international prices of different irrigated agricultural commodities, or different patterns of seasonal conditions seen in the last 15 years. The scenarios were developed to help the Panel understand the potential direction and order of magnitude of shifts resulting from water reforms, changing climate, and changing irrigated production across the Basin.

4.2.1. Modelling assumptions

The work compares simulations of what could happen in the future under water recovery and with climate impacts. Assumptions common to both models were:

- **Current market** is the 'base case' for comparison within each scenario. This scenario assumes current irrigation development (including horticultural plantings), current trade rules and commodity prices, and accounts for environmental water recovery to date under the Basin Plan. The base case also assumes current water management arrangements across the Basin, such as current limits to Inter Valley Transfers (IVT).
- **Future market** scenario assumes two key changes from the current scenario: First, that existing horticultural plantings (particularly almonds) mature and require more water, and second that there is full implementation of future water recovery to meet Basin Plan requirements (3,200 GL target). The ABARES modelling assumes this water recovery occurs through on farm investments. The Wittwer modelling assumes this occurs through a mix of on and off-farm investments and infrastructure upgrades, implemented by 2024.
- **Future market (dry)** assumes a drier climate future than observed in recent decades. The scenario assumes Basin rainfall is 3% lower and in-flows and water supply are 11% lower, based on CSIRO's 2008 assessments of future water availability.

The analysis does not provide a prediction of future prices or irrigation activity. Results are presented for representative 'dry', 'average' and 'wet' seasonal conditions, and are not forecasts for specific future periods. The ABARES analysis simulates a range of water supply conditions for each scenario, to provide a picture of water market and irrigation outcomes across representative 'dry', 'average', and 'wet' years. Scenario assumptions for ABARES' model are further set out in Table 2.

Table 2: Scenario assumptions for ABARES analysis

	Rainfall	Allocation volume	Southern MDB water recovery	Recovery mechanism	Water demand [a]
Base					
Current [b]	No change (2006–18)	No change	Current	NA	Current
Scenarios [c]					
Future	No change (2006–18)	No change	Approx. 425 GL future recovery	On-farm programs [c]	Modelled increase [a,d]
Future (dry)	3% decrease	11% decrease	Approx. 425 GL future recovery	On-farm programs [c]	Modelled increase [a,d]

Notes: (a) Water demand refers to irrigators' willingness to pay for water. The volume of water use in a given period is determined by the balance of water demand and water supply. (b) Current market reference case assumes current farms, rules and arrangements, and so results differ from observed historical water use and irrigated production. (c) ABARES analysis assumes on-farm investment, while Wittwer modelling assumes a mix of on-farm and off-farm modelling. (d) Water demand increases due to maturing of current almond plantings, and the effect of increased water use efficiency associated with on-farm infrastructure investments to achieve water recovery.

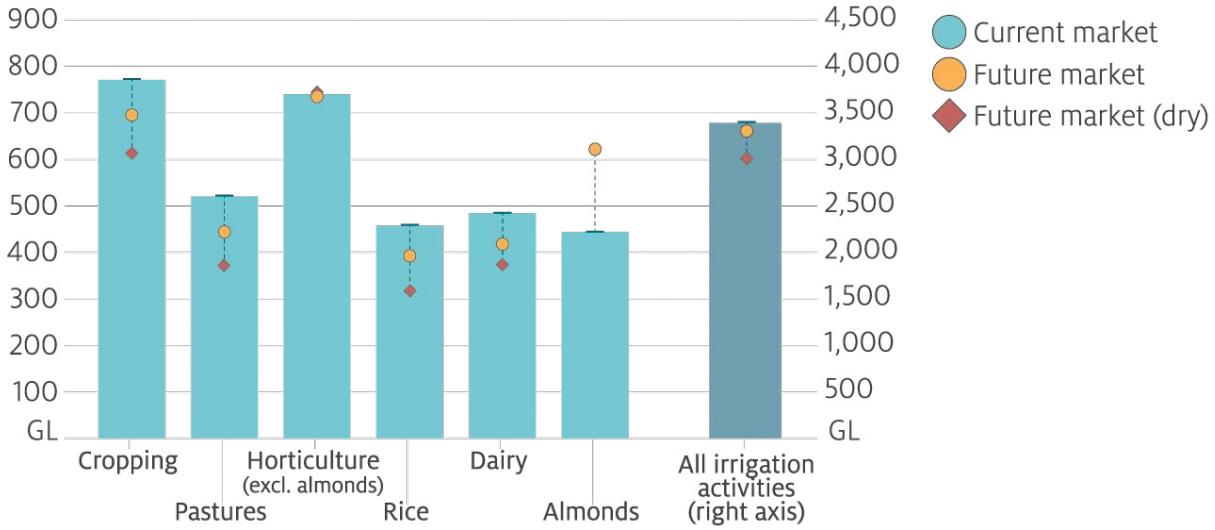
4.2.2. Key insights from the ABARES scenario analysis

The ABARES scenario modelling provides insights into the potential future operating context of Basin irrigated and dryland agriculture and Basin communities. Under their assumptions and scenario modelling, ABARES simulations suggest that:

- **Water use will continue to shift between regions and locations, even with no further changes in land use.** Compared to the base case, the simulations suggest almond water use is expected to increase in the future by around 180 GL (41%) as these plantings mature, resulting in water use by all other sectors other than horticulture falling (Figure 7). Water use by dairy and rice falls on average by 14% and 15% respectively in the future market scenario (relative to the current market scenario).

- **There would be enough water to meet future horticulture demand in the scenarios modelled, including in a dry scenario, even if Millennium Drought conditions occur again.** In all scenarios, surface water and groundwater supply are sufficient to meet demand from horticultural plantings (fruits, nuts and grapevines) even under a repeat of Millennium Drought water supply conditions. Horticultural plantings are estimated to use around 1,276 GL on average each year in the future scenarios. In practice, there remains some risk of supply shortfalls within each water year, particularly if future conditions are drier than modelled or trade is tightened. There is limited water left over for other users.

Figure 7: Water use, by industry activity and for all irrigated activity in the southern Basin



Source: ABARES, commissioned by the Panel.

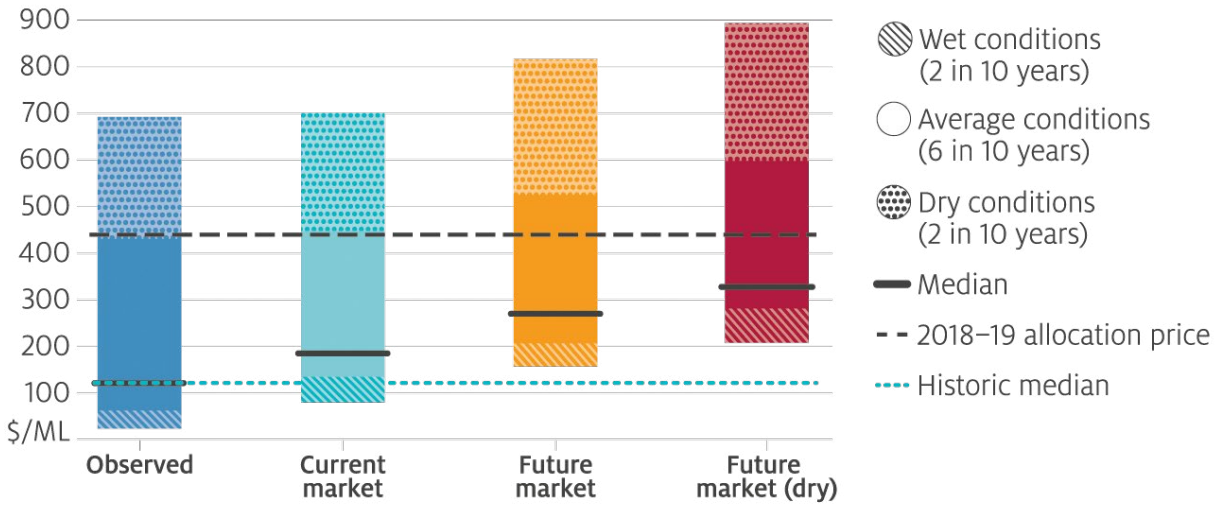
- **Water recovery and increased demand from maturing almonds could result in average water prices increasing significantly.** Compared with the current market scenario, allocation prices in the future market scenario are estimated to be 28% higher on average, and above $200 per ML in eight out of 10 years in the southern Basin (Figure 8). Under drier conditions in the future market (dry) scenario, allocation prices in the southern Basin are 50% higher on average than in the current market scenario. It is important to note the structure of the ABARES model means it is likely to overstate prices to some extent, because it does not account for adjustment and adaptation by farmers, including potential future changes in irrigated land use in response to these pressures.

- **Water prices in the future may become more sensitive to small rainfall shifts.** In the future scenario, the ABARES analysis suggests a 3% change in average rainfall results in a 17% increase in temporary water market prices in the southern Basin. Reduced rainfall decreases supply and increases demand (since irrigators are willing to pay more for water required to offset lower on-farm rainfall). This sensitivity highlights that small changes in average rainfall are expected to have very substantial impacts on water prices.

- **Net water trade between regions would increase** (Figure 9). Maturing of recent plantings and higher water prices result in increased net trade out of the Murrumbidgee system and above the Barmah Choke in NSW and Victoria to supply horticultural water use below the Choke.

- **Inter-regional trade limits would have larger effects on water prices.** Growth in water demand in the lower Murray due to maturing almond trees (particularly in NSW and South Australia Murray) leads to greater pressure for inter-regional water trade, more frequently binding trade limits and larger differences in prices between regions. Particularly in dry years, inter-regional trade limits lead to significantly higher prices in the Murray below the Barmah region compared with the Murrumbidgee.

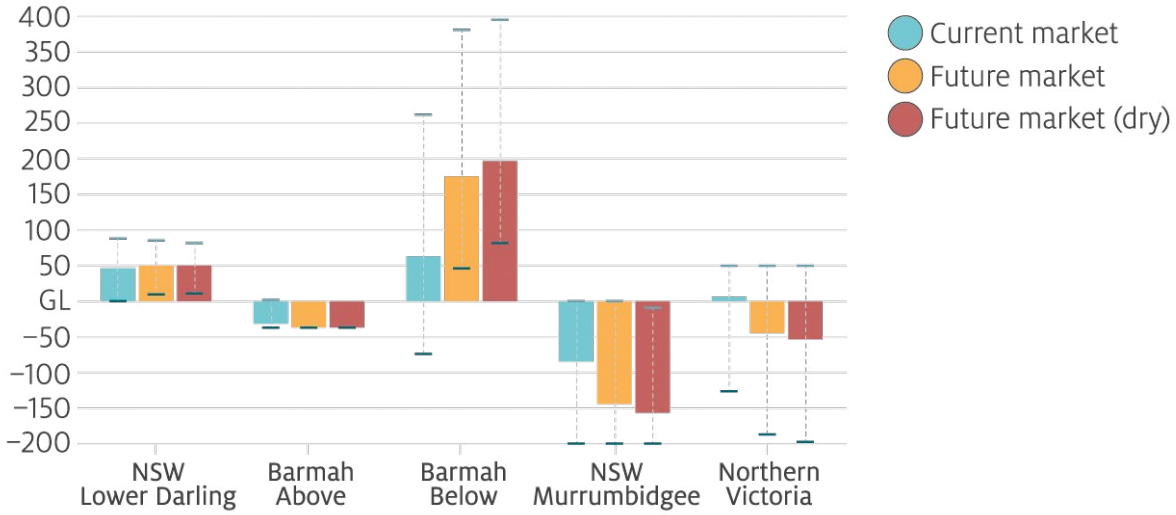
Figure 8: Weighted average allocation prices in the southern Basin



Source: ABARES, commissioned by the Panel.

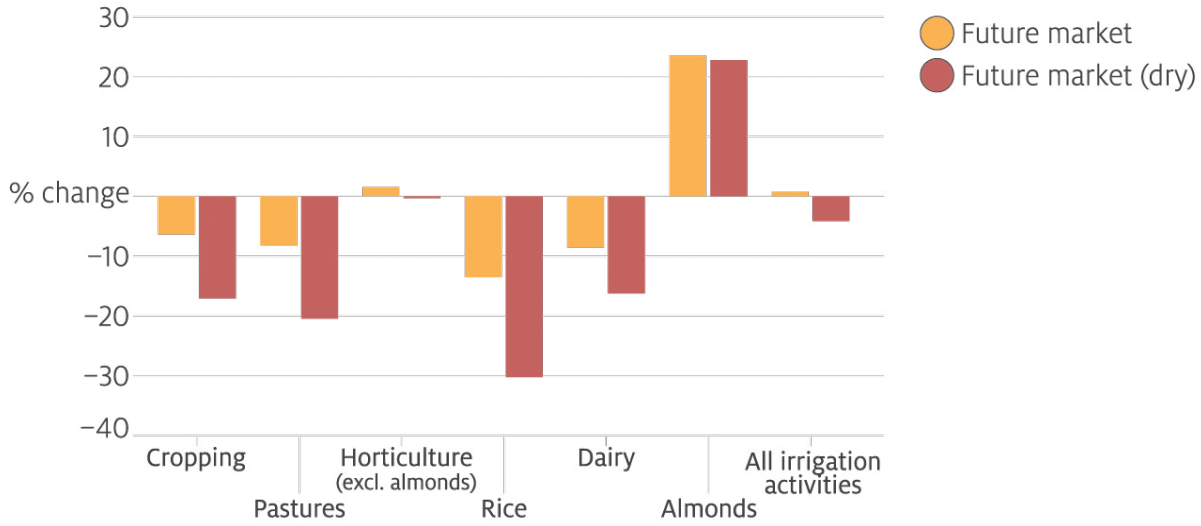
- **Water recovery results in significantly lower consumptive water use. The value of irrigated output rises marginally in the southern Basin if there is no change in future rainfall and falls by around 4% in dry conditions** (Figure 10). In the future market scenario with no change in rainfall, this happens because: (1) water moves to higher value almond production, and (2) reductions in surface water extractions are partially offset by water being taken from groundwater and other supply options. The Panel notes this outcome assumes that almond prices remain at 2018–19 levels.
- **The gross value of irrigated agricultural production (GVIAP) from traditional irrigation sectors declines.** The value of dairy and rice sector output is modelled to be 9% and 13% lower respectively in the future market scenario relative to the current market scenario.

Figure 9: Average net trade, by trading zone in the southern Basin



Source: ABARES, commissioned by the Panel.

Figure 10: Changes in the gross value of irrigated agricultural output in the southern Basin



Source: ABARES, commissioned by the Panel.

4.2.3. Key insights from the Wittwer scenario analysis

The commissioned work by Wittwer suggests investing $4 billion to recover water through on-farm irrigation infrastructure would provide economic benefits equivalent to $2.9 billion to the Australian economy over the period assessed. Wittwer's scenario modelling looks at impacts of recovery across the southern and northern Basins.

This modelling results suggest that the long term benefits of managed environmental water, such as improved amenity, recreation and tourism outcomes, would need to provide at least $1.1 billion in long term value to communities inside and outside the Basin in order to deliver a net benefit nationally.

This shortfall reflects both the reduction in water used for irrigated agriculture, and that other potential investments would provide higher economic return. It is important to note that the shortfall estimate does not account for any economic benefits of water recovery, such as enhanced tourism activity, recreation opportunities, or working river benefits such as salinity impacts.

The scenario results reinforce Panel findings (section 3.4) that evidence of benefits achieved to date appears weak, and that there is an urgent need to better understand and assess future environmental impacts of managed environmental water, and the flow-on social and economic benefits (and possible costs) for Basin communities, economies and industries.

Other insights from the Wittwer modelling include:

- **Northern Basin impacts from future water recovery will be smaller than in the southern Basin**, reflecting lower levels of water recovery and fewer opportunities for productive infrastructure investment in the north.

- **Net water exporting regions are more likely to perform poorly economically than net water importing regions under future water recovery.** Changes in relative water scarcity may result in some regions increasing net water sales and decreasing farm output in the southern Basin. Other regions may increase net water purchases and increase farm output. In either case, regions increase their real disposable income. For example, in the water exporting Griffith–Murrumbidgee region, farmers sell water and reduce farm output in all years. The largest water sales income and farm output reductions relative to base are in drought years when water prices soar. The water importing Murray River–Swan Hill region increases farm output relative to base. In both regions, disposable income reflected in real household consumption increases in all years relative to base.

- **On- and off-farm irrigation infrastructure will deliver short term economic stimulus in regional communities, but much of the economic activity passes over communities.** The Wittwer commissioned work suggests $4 billion of investment in irrigation infrastructure upgrades may add around 1,000 jobs in the Basin in each of the five years when the upgrades occur. Most of these jobs are created in the southern Basin. After the construction phase, Basin jobs would be up by around 100 people across the entire Basin, relative to job numbers if there were no upgrades. Those 100 additional jobs would mostly result from on-farm productivity gains that the upgrades create, and from water being shifted into increasing higher value almond production. Most of these jobs would be in the southern Basin.

- **Investing more broadly in regional communities can achieve more employment than can investing in irrigation infrastructure alone.** To stimulate discussion and thinking about alternative futures, the Panel asked Wittwer to simulate what could happen in regional Basin economies if $1.5 billion was spent on water recovery and $2.5 billion was spent in Basin communities to fund additional services in things such as health, education and community care between 2020 and 2029. The Panel emphasises this scenario was investigated to look at how different expenditure in Basin regions supports economic activity and jobs. The scenario is a simulation. It does not reflect government policy. The Panel recognises that current water market prices and policy settings mean it is unlikely that the $1.7 billion allocated through the Water for Environmental Special Account would be enough to recover the 450 GL upwater.

The key findings from this scenario are:

- Each dollar spent on health, education and community care services creates four times as many jobs within the Basin as infrastructure upgrades spending. In this simulation, employment rises by 1,500 to 1,600 jobs across the Basin for the period from 2020 to 2029, as a joint result of water recovery investment and expenditure on services in Basin communities.

- The net economic loss to the Australian economy is smaller than it would be in scenarios involving investment in infrastructure upgrades alone, with larger indirect economic benefits to non-agricultural sectors and smaller indirect benefits to agricultural producers. Note, these economic impacts do not account for benefits of enhanced environmental, working river, or tourism, recreation or social benefits from water recovery.

The Panel also notes that broader spending could also lead to lasting flow-on benefits for Basin communities, such as improved health, training and education outcomes.

In terms of the national net economic impact and additional jobs created in the Basin, this scenario suggests to the Panel that spending across the economy may create more jobs in Basin regions than spending on infrastructure alone. Such expenditures would do little to maintain the value of agricultural output or supply chain activity.

Appendix A: Reviews and inquiries

Five major reviews that touch on aspects of our Review are in progress or recently concluded:

- The Australian Competition and Consumer Commission's (ACCC) water markets inquiry is examining options to improve markets for tradable water rights, including ways to enhance their operations, transparency, regulation, competitiveness and efficiency (interim report on 31 May 2020 and final on 30 November 2020).

- The Keelty review of management of Murray–Darling Basin water resources examined the impact of changing distribution of in-flows to the southern Basin on state shares under the Murray–Darling Basin Agreement. It is also examined how reserves required under the Murray–Darling Basin Agreement may affect state water shares (reported 31 March 2020).

- The Water for the Environment Special Account review examined whether current resources are adequate to achieve the Murray–Darling Basin Plan target of 450 GL of additional environmental water and whether to ease or remove constraints by 2024 (reported in February 2020).

- The Senate Select Committee Inquiry into the Multi-Jurisdictional Management and Execution of the Murray–Darling Basin Plan is examining the responsibilities for Commonwealth, state and territory governments arising out of the Murray–Darling Basin Plan. It is also considering the effects of the different approaches Basin States use to manage water resources in the Basin (reporting in November 2020).
- An Independent Panel chaired by Jane Doolan delivered a report on the risks and challenges of delivery shortfall in the southern Murray-Darling Basin to the Murray-Darling Basin Ministerial Council in December 2019. The Panel will provide a further report to the Ministerial Council at its next meeting.

Appendix B: Supplementary material

B.1 About the social and economic condition research (section 2.2)

The commissioned research, Thriving, surviving, or declining communities: socio-economic change in Murray–Darling Basin communities, draws on data from the Australian Bureau of Statistics (ABS), the Hutchinson Drought Severity Index, the Australian Institute of Health and Welfare and the Regional Wellbeing Survey.^^ While we understand this data represents the best available data for Local Government Areas (LGAs), there are important limitations, including the fact that some of the data is dated so does not reflect current conditions in Basin communities.

Specifically, data and information about social and economic conditions in the Basin need to be improved as follows:

- The most recent ABS census data was produced in 2016. In some communities, conditions in 2019 were quite different from those in 2016, 2017 or 2018, particularly where drought substantially worsened through 2018 and 2019. This problem emphasises that data must be collected more frequently if governments want to understand current community conditions.

- Important social and economic data does not always go to the small area scale, such as a town. For some datasets, where the data does go to town or a smaller area scale, sample sizes can be too small to give confidence that the values are representative. Many of the datasets do not allow us to look clearly at differences within regions. The result is that the data may not reflect differences in wellbeing across people within regions, or within regions across time. This problem emphasises that social and economic data must be collected at a more disaggregated spatial scale, or that disaggregated data needs larger sampling, if governments want to understand current community conditions.

- First Nations peoples are underrepresented in existing datasets. It is difficult, therefore, to understand social and economic conditions at present, to track changes over time, or to demonstrate issues and needs as well as benefits and successes.

- The relationships between ecological and working river condition and social and economic condition are not established. We discuss this issue more in section 3.4.

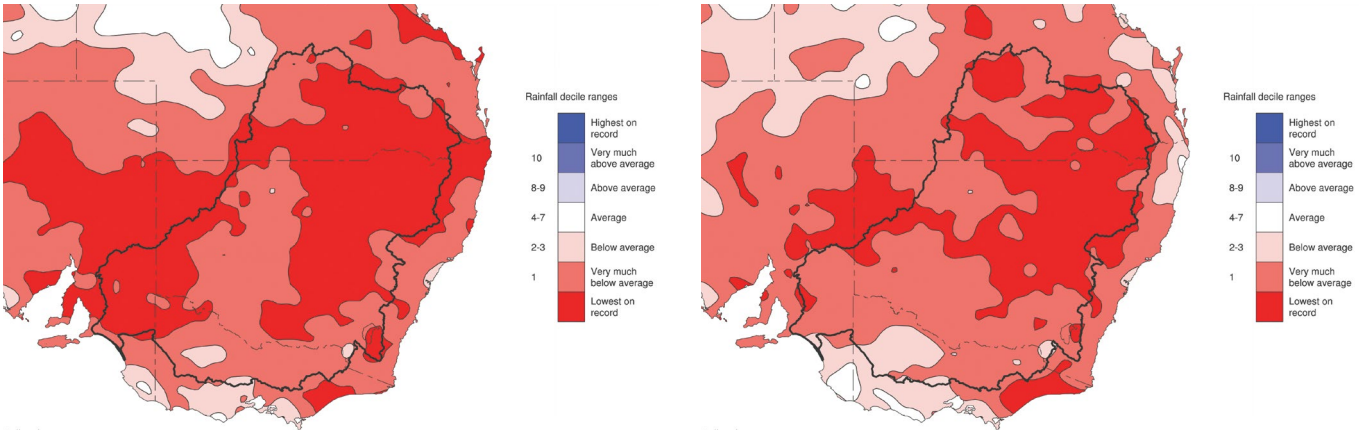
We can describe communities and their social and economic conditions in many ways. And, there are no agreed thresholds for defining 'good' versus 'bad' conditions. Consequently, our evaluation compared Basin regions to regional Australia averages.

^^ You can read more about the evaluation approach and datasets in the commissioned research.

B.2 Drought has amplified existing pressures and created challenges for many Basin communities

Most of this Review took place in a time of exceptional dryness. Rainfall in most of the Basin was substantially below average in each of 2017, 2018 and 2019 (Figure 11). Worsening these dry conditions were record high temperatures, low soil moisture, and declining water storages. As a result, southern Basin storages were at 38% of capacity in January 2020. Even worse, in the northern Basin, consistent low in-flows to major catchments meant storage levels were below 6% by January 2020—lower than levels during the Millennium Drought (2001–09). Some towns, such as Euchareena and Stanthorpe, had to truck in water in 2019 for critical human needs. Although welcomed, rainfall throughout February and March has not broken the drought.

Figure 11: Australian rainfall deciles for the 24 months from January 2018 to December 2019 (left), and 36 months from January 2017 to December 2019 (right), based on all years since 1900



Source: BoM monthly drought update.

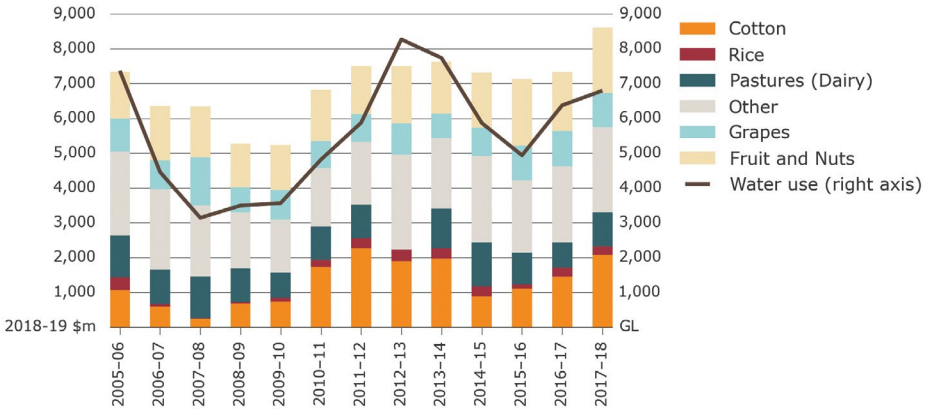
Lower than average rainfall over the past few decades, and recent drought conditions across most of the Basin, have placed pressures on agriculture (dryland and irrigated), town supplies, First Nations ecosystems and recreational users.

Low rainfall resulted in low water allocations to entitlement holders. So, less water is available for production, which leads to reduced irrigation commodity output. But the relationship between water use and the gross value of irrigated agricultural production (GVIAP) is not linear, because water moves to higher value uses. Figure 12 shows this relationship for the GVIAP and water use in the Basin for the past 15 years. While water use fell by 57% during 2005–06 and 2007–08, GVIAP fell by only 13%. In part, this outcome happened because water could shift to higher value uses in these years. Sustaining the value of production in this way can significantly reduce negative social and economic consequences of lower water availability due to drought.

Drought conditions heavily influence water markets, including driving increased water prices. Supply is the biggest driver of water allocation prices, and rainfall is the most significant factor influencing supply. Drought conditions over the past few years mean water prices in the southern Basin are at their highest levels since the Millennium Drought. Higher prices are placing additional pressures on irrigators who need to purchase water. They are particularly challenging those who mainly or completely rely on the water allocation market.

At the time of our consultations, many regional communities were also facing water restrictions for town and domestic uses. The costs of these restrictions can be difficult to estimate, but can be very high for Basin households, as demonstrated by analysis undertaken following the Millennium Drought. We spoke with some communities that are concerned about water security for critical needs, as well as the negative impacts of drought on amenity, health, wellbeing, recreational fishing and boating, tourism and investment.

Figure 12: Gross value of irrigated agricultural production (GVIAP) and water use in the Murray–Darling Basin



Source: ABS, Water Use on Australian Farms.

Note: In 2012–13 'other' includes 'Dairy production'.

Drought is part of the long history of Basin communities. And First Nations peoples have a deep appreciation for how wet and dry cycles affect the life of our rivers and landscape. They are deeply concerned that the way we use water and manage the rivers is contributing to changes not consistent with this tradition. They consider worsening river conditions in dry times is contributing to poorer health outcomes in their communities and causing despair for their loss of tradition.

B.3 Scenario modelling frameworks

The Panel commissioned analyses using the ABARES water trade model, and Victoria University's TERM–H20 regionally detailed whole economy model. The ABARES report and the Wittwer (Victoria University) working paper are cited in the reference list at the end of this report.

The ABARES model covers irrigated water use and trade in the southern connected Murray–Darling Basin, but not water use in the northern Basin. The Wittwer modelling covers all Basin regions, providing insights into economic activity across all sectors (including irrigation, dryland farming, and other sectors) in the northern and southern Basins.

The ABARES modelling provides results for water use by industry and region, prices of water allocations, water trade between regions, and the GVIAP. This analysis assumes no changes to fixed assets, such as land available for irrigation, and does not allow land use to shift between sectors or irrigated and dryland sectors. It also assumes no innovation, adaptation or improvements in productivity by irrigation sectors and enterprises.

Also note the ABARES analysis:

- is based on current irrigation farms using current capital and technology, and does not allow for long term adaptation or structural adjustment
- assumes historical climate conditions for the current market and future market scenarios that match 2006–18 but that are drier than the average for the longer historical record
- assumes trade rules and commodity prices match observed values in 2018–19 and does not account for forthcoming changes to the Goulburn Inter Valley Trade (IVT) limit or potential future shifts in commodity prices.

The Wittwer modelling provides additional results for regional economic activity, sector output and value added, employment, and investment. It also provides insights into interactions between sectors, including the potential for activity to shift between dryland and irrigated agriculture. The analysis allows for trend improvements in productivity and shifts in activities and inputs across sectors and regions.

Both models draw on available evidence and analysis of the impacts of water recovery on water demand and prices (section 3.2.2).

INDEPENDENT ASSESSMENT OF SOCIAL AND ECONOMIC CONDITIONS IN THE BASIN

Website: https://www.basin-socio-economic.com.au/
Email: independentpanel@mdba.gov.au