

Chapter 11 – Economic and social matters

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11 Economic and social matters

11.1 Introduction

As described in previous chapters, the Food Bowl Initiative was prompted by the recognition by local stakeholders (businessmen, politicians and service providers) that unless a significant urgent intervention was made, the GMID would not have a viable future.

This chapter describes:

- public consultation activities undertaken, and their outcomes
- the economic and social aspects of the project
- benefits arising from the deployment of water savings.

11.2 Consultation

Public consultation undertaken for the project includes consultation undertaken by:

- the independent Food Bowl Modernisation Steering Committee (**FMSC**)(an independent committee)
- NVIRP as part of project implementation
- Victorian Government and an independent consultative committee in developing the *Northern Region Sustainable Water Strategy* (DSE 2009a) (**NSWS**).

11.2.1 Food Bowl Modernisation Steering Committee

NVIRP has had a long process of development through the work of its predecessor the Food Bowl Modernisation Steering Committee. Consultation conducted by the FMSC included:

- thirteen consultation sessions across the GMID (in Swan Hill, Kerang, Pyramid Hill, Rochester, Nathalia, Shepparton, Cobram, Benalla, Mansfield, Tatura, Yea, Lockington and Kyabram). These advertised forums were open invitation and held in local venues, to allow participants to gain a better understanding of the draft recommendations. Various Steering Committee members also attended all sessions providing responses to community questions. The information sessions logged 400 questions with responses under the five streams of Governance, Modernisation, Environment, Melbourne entitlement and Irrigators share. Attendees were able to access a copy of the draft recommendations, submission sheets and fact sheets to assist in the submission process. In addition, the Department of Sustainability and Environment (**DSE**) customer call centre provided submission information
- more than 60 public presentations were made to community groups
- key stakeholders were provided with an overview of the FMSC recommendations in September 2007

- invitation was extended to the community to make submissions on the draft report released by the FMSC in October 2007. Submissions on the draft report were received up until 23 October 2007. Over 140 submissions were received.

Submissions received, together with the public consultation process, informed the FMSC's final report to the Minister for Water in November 2007.

11.2.2 NVIRP activities

Since its establishment, NVIRP has been proactive in the community and has held a large number of irrigator presentations explaining NVIRP and inviting questions from the community. For example, during October-November 2008 NVIRP's Executive Manager Planning and Executive Manager Modernisation spoke at 13 meetings held across the regions of the GMID. A copy of the presentation, together with other information material and an invitation to contact NVIRP for information on the modernisation is available (together with details of works, copies of relevant reports and information on planning and environmental approvals) on the NVIRP website www.nvirp.com.au. The website ('at events') also contains details of a free bus tour which is conducted throughout the various parts of the GMID for any member of the community to view modernisation and understand the project.

NVIRP has established or participates in a number of committees to help guide the development and implementation of the project including:

- Technical Advisory Group on irrigation modernisation to overview and provide advice on irrigation modernisation across the GMID. The group includes agencies and individual landholders.
- The Agency Liaison Group which ensures that there is a formal avenue for ongoing consultation and communications for the life of the project between affected councils' planning staff, NVIRP and other key stakeholders.
- Modernisation Consultation Committees for each irrigation area which provide landholder input to developing and implementing a sustainable future for the relevant irrigation area. The committee includes agencies and individual landholders.
- Technical Advisory Committee on the environment, comprising Parks Victoria, Goulburn Broken Catchment Management Authority, North Central Catchment Management Authority, Goulburn-Murray Water, Department of Sustainability and Environment and the Department of Primary Industries.

Table 11-1 summarises NVIRP public consultation activities.

Table 11-1: NVIRP public consultation activities

Consultation	Summary
Stakeholder and Community Meetings	<p>Over 1,300 people have attended meetings convened by NVIRP to present and consult on the project. The meetings were advertised through local media and letters to customers. Meetings held and planned include</p> <ul style="list-style-type: none"> • Murray Valley (November 2008, September 2009) - Cobram, Katamatite, Numurkah, Waaia, Nathalia • Pyramid-Boort (December 2008, April 2009, October 2009) - Durham, Boort • Rochester (October 2008, December 2008, September 2009) • Campaspe (December 2008, February 2009) • Central Goulburn (November 2008) • Torrumbarry (November 2008, December 2008, May 08, December 2009) - Lake Charm, Lake Boga, Cohuna, Kerang, Murrabit, Koondrook, Leitchville
Council resolutions	<p>Letters received in March 2009, providing in principle support for an amendment under Section 20(4) of the <i>Planning and Environment Act 1987</i> to facilitate the NVIRP for each of the seven municipalities and the holistic approach to environmental assessment has been given by each of the Councils through letters sent to NVIRP.</p> <p>The seven councils are City of Greater Shepparton, Shire of Campaspe, Rural City of Swan Hill, City of Greater Bendigo, Shire of Loddon, Shire of Gannawarra and Shire of Moira</p>
Agency Liaison Group	<p>This group has been established to discuss project issues relevant to local government. Its membership includes representatives from City of Greater Shepparton, Shire of Campaspe, Rural City of Swan Hill, City of Greater Bendigo, Shire of Loddon, Shire of Gannawarra, Shire of Moira, Department of Planning and Community Development, Department of Sustainability and Environment, North Central Catchment Management Authority, Goulburn Broken Catchment Management Authority.</p> <p>To date, the group has met on the following dates:</p> <ul style="list-style-type: none"> • 30 January 2009 • 24 June 2009 • 5 August 2009 • 24 September 2009
Technical Advisory Committee for Environmental Watering Plans	<p>The purpose of this committee is to discuss the wetlands and waterways for Environmental Watering Plans and related issues. Its membership includes representatives from Goulburn Broken Catchment Management Authority, Northern Central Catchment Management Authority, Department of Primary Industries, Department of Sustainability, Parks Victoria, Goulburn Murray Water</p> <p>To date, the committee has met on the following dates:</p> <ul style="list-style-type: none"> • 16 October 2008 • 21 November 2008 • 19 December 2008 • 20 February 2009 • 8 April 2009 • 5 June 2009 • 15 July 2009 • 9 September 2009
Cultural Heritage Meeting	<p>Meeting to discuss approach to Aboriginal Cultural Heritage (10 February 2009). Representatives attended from Yorta Yorta Nation Aboriginal Corporation, Dja Dja</p>

Consultation	Summary
	<p>Wurrung Clans Aboriginal Corporation and Aboriginal Affairs Victoria. Subsequent meetings throughout GMID for discussions on cultural heritage aspects (April 2009). Meeting with Yorta Yorta Nation Aboriginal Corporation (24 August 2009)</p>
Other meetings and briefings	<p>Other meetings and briefings have included:</p> <ul style="list-style-type: none"> • Nathalia Information Session. 50 people attended in addition to 7 members of the Steering Committee (3 October 2007) • Rochester Information Session (3 October 2007) • Lockington Public Information Session (8 October 2007) • Pyramid Boort Water Services Committee Meeting (22 November 2007) • GMW Executive Staff (27/28 November 2007) • Environment Group (28 November 2008). 15 attendees • Regional Directors and CEO presentation. Representatives from Campaspe Shire, Gannawarra Shire, Loddon Shire, Mildura Rural City, Moira Shire, Swan Hill Rural City (CEOs and Mayors in attendance) (29 November 2007) • Country Woman's Association (29 November 2007) • Victorian Farmers Federation (30 November 2007) • Murray Group of Councils. Representatives from Bendigo Shire, Mansfield Shire, Strathbogie Shire, Murrindindi Shire, Alpine Shire, Wangaratta Rural City and Wodonga City (5 December 2007) • Torrumbarry Water Services Committee (6 December 2007) • North East Group of Councils. 12 people attended in addition to 7 members of the Steering Committee (6 December 2007) • Regional Briefing with representatives from G-MW, DPI, DSE, CMAs (7 December 2007) Over 70 responses received • Regional Staff presentation. Representatives from G-MW, DPI, DSE and CMAs, with attendees in excess of 100 (7 December 2007) • Municipal Association of Victoria Water Task Force (10 December 2007) • Water Services Committees: Murray Valley, Pyramid Boort and Rochester Irrigation Area (16 September 2008) • Elmore Field Days (7-9 October 2008) • Victorian Country Press Association annual conference (14 October 2008) • Real Estate Investors Victoria presentation (30 October 2008) • Shepparton Rotary presentation (18 November 2008) • Landcare presentation (12 December 2008) • Annual Water Symposium Sydney (20-24 February 2009) • Salinity exchange seminar (19-20 February 2009) • Ozwater conference Shepparton (28-29 February 2009) • National Program for Sustainable Irrigation Modernisation Workshop Shepparton (12-13 March 2009) • University of Melbourne Public Lecture – Water in the Goulburn Valley – Seizing future opportunities (23 April 2009) • Elmore Expo – presentation (3 August 2009) • Presentation to National Water Australia Conference, Melbourne (19 August 2009)

11.2.3 Northern Region Sustainable Water Strategy

For the past two years, the *Northern Region Sustainable Water Strategy* (DSE 2009a) has been the subject of a collaborative process involving Government departments, independent experts, key water industry stakeholders, including urban, rural and environmental water users and the broader regional community. Chapter 6 of the strategy deals with 'Modern, Efficient and Sustainable Irrigation', including the implementation of NVIRP. Milestones in the development of the strategy are set out in Table 11-2

Table 11-2: Milestones in the development of the Northern Sustainable Water Strategy

Documentation	Content	Public consultation
Discussion Paper – January 2008	Resource review and outlook Flags the range of potential responses Invites feedback on additional options	January to March 2008 Public consultation period including: Public submissions Stakeholder information sessions Independent panel reporting January to May 2008
Draft strategy – October 2008	Feedback from public submissions to the Discussion Paper Options based on a set of guiding principles Government's proposals open for community comment	October to December 2008 Public consultation period including: Public submissions Stakeholder information sessions Independent panel reporting October 2008 to February 2009
Final strategy – released 9 November 2009	Government's actions to secure the region's water future over the next 50 years, including support for NVIRP	

11.2.4 Consultation outcomes

The FMSC agreed that strategic investment in irrigation infrastructure was essential to enhance productivity and maintain the growth of food industries in the region, especially in the context of lower rainfall.

A key outcome of NVIRP ongoing consultation is that development and implementation of the project is occurring with a high level of input from the regional community.

Close liaison with agencies responsible for managing environmental outcomes in the region is helping to develop more robust environmental solutions and to seek additional environmental benefits. For example, NVIRP is currently seeking to implement a number of environmental enhancement projects on behalf of the catchment management authorities that would otherwise remain unfunded. Implementing them at the same time as the modernisation creates economies of scale.

The NSW consultative committee noted that submissions generally supported a targeted approach for projects that seek to achieve savings through modernisation of infrastructure. The committee observed that, as well as providing savings for consumptive and environmental uses, modernisation also needs to focus on improving the level of service provided to irrigators and the environment so that the most beneficial use of the available water can be made.

11.2.5 Consultation on draft PER

The draft Public Environment Report (PER) was placed on the NVIRP website from 21 January to 17 February 2010 for public comment. A small number (eleven) of submissions were received. NVIRP reviewed the submissions in detail and provided a response to each issue raised. A number of issues were not relevant to EPBC Act or the PER. Key relevant issues raised were:

- The assessment of effects on the Goulburn River. NVIRP responds that it is included.
- The achievability of water savings to mitigate any potential effects of the project on MNES. NVIRP responds that mitigation water is provided ahead of any water savings.
- The reasons for not including the up to 175 GL of environmental entitlements in the assessment of effects. NVIRP responds that this results in a more conservative assessment of potential effects.
- The methodology for identifying the wetlands and waterways requiring Environmental Watering Plans. NVIRP responds that further advice has been received from the Expert Review Panel, confirming that the approach has addressed its previous comments.
- The methodology and results for South Australian Ramsar wetlands were questioned. NVIRP has provided further explanation in the PER.

Appendix 21 provides a summary of the comments and NVIRP's response. Where appropriate, NVIRP revised the draft PER in response to the comments, as noted in the appendix. The submissions received are included at Appendix 22.

11.3 Identification of affected parties

As indicated by the above consultative framework and the stakeholder diagram at Figure 11-1, there are many stakeholders in NVIRP. All of these are 'affected parties' in some sense. Indeed, the issue of water availability and efficient use of water resources is now a matter of general community concern.

Stakeholder Map



Figure 11-1: NVIRP Stakeholders

Concerns by these ‘affected parties’ may range from the individual irrigator level in respect to the level and timing of an incentive package being offered for new farm connections or wider community concerns relating to the level of water savings. Through consultation and transparent processes such as the development of water saving protocols NVIRP is seeking to identify and address concerns of ‘affected parties’.

There has been some suggestion that drainage diverters may be more affected by modernisation than other irrigators. Drainage diversion agreements were offered to landowners generally as a supplementary supply to irrigation and were only for opportunistic volumes. Importantly, modelling to determine available volumes for drainage diversion did not include outfall volumes. NVIRP targets the losses which are not in any case available to diverters. Drought, continuing low allocations and operational practices by Goulburn-Murray Water (G-MW) have reduced the volume of water available for drainage diversion since the mid 1990s, prior to modernisation. Drainage diverters have been made aware by G-MW of the limitations of the agreement. Therefore drainage diverters are not differentially affected by the action.

The action is considered to be overwhelmingly of benefit to regional productivity and will assist irrigators through greater responsiveness and accuracy in meeting their water needs.

11.4 Economic

11.4.1 Economic context

The GMID is Australia's largest irrigation district and the single largest user of water in the Murray-Darling Basin. Irrigated agricultural commodities from northern Victoria, which incorporates the NVIRP area, generated approximately \$1.4 billion in production annually in 2006/07 and contributed inputs to a significant local processing industry. Prior to the drought, the food processing industry was one of Victoria's fastest growing industries, its main exporter and a major employer. Victoria's food industry is a mainstay of rural and regional economies.

The GMID supports:

- approximately 26% of Australia's milk production, which is sold either as fresh milk or value added in the form of butter, cheese, yoghurt and dried milk products
- 95% of Australia's tomato processing capacity (which is located in the region)
- 30% of Victoria's gross value of agricultural production, including 75% of Victoria's pome and stone fruit, 95% of grape production and 35% of milk production
- other sectors such as stockfeed, fertilizer, chemicals, agricultural machinery and processing equipment, package, transport and logistics sectors.

The GMID is therefore an important region economically both for Victoria and nationally.

The future of sustainable irrigation in the GMID is severely compromised under adverse climate change scenarios. For example, under medium climate change projections, water availability for consumptive use in the GMID could be reduced by over 300 GL. As described in Chapter 2, under the most extreme climate change predictions, total inflows reduce by between 32% - 58% across northern Victoria.

As described in Chapter 3, modernisation of the GMID is therefore a critical response to the challenges of climate change and to help secure the future of Victoria's Food Bowl Region.

11.4.2 Without modernisation scenario

The implications of the 'without-modernisation' scenario for productivity are that the regional economy would stagnate or decline as there would be significant impediments to investment. The following attributes would define the average property:

- investment would generally not take place to modernise properties as irrigators would not receive incentives and the level of service provided would not be sufficient to support new irrigation technologies
- levels of water-use-efficiency would not improve, leaving irrigators at risk from climate change and reductions in entitlement availability

- effective margins available from irrigation would decrease as water charges increased significantly.
- the productive base would erode:
 - larger properties: investment and growth would tend to take place elsewhere, either downstream in Victoria or across the river in NSW where there are larger properties and direct access to the river
 - medium sized properties: would increasingly seek off-farm income as properties could not meet competitive market prices for outputs
 - smaller properties: a larger percentage of farms would become life-style or transfer to dryland farming
- lower value activities, such as mixed farming, would exit irrigation while there would be a reduction in the number of irrigators in the dairy sector. Horticulture would remain but would not grow as it seeks higher levels of service with water-on-demand
- irrigation sector dependent service industries and downstream processing would shrink, further eroding the regional productive base.

11.4.3 Economic benefits and costs

The project will:

- facilitate greater productivity of the region's agricultural enterprises
- reduce the costs of maintaining the system thereby reducing the water charges that would otherwise be faced by irrigators and will lead to retention of irrigation water in the GMID. Taken together, these factors are expected to generate greater agricultural production than would be possible in the absence of the project
- provide water savings which will increase the availability of water for consumptive and targeted environmental use
- benefit the region's economy from the additional activity in the agricultural sector
- decrease the environmental footprint of the irrigation system.

Taken together, these factors are expected to generate greater agricultural production than would be possible in the absence of the project, creating a more stable production base able to support secondary value adding industries in the regional and rural communities.

11.4.3.1 Productivity improvements

Productivity benefits on-farm are the largest direct benefit of the project. Productivity gains result from a range of projected changes, including an enhanced productivity per ML of water applied, increase in farm size and change in enterprise sector.

NVIRP's delivery of higher levels of service and provision of new connections has the potential to drive three levels of productivity gain. It can:

- drive greater productivity even within existing irrigation and production systems
- promote on-farm investment in greater water-use-efficiency within existing production systems
- promote a step change in production including new irrigation technology.

Few of the productivity investments and gains would be likely to go ahead without the enhanced levels of service from system upgrades and the provision of a new connection.

The project aims to provide fewer connections to the irrigation supply system and decommission many of the assets that make amalgamation expensive. It will also provide a level of service that would be complemented well by automation. Therefore, existing businesses are expected to grow and outside investors attracted to create some very large businesses through reconfiguring existing businesses.

The move to larger property sizes will only generate commercial benefits from economies of scale if the amalgamation allows a saving in labour costs per unit of production. That can only occur if it is possible to automate the irrigation systems on-farm. Automation relies on consistent flows and automated outlets. Neither of these is available on the spur channels. Both will be delivered through NVIRP.

NVIRP will drive four core changes that are critical for generating enhanced productivity:

- a move towards larger properties that can achieve economies of scale
- a move from lower value activities to higher value activities, i.e. a change in property enterprise type e.g. from mixed farming to dairy or horticulture
- an increase in the value of production within each sector, e.g. a move within mixed farming from lower value crops to higher-value fodder crops for dairy
- an increase in water use efficiency and productivity, e.g. adoption drip or high flood flow reduces water use and enhances productivity.

The basis of these expectations is set out below.

11.4.3.2 Business size

Farm businesses across Victoria have been progressively increasing in size. In the GMID, the average dairy cattle herd size increased from 71 cows in 1970-71 to 263 in 2001-02 (ABS 2004). At an annual growth rate of just under 4 per cent this saw the size of businesses double in approximately 25 years – or one generation.

Without NVIRP, this trend is likely to stagnate. The high density of irrigation infrastructure increases the costs of amalgamating properties and creating larger paddocks, while the poor levels of service make automation (necessary to achieve labour efficiencies) more costly. This is evidenced by the attraction of ‘greenfield’ sites that were unconstrained by historic infrastructure for investors wishing to make major irrigated horticultural developments (Barr 2005). Anecdotal evidence also suggests a move by some dairy farmers from the GMID to southern NSW due to the scale that could be achieved.

By decommissioning many of the assets that make amalgamation expensive and providing an automated delivery service, business growth will be facilitated. Automation relies on consistent flows and automated outlets, neither of which are available on the spur channels. Historically, the move to larger businesses generates increased water productivity. This is because larger properties tend to be managed more intensively, have greater professional management and are better able to achieve economies of scale.

11.4.3.3 Value of activity

At present some 36% of the water used within the GMID is used on mixed properties for a range of activities including pasture and lower value crops (GMW 2009). This water use is estimated to generate a gross margin of around \$150 per ML. By comparison:

- some 60% of the water is used by the dairy sector generating a gross margin of around \$300 per ML
- 5% of the water is used in horticulture which can generate an average gross margin of approximately \$1,500 per ML.

The current system allows for horticulture only where the sandy soils are 'commandable' (that is, can be accessed by a gravity-driven delivery system) and as long as it is a small draw on water resources (and can therefore take its water from channels with little effect) or where it is located along a river (and thereby effectively becoming a diverter). Guaranteeing these levels of service away from rivers and to a larger horticulture sector is not possible under the current delivery system, restricting the sector to its current size of 5%.

In other irrigation areas, dairy farms increasingly rely on 'cut and carry' systems in addition to their grazed pastures. Mixed farmers have begun growing high value fodder crops (e.g. maize and lucerne) for the dairy sector. These crops have greater production potential than the perennial pastures and cereals seen in the GMID, but rely on better levels of service than the current delivery system can provide. Maize is highly susceptible to water logging and can suffer significant yield loss (5 – 8 tonnes Dry Matter/ha) under border-check irrigation unless managed well (Mason et al. 1987).

NVIRP will provide the higher levels of service necessary for horticulture and alternative crops to develop and will enable the sandier ridges to be irrigated with piped supplies.

11.4.3.4 Enhanced service levels

In a future with more scarce irrigation water, the main area where the dairy sector, and indeed the horticulture sector, in the GMID will need to achieve productivity gains is in relation to irrigation. However, to achieve these gains irrigators would need to invest in new irrigation technologies and practices that rely on a higher level of service than they are currently receiving.

NVIRP will enhance the levels of service available to irrigators by delivering:

- uniformity of flow

- increased flow rate and increased head of supply
- reduced ordering time.

Increased flow rate reduces the extent of water logging of crop or pasture, leading directly to productivity gains. It also improves the 'on-time' delivery of the irrigation water and reduces accessions to groundwater tables and resulting salinity issues.

The current water delivery system cannot guarantee sufficient flow rates and consistency to enable rapid application and removal of water. Some irrigators have addressed this issue by making the irrigation bays within their paddocks narrower (hence increasing the speed with which water passes over the bay). However, this is an expensive alternative.

The new system should provide near water-on-demand. This will allow irrigators to irrigate in small amounts often or prior to a forecast heat event or frost (particularly important for valuable horticulture crops), thereby more accurately meeting the plants' needs. The current manual system requires up to four days notice for water delivery, which prevents timely application of water. Again, some irrigators have addressed this issue by building their own storages. However, this is also an expensive option and generates additional water losses (evaporation and seepage and leakage).

11.4.3.5 Improved water use efficiency

Increased flow rates will mean less water percolates to the subsoil, is lost to the plant, or flows off the end of irrigation bays. Adoption of new irrigation systems will also reduce water losses and effective water-on-demand will result in less irrigation water wasted following unexpected rain events. These changes will lead to greater productivity in terms of yield achieved per ML.

11.4.4 Avoided increases in water charges

There are a number of factors driving up the costs of the irrigation supply system in the GMID. First, the irrigation infrastructure in the GMID is ageing and is costing increasing amounts to maintain. This will continue in the future. Much of the current infrastructure is also nearing the end of its functional life with significant implication for its renewal.

Second, new national metering standards which passed the Senate on 22 December 2009 will impose a significant cost by requiring the replacement of most of the meters in the GMID.

Third, the costs per ML will rise as water continues to be traded out of the district (whether to irrigation or through the buyback) in an untargeted manner. Without NVIRP, this would leave fewer members on each spur channel but most spur channels still operating. Therefore G-MW would have to continue to service all channels, despite a decreasing volume of supply from which to recover the costs, and with the same amount of water being lost through fixed losses such as seepage and evaporation. Termination fees would in all likelihood be insufficient to cover these increasing costs.

These increasing costs would lead to higher water charges (estimated, without NVIRP co-ordination, to increase more than 100%) (GMW 2009).

With this increase in water charges, effective margins available from irrigation would decrease, the irrigation sector would become less competitive than those in other regions and the regional economy would stagnate at best and more likely contract significantly.

Under NVIRP any increase in water charges will be modest because:

- the new system will provide higher levels of service, enabling greater productivity that will make this district more competitive and reduce water trade out of the district
- buyback within the district will be targeted to areas of high seepage and leakage and far from the backbone. This will minimise impacts on G-MW's revenue requirements while maximising water savings and
- the new system will have a smaller footprint, thereby reducing its maintenance costs.

Greater productivity is also driven by:

- **Access to water:** it is assumed that, if the project is not implemented, water trade continues to see water leaving the district. By comparison water availability is expected to stabilise with the implementation of NVIRP (following the Commonwealth's buyback program)
- **Input costs:** it is assumed that water charges rise less steeply, to reflect the lower 'whole of life' costs of the modernisation.

It is assumed that these improvements in productivity will not occur if the project is not implemented. This scenario would see the regional economy stagnate or contract. The productivity benefits will occur over time and result from changes at the level of the individual enterprise and in the wider regional investment environment.

11.4.4.1 Regional economic impacts

Wider regional economic impacts will arise as secondary effects from changes in the demand for the provision of goods and services consequential on changes in the level of productivity in the irrigation sector.

The increase in productivity on-farm will generate employment in the industries that service the dairy, mixed farming and horticulture sectors including banks, chemical and fertiliser retailers and machinery dealers. It will also generate employment in the industries that transport, process and distribute the agricultural products. In the GMID, the milk processing industry is a large downstream service sector located within close proximity to the primary production.

This economic activity in turn stimulates further demand through the economy as workers in these industries purchase goods and services such as accommodation, food, transport and recreation.

11.4.4.2 Costs

As described in Chapter 1, the capital cost of the \$2 billion project is funded by the Commonwealth and Victorian governments, Melbourne Water and irrigators. The costs associated with the project include:

- modernisation of the backbone, replacement or rationalisation of meters and the creation of new direct connections to the backbone for spur channel customers
- ancillary activities to promote the connections program, such as termination payments for surrender of delivery share
- the costs of implementing the program and operating the State-owned enterprise, NVIRP.

On-going 'whole of life' costs of running the irrigation supply system will be funded by Goulburn-Murray Water. These costs will be lower than running the pre-modernised irrigation system.

11.4.4.3 Retention of irrigation water in GMID

Up to 425 GL (long term annual average) water savings will be generated. Of this, up to 175 GL will be provided for irrigation.

11.4.5 Summary

The investment proposed by the Commonwealth and Victorian governments and other contributors will generate multiple economic benefits. The project will:

- facilitate greater productivity of the region's agricultural enterprises
- facilitate wider regional economic benefits
- reduce the costs of maintaining the system thereby reducing the water charges faced by irrigators
- lead to retention of irrigation water in the GMID.
- the implications of the 'without modernisation' scenario for productivity are that the regional economy would stagnate or decline.

11.5 Social

The GMID community has been relatively fluid over the last ten years - the ageing population, drought, and fluctuating commodity prices have had negative impacts on the community and its social sustainability.

Modernisation recognises these changes and assists in providing a transition to a more viable sustainable future.

11.5.1 Social profile

Characteristics of the GMID community:

- The population of the GMID is approximately 123,000.
- From 1996 to 2006, the GMID community showed a trend of slow population growth, with an increasing ageing population. The population of the GMID grew by approximately 10% between 1996 and 2006, with 11,000 extra persons added to the region.

- This rate of growth is less than half of that recorded for regional Victoria. Reflecting the slow rate of population growth is the ageing of the GMID population.
- High migration rate of young people out of the region.
- Slight worsening in the level of disadvantage experienced in the GMID.
- High employment growth compared to regional Victoria.

Research has also shown that farmers, despite earning negative incomes, usually do not become unemployed. Instead, they go deeper into debt and cut the operating costs of their farms (AIFS 2008). Therefore, while employment may seem strong in the GMID, it may be hiding a financially stressed community.

For the GMID, this has two serious implications:

- Firstly, if conditions return to those pre-drought, the irrigation community will still be paying off its debts incurred in this period for several years, prolonging the impact of the drought.
- Secondly, if drought conditions continue, it is likely that farming households will continue to take on debt and some may find themselves unable to exit the industry without significant losses or even falling into bankruptcy. This could potentially be absorbed by the GMID community, but if this were to occur on a large scale, it would have serious implications for the viability of the region.

As a result of the drought and the reduced need for on-farm employees, the labour market of the GMID changed significantly from 1996 to 2006. Agriculture, forestry, fishing, wholesale and retail trade industries all experienced a drop in the proportion of total employment they accounted for.

Since 2006, it is likely that the number of persons employed in the agriculture, forestry and mining industries has declined even further given the GMID's dependence on dairy farming.

The drought has significantly affected the dairy industry, reducing the profitability of farms by increasing the cost of feed and reducing the availability of perennial pasture for dairy farmers. Reductions in water entitlements being delivered to irrigators has resulted in only 38% of land established for irrigation being irrigated in 2008-09 (Dairy Australia 2009). This has in turn increased the dependency of farmers on import fodder to feed their stock. Combined with low prices, this has meant that many dairy farmers are operating at a loss, a situation that is expected to continue in the short term. As a consequence, some dairy farmers have reduced their herd sizes while others have exited the industry. More broadly, it is expected that reductions in production will result in the rationalisation of manufacturing capacity in the long term (Dairy Australia 2009).

The outlook for dairying in the GMID will undoubtedly have a significant impact on the wider community. Rationalisation of manufacturing and the closure of farms will result in job losses within a community that is already impacted by the drought. Even if dairy prices recover, it can be reasonably assumed that, where farms do not occupy amenity locations, they will continue to be consolidated into adjoining farms.

Numbers of employees were growing in industries such as manufacturing and construction. This suggests that while the GMID has been impacted by drought, the community has shown some adaptability and diversified its economy.

11.5.2 Effects of drought

Drought had a significant impact on the irrigation community of the GMID leading to a marked decrease in the allocations of water that irrigators have received from G-MW. In 2005/2006 irrigation customers were receiving between 0% and 58.1% of the allocations they were receiving in 1995/1996 (see Chapter 2).

Given the reliance that the GMID community has on water for irrigation, lower water entitlements would suggest that irrigators in the district are likely to be under considerably more strain than at the time of the 2006 Census. As such, it is likely that many of the trends identified in the snapshot will be accelerated such as the:

- ageing of the irrigation population
- trend away from on-farm labour as employment opportunities dry up.

It is also likely that the increasing numbers of irrigators who wish to exit the industry will be unable to do so, given the depressed land prices, high debt, and the limited financial resources of other irrigators who may wish to buy them out.

Farmers who wish to leave their farms will not only be those whose businesses are failing but also those who wish to retire. Older farmers facing reduced farm incomes as a result of the drought may no longer be able to finance their retirement and have to work longer, contributing to the ageing of the farming population. As a result of lower water allocations and permanent water being traded out of the irrigation districts, there has also been a large reduction in the amount of land being irrigated across the GMID.

Should there continue to be a net loss of water from the system, it is likely that this will reduce the long term viability of the system and possibly trigger further rationalisation. This, however, would be difficult to plan for and without compensation would likely result in disruption to the GMID community.

Research by the Australian Institute of Family Studies (based on the findings of the 'Rural and Regional Families Survey') found the drought, combined with reduced water allocations, is likely to have significant implications for the viability of many irrigators in the GMID (AIFS 2008).

Where respondents were located in drought-affected areas, they were twice as likely to respond that their farms were not viable than those in non-drought impacted areas. As such, it is likely that the current drought will lead to further farm closures and consolidation within the agricultural sector in the GMID. Aside from impacts on the financial well-being and the viability of the GMID community, drought was also found to have:

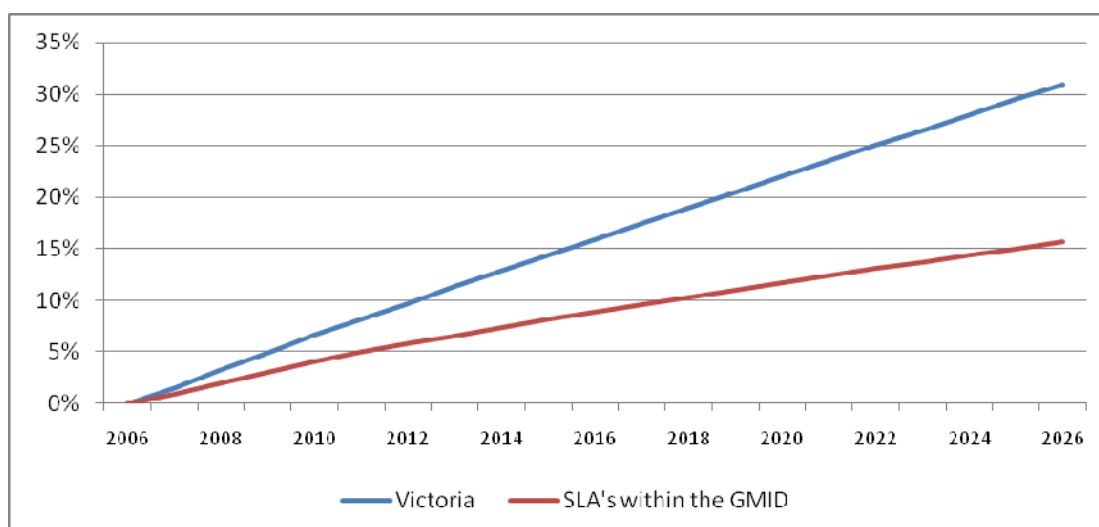
- negative impacts on community well-being through the inequitable distribution of impacts
- negative impacts on workload
- adverse impacts on health

- increased social isolation
- adverse effects on the businesses reliant on the agricultural sector.

It can be reasonably assumed that all of these impacts are currently being felt within the GMID community given the combined impacts of drought, low water allocations and depressed dairy prices.

11.5.3 Projections

Based on current trends, the population of the GMID is likely to continue to gradually grow in the short term, with a population 15.7% per cent greater than 2006 levels in 2026. As shown in Figure 11-2, this is approximately half that anticipated for Victoria as a whole.



SLA – Statistical Local Area

Figure 11-2: Population projection for the GMID and Victoria

Source: DPCD: Victoria in Future 2008 - Population Projections

The population growth of the GMID is anticipated to slow from 2011, suggesting that a population peak, followed by a fall, will be experienced soon after.

The low level of population growth is being led by Gannawarra and Loddon Shires which are expected to experience population decline relatively soon, while Greater Shepparton is expected to grow sharply during this period.

The irrigation community is anticipated to change in the future with:

- increased consolidation of smaller farms
- a continual move from irrigation to dryland farming, placing increased pressure on the water authorities to rationalise irrigation infrastructure.

For the GMID, this will mean continued consolidation of irrigated farms, which could potentially result in a shift in households from rural areas. There will also be some smaller farm holdings that exist within the GMID, but these are likely to be either lifestyle properties or high-value horticultural farms.

In summary, the irrigation community in future will be:

- smaller in terms of population numbers
- larger in terms of individual farm size
- interspersed with small farms with different attitudes towards irrigation, particularly in high-amenity areas.

The urban areas within the GMID may also host some of the former farming households who move off the land.

It is also possible that the increasingly expensive maintenance costs associated with irrigation infrastructure – combined with the number of irrigators already leaving the system as a result of water buybacks, permanent water trading or abandoning irrigation all together – will result in higher water fees. This will affect the viability of the remaining irrigators and potentially accelerate the rate of population loss in the rural areas of the GMID.

11.5.4 Changed public access to channels

A reduced public infrastructure backbone of channels and associated rationalisation of spur channels, resulting from the implementation of NVIRP, will change public access to irrigation channels in the following ways:

- some areas, previously under irrigation, will convert to dryland farming
- new connections, irrigators taking responsibility (private ownership) of previously public infrastructure
- requirement for some irrigators, who are distant from the backbone, to connect via a syndicate
- improved public safety.

Where irrigation is less economically viable, an area may become converted to dryland farming. This means that future investors in the area will not have the option for irrigation. However, irrigated areas that are modernised will offer more attractive investment prospects. The reduction in the irrigation footprint also brings environmental benefits as the water regime in the area returns more closely to pre-irrigation days.

Change in service point direct to the backbone will see some irrigators taking over the ownership and responsibility for what was previously public irrigation infrastructure. This is taken into consideration as part of the connections incentive package.

Where an irrigator is too distant from the backbone to connect directly, they may have to work with their neighbours to form a syndicate. Water would be delivered to a single service point on the backbone. The syndicate would then have shared infrastructure and an agreement as to how to manage and maintain that infrastructure. As described in Chapter 3, NVIRP has a program to offer landholders, including syndicates, appropriate financial incentives.

Goulburn-Murray Water runs public safety campaigns to raise awareness that irrigation channels are designed to deliver water as efficiently as possible. Irrigation channels are hazardous places. Therefore, preventing public access is beneficial. NVIRP has a risk-based approach to fencing channels as part of modernisation, depending on each channel's public access risk profile. NVIRP is also developing methods for safe egress, should a person inadvertently access a lined modernised section of channel.

11.5.5 Social benefits and costs

The modified operation of the modernised GMID will have a significant impact on communities in the GMID by providing a more sustainable future for the region and supporting further regional development. There may, however, be some households and localised areas that could be disadvantaged, mainly through rationalisation of infrastructure, and declining populations in select communities.

The social benefits and costs of NVIRP for the local community, the region and the nation are summarised in Table 11-3.

Table 11-3: Social benefits and costs

Effect	Comments
BENEFITS	
Water security	Will improve the water security of the region and will give confidence to current and future new users that they are connecting to a consistent, reliable supply. This will improve the future viability of the region and will secure the investment.
Food security	Will result in increased production per input of water, ensuring that Australian consumers will be able to rely on food from the region.
Employment	Improvements in farm efficiency are likely to improve the viability of secondary and tertiary industries that rely on agriculture to operate, creating more employment opportunities.
Planning certainty	Local and State Governments will be able to make informed decisions on how the GMID community should grow, balancing agricultural needs with community desires, such as residential housing in amenity areas. It will also allow Local and State Governments to better plan future provision of social infrastructure and services if they are able to anticipate which areas will decline and which areas will continue to grow.

Effect	Comments
Improved financial well-being	Improved customer service levels for all irrigators – combined with financial compensation for those whose irrigation infrastructure is modernised or rationalised – will decrease levels of debt or improve cash flow for irrigators. This will reduce dependency on off-farm work, increase discretionary income and reduce stress associated with financial hardship.
Local business	Local businesses will benefit from investment associated with the Project. The Project will contribute to the economic sustainability of the GMID, providing employment and giving residents of the GMID confidence that their community has a secure future.
Equity of impacts/perceptions of fairness	The GMID community, which will bear most of the impacts associated with modernisation, will also receive the most direct benefits, further enhancing the perceptions of 'fairness' associated with the Project. As the connections program aims to reach all current spur channel customers, this reduces the potential for differentiation between those who have participated in the modernisation program and others
COSTS	
Equity of impacts and perceptions of fairness	Irrigators who are no longer serviced by spur channels who may have to form syndicates to gain access to water may believe themselves to be disadvantaged.
Re-skilling	Where irrigators leave the agriculture industry, they may face re-skilling challenges associated with new employment.
Population loss in less-viable communities	Where irrigators need to move from one region to the next, loss of population is likely to impact on community cohesion and existing social networks in local communities. In turn, this may reduce the level of participation within local communities, which has already declined under the current drought conditions. This will have a negative impact on the levels of social capital within select communities in the GMID.
Reductions in social infrastructure	The loss of people in particular regions within the GMID as a result of farm consolidation and rationalisation of the spurs is likely to reduce the community's capacity to support social infrastructure and services such as schools or medical services.

There may be some households who see themselves as being disadvantaged by modernisation based on the changed nature of their service point or the impacts on the regional area, for example changes in farm types or decreasing population.

The major social benefit of NVIRP is that, in the long term, it secures the future of the GMID community by providing enhanced water security, facilitating employment growth and largely equitably distributing benefits through the community. However, given the drought and farm amalgamations, there are some trends NVIRP will not be able to arrest, such as the depopulation of some rural areas and the consequent declines in social infrastructure this entails. However, NVIRP does provide the opportunity to slow this decline and facilitate a smoother transition for households that would have been compelled to leave the land due to age or financial hardship.

The benefits of NVIRP extend beyond the GMID however, with all Australians deriving a benefit from increased food and water security as well as better natural flows in the waterways.

11.6 Environment

Northern Victoria is built around and dependent on its natural assets. Regional communities rely on healthy rivers and wetlands to provide reliable, high quality water for households, farms and industry, maintain social and heritage values and provide recreational and tourism opportunities.

However, as outlined in Chapter 2, many of the northern Victorian rivers and wetlands are in poor or very poor environmental condition. This has been shown in the 1999 and 2004 Victorian Index of Stream Condition reports, the 2008 MDBC Sustainable Rivers Assessment Report and the three annual Icon Site Condition Reports for the Living Murray Initiative. Some key facts about the rivers and wetlands in the north of the state include:

- about 50% of native fish species in northern Victoria are listed as threatened under the *Victorian Flora and Fauna Guarantee Act 1988* and the EPBC Act
- about 70% of River Red Gums along the Victorian side of the Murray are classified as dead or dying
- in 2007, waterbird numbers in south east Australia were down to about one third of their average numbers
- many of the river systems are flow-stressed with flow regimes significantly less than required to sustain existing ecological objectives.

Much of this degradation is due to the construction of large storages, major water extraction for irrigation and town water supply and the effects of land clearing and poor land management practices over the past 100 years. The provision and maintenance of the irrigation system in the GMID has contributed substantially to the current environmental condition of these systems.

Successive Victorian and Commonwealth Governments have recognised the need to improve the environmental condition of the rivers and wetlands in northern Victoria and have invested significant funds in programs aimed at river and wetland restoration over the past twenty years. These have included:

- the Victorian Salinity Program and the National Action Plan which aimed to reduce saline groundwater tables through improved irrigation practices, community drainage schemes, groundwater pumping schemes, salt interception schemes and improved dryland management
- the Victorian River Health Program which aims to improve the environmental health of rivers in Victoria through a range of water quality improvement, habitat restoration and catchment management works
- Victorian and Commonwealth water recovery programs which invest to provide additional water for the environment and reduce the impact of overallocation
- the Victorian Sustainable Irrigation Program which aims to increase production from irrigation at the farm level whilst reducing environmental impact. It assists in managing irrigation farm water and catchment drainage to deliver salinity mitigation, improved water quality, water savings and productivity benefits.

NVIRP is the next step in the evolution of a more sustainable irrigation system in northern Victoria and it will represent a major quantum shift. One of the Victorian Government's objectives for the action is to improve the health of the northern Victorian rivers, floodplains and wetlands through:

- provision of up to 175 GL of callable, tradeable environmental entitlements
- reduction in the environmental footprint of the irrigation system
- retention and, where possible and practical, the enhancement of infrastructure to deliver environmental water.

In terms of its environmental footprint, NVIRP will move water regimes towards a pre-irrigation regime, including:

- decreasing the seasonal flow inversion of natural waterways and improving water quality through nutrient reduction
- reducing groundwater recharge, affecting groundwater levels and salinity
- removing 'unseasonal' water delivery to wetlands, where this is adverse, assisting in restoring wetting and drying cycles and improving water quality through nutrient reduction
- significantly reduce the physical size of the irrigation system i.e. the actual footprint on the landscape.

These changes are, for most areas, beneficial. Where there are wetlands and waterways which have changed so much that environmental values are now dependent on these outcomes of the irrigation system, safeguards are being put in place (refer to Chapter 6 for potential significant adverse impacts and Chapter 7 for safeguards and mitigation measures).

The other key environmental outcome from NVIRP is the generation of up to 175 GL of callable tradeable environmental entitlements. The benefits of these and the infrastructure to deliver environmental water are discussed below.

11.7 Benefits of water savings

As described in Chapter 1, neither Commonwealth nor Victorian government administrative decisions regarding the deployment of water savings are part of the action that has been referred for assessment.

However, this section provides a synopsis of the benefits arising from the deployment of water savings, to provide context.

The action will generate up to 425 GL (long-term annual average) water savings. Water savings generated will be used to:

- provide water for the environment (up to 175 GL long-term annual average)
- enhance water availability to support improved productivity in Victoria's Food Bowl region (up to 175 GL long-term annual average)
- provide water to Melbourne (up to 75 GL long-term annual average).

11.7.1 Water for the environment

As a consequence of NVIRP, up to 75 GL (long-term annual average) of savings will be converted to Victorian environmental entitlements and up to 100 GL (long-term annual average) of savings will be held by the Commonwealth Environmental Water Holder. These will be callable, tradeable environmental entitlements and will be in addition to existing Victorian Government environmental entitlements and water recovery commitments to the Living Murray and Snowy River initiatives.

Experience in managing rivers and wetlands through the current drought has shown clearly the value of callable, tradeable environmental entitlements as environmental management tools.

The focus for environmental management during drought is to ensure that river and wetland assets survive and have the capacity to recover in wetter years. To do this, environmental managers need sufficient water in dry years to maintain drought refuges (i.e. key wetlands and river reaches), avoid catastrophic events and ecological loss and be able to provide dry spell breaking flows at the required frequency to maintain species and communities. In wetter years, the focus is on providing river freshes and flushing flows and extensive wetland and floodplain watering. The imperative for environmental managers is to provide water to meet these changing environmental demands as efficiently and effectively as possible.

The environmental entitlements recovered through NVIRP provide this capacity. They will have the same characteristics as water provided to irrigators and towns i.e. a callable volume in storage can accrue allocations, temporary trade, carry over provisions and be able to be extracted for use at specific locations. They will also be able to be used at multiple locations as the water travels downstream (provided losses and water quality issues are accounted for). This means that the water can be called out of storage at desired times to meet specific environmental needs at a number of sites.

These callable, tradeable environmental entitlements provide the capability for active, efficient and responsive environmental management. It enables environmental water to be deployed:

- according to actual seasonal requirements and antecedent conditions recognising the climatic conditions at the time
- to any river or wetland connected to the northern Victorian regulated system
- in conjunction with consumptive water to achieve environmental outcomes (e.g. underwriting losses when consumptive water is used en route for an environmental purpose)
- prioritised to ensure best environmental outcome
- at multiple sites, on its way downstream.

It is the best defence for the environment against the uncertainty and risk posed by climate change by providing environmental managers with the flexibility to use water for whatever the environmental priority is at the time – whether it is a drought refuge, or creation of a winter breeding river fresh. It also enables environmental managers to manage temporal risks through carryover and to utilise the market wherever this provides an environmental benefit.

The value of callable, tradeable environmental entitlements has been vividly demonstrated recently by the Northern Victorian Environmental Watering Program which over the last two years has provided water from the Victorian Flora and Fauna Entitlement to:

- maintain drought refuges
- avoid catastrophic loss of species and communities
- avoid catastrophic events (e.g. fish deaths).

In many cases, this has been in partnership with the Commonwealth and Living Murray Program. The outcomes of this watering program have been outlined in *Environmental Watering in Victoria 2007/08*. However, examples include the provision of environmental water:

- to save the Murray Hardyhead from extinction by providing water to stop three small lakes from drying out
- to stop 560 ha of River Red Gums in the Mallee from dying, including some that are over 500 years old

- to maintain one key reach in the Wimmera River as a drought refuge in 2008 and 2009, providing capacity for the river and its ecological communities to start recovery after spring rains in 2009
- to prevent a blackwater event and maintain water quality in the Campaspe River and prevent a fishdeath
- to maintain a series of drought refuges (for waterbirds, frogs and tortoises) including Reedy Swamp , Little Lake Boort, Kinnairds Swamp
- to maintain key areas of the Living Murray Icon Sites – Hattah Lakes, Gunbower forest and Lindsay-Walpolla islands.

Waterbird breeding was reported at a number of these sites in response to environmental watering. In December 2009, the only wetlands in the GMID with any significant water in them were those that are part of the irrigation system or where environmental water has been deployed.

NVIRP will provide up to 175 GL of new environmental entitlement. Whilst not sufficient to meet all of the environmental water requirements of the rivers and wetlands in northern Victoria, it goes a long way to meeting the targets for environmental water recovery outlined in the *Northern Region Sustainable Water Strategy* and will provide significant high reliability water to provide for the survival requirements of these systems during extended drought.

In addition to new environmental entitlements, NVIRP is committed to retaining and where possible and practical, enhancing infrastructure to deliver environmental water. As outlined in Chapter 7, this is part of the Water Change Management Framework and ensures that current means for delivery of environmental water are recognised and maintained whilst also investigating opportunities for improving delivery options.

11.7.2 Water for irrigators

As discussed in Section 11.4.3.1, there are significant productivity gains available to irrigators, even without taking into account the additional water made available from modernisation. The relative advantage of modernisation is then reinforced by the greater availability of up to 175 GL of water.

11.7.3 Water for Melbourne

The delivery of up to 75 GL of water savings to Melbourne will deliver additional security of water supply. This forms a key component of the Victorian Government's *Our Water, Our Future: The Next Stage of the Government's Water Plan* (DSE 2007). The plan aims to secure Victoria's water supplies in the face of drought, climate change and a growing population.

The delivery of water savings to Melbourne is one of the augmentation options announced by the Victorian Government to supply additional water to Melbourne. This also includes a Seawater Desalination Plant. These measures build on the significant water savings achieved to date through conservation programs and previously announced measures including the reconnection of Tarago Reservoir.

Of these projects water savings from NVIRP delivered via the Sugarloaf Pipeline is the only augmentation option that can deliver additional water in the short term.

11.8 Conclusion

The modernisation of the irrigation system was prompted by the recognition that unless a significant urgent intervention was made, the GMID would not have a viable future. Extensive consultation confirmed public support for the project. Consultation also highlighted that, as well as providing savings for consumptive and environmental uses, modernisation also needs to focus on improving the level of service provided to irrigators and the environment so that the most beneficial use of the available water can be made.

Economically, the project is expected to result in improvements in agricultural production and increases in regional economic activity as a result of greater activity in the local agricultural industry.

Over recent years, drought and fluctuating commodity prices have had negative impacts on the GMID community and its social sustainability. The major social benefit of NVIRP is that, in the long term, it secures the future of the GMID community by providing enhanced water security, facilitating employment growth and largely equitably distributing benefits through the community.

However, given the drought and increases in farm size, there are some trends NVIRP will not be able to arrest, such as the depopulation of some rural areas and the consequent declines in social infrastructure this entails. However, NVIRP does provide the opportunity to slow this decline and facilitate a smoother transition for households that would have been compelled to leave the land due to age or financial hardship.

There may be some households and localised areas that see themselves as being disadvantaged by modernisation. Through consultation and transparent processes, such as the development of water saving protocols, NVIRP is seeking to identify and address concerns of 'affected parties'.

The benefits of NVIRP extend beyond the GMID however, with all Australians deriving a benefit from increased food and water security as well as better natural flows in the waterways.

Irrigation has had a substantial adverse impact on environmental values in the GMID. Recognising that water in the region is intensively managed, in modernising the irrigation system the water regime will move towards a pre-irrigation regime, benefiting environmental values in the region. These benefits include:

- decreasing the seasonal flow inversion of natural waterways
- reducing groundwater recharge, affecting groundwater levels and salinity
- removing 'unseasonal' water delivery to wetlands, where this is adverse, assisting in restoring wetting and drying cycles.

In site-specific instances where significant adverse effects on high environmental values may occur, NVIRP has a management and mitigation framework to address this.

The action will generate up to 425 GL (long term annual average) water savings.

Water savings generated will be used to:

- provide water for the environment (up to 175 GL long term annual average), improving the ability to maintain and enhance environmental values
- enhance water availability to support improved productivity in Victoria's Food Bowl region (up to 175 GL long term annual average), adding to the productivity improvements achieved through irrigation modernisation
- provide water to Melbourne (up to 75 GL long term annual average), increasing the security of supply.