



Irrigation industry economic benefits

Murray Darling Basin

Prepared by **macroplan**
For **Northern Valley Irrigators Alliance (NVIA)**
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Executive Summary

Purpose

Northern Valley Irrigators Alliance (NVIA) engaged Macroplan to prepare a high-level overview of the value and flow-on benefits of investment in the irrigation industry in the northern basin of the Murray Darling Basin.

The purpose of this document is to inform and assist the industry, Government and other stakeholders develop policies to the benefits of industry, local communities and other stakeholders.

The scope undertaken by Macroplan included:

- Review of available data on the aggregated size of the irrigation industry in NSW including how much invested and the direct value of the industry output.
- Assessment of flow-on benefits using a multiplier to the State and local communities – including employment, gross state and regional product.
- Delineation of the Northern and Southern Basins of the Murray Darling Basin to compare the flow on benefits.

This assessment considers investment in irrigation projects specifically within the northern basin of the Murray-Darling Catchment. A watershed delineates the two basins – the northern basin runs into the Darling River and the southern basin feeds the Murray River.

Economic highlights

- Economic activities within the northern basin that rely on irrigation include stock watering, general agriculture, manufacturing industries (generally food-processing industries) and mining. Other water uses include urban and domestic requirements.
- The resident population of the northern basin was 645,200 residents as of June 2020, which had grown from 641,000 residents in June 2016.
- As of 30 June 2020, 71,800 businesses were located in the northern basin, including 27,700 businesses with operations predominantly in the agriculture, forestry and fishing sector (38.6%).
- In the 2019-2020 financial year, 1,365 businesses in the northern basin reported an annual turnover of \$5million or more.
- Employment within the northern basin grew from 301,800 in 2016 to 319,200 by May 2021 (1.1% annual average growth). Strong growth of the agriculture, forestry and fishing sector underpinned the positive labour market performance.
- The study area also has a nationally-significant agricultural sector and produced \$6.1 billion in livestock and cropping activities in 2019-20.
- The northern region produces more than half of Australia's cotton lint crops (irrigated and non-irrigated) and sorghum for grain. It also produces 40% of Australia's total eggs.

1_Economic contribution of irrigation in the northern basin

This report includes a set of sections that present our findings in relation to an investigation into the economic scale and value of the irrigation industry in the northern basin. It presents the definition of the study area, its economy, employment growth and agricultural production. It concludes with an overview of the economic multipliers that would be associated with a potential investment in the irrigation industry in the northern basin to demonstrate the economic benefits that could be generated for a regional community located in the northern basin.

1.1_Study area

The northern basin of the Murray-Darling Basin covers an area which is around 9% of Australia's total land mass and 62.4% of the Murray-Darling Basin catchment area. The northern basin contributes around 40.6% of the total Murray-Darling water resource (Australian Bureau of Statistics, Value of agricultural commodities produced 2019-20). The northern basin includes several sub-catchments across New South Wales and Queensland including: Barwon-Darling, Border rivers, Condamine-Balonne, Gydir, Macquarie-Castlereagh, Moonie, Namoi and Paroo (Map 1.1).

Map 1.1_Murray Darling Basin



Source: Murray-darling Basin Authority 2021; Geoscience Australia

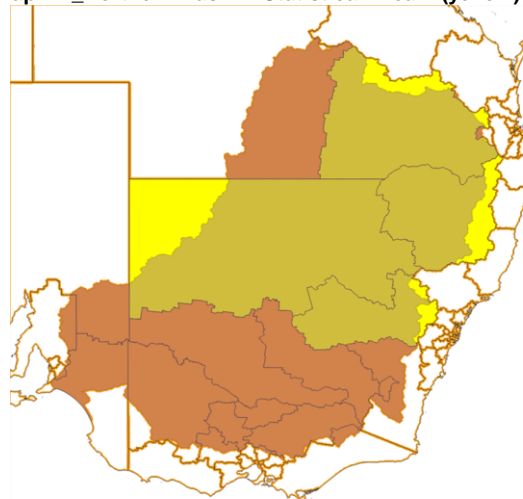
Statistical boundary definition

For the purposes of economic statistical analysis, the study area for this assessment is based on the Australian Statistical Geographic Standard (ASGS) using the 2016 definitions for the following Statistical Area (SA) 4 boundaries (Map 1.2):

- New England and North West SA4
- Central West SA4
- Far West and Orana SA4
- Darling Downs - Maranoa SA4

Statistical data available for these areas includes agricultural production statistics from the ABS, tourism data from Tourism Research Australia and labour market data from ABS and the Department of Education, Skills and Employment.

Map 1.2_Northern Basin – Statistical Area 4 (yellow)



Source: Australian Statistical Geographic Standard 2016

Economic highlights

Economic activities within the northern basin that rely on irrigation include stock watering, general agriculture, manufacturing industries (generally food-processing industries) and mining. Other water uses include urban and domestic requirements.

The resident population of the northern basin was 645,200 residents as of June 2020, which had grown from 641,000 residents in June 2016. This represents a relatively modest annual average population growth rate of 0.2%.

As of 30 June 2020, 71,800 businesses were located in the northern basin, including 1,206 businesses employing 20 or more staff. The 27,700 businesses with operations predominantly in the agriculture, forestry and fishing sector made up 38.6% of all businesses in the northern basin.

In the 2019-2020 financial year, 1,365 businesses in the northern basin reported an annual turnover of \$5million or more. This was up from 1,188 high turnover businesses in 2016.

In the five years to June 2020, \$3.6 billion in non-residential building approvals in the northern basin reflected high levels of investment in new and replacement commercial premises. In turn this has led to demand in building approvals.

The study area also has a nationally-significant agricultural sector which is discussed in detail later in this report.

1.2_Employment growth

Data from the ABS Labour Force Survey and the Department of Education, Skills and Employment show that employment growth in the agriculture, forestry and fishing sector within the northern basin increased from 32,800 people in 2016 to 51,100 by May 2021. This increase of 18,300 workers over the five-year period represented an annual average increase of 9.3%.

Over the same period, total employment increased from 301,800 by 17,400 workers to 319,200 by May 2021. Therefore, the agriculture, forestry and fishing sector more than made up for job losses in other parts of the economy.

The irrigation industry employment is part of the electricity, gas, water and waste services industry sector. Employment in this sector increased from 5,200 workers in 2016, to 6,100 by May 2021. While the increase of 900 workers was modest in number, it represented an annual average growth of 3.2% which was considerably stronger than the overall employment growth rate of 1.1%.

Other employment sectors with strong growth include education & training; transport, postal & warehousing; administrative & support services; and the health care & social assistance sector.

The growth projections by the Department of Education, Skills and Employment for the northern basin SA4s shows the same sectors that have been strong over the past five years are forecast to grow in the future, with one exception – employment in the agriculture, fishing and forestry sector is forecast to decline by around 1,700 workers. Macroplan however, has a contrary view given the past strength of the sector including the total growth of 18,800 workers between May 2016 and May 2021 (which incorporates growth of 700 workers in the 12 months to May 2021).

Figure 1.1_Employment growth by industry sector 2016 to 2021 (Northern Basin Statistical Area 4)

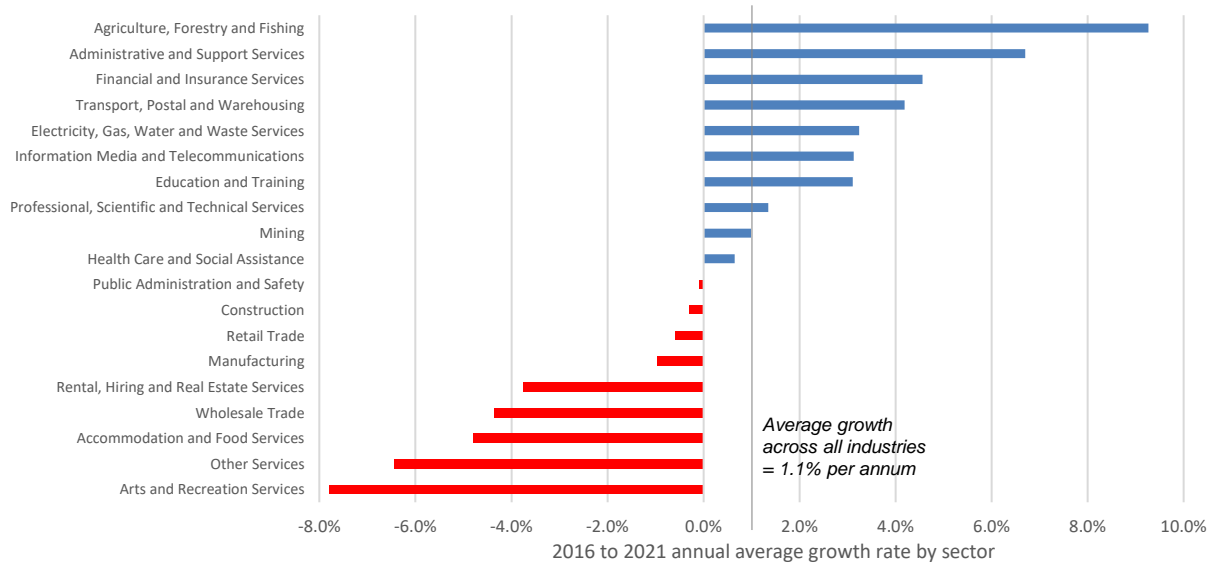


Table 1.1_Employment by sector (Northern Basin SA4)

Industry sector	May-2016	May-2021
Accommodation and Food Services	24,800	19,400
Administrative and Support Services	6,000	8,300
Agriculture, Forestry and Fishing	32,800	51,100
Arts and Recreation Services	3,900	2,600
Construction	20,300	20,000
Education and Training	26,600	31,000
Electricity, Gas, Water and Waste Services	5,200	6,100
Financial and Insurance Services	2,000	2,500
Health Care and Social Assistance	39,700	41,000
Information Media and Telecommunications	1,800	2,100
Manufacturing	23,500	22,400
Mining	11,900	12,500
Other Services	15,900	11,400
Professional, Scientific and Technical Services	10,100	10,800
Public Administration and Safety	20,500	20,400
Rental, Hiring and Real Estate Services	2,300	1,900
Retail Trade	31,200	30,300
Transport, Postal and Warehousing	15,800	19,400
Wholesale Trade	7,500	6,000
Total employment across all sectors	301,800	319,200

Sources: ABS Labour Force Survey 2021; Department of Education, Skills and Employment 2021

1.3_Agricultural production

Irrigation is a critical foundation for the agricultural sector in the northern basin. This includes water to provide feed crops for livestock as well as crops for human consumption. Water is also critical for the food processing sector and underpins growth of the slaughtering industry for domestic consumption and exports.

Table 1.2_Agricultural production (Northern Basin SA4)

Major agricultural category	Gross value 2019-20 (\$m)
Livestock products	863.6
Livestock slaughtered and other disposals	3,785.0
All crops	1,461.5
Total agriculture	6,110.1

Sources: ABS Agricultural Production 2019-20

Livestock slaughtering and disposals in the northern basin were valued at \$3,785 million in 2019-2020. This was made up of cattle and calves (\$2,559m), sheep and lambs (\$644m) and the remainder value evenly split between pigs and poultry disposals.

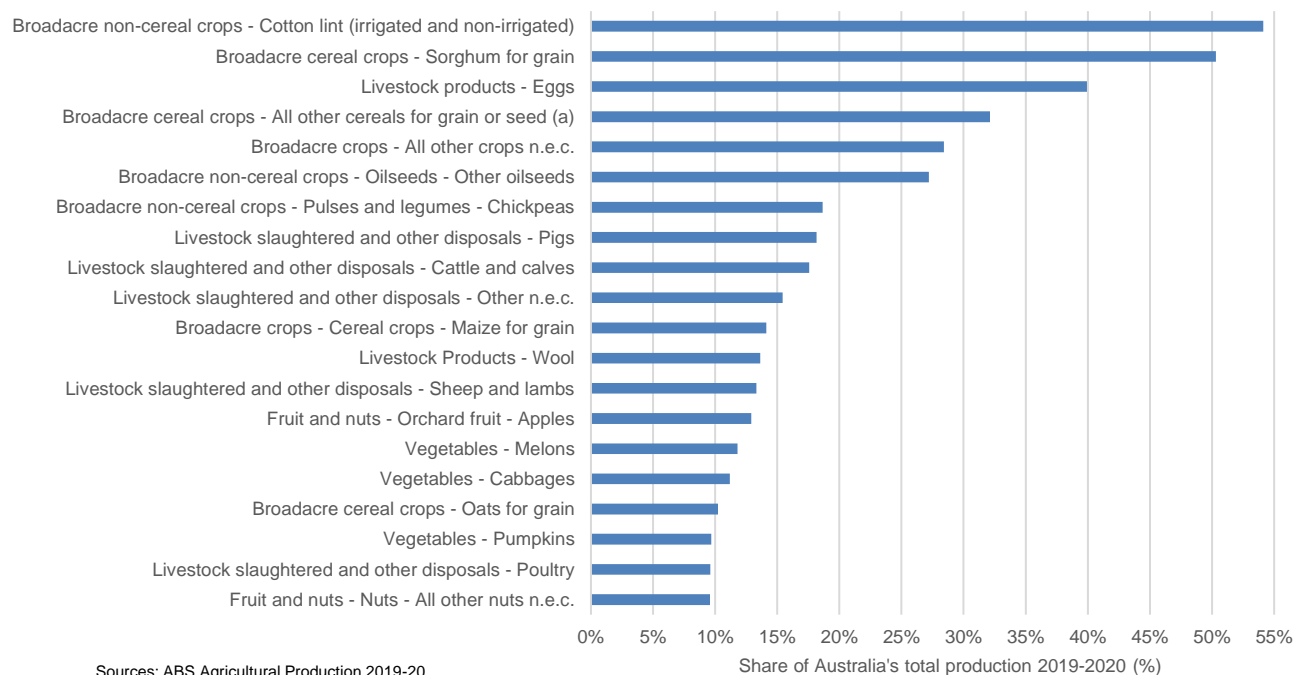
Livestock products included wool (\$374m), eggs (\$352m), and milk (\$137m).

Broadhectare crops (mainly wheat) contributed \$882m to the total crop production of \$1,461m. Vegetables, fruits and nuts made up the balance.

Comparing the production of commodities in the study area to Australia’s total production provides an assessment of the economic importance of the northern basin. Figure 1.2 shows the proportion of Australia’s total agricultural production that comes from the northern basin area.

The northern basin study area produces more than half of Australia’s cotton lint (irrigated and non-irrigated) and sorghum for grain. It also produces 40% of Australia’s eggs. In summary, the irrigation industry includes many sectors, and should not be considered as being limited to cotton and rice.

Figure 1.2_Agricultural production – top 20 commodities by share of Australian production (Northern Basin SA4) – 2019-2020



Sources: ABS Agricultural Production 2019-20

Notes: (a) Including triticale. n,e,c – not elsewhere classified

1.4 Economic multipliers of selected agricultural commodity production

Direct assessment of the irrigation industry is not readily possible from a desktop analysis. Therefore, this section covers some of the related industry sectors that benefit from the irrigation industry and considers the economic inputs and outputs of those activities.

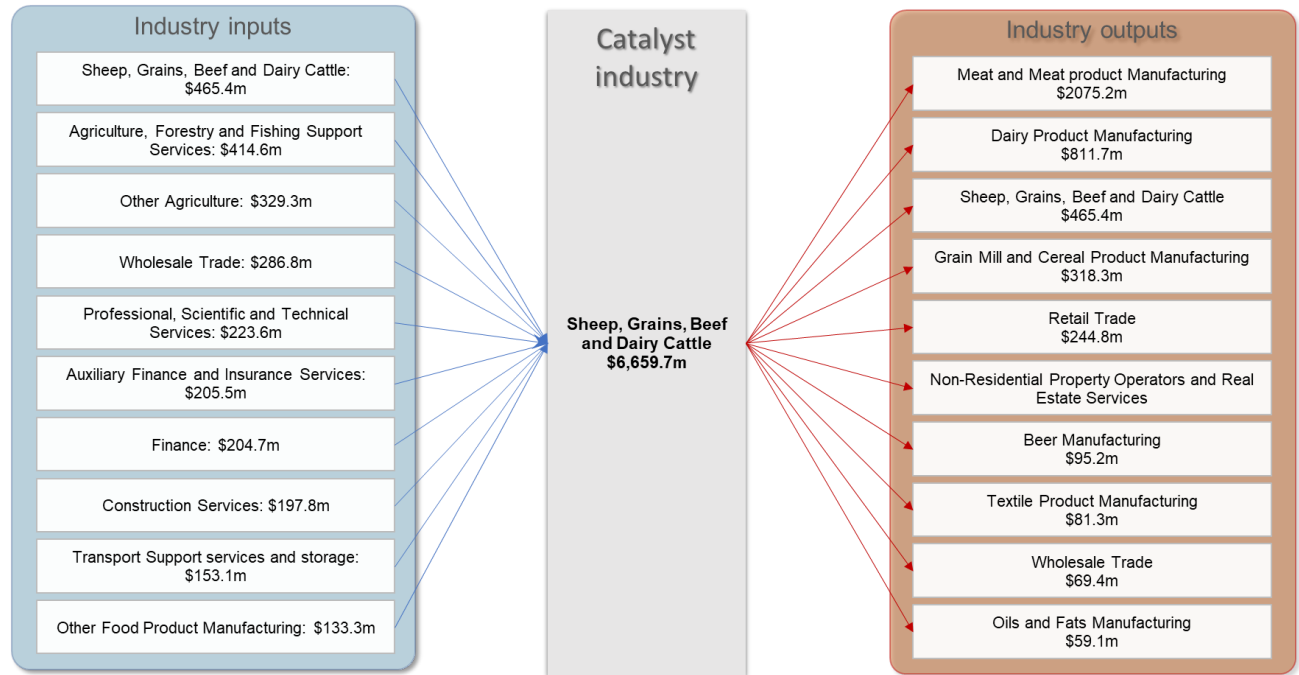
Given the limitations of this approach to directly examining the impacts of the irrigation industry, this section looks at sectors of the economy that are likely to benefit in some way (directly or indirectly) from investment in irrigation in the study area.

Macroplan has selected two industries to consider from the Australian national accounts classifications (ANZSIC06):

- Sheep, grains, beef and dairy cattle
- Meat and meat product manufacturing

The economic value of individual industry sectors and the flow-on impacts from industry can be estimated from the industry input-output of the Australian national economy. Using the value of production of specific commodities, the figure on the right shows the related industry sectors that provide direct inputs and direct outputs from the industry category 'sheep, grains, beef and dairy cattle' (ANZSIC06 description).

Figure 1.2 Economic linkages and value of production – case study of the sheep, grains, beef and dairy cattle industry sector



Sources: Macroplan industry input-output analysis based on ABS National Accounts data

The selected example in Figure 1.2 shows that the industry sector has internal production. This means that the sheep, grains, beef and dairy cattle industry produces goods and services that are used within the same industry sector.

Figure 1.2 shows only the top ten industry inputs, but in reality there are inputs from many sectors of the economy. The same with the outputs, only the top ten sectors are shown, but in practice the outputs can be broad across many industry sectors

1.4 Economic multipliers of selected agricultural commodity production

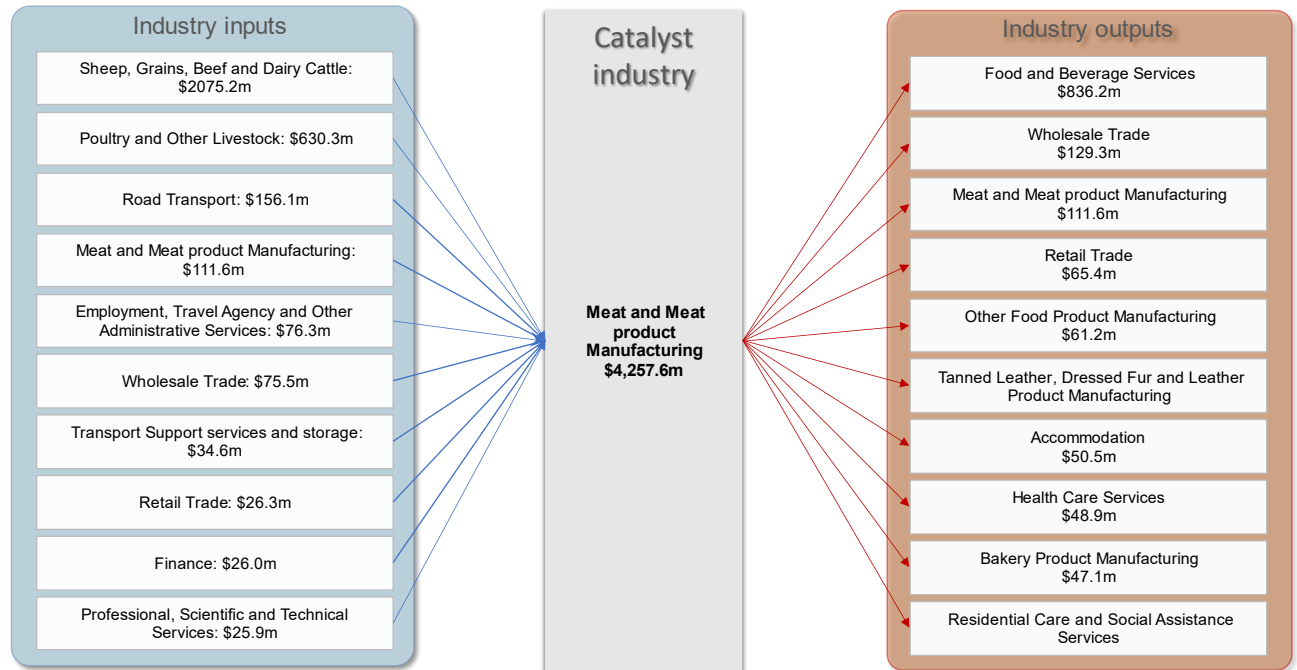
The value-adding industry sectors of the economy draw on a broad range of industry inputs to support production and distribution. For example, the meat and meat processing sector is a significant water user in the northern basin and this critical input enables the sector to produce around \$4.3billion (2020 dollars) in total economic value each year.

Figure 1.3 shows the dollar value of the industry inputs of the top ten sectors that support the meat and meat processing industry.

The industry flows show some interesting economic linkages:

- The meat and meat processing industry is an input to its own production and an output. This reflects the different businesses in this sector that purchase from, and sell to, other businesses in the same sector.
- While the inputs are heavily dependent on a few sectors - particularly the sheep, grain, beef and dairy cattle sector, which provides around half of the total economic inputs – the outputs tend to be spread more broadly across the economy.

Figure 1.3 Economic linkages and value of production – case study of the meat, and meat product manufacturing sector



Sources: Macroplan industry input-output analysis based on ABS National Accounts data

1.5_Employment growth

New investment in the irrigation industry can support local employment by improving agricultural production and water conservations, while promoting local industries and generating more employment during the planning, construction, operation and maintenance stages.

There are three elements to the impact of expansion of any industry, including irrigation:

- First, there is the direct employment, value-added (income), and output in that industry.
- Secondly, there is the indirect employment, value-added (income), and output of other industries supplying inputs into the industry.
- The third element is the induced spending impact. This comes from the economic ripples that result from added consumption generated by the added income spent by those employed directly and indirectly.

Development Phase

Based upon details provided, the estimated project cost of the irrigation project is expected to be approximately \$20 million, which comprises earth works, construction, and installation etc.

Assuming 2 years of development, this scenario project will generate 20 to 30 full-time equivalent jobs per annum directly in the construction industry and a further 30 to 40 full-time equivalent jobs per annum indirectly.

Post-development

Direct Employment

The investment will allow for continuing and expanded local employment outcome (agriculture & water supply & irrigation industry). Based on the given information, as well as 30 years of experience in preparing assessments of this nature, the potential investment at this scale can create about 8 to 10 FTE workers.

Indirect and Induced Employment

The following analyses of the 'Water Supply, Sewerage and Drainage Services sector' (Table 1.3) indicate the linkages with other sectors within the broader regional area. In 2016, the sector employed 100 direct jobs, on this measure the total impact is 223 jobs, implying a ratio of 2.23 jobs for each direct job. Therefore, the total employment multiplier is 2.23

The investment would allow for expanded employment outcomes in terms of direct jobs which means it can generate additional indirect jobs. Based on our multiplier assessment, it can create about 10 to 12 FTE indirect jobs.

Table 1.3_Total Impact of 'Water Supply, Sewerage and Drainage Services' Sector, Broader Region)

	Direct	Indirect	Induced	Total Impact	Multiplier
Output (\$'m)	82.2	19.9	31.7	133.8	1.63
Value Add (\$'m)	48.5	10.3	24.9	83.7	1.73
Employment (jobs)	100.0	48.8	73.9	222.7	2.23

Economic Output & Industry Value Add

The assessment also identifies the following as potential benefits from operation of this assumed investment and the irrigation pipelines:

- Additional \$12.5 million per annum in economic output with direct and indirect outputs of \$7.9 million and \$4.6 million.
- Additional \$7.5 million per annum in Gross Regional Product (GRP) with direct and indirect impacts of \$4.3 million and \$3.2 million.

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