

Vision

AgriNorth

A strategic plan for the Northern
Agricultural Districts

June 2001



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Prepared for the Northern Agricultural Districts Rural
Plan Committee

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Background

The Northern Agricultural Districts Plan, “Vision AgriNorth” has been developed to identify strategies to achieve the vision of:

“a thriving, innovative, dynamic region utilising its assets and resources to maximise, in a sustainable manner, the economic, social and environmental benefits to the Northern Agricultural Districts”.

The impetus for development of this Plan has been the poor performance of the agricultural sector due to poor seasons and low commodity prices in recent years. As a significant contributor of wealth to the region, the agricultural sector's downturn has had a significant impact on the community. The plan therefore focuses on opportunities for agricultural development of the region.

For the purposes of this Plan, the region encompasses the areas of the Mount Remarkable District Council, the Port Pirie Regional Council, the Northern Areas Council and the Wakefield Regional Council. However, the outcomes of the Plan are not necessarily restricted to these areas alone.

The Plan has been developed through a number of steps including:

- Raising awareness of the need for regional strategic planning and building a regional focus;
- Community consultation to scan for ideas, experiences, observations, suggestions and comments;
- Development of a “regional profile” or audit of the region's resources;
- Analysis of the region's strengths and weaknesses;
- Discussion of strategies to be included in the Plan.

The Regional Profile, containing information, statistics and data pertaining to the region, has been produced as a separate report. It is intended that “Vision AgriNorth” and the Regional Profile will become a resource for individuals, community groups and government agencies.

1 Introduction

This plan has been developed by the Northern Agricultural Districts Rural Plan Committee to signal strategic directions for agricultural development, yielding economic, social and environmental benefits, for the region. It is intended for anyone with an interest in fostering such development.

It has not been produced as a blueprint for the Committee to pursue. On the completion of the Plan, the Committee has fulfilled its purpose and becomes defunct.

Section 2 contains a Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis which has drawn on community opinions and findings from the "Regional Profile" or audit of the region.

Section 3 uses the SWOT Analysis to consider and discuss particular strategic directions which are believed to offer the best opportunities for the region.

Section 4 suggests strategies which are intended for implementation by anyone. However, potential "Drivers", regarded as the people or organisations most likely or in the best position to implement the strategies, are suggested in each strategic area.

It is the Committee's intention to make "Vision AgriNorth" available to agencies, organisations, groups and individuals with agricultural interests in the region, to flag opportunities, stimulate interest and act as a catalyst for action. Some of the strategies and actions proposed are already being pursued, using ideas and information generated during the development of the Plan.

2 Springboards and Hurdles for the region

The stimulation of regional development requires an understanding of the region's strengths, weaknesses, opportunities and threats. These are the factors that can launch or hinder initiatives and action. Successful strategies will build on strengths and overcome or avoid barriers. The following strengths, weaknesses, opportunities and threats have been identified from community consultation and an audit of the region's resources.

Strengths:



The Northern Agricultural District is generally regarded by its inhabitants as a reliable area for dryland agriculture compared to other regions in the State such as Upper Eyre Peninsula and the Murray Mallee. It is one of the longest established farming areas in the State.

Drought conditions are not expected to persist beyond one year. The productive soils have not required significant amounts of nutrients, apart from phosphorus, to make them suitable for cropping and grazing. The area is some times referred to as the “breadbasket” of the State.

People who have contributed to the development of this Plan have expressed a strong attachment and commitment to the region. They believe it has a good climate, is scenic, has clean air and sunshine, and offers a good lifestyle. There are good facilities such as schools and hospitals but there are concerns about the lack of people to sustain these assets.

Freight routes through railways, the sea port at Port Pirie, the National Highway and the proximity of the area to Adelaide (and air freight outlets) can move produce out of the region quickly. The southern part of the region is within 90 minutes of Adelaide airport and meat exporters already take advantage of this.

The numerous small towns in the region represent a demographic resource as their aggregate population has actually increased during the 1981 – 1996 period.

There is strong development occurring in the Wakefield Regional Council district. Balco, a hay and grain exporting business, accounts for approximately 15% of Australian overseas sales of hay products and ships wheat in container loads to Vietnam and Korea (Balco Australia 2000). Balco is developing a site at Bowmans, to access national rail and road freight routes. At Port Wakefield, Primo is processing pork for air freighting to Asia and is regarded as having the best boning facility in Australia (P. Barry, Wakefield Regional Council, pers. comm.).

The likely reasons that the Wakefield area is progressing in comparison to other parts of the NAD are:

- Large areas of land of low population density close to Adelaide;
- A central location for the Yorke Peninsula and Northern cereal growing areas;
- People with entrepreneurial skills and vision;
- Different land use zoning which allows development applications to be processed more rapidly.



Weaknesses:

There is no common issue or identity that serves to unify people in the region. The most common factor mentioned is that the region is strongly reliant on primary production, however, quite different seasonal conditions and crop yields have been experienced in the region in the past few years. Table 1 shows how crop yields have varied between the 4 Regional Councils over 3 seasons:

Table 1: Average Wheat Yields (t/ha) per Regional Council Area

Source: Australian Bureau of Statistics AgStats

	1995/96	1996/97	1997/98
Mt Remarkable	2.2	1.6	1.8
Port Pirie	2.2	2.4	2.2
Northern Areas	2.8	2.4	2.2
Wakefield	2.6	2.6	2.6

It is extremely difficult to define a unifying vision and apply a regional “brand” for the region. Whereas names like “Barossa Valley”, “Kangaroo Island” and “Flinders Ranges” achieve recognition in the wider population, the term “Northern Agricultural Districts” does not and there seems to be no other name that could do so.

There is strong attachment to local communities in the region. People tend to identify far more strongly with their local community than the region and this also contributes to the lack of a strong regional “identity”.

There is little processing or value adding to primary products in the region compared to the rest of the State. There is little “clustering” of industries associated with agricultural production.

There is a “bulk export” mentality in that most of the commodities grown have been traditionally produced in large quantities for export markets with little thought to the supply chain from producer to consumer. Producers generally lack marketing skills or knowledge about what consumers want.

There is a belief that the region lacks input from research bodies because it is “between a day trip and a safari” from their bases – that is, it is too far to visit

and work in within a day but lacking the attraction of spending a week working “in the bush”.

Poor seasons and low commodity process have resulted in a lack of capital to invest in diversification and value-adding opportunities.

There are fewer people on the land so more and more responsibilities are falling on less people. Farmers are managing larger tracts of land that they have bought, are leasing or share-farming. There are fewer skilled people and fewer community workers. With the associated loss of services, such as schools, garages, and banks, it is more difficult to attract new people and new ideas into the region.

There is a belief that because the region is regarded as politically stable, it is ignored by politicians compared to other parts of the State where independent Members of Parliament are seen to have considerable influence in achieving benefits for their electorates.

Good quality water is in scant supply. There are relatively few areas of high rainfall to generate sufficient runoff for storage. In the past decade there have been drier seasons and insufficient runoff to store enough water for irrigation purposes. Groundwater supplies are generally poor quality and / or low yielding.



Opportunities:

There are three reservoirs in the region that are maintained by SA Water as emergency domestic water supplies. Since the introduction of the filtration plant at Morgan, the untreated water caught from runoff and stored in these reservoirs cannot be used in the pipeline system. It would require a catastrophic event for SA Water to require this water for domestic purposes. The water stored in the reservoirs could possibly be used for other purposes such as irrigation, aquaculture, tourism and recreation.

The Morgan-Whyalla pipeline has excess capacity as the population of the cities around Spencer Gulf has declined. SA Water is offering this water for irrigation.

There are export abattoirs at Port Pirie and Port Wakefield. There is also an abattoir at Peterborough that processes horses for human consumption overseas.

AusBulk owns a network of grain handling and storage facilities in the region with a regional centre at Gladstone, a strategic site at Bowmans, a port terminal at Port Pirie and cells and bunkers at several locations. This opportunity to segregate grain or other commodities in the region could be particularly useful for niche marketing.

The planned Adelaide-Darwin railway line could serve as a conduit for container loads of products from the region to Asia.

There is a regular container ship route which includes Port Pirie and can take containers to various destinations throughout Asia.

Internet access is available throughout the region and allows easier access to information, the ability to market goods throughout the world and an efficient means of communication.

There is an acute political sensitivity at State and Federal Government level of concerns in rural and regional Australia. A number of assistance and development programmes have a specific emphasis on providing support to businesses and communities in areas away from capital cities.

The Northern Areas Council has instigated a project, "New Directions for Farming in the Upper Mid North Region", to assist producers look at diversification opportunities.

There are already entrepreneurial people in the region opening up new industries and value-adding. For example, vineyard, olive and potato production is expanding in the area; agricultural engineering expertise is being sold into China; hay products and meat are being exported overseas from the region. Austrade has a representative in the region who is available to assist businesses looking to export products.

Threats:



Major threats include a continued loss of people and their skills, knowledge and experience; a continued downturn in prices for agricultural commodities; and increased costs of production, particularly transport costs.

3 Key Strategic Directions:

3.1 Irrigation

Opportunities for diversification in the region are limited due to the lack of sufficient quantities of good quality water. Most crops of higher value require irrigation.

There are four main sources of water in the Northern Agricultural Districts:

- **Surface run-off & storage in dams.**

There are few areas of higher rainfall where sufficient run-off can be generated to provide a reliable and sufficient quantity of water to sustain irrigation. Evaporation and seepage losses are quite common (Dept. for Water Resources 2000).

- **Underground water.**

Apart from a few aquifers, most of the underground water in the region is too saline for irrigation and / or provides poor yields. There is a supply of good quality underground water in the Baroota area and this is used to irrigate vines, olives, potatoes and lucerne. However, there are concerns that the aquifer is being over-exploited and a moratorium preventing further development has been imposed until more investigation work is carried out.

Saline water can be desalinated but this is an expensive option. For example, a desalination plant which produces 100 KiloLitres (KL) per day costs \$450,000 to install and around \$1.50 /KL to operate (\$150 / day). Larger plants are more expensive to install but cost less per KL to operate. A plant capable of producing 600 KL / day of fresh water costs \$1Million to install but has reduced operating costs of approximately \$0.75 per KL (G. Kilmore, SA Water, pers. comm.). The disposal of the saline wastewater is a major problem and it can be quite expensive to get rid of it in a way which does not cause degradation of land or underground water supplies.

- **Reservoir water.**

The three reservoirs at Baroota, Bundaleer and Beetaloo have the collective capacity to store 15,660 ML (Table 2). The combined sustainable yield from the reservoirs is estimated to be 2,600 ML / year (allowing for minimum reservoir holding requirements for emergency supplies) (BC Tonkin & Associates 1999).

SA Water has recently approved the sale of this sustainable yield of water from the reservoirs. The price of this water will be approximately 50 c/KL (N. Fernandez, SA Water, pers. comm.). In years that this level cannot be maintained, water will be pumped into the reservoir from the Morgan-Whyalla pipeline.

Table 2: Reservoir Data

Source: BC Tonkin & Associates (1999)

	Bundaleer	Baroota	Beetaloo
Catchment Size (km ²)	428*	136	48
Reservoir Capacity (ML)	6370	6140	3150
Average Inflow (ML/yr)	1500	2950	1260
Average run-off (mm/yr)	13.1	31.0	49.3
Average catchment rainfall (mm/yr)	451	645	645
Sustainable Yield taken from November to March Only (ML)	548	1292	791
Sustainable Yield taken evenly all year round (ML)	211	1418	860
Proportion of Inflow lost due to Evaporation and other losses (%)	67	38	32

* this includes the 420 km² catchment that is partially diverted into the reservoir from the Bundaleer Creek

There is no infrastructure to support piping of water from the reservoirs to irrigation areas hence any irrigation development using reservoir water will need to include the costs of this piping. In order to keep these costs to a minimum, irrigation development close to the source will be more economic than development further away.

Immediately below the Baroota reservoir, land is already used to grow vines, olives, potatoes, peas and lucerne with irrigation from underground water. The soils are mainly calcareous loams on slopes of less than 2%. There is some suggestion that overflows from the reservoir recharge the underground water supply at Baroota and that irrigators would be better served by allowing flows from the reservoir down the Baroota Creek to recharge the aquifer.

At Beetaloo, the topography is mainly rolling to steep hills with some flatter land along the Crystal Brook. Some of this land is suitable for irrigation but the area is small.

The Bundaleer reservoir is surrounded by land that is either quite steep or has shallow and poor soils. The channel that diverts water from the Broughton River and Freshwater creeks to the east is no longer used, as the water it diverts is too saline for domestic use. It is uncertain whether this channel could be utilised again. The channel from the Bundaleer creek is used intermittently, subject to the salinity of the flows. It is possible that if the water in the reservoir was not used for domestic purposes, more flows could be diverted via the channels to the reservoir.

The Bundaleer and Beetaloo reservoirs are within the Broughton River catchment. There is concern that the River is suffering degradation and there is suspicion that this is partly due to reduced flows. The possibility that release of water from the two reservoirs might improve environmental conditions in the Broughton should be considered.

Of the three reservoirs, Baroota offers the best prospects for irrigation given that it has the most suitable land within a reasonable distance of the reservoir and irrigation is already practised there.

There are other potential uses for the water in the reservoirs which are not discussed here, given the plan's focus on agricultural development. For example, the Spalding Community Development Board is investigating using the Bundaleer reservoir for tourism, recreation or possibly aquaculture.

There is concern that SA Water will sell the water from the reservoirs (or even the reservoirs themselves) to the highest bidder without consideration for using the water for a purpose or purposes that generate the highest regional economic, social and environmental benefits. Members of the community are worried that they have no influence over how the water will be used and that valuable opportunities beneficial to the whole community will be lost.

- **Morgan-Whyalla pipeline**

Large quantities of water can be made available all year round from the Morgan-Whyalla system (Australian Water Environments 2000). Excess capacity is greatest during the winter months and is cheapest during this period. Under the worst case annual demand scenario of 29,320 ML, it is estimated that there is a spare capacity of 35,540 ML per year (BC Tonkin & Associates 1999).

The price of this water at the pipeline is 56c / KL during winter months rising to around 93 c/KL during summer (N. Fernandez, SA Water, pers. comm.). Water allocation licences have to be procured from the River Murray water market.

Costs of piping the water from the Morgan-Whyalla pipeline to the paddock are borne by the irrigator and have to be included in the development costs of an enterprise. The closer the irrigated land to the pipeline, the lower the infrastructure costs.

As the cost of the water is much cheaper in winter than summer, irrigators can either look to grow winter crops or store the water during winter for use over summer. There are 3 storage options:

- In the Barossa Valley, growers are storing off-peak water in dams. This option is also available to producers in the Northern Agricultural Districts where dams can be built, however there would have to be allowances for seepage and evaporation losses from dams. There could be over 1 metre of evaporation losses over summer (Australian Water Environments 2000). Development costs would include the cost of the dam and pipes to and from it.
- The reservoirs could possibly be used for storing pipeline water. Evaporation losses from these could be high and there would be infrastructure costs associated with pumping water into and out of the reservoir.

- Another option for storage is Aquifer Storage and Recovery (ASR). The pipeline water is injected into an aquifer and retrieved later. In the Northern Agricultural Districts, there are a few aquifers that have the potential to be used for ASR. These have been identified to be north and south of Wirrabara, around the Nelshaby – Napperby area and to the north of Port Germein (Australian Water Environments 2000). However, the use of ASR is quite site specific and detailed analysis of any proposed bore would have to be undertaken to assess its suitability for storage. Infrastructure costs would include piping to the bore, pumping from the bore and piping to the irrigation area.

Using River Murray water for irrigation has some environmental concerns. The salinity of the water is between 220 – 440 mg/L and application of this water is in effect adding more salt to the soil. Over-application of the water could cause water tables to rise, mobilising salt in the soil profile. In the Baroota region where the aquifer is already being used for irrigation, leaching of excess irrigation water into the underground water could degrade the quality of the aquifer. In most other situations, the underground water is much more saline than the River Murray water so the main concern would be a rise in these water tables caused by over-application of irrigation water.

A detailed assessment of the environmental impact of irrigation is required to identify the risks and suitable management practices to reduce these risks. In all situations, the implementation of “best practice” irrigation technology should result in less environmental problems and improved efficiency.

The most suitable areas within reach of sufficient pipeline water for irrigation appear to be in the Baroota area and the Nelshaby-Napperby area.

At Baroota, there is infrastructure in place, such as electricity to power irrigation systems, although further development will have to be discussed with ETSA Utilities. The soil types are mainly calcareous loams on plains of less than 2% slope and low sandy rises. There are approximately 650 ha of this land type of which around 100 ha are currently under irrigation to grow vines, olives, potatoes (spring and winter), garden peas (autumn and spring), lucerne, melons, pumpkin and stone fruit. The Baroota area also offers a frost-free, mild winter climate. This could offer market advantage in getting produce into markets earlier than traditional areas. The vineyards established at Baroota are often the first to be harvested in the State each year.

The soil types at Napperby and Nelshaby are not as suitable for intensive horticulture as they are quite stony on the steeper slopes near the Morgan-Whyalla pipeline. Further away from the pipeline towards the coast the soils are less stony and on gentler slopes however the soil type is predominantly a loam over clay. In some places this clay is dispersive and therefore poorly drained. There are approximately 850 ha of land down-slope from the pipeline with 10-20% surface stone and approximately 850 ha of land with less than 10% surface stone. An aquifer along the foothills of the Southern Flinders Ranges might be suitable for water storage and recovery (Australian Water

Environments 2000). The area also has a history of market gardening although there are very few commercial gardens currently operating. This area also has the advantage of a frost-free climate and an early season.

Near the Wirrabara Forest, a few bores have been identified as suitable for aquifer storage and recovery. However, the location of these bores is at some distance from the Murray pipeline system. Some of the underground water in this area might be suitable for irrigation but yields are poor. The soils in the area near these bores are either prone to soil structure problems and waterlogging or on steep, rocky and stony hills.

Irrigation requirements using pipeline water and based on the practices currently being employed by growers in the area for these crops are presented in Table 3. These figures are averages only and climatic variability will significantly affect water consumption. Figures are also given for some other crops that are grown in similar climates elsewhere in the State and have been identified as having market growth potential. Data for the Nelshaby-Napperby area has also been included although the suitability of the land for crops such as potatoes and onions is doubtful due to its stoniness.

Table 3: Estimated Total Yearly Irrigation Requirements (mm) for a range of crops grown under average seasonal conditions at Port Germein and Nelshaby

Source: Mark Skewes, Irrigated Crop Management Services, PIRSA Rural Solutions

Crop	Port Germein	Nelshaby
Carrot	847	833
Garlic	640	568
Onion (early)	650	576
Onion (late)	1167	1158
Potato (summer)	982	954
Potato (winter)*	758	719
Olive	1098	1045
Olive (reduced yield)**	1015	962
Winegrape	850	819
Winegrape (reduced yield)***	472	463

* Spring potatoes at Baroota, modelled on current practices, are estimated to have a Total Yearly Irrigation requirement of 348 mm

** the reduced yield figure is given to reflect current practices in the Baroota area where some olives are receiving less than the optimum due to inadequate irrigation systems.

*** the reduced yield figure is given as vines in the Baroota area are intentionally under-irrigated for quality reasons.

Economic analyses have been undertaken by EconSearch Pty. Ltd. for two of these crops – potatoes and vines. The detailed analysis is presented in Appendix I. Potatoes and vines have been selected as previous work indicates that they currently offer the best potential returns.

Cost Benefit Analysis was used, based on developing 250 ha of vineyards and 250 ha of winter potatoes on land currently used for cereal growing.

Irrigation rates were based on current irrigation practices being used in the area.

Based on a number of assumptions on a range of factors such as product yields, infrastructure and operating costs, the analysis determined that this development would yield an estimated Net Present Value of \$1.1 million, a Benefit-Cost ratio of 1.2 and an Internal Rate of Return of 8%. This result was based on the assumption that long-term prices would average 70% of Year 2000 prices for grapes and 90% of Year 2000 prices for potatoes.

The Cost Benefit Analysis was very sensitive to water application rates - reducing these by 20% for both crops could increase Net Present Value to \$3.7 million. Similarly, wine grape and potato prices could have a significant effect on Net Present Value. If long-term prices for potatoes and wine grapes averaged 100% and 90% of Year 2000 prices in real terms respectively, the development would yield an estimated Net Present Value of \$3.2 million and \$7.0 million respectively.

There are other areas in the Northern Agricultural Districts that have the potential for irrigation where they are within reach of the Morgan-Whyalla pipeline. However, they do not necessarily have the power infrastructure in place, the irrigation "history" or the people with the appropriate skills for growing irrigated crops that exist in the Baroota and Napperby / Nelshaby areas.

It is expected that people with the expertise in growing irrigated crops such as potatoes will expand their operations from existing areas, such as the Riverland or Northern Adelaide Plains, rather than see existing landholders move into horticulture. There are very high capital costs involved in setting up irrigation development which current landholders might not be able to afford. There will be some people living in the region who will diversify into, obtain employment with or sell or lease land to these "new" enterprises. However, the development of the area will be much quicker and have a greater chance of success if new people with appropriate skills are encouraged to move into the region.

3.2 Developing New Products and Adding Value to Existing Ones

For the purposes of this plan, new products are ones that are not currently being commercially produced in the region. Adding value ("value-adding") is processing and/ or marketing existing products to increase returns from these products to the region.

Developing new products or adding value to existing ones will bring a number of benefits to the region such as:

- Reduced reliance on "traditional" agricultural products;
- Improved use of the region's resources by not allowing a single industry to dominate the economy, culture or environment;

- Reduced subsidisation of rural industries;
- Improved stability of rural incomes;
- Provision of a wider range of regional industries which generate wider employment and stimulate regional development;
- Improved biodiversity and reduced genetic vulnerability that agriculture frequently faces.

(Ferguson and Fletcher, 1999)

There are already examples of diversification in the region such as viticulture, olive growing, ostriches, alpacas, deer, angora goats, buffalo, floriculture and organic farming to name a few. Examples of processing or marketing of existing products are fewer. Balco is a company selling hay products to specialist markets while the abattoirs at Port Wakefield are exporting pork by air to Asia. Generally the bulk of economic returns from agriculture in the Northern Agricultural Districts rely on selling raw product out of the region.

There are several reasons why many producers have not diversified or value added to their products:

- New products cannot be viably grown for climatic reasons such as rainfall and temperature requirements;
- Other people can produce the same products elsewhere more cheaply. For example, Asian countries can process Australian raw products more cheaply than Australia because of their lower labour costs; close access to markets will usually attract lower freight costs; some processed products such as canola oil face import restrictions in overseas countries;
- An inability to deliver a consistent supply of high quality produce because of seasonal fluctuations or a lack of number of growers to satisfy demand;
- The tendency for producers to look to new products when they are crisis-driven and usually cash-strapped. There is often little information, a long wait for profits and a high risk associated with new industries that adds to the financial threat;
- Farmers who have produced commodities such as wool, wheat and barley and sold them through marketing boards have often not developed their own marketing skills, relying on others to do this for them. They therefore lack motivation and / or confidence to seek out new products and markets;
- There has been a tendency to focus on determining the production requirements of a commodity, that is, how to grow it, without enough attention being paid to industry management and marketing. A market opportunity can often disappear in the time it takes to work out how to produce a new commodity.

Hyde (1997) lists a number of key success factors that have been identified for the development of new rural industries. These include:

- *The champion*: a key person – an entrepreneur or industry leader who directly or indirectly provides vision, motivation, energy, ideas and commitment.

- *Market focus:* people research thoroughly, maintain close contact with their customers and communicate well with all people in the supply chain.
- *Location factors:* climate, soil, topography, water, infrastructure.
- *Transferable technologies:* the ability to transfer or adapt production and processing technology already being used in other locations; market access and market development can be easier if the product is already in use; simple technologies are easier to adopt or adapt than complex ones but complex technologies might provide more business security; technologies which share skills and machinery already used elsewhere in the business will usually be more quickly adopted.
- *Financial management:* people have adequate financial resources available; have operational funds for an extended period until the new industry becomes profitable; access to government incentives and subsidies but the ability for the new industry to be profitable without these; have considered joint venture arrangements for capital, expertise, markets and market linkages but also considered the compatibility and ability of partners.
- *Style of operation:* people or businesses have strong profit and quality focus; a strategic long-term approach; considered value-adding and vertical integration opportunities; compatibility of the new venture with existing farm or processing operations; the ability to quickly adopt new technologies; considered joint venture opportunities.
- *Government support:* through provision of a sound economic environment; information for developers; research and development support; services and representation such as in market access negotiations.

Many of these factors are based on human skills, an element often overlooked. There is a tendency to look at the physical ability to produce a new product such as “where will it grow?” rather than look at the skills and abilities of the person proposing to grow the new item.

These key factors could be used as a screen for assessing new industry opportunities in the Northern Agricultural Districts.

Within the scope of this strategic plan, it is unrealistic to expect that it will be able to prescribe what new products or processing opportunities should be pursued in the Northern Agricultural Districts. As Fletcher and Kregor (1998) point out, “Attempts in the past have been made to identify “best bets” so that attention can be directed to “promising” new crop industries, in preference to others. Unfortunately, the numbers of issues which need consideration in such analyses are almost endless and the available information is scant and unreliable. ... The outcomes from analyses of “best bets” can so easily be prejudiced by issues unrelated to the long-term viability of a particular industry. Such issues have included the minimisation of income tax liabilities, the publicising of regional development or the curiosity of the public. ... As a result, relatively unimportant issues have attracted the attention of entrepreneurs, members of the media, politicians, funding agencies and the

public. At the same time, crucial matters, such as the marketability of a new crop product or the existence of a threatening disease which can render a new crop unprofitable are paid little or no attention as the hype around a new crop builds.” (Fletcher and Kregor 1998).

Many of the initiatives that develop depend on the skills of individuals – their ability to seek out information, communicate with people in the supply chain, find partners, look for markets and so forth. Successful development of regional growth opportunities will rely more on stimulating the development of people’s skills rather than identifying specific products to grow or process. However, analysis of a number of prospects of economic growth and their relevance to the Northern Agricultural Districts suggests there are possibilities worth further investigation and development for producers looking for new directions. These include irrigated crops; pharmaceutical, nutraceutical and industrial products; organic or “environmentally friendly” produce; and niche products.

Irrigation has previously been discussed. Horticulture and viticulture are seen to offer the best returns for irrigation in the region.

New pharmaceutical, nutraceutical and industrial products are agricultural products grown for use in drugs, cosmetics, health products, nutrition, fuel, bioplastics and so forth.

There is a demand for these products that is being driven by “fundamental shifts in demand for improved health and quality of life and renewed concern about the long-term availability of petroleum-based products” (Wondu Holdings Pty. Ltd. 2000 p viii).

It is estimated that the active components of prescribed pharmaceuticals which have their origin in flowering plants is expected to rise from 25% to 30% over the next decade, which represents a \$US 30 billion global market growing at 6% per year. Herbal supplements, minerals and vitamins, a global market of \$US 45 billion, are predicted to experience continued growth of 10% or more. The market for “functional foods” such as dietary supplements, sugar and fat substitutes, fibre enriched foods, vegetables, fatless meat, skim milk and similar products could become 50% of the food retail turnover (\$US 500 billion per year) in developed economies (Wondu Holdings Pty. Ltd. 2000).

“Australia has the capacity and is internationally competitive in growing most animals and crops that have the primary content sought by functional food markets....It also has the potential to supply many of the herbs with significant markets and growth prospects (garlic, ginkgo, ginseng, Echinacea, golden seal, St John’s Wort and Saw palmetto)” (Wondu Holdings Pty. Ltd. 2000 p ix).

Products which contain most of the materials for production of functional foods and which have the best prospects are oats, soy, flaxseed, canola, garlic, broccoli and other cruciferous vegetables, citrus fruits, cranberry, tea, wine and grapes, fish, omega-3 diet eggs, dairy products and beef.

In the Northern Agricultural Districts, oats, canola, wine grapes, dairy products and beef are already being produced. St John's Wort is a weed growing in some parts of the region (eg Bundaleer Forest). Garlic is grown in the Riverland of South Australia. It requires light, well-drained soils and good quality and quantity of water. It offers the best potential of the herbs listed as the ones with the best prospects. All herbs grown commercially in Australia require irrigation (Farm Diversification Information Service and Sterling 2000) but the climate on the western side of the southern Flinders Ranges is similar to that of areas where garlic is currently being grown. Another plant that occurs naturally in the region and is regarded as a potentially useful medicinal plant is *Santalum acuminatum*, the Quandong or wild peach.

The pharmaceutical, nutraceutical and industrial products market will most likely require partnerships, alliances and integration with large, multinational food, pharmaceuticals and chemical companies. For such an industry to develop in the Northern Agricultural Districts, the most strategic move would be to establish links with these companies, determine what their product needs are and, for products that can be grown in the region, establish supply sources.

The most likely prospects for the Northern Agricultural Districts lie in functional foods from products already being grown in the region and possibly native plant and animal species. The irrigation requirements of herbs limits their opportunities. While Australia does have one of the world's largest holdings of diverse native plants, limited rainfall does present a significant impediment to the development of commercially viable enterprises (Wondu Holdings Pty. Ltd. 2000).

Organic / "Environmentally friendly" products

Products with attributes which infer that they are safe, healthy and do not impact adversely on the environment, are increasingly being demanded by consumers in Europe, Asia and North America. However, products need to carry verifiable assurances that they meet these criteria in order to attract a premium price. The global market for organic produce was around \$US 11 billion in 1997, with growth rates of approximately 20% per year for the past 5 years. In the USA, Japan and several European countries, organic foods are the fastest growing sector of the food industry (McCoy and Parlevliet 2000).

While Australia is recognised as having a good reputation for organic standards and related export regulations, it has been slow to respond to demand for organic produce compared to countries such as the USA and New Zealand. Limited production is seen to be one of the major barriers to capturing a share of the market.

Domestically, Australia's market for organic products is growing relatively slowly in comparison to the United States, Europe and Japan with main outlets being specialty stores and health food shops. Current and potential export destinations are listed in Table 4.

Table 4: Organic products - current export destinations, immediate export opportunities and products with good future export potential
Source: McCoy and Parlevliet 2000

Product	Currently exported to	Major immediate supply shortages in	Good future export potential to
Alfalfa seed		Europe	
Baby food			Japan
Barley	Japan	Europe	
Beef	Japan		Japan, Asia
Biscuit mix	Japan		
Canola			Japan, SE Asia
Canola oil	Japan	Japan	
Chick peas	Holland	USA	
Eucalyptus oil	Europe, USA		
Flour	Japan, Italy		
Flour-premix	Japan		
Honey	Singapore		Europe
Legumes			SE Asia
Meat			Japan
Milk		Japan	Japan
Oats	Switzerland, Japan		Switzerland, Germany
Olive Oil			Japan
Pasta		Japan	
Potatoes			Asia
Triticale	Japan		Japan
Wheat			SE Asia
Wheat-durum	Italy		
Wheat-hard	Austria, Switzerland, Japan, UK Holland, Norway, Sweden	Europe, Holland	Europe, Japan, SE Asia
Wheat-noodle	Japan	Japan	Japan
Wine	Europe, UK, Japan	Japan	Japan
Wool	Germany, Japan		
Wool-coarse		Germany	

A major sector within the organic food industry is cereals and cereal-based products. There are good export opportunities for cereal-based processed foods such as baby foods, breakfast cereals, pasta, noodles, ready meals and flour-based ingredients (McCoy and Parlevliet 2000).

Changing to production of organic produce would represent a major shift for most farmers in the Northern Agricultural Districts, where conventional agricultural systems use significant amounts of pesticides and processed

fertilizers. Most organic cereal cropping systems would be expected to produce significantly less yields and could lead to more land degradation, for example by replacing herbicides with more cultivation. However, there are possibilities that producers could move to Environmental Management Systems (EMS) which enable producers to demonstrate that their production system is geared towards minimal impact on the environment. There are generic standards – the International Standard of Organisation (ISO) 14000 series – that are the basis for Environmental Management Systems. EMS is still in its infancy but there is potential for producers in the Northern Agricultural Districts to set up “earth friendly” farming systems. Many producers have or are adopting land management practices that are reducing erosion, addressing salinity and acidity problems, and encouraging biodiversity on the farm. It is possible that establishing a set of standards for these properties against which environmental management could be assessed, could be used as a marketing tool. Before this can be done, market research would have to establish that there is a viable market for such “earth friendly” products.

The lack of irrigation in the region could perhaps become a marketing tool. Dryland farming could be promoted as an “environmentally friendly” practice as irrigation is being identified in some quarters as land degrading and partly responsible for causing significant environmental problems such as in the Murray-Darling River system.

Native Species

Products from native animal and plant species should be given some consideration because local species are well suited to local climates and soils, and they represent a vast pool of genetic diversity. However, products and markets are in the very early stages of development so there is little commercial production.

Products from animal species such as kangaroo and emu, include meat, hides and oil. Another potential native animal industry is the breeding and rearing of native birds and reptiles for pets. Common Australian birds and reptiles can be up to 60 times more valuable overseas than in Australia however there are major impediments to the development of an export industry because of regulatory restrictions and moral concerns (Wilson 1997).

Native plant species are used to produce food / flavour, medicinal, oil, flower, foliage and timber products.

In the Northern Agricultural Districts, possibly the most significant opportunities are offered in the food / flavour area. Australian Native Produce Industries (ANPI) are exporting condiments such as wild lime honey and soy sauce, lemon myrtle coconut curry sauce, bush tomato chilli sauce and sweet lemon myrtle chilli sauce to leading supermarkets in the United Kingdom. These are sent in container loads and worth around \$250,000 a month (Anon. 2001).

ANPI reports that “the market for many native crops is strong and all indications are that it will continue to grow and be sustainable” (Australian Native Produce Industries 2001). It lists bush tomato, lemon aspen, lemon myrtle, mountain pepper, muntries, native citrus, quandong, ribberies and wattleseed as Australian native food crops with potential for farm-based production.

The quandong (*Santalum acuminatum*) is an indigenous species in parts of the Northern Agricultural Districts. Australian Native Produce Industries estimate that gross returns of \$25,000 / ha could be achieved under irrigation. Dryland plantings at wider spacings with lower yields would give lower returns.

Wattleseed is collected from *Acacia victoriae*, another indigenous species in the region. *Acacia victoriae* tolerates heavy frosts, severe drought, lime and saline soil conditions and lends itself well to dryland cultivation. It is estimated that a gross return of \$9,375 / ha could be achieved (Australian Native Produce Industries 2001).

Other species that do not occur locally but might grow in the region are the bush tomato and desert lime. The bush tomato (*Solanum centrale*) occurs throughout central Australia in rainfall regimes of 150 – 300 mm, usually on red, sandy soils. It is possibly suited to the lighter textured soils of the Northern Agricultural Districts and tolerates drought, frost and soil lime but requires high levels of sunshine for fruit ripening. Estimated gross returns are up to \$19,800 / ha under irrigation.

The desert lime (*Citrus glauca*) occurs throughout the 250 – 500 mm rainfall areas of temperate South Australia, New South Wales and Queensland on a wide range of soils. It is moderately tolerant of frost, drought and soil lime. Under irrigation, estimated gross returns of \$10,000 / ha are achievable (Australian Native Produce Industries 2001).

Growing commercial quantities of suitable quality fruit is not easily achievable. However, an attractive aspect of production is that markets do exist and companies such as ANPI are prepared to offer “buy back” production contracts.

“Niche” products

Niche marketing refers to the selling of specialty products into small markets. Some producers in the Northern Agricultural Districts are already doing this, for example organic alfalfa seed for sprout growing, lucerne hay for gardens.

By its very definition, niche marketing is not for everyone – niche markets are limited and, being relatively small, hard to find. Links need to be built with consumers through the supply chain to determine what the market is seeking. It is important to find ways to support those supplying niche markets because just as Australia’s economy is driven by numerous small businesses, the region’s agricultural development is more likely to grow through the collective result of numerous small activities rather than from one large industry.

The Internet offers opportunities for producers to find out what consumers are looking for, as well as to market produce. Sites such as “Agriwatch” (www.agriwatch.com) inform farmers, traders, processors and service providers about market news, world buying trends and market research on new agricultural initiatives (Anon. 2001 (b)). Agre-com operates a specialist Internet butcher providing quality assured red meat products from a property in the South East (Agre-com Pty. Ltd. -).

The container ship freight route that includes Port Pirie could facilitate the export of containers of produce from the region. The lack of refrigerated containers limits the scope but it still represents a means of shipping grain, dried fruit and vegetables, honey, wool, tinned produce, UHT milk, oil and other commodities.

Fine foods export facilitator, Gullin Gourmet, is based near McLaren Vale. It sources innovative, high-taste food products from South Australia and interstate and helps small-volume companies overcome prohibitive freight costs by sharing shipping containers (Anon. 2001 (a)). This mechanism could also be employed to help Northern Agricultural Districts exporters take advantage of the container ship opportunity at Port Pirie.

Dairy farmers are experiencing the effects of de-regulation of the dairy industry. Assistance packages being offered to dairy farmers could facilitate the development of new products such as cheddar cheese. As dairy cows in the region are primarily fed on grain and hay, and not irrigated pastures like their counterparts in other areas, there is probably a taste difference in their milk that could be exploited. A possible market is the gourmet food stalls at the Central Market in Adelaide, where specialty cheeses or regional produce are sold.

The identification of potential markets is going to rely largely on the entrepreneurial skills of individuals given the relatively small size of these markets. However, support can be given to help producers make links with markets and consumers through industry and government programmes and activities such as “HOFEX”, an international food and beverage trade fair.

Aquaculture

Much of the State’s regional development in recent years has been spurred by aquaculture. A specific project, “Facilitating Growth in Aquaculture within the Mid North, Riverland and Barossa Regions” has been initiated by the Mid North Regional Development Board, Barossa Light Development, Riverland Development Corporation and PIRSA Aquaculture SA. The expected outcomes are the determination of viable aquaculture options for the region and related specific information on costs, infrastructure, species, culture systems and types of aquaculture.

It is expected that results of this project will have relevance to the Northern Agricultural Districts. Therefore, to avoid duplicating effort, it is not being specifically addressed in this plan.

To capitalise on these potential growth areas there are a number of supporting actions that need to occur.

The State Food Plan model for assisting the food industry to become internationally competitive identifies “enabling capabilities” required by industry members. These are:

- Culture of innovation and collaboration
 - access to opportunities
 - grower networks
 - producer / processor alliances
- Targeted market development
 - access to market intelligence on customer / consumer requirements
 - access to efficient logistics services
 - marketing groups
- Innovative product and process development
 - market-driven product specifications
 - access to prototype and testing equipment
 - access to packaging solutions
 - access to engineering solutions
- Innovative demand chain practices
 - food safety
 - best practice benchmarks
 - codes of practice along the chain
 - education and training along the chain
- Ecologically sustainable production
- Strategic investment
 - industry – government partnerships
 - whole of government coordination

(Food for the Future 2000)

Some of these capabilities will need to be developed amongst people in the Northern Agricultural Districts to achieve growth for the region.

There is a number of funding sources available from government agencies to help producers acquire appropriate skills. For example, the Federal Government’s “Farm Innovation Program” is available to encourage the adoption of innovative practices, processes and products in agricultural food, fishing and forestry industries. This represents an opportunity for people to make their businesses more productive and profitable, or to implement a good, new idea. There are also sources of venture capital, export assistance, structural adjustment support and community development funding available through a wide range of programmes. Details of some of these are provided in Appendix II.

Specific actions proposed are:

Develop a “supply chain” culture

This will require changing growers’ mindsets from producing a raw commodity to knowing and understanding all the factors in processing and marketing so that producers think of growing a product that will sit on a shelf.

Help people to help themselves

Producers will have to be more proactive and have greater marketing skills and awareness, as they cannot rely on other people to sell their product for them anymore. Producing a new product will need more than a knowledge of how to grow a new crop – it will also need an understanding of what the product is intended for, where it will be sold and who all the players are between the grower and the consumer.

The “Do Our Own Research” Marketing course developed by the School of Land and Food at the University of Queensland, (Fletcher and Kregor 1998) describes the steps that producers who are looking at new industries need to go through.

The course is designed to help participants develop their own understanding of a new crop industry by asking:

- What is the product?
- What are the product’s uses?
- Is the product traded – where and how much?
- Who buys the product?
- What will be the future demand?
- What is the market price?
- What are the market limitations?
- What are packaging, distribution and product delivery requirements?
- What advertising and promotion will be used?
- How will the product be sold and marketed?
- Who are the players in the value chain?
- What is the market segmentation?
- What is the product life cycle?
- What is the market growth

Producers who undertake this course learn how to answer these questions and so it helps them decide whether or not to invest in a full business plan for a potential enterprise.

People with entrepreneurial skills will continue to lead the way in finding new products and markets. These skills need to be fostered and linked to others to help “get things done”.

Building alliances and networks is an important step for reasons such as collective negotiating, maintaining a consistent supply and quality of goods, and improving efficiency of operations. However, they need to be developed carefully as one poor partner in a joint venture can let the whole team down.

Promote investment in the “good” years

When an industry is doing well, the tendency is to invest more in that industry, often leading to an over-supply and subsequent collapse. The collapse then triggers a search for a new venture, often at a time when high capital costs and high risks associated with a new venture can least be afforded. “Boom” times should be the time to encourage strategic investment elsewhere so that a viable alternative industry or income is established by the time the “bust” comes.

3.3 Infrastructure and Provision of Services

Development planning plays a significant role in determining land use and therefore the development of new industries. Obtaining planning approval through local government can be a lengthy process and a “turn-off” to investors.

While there is recognition that development is important for local and regional economies, residents are often opposed to development near them because of pollution concerns such as noise, dust, increased traffic and odours. There are also concerns about the effect on property values.

People in the Northern Agricultural Districts have expressed enjoyment of quality of life values associated with rural living but are concerned about the loss of services and people from the region. They see the need to stimulate local economies to generate employment and prosperity to maintain services, however industry development sometimes impinges on their quality of life. It is therefore very difficult for local government to balance the needs of electors against the needs of the electorate.

The Wakefield Regional Council has taken steps to recognise that diversification and value-adding to rural industries contributes a significant component to the local economy. It has designated land in the “Primary Industry” zone to allow development of an industrial nature if it “is associated with the processing or handling of primary produce, adds value to the rural activity and would be of benefit to the rural community” (Wakefield Regional Council 1999 p 53).

While other Council’s development plans do not necessarily preclude these “value-adding” activities in their descriptions of land in the “Rural Zone”, it is unclear what planning requirements have to be met for such activities.

Local government controls horticultural development within the region by requiring that proponents must be able to demonstrate that there is sufficient water of suitable quality to provide for the proposed use. Any proposed development of fruit and vegetable enterprises in the Northern Agricultural Districts is subject to planning approval. No development approval is required for irrigation of lucerne, cereal or pulse crops so there is potential to exploit a water resource within current land use planning guidelines.

Infrastructure requirements such as electricity, water and roads, pose a “chicken or egg” dilemma for the region. Investment in an area can be hampered by a lack of infrastructure; infrastructure will not usually be put in place until there is a demand for it.

Reasonable quantities of Murray River water can be accessed from the reticulated system throughout most of the Northern Agricultural Districts although away from the main trunkline, specific needs have to be assessed on a case-by-case basis. Electricity is also available throughout the region however for industrial power demands such as for irrigation pumps or processing plants, the availability of sufficient power is again subject to site-specific scrutiny of proposals by ETSA Utilities. In this situation, investment decisions might be guided by where high-power plants are already operating, for example, centre-pivot irrigation systems are already in use at Baroota. In order to have infrastructure put into new locations, cluster development will probably have to be considered so that a number of businesses can share infrastructure costs.

Upgrades of National Highway 1 and the proposed road-train route from the Barrier Highway through Peterborough and Gladstone to Highway 1 have begun. However, if increased activity were to occur on other roads as a result of a new activity in the area, road improvements would have to occur with the development of that new activity. The roads connecting grain silos to Gladstone and Port Pirie will continue to be important routes for producers as the silos offer opportunities for storage of niche grain products as well as for bulk grain.

Some companies such as AusBulk and Balco, are positioning sites at Bowmans adjacent to the railway line from Adelaide to Crystal Brook. This takes advantage of the close proximity of the railway line and the National Highway, and the proposed Adelaide – Darwin rail link. It is possible that Crystal Brook could also become a strategic site because of its proximity to rail.

Sourcing of containers has reportedly been a problem for hay exporters on Yorke Peninsula. If the opportunity of exporting container loads of produce is to be exploited, then having enough suitable containers on hand will be important. Rail could be a means of collecting containers from other ports.

The export of fresh goods from the region relies on air freight from Adelaide airport. The Port Wakefield abattoirs, market gardeners on the Northern Adelaide Plains and Hills, and seafood producers on Yorke and Eyre Peninsulas could perhaps be better served by an international air strip specifically dedicated to freight, unrestricted by curfews and domestic passenger schedules. This could be located near Highway 1 around Port Wakefield where there are large tracts of relatively low-price land.

Provision of agricultural contracting services is a potential growth area in the Northern Agricultural Districts. There are larger land holdings being managed by fewer people. As land becomes available through sales, lease or share-

farming agreements, there are opportunities for contractors to provide a range of services.

Contracting services are already available for various farming operations – for example, shearing, lamb tailing and mulesing, fencing, crop spraying, crop sowing and harvesting. Contractors can spread the cost of machinery or equipment and gain a greater return to capital by providing a specialist service. Purchasers of these services are saved the costs of investing in equipment and gain the benefits of having skilled operators perform the tasks. In particular, people who buy land but do not necessarily have much agricultural experience, could benefit from having a range of services available to them. This could lead to a more efficient and productive use of resources.

There could be greater utilisation of contractor services through the implementation of a training and accreditation scheme, and the development of a register of contracting services. This could be a web-based service which can be readily maintained and updated. People looking to invest in the region could be offered a range of services from accredited providers. Training for contractors would include legal, financial and business management, as well as in their trade. Recognition of their competencies through an accreditation scheme would provide customers with a guide to the contractors' abilities.

The provision of contracting services combined with development controls could help keep more agricultural land intact for productive use and reduce the amount of land turned over to "hobby" farming. For example, people from outside of the region could still be attracted to buy farming land with a dwelling on it but encouraged to let "professional" farmers farm the land. In this way, new people are attracted to the region but some of the problems associated with "hobby" farming such as weeds, inefficient use of land, complaints about pesticide use and so forth, could be averted. Real estate agents would be important factors in this scenario as their promotion of land sales will influence buyers.

3.4 Building the Community

The development of communities and the skills of people within those communities is essential to build a prosperous region.

The decline in population and the associated decline in services needs to be arrested if the region is to achieve the vision of a thriving region utilising its assets and resources to maximise economic, social and environmental benefits.

There are three main thrusts proposed for the Northern Agricultural Districts:

- Attract new people to the region;
- Keep people in the region, particularly younger people;
- Form an action / lobby group.

A culture needs to be developed of welcoming people, no matter how long their stay or background, to attract new people to the region. While many in the community say they want to see more people living in the area, they probably prefer them to be “people like us”. Members of consultation groups have highlighted the fact that towns are “full”, that is, all the houses are occupied, but there are fewer and fewer people available to take on volunteer roles in the community. There are people living in the region who do not participate in their communities. They are a resource and endeavours should be made to involve them in the community. For example, towns could have “ambassadors” for their town whose job is to welcome new residents, tell them of the community’s facilities and businesses, and help them establish links with others in the community.

Diversity of backgrounds could also present a challenge. For example, there is little racial diversity in the region’s rural community. At the 1996 Census, 96.6% of the population of the region were born in Australia or in mainly English speaking countries (Regional Statistics Unit 2000). In particular, if people from other areas with horticultural experience are encouraged to establish businesses in the region, they could be members of ethnic communities such as the Vietnamese community, and significant efforts will have to be made to make them feel welcome in the area.

Younger people often leave the region to seek training and / or employment. Tertiary studies in particular require young people to move. Initiatives are being investigated to assist those who wish to learn but do not want or are unable to move. For example, the Jamestown Community School has been promoting discussion on the establishment of a “Centre for Lifelong Learning”. This is a concept that focuses on learning, rather than simply education and training, and investigating ways learning can be encountered other than through traditional systems.

Educational institutions are now looking to prepare students for “setting up a business”, not just “getting a job” as it is recognised that encouragement of the sound development of businesses leads to more employment opportunities.

A number of leadership courses are now being offered to members of rural communities and the up-take of these should be encouraged. However, the term “leader” is somewhat deceptive because people who have leadership skills do not always see themselves as leaders. There is also a concern that people who undertake leadership training set themselves up to become victims of the “tall poppy” syndrome. Leaders are members of teams and there could be greater emphasis placed on team skills for communities so that people can learn to work together effectively to achieve change.

There is already a strong community health programme operating in the Mid North which is providing projects and training to assist in the development of community building. Links could be established with this group to develop broader community development programmes.

Members of the community in the Northern Agricultural Districts have identified the need to form an action or lobby group for the region. They believe that such a group is needed to “knock on doors” and put pressure on government to initiate action.

This is partly a reflection of the fact that there has not been a common crisis or rallying point in the region to bring people together and gain attention for the area. Many of the problems encountered by people in the region are being encountered in other locations as well - there is nothing unique in the Northern Agricultural Districts to focus on.

There is also the perception that being a relatively politically stable area, the region tends to be ignored by political parties who are more focussed on appeasing electors in marginal or independent seats.

The purpose of the action group will be to facilitate agricultural development in the region by lobbying government, industry and service providers. There will be links to other groups such as Regional Development Boards, the South Australian Farmers Federation, Agricultural Bureau branches and industry groups but the focus will be on developing opportunities for the Northern Agricultural Districts. It will need to be an independent body, with clear mission and purpose. The drive to form this group will have to come from the community.

4 Recommended Strategies

Outcome	Strategies	Examples of Actions	Drivers
Irrigation opportunities capitalised	<p>Promote use of “off-peak” pipeline water for irrigation</p> <p>Promote sustainable use of water resources</p> <p>Control development of irrigation areas to match water and land resources</p>	<ul style="list-style-type: none"> • Develop comprehensive water management plan for the Baroota area • Assess environmental impacts of irrigation using water from Morgan-Whyalla pipeline • Promote availability of water and land in Baroota and Napperby- Nelshaby region to viticulturists and horticulturalists in other regions and industry groups • Investigate feasibility of aquifer storage at specific sites • Review planning requirements for expansion and development of irrigated areas • Promote best practice technology to optimise water use and protect the environment • Seek funding from National Action Plan for Salinity and Water Quality to investigate efficient use of water resources throughout region 	<ul style="list-style-type: none"> • Regional Development Board • Dept. Water Resources • Local Government • local landholders • real estate agents • industry groups • training providers • NAD Natural Resource Management Committee
Range of uses developed for reservoirs	<p>Analyse economic, social and environmental impact of range of uses for reservoirs</p> <p>Develop uses which provide greatest benefits for region</p>	<ul style="list-style-type: none"> • Identify likely uses and interest groups • Alert interest groups to possible availability of reservoirs • Assess impacts of range of uses • Negotiate use of reservoirs with SA Water • Develop plans for ongoing use and management of the reservoirs 	<ul style="list-style-type: none"> • Regional Development Board • SA Water • Local Government • Community Development Boards • Environment Protection Agency • NAD Natural Resource Management Committee
Increased returns to region from new products and value-adding	<p>Develop people's skills in innovation, marketing, leadership, communication</p> <p>Develop networks and</p>	<ul style="list-style-type: none"> • Promote need for marketing skills • Assist producers to access training • Assist the formation of networks and groups • Encourage entrepreneurs by linking them with people in supply chains and assist them to access funding 	<ul style="list-style-type: none"> • agribusiness training providers • industry groups • farmer groups • producers • Regional Development Boards

	<p>alliances of people in supply chain</p> <p>Inform producers of possible growth areas</p> <p>Investigate growth areas by liaising with potential customers</p>	<p>assistance</p> <ul style="list-style-type: none"> • Promote possible growth areas of agriculture • Approach pharmaceutical & nutraceutical companies to ascertain their supply needs • Assess the market demand for “earth friendly” products • Liase with proponents of aquaculture study to promote findings and relevance to NAD • Investigate potential for dairy products from region such as cheddar cheese, UHT milk, organic milk • Encourage use of Internet as a tool for marketing produce 	
Required infrastructure available	<p>Liase with utilities to develop planning processes</p> <p>Develop air export facilities</p>	<ul style="list-style-type: none"> • Investigate feasibility of international freight airport at Port Wakefield • Develop mechanism for analysing development proposals on a broad “scoping” basis rather than a case by case basis with utilities • Analyse planning zones to assess requirements for diversification and value-adding 	<ul style="list-style-type: none"> • Regional Development Boards • industry groups • Infrastructure SA • Invest SA • Local government
Skilled, co-operative, “can-do” communities providing a wide range of services for the region	<p>Develop skilled, network of contractor services</p> <p>Develop community skills in leadership and community building</p> <p>Develop “welcoming” communities</p> <p>Establish “action” group to foster regional agricultural development</p>	<ul style="list-style-type: none"> • Assess interest in developing training packages and accreditation for contractor services • Develop register of contractor services available in region • Foster training and recruit participants for leadership and community development training • Foster development of “learning communities” • Identify ways of making new people more welcome to the region • Encourage community “ambassadors” to welcome new people to towns and communities • Identify “champions” and people interested in forming group, set up initial meeting 	<ul style="list-style-type: none"> • training providers • workforce providers • Regional Development Boards • town & community Development Boards • Local Government • community members

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APPENDIX I

**A Cost-Benefit Analysis of Using Excess Capacity
in the Morgan-Whyalla Pipeline for
Irrigation Development in the Baroota District**

**Prepared for
PIRSA Rural Solutions**

**as a contribution to the project;
“Facilitating the Development of the Northern Agricultural Districts
Rural Plan”**

**Prepared by
EconSearch Pty Ltd**

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1. Background

In June 2000, a Notice of Restriction under Section 16 of the *Water Resources Act* was placed on the use of groundwater in the Baroota area, restricting the taking and use of water for pre-existing crops at pre-existing rates (PIRSA Rural Solutions 2000).

The aim of this EconSearch analysis was to determine the broad financial feasibility of further irrigation development in the Baroota district using alternative sources of water. Two alternatives were identified:

- using excess capacity in SA Water's Morgan-Whyalla (MW) pipeline; and
- using up to the sustainable yield¹ in SA Water's Baroota reservoir.

Given the restricted yield and reliability of water supplies from the Baroota reservoir², the use of excess capacity in the MW pipeline was considered to be a more viable long-term alternative source of irrigation water for the district. In practice, a combination of the two alternatives could be possible.

The method of analysis used in this study, Cost-Benefit Analysis (CBA), is briefly described in Section 2, key assumptions used in the analysis are detailed in Section 3, the results of the CBA and sensitivity analyses on the results are presented in Section 4 and the key background data are provided in Appendix 1.

¹ The annual volume of water that can be extracted from the reservoir such that the storage level drops below one third in only 1 month in 12. The sustainable yield would not be available for harvest 1 year in 10 (Mary-Anne Young, PIRSA Rural Solutions, pers.comm.).

² The estimated sustainable yield of the reservoir is 1 gigalitre (i.e. 1,000,000 kilolitres) per annum (Nes Fernandez, SA Water, pers. comm.).

2. Method of Analysis

The economic analysis undertaken in this consultancy uses Cost-Benefit Analysis to provide information on the merits of implementing the Baroota irrigation 'scheme' (i.e., 'irrigation option 1') in comparison to not implementing the scheme (i.e., the 'base case').

The economic analysis uses a 20 year time horizon to take account of the expected future flow of benefits and costs under the With (irrigation option 1) and Without (base case) scenarios. However, the benefits and costs that accrue in the future must be discounted so that they are comparable to today's values. The rate at which future values have been discounted in this analysis is 7 per cent.

A standard rate of 7 per cent is currently used by the Commonwealth and most State Governments for public sector project appraisals (SA Treasury 1990). The standard rate used by Government is set at a level to maintain a 'level playing field' between public and private sectors, so that public sector investment does not displace higher-yielding private investment. This method of 'setting' the discount rate is based on the concept of the 'social opportunity cost' of capital. An alternative concept for setting the discount rate is to use the concept of a 'social time preference' rate, which represents society's preference for present as against future consumption.

Once the values for each option have been discounted back to present day terms and summed to produce present values of the total benefits and total costs, the Net Present Value (NPV) of each option can be determined. This is done simply by subtracting the present value of costs from the present value of benefits. With all CBAs the decision rule is that, subject to the objectives and consideration of intangible and equity issues, a project is acceptable if the NPV is equal to or greater than zero.

An alternative measure that uses the same type of information as NPV, is the Benefit Cost Ratio (BCR). This refers to the ratio of discounted benefits and discounted costs and should be greater than one for a project to be feasible.

The third measure used to indicate the feasibility of alternative project options is the Internal Rate of Return (IRR). The IRR represents the discount rate at which the net present value is zero and is a simple test for funding agencies or investors to compare the returns of the proposed investment with those from traditional market investments.

The NPV has been calculated using the standard process specified in Department of Finance (1991, p. 48) as an incremental NPV. That is:

$$\text{NPV} = \text{PV}(\text{'With' scenario benefits} - \text{'Without' scenario benefits}) - \text{PV}(\text{'With' scenario costs} - \text{'Without' scenario costs})$$

and the BCR is calculated as follows:

$$\text{BCR} = \frac{\text{PV}(\text{'With' scenario benefits} - \text{'Without' scenario benefits})}{\text{PV}(\text{'With' scenario costs} - \text{'Without' scenario costs})}$$

The merits of implementing an irrigation 'scheme' in the Baroota district using excess capacity in the MW pipeline have been assessed in terms of NPV, BCR, and IRR.

3. Key Assumptions Used in the Cost-Benefit Analysis

3.1 Area of land available

It was assumed that approximately 500 ha of land suitable for the development of perennial and horticultural irrigated crops was available for development in the Baroota (groundwater) Restricted Area. The soils in this area are predominantly calcareous clay loams on plains with slopes of less than 2 per cent with low sandy rises. Approximately 100 ha of soils of this type are currently used for growing irrigated crops in the Baroota district, predominantly wine grapes, potatoes and a range of other vegetable crops (Mary-Anne Young, PIRSA Rural Solutions, pers. comm).

3.2 Development scenarios

There is a wide range of possible irrigation development scenarios, given the availability of a suitable water supply. For the purposes of this analysis it was assumed that:

- the 500 ha of available land would be developed over a period of 3 years;
- the development would be based on two enterprises only, wine grapes and winter potatoes; and
- the existing land use is predominantly cereal grain growing.

The base case

Although the current land use on the 500 ha of 'available' land is also likely to include grazing activities and non-agricultural uses, the growing of Australian Standard White Wheat was considered to be a reasonable proxy for the base case.

A gross margin for this enterprise (Stock Journal and PIRSA Rural Solutions 2001) was considered to provide a reasonable estimate of the benefits of the base case. An estimate of depreciation on machinery necessary for cropping 500 ha was used as a proxy for the capital costs of the base case. An allowance of \$100 per hectare was included to account for other overhead costs.

Irrigation option 1

Wine grapes

For irrigation option 1 the following assumptions were made.

- An area of 250 ha of wine grapes would be developed over a period of 3 years, 50 ha in year 1 and 100 ha in years 2 and 3.
- Each individual development would be 50 ha in total (i.e. a total of 5 independent operators).
- Each individual development would comprise, by area, 40 per cent Cabernet Sauvignon, 40 per cent Shiraz and 20 per cent Merlot. These are varieties which are currently grown in and are best suited to the region (Madigan 2000).

- The average irrigation water requirement for each variety was assumed to be 4 MI/ha/annum, based on the use of regulated deficit irrigation³ (Tony Thompson, pers comm). This was considerably less than the irrigation requirement for wine grapes in the Baroota Restricted Area as reported by PIRSA Rural Solutions (2000, p.5), that is 8.5 MI/ha/annum. However, given the infrastructure and ongoing costs associated with sourcing water from the MW pipeline, the former estimate was considered to be a more financially feasible option⁴.
- Long-term (20 year) grape prices were estimated to average 70 per cent of levels reported for the 2000 vintage in the 'South Australia Other' region⁵ (Phylloxera and Grape Industry Board of SA 2000). This price differential approximates the medium term (2000/01 to 2005/06) projection for the Riverland indicator price for Cabernet Sauvignon (ABARE 2001).
- Average target yields for the region were estimated to average 12-15 t/ha (Ben Robinson, pers. comm.). This was slightly higher than current average yield for wine grapes in the Baroota district of approximately 10 t/ha (Ben Robinson, pers. comm. and Madigan 2000).
- Gross margins and a development budget for this hypothetical development were based on up-to-date cost information (capital, variable and overhead) and model provided by Philip Taylor (PIRSA, pers. comm.).
- An allowance of \$500/ha/annum for overhead costs (additional to capital costs) was included in the analysis.

Potatoes

For irrigation option 1 the following assumptions were made.

- As for wine grapes, an area of 250 ha of winter potatoes would be developed over a period of 3 years, 50 ha in year 1 and 100 ha in years 2 and 3.
- As for wine grapes, each individual development would be 50 ha in total.
- Each individual development would comprise two 25 ha centre pivots. The capital cost involved with purchasing and installing each centre pivot was estimated to be \$65,000 or \$2,600 per hectare (Phil Caldicott, AusRain and Richard Pocock, Bauer Irrigation, pers. comm.).
- The average irrigation water requirement for winter potatoes in the Baroota Restricted Area was assumed to be 3.5 MI/ha/annum (PIRSA Rural Solutions 2000).
- A gross margin for winter potatoes was derived by EconSearch using an average price for crisping potatoes (Peter Alexander, The Smith's Snackfood Co.Ltd., pers. comm.), an average yield for the Baroota district (Chris Williams, PIRSA Lenswood, pers. comm.) and information obtained from Peter Scholefield (Scholefield-Robinson Horticultural Services Pty Ltd, pers. comm.).
- Long-term (20 year) potato prices were estimated to average 90 per cent of the year 2000 price. This price differential approximates the average decline in real prices received for vegetables in Australia for the period 1982/83 to 1999/00 (ABARE 2000).

³ Regulated deficit irrigation is an irrigation technique designed to reduce water use by stressing the vine without reducing yield. It may also have some impact upon grape quality. There are, however, additional capital costs associated with installing an extra dripper line in each row of the vineyard. This cost has been incorporated in the development budget.

⁴ The trade off between grape yield and grape quality was also considered as part of this analysis.

⁵ This region includes the Southern Flinders ranges as well as Yorke and Eyre Peninsulas.

- An allowance of \$500/ha/annum for overhead costs (additional to capital costs) was included in the analysis.

Irrigation water infrastructure and supply

For irrigation option 1 the following assumptions were made.

- Each individual connection (10 in total) to the MW pipeline would cost approximately \$12,000. This would include the cost of a meter to record supply levels (Nes Fernandez, SA Water, pers. comm.).
- In order to service the area under analysis (500 ha) it was estimated that approximately 10 km of mains at \$50,000 per km would be required. This cost would be spread evenly amongst the 10 individual growers.
- In addition, a quantity of sub-mains would be required to deliver the water from the farm gate to the grape block or centre pivot. It was assumed that each grower would require approximately 1 km of sub mains at \$16,000 per km (Philip Caldicott, pers. comm.).
- It was assumed that water supplied to vineyards by SA Water would be taken at peak rates⁶ (November to April), estimated to be 96 cents per kilolitre (i.e. the state-wide peak supply price of 91 c/kl plus 5c/kl to lease the water from SA Water⁷).
- It was assumed that water supplied to potato growers by SA water would be taken off-peak (May-October) and would cost approximately 56 c/kl to supply, including the cost of leasing the water from SA Water.
- Assuming the 'scheme' has a life of 80 years, the salvage value of shared infrastructure (mains and connections) at year 20 is 75% of the initial investment.

⁶ Aquifer or dam storage and recovery schemes were not considered for this analysis.

⁷ Alternatively, growers could obtain their own Murray water licence thus reducing the supply price by approximately 5c/kl.

4. Results of the Cost-Benefit Analysis

4.1 Overall results

Based on the data and assumptions outlined in Section 3, the use of excess capacity in the MW pipeline for irrigation in the Baroota district (i.e. the Baroota irrigation scheme) was estimated to yield a positive Net Present value (NPV) of approximately \$1.1 million, a Benefit-Cost Ratio (BCR) greater than 1 (1.2) and an Internal Rate of Return (IRR) of 8 per cent. A summary spreadsheet of the calculations is presented in Appendix 1.

Thus, based on the simplifying assumptions (Section 3) and subject to the consideration of intangible benefits and costs (externalities⁸) and equity issues, the scheme has positive financial merit.

4.2 Sensitivity analysis

In order to provide some perspective on these results and to indicate the sensitivity of the results to changes in key variables, sensitivity analyses have been undertaken for:

- wine grape prices;
- potato prices;
- irrigation requirements for wine grapes and potatoes in the Baroota district; and
- initial 'scheme' capital costs.

Each sensitivity analysis was undertaken individually, holding all other variables constant. The range of parameter values used in each sensitivity analysis was chosen to reflect, as best as possible, the uncertainty of that parameter⁹.

Grape price

The sensitivity analysis of the results to changes in the grape price assumption was based on the conservative judgement that long-term (20 year) grape prices in the district were likely to be less, in real terms, than the weighted average price for the district for the 2000 vintage. The base assumption was that long-term grape prices would average 70 per cent of Year 2000 prices.

The results of the analysis (Table 4.1) indicate that, holding all other variables constant, the results of the CBA are very sensitive to the grape price used in the analysis. If the long-term grape prices in the district were to average 90 per cent of Year 2000 prices the scheme would return a significantly higher NPV.

⁸ An externality exists when a production or consumption activity has an indirect effect on other production or consumption activities that is not reflected directly in market prices. Externalities can be positive or negative (e.g. the importation of additional salt into the local hydrological system).

⁹ The range of values were based on historical data, projections and other information available to Econsearch.

Table 4.1 Sensitivity of the CBA Results to Changes in the Grape Price Assumption

	Long-term grape prices as a percentage of Year 2000 prices		
	50%	70% ^a	90%
NPV	-\$4.8m	\$1.1m	\$7.0m
BCR	0.3	1.2	2.0
IRR	0%	8%	14%

^a Base assumption outlined in Section 3.

Source: Econsearch analysis

Potato price

The sensitivity analysis of the results to changes in the potato price assumption was based on the possibility that long-term (20 year) potato prices in the district could be less, in real terms, than those received in the district in Year 2000. The base assumption was that long-term potato prices would average 90 per cent of Year 2000 prices.

The results of the analysis (Table 4.2) indicate that, holding all other variables constant, the results of the CBA are very sensitive to the potato price used in the analysis. If the long-term potato prices in the district remain at Year 2000 prices, in real terms, the scheme would return a significantly higher NPV.

Table 4.2 Sensitivity of the CBA Results to Changes in the Potato Price Assumption

	Long-term potato price as a percentage of Year 2000 price		
	80%	90% ^a	100%
NPV	-\$1.0	\$1.1m	\$3.2m
BCR	0.8	1.2	1.5
IRR	6%	8%	11%

^a Base assumption outlined in Section 3.

Source: Econsearch analysis

Water use

The sensitivity analysis of the results to changes in the irrigation requirement assumptions was based on a high and low water use scenario. For the low water use scenario, it was assumed that water-saving technologies could be employed such that water use was 20 per cent less than the base assumptions, without a yield penalty. For the high water use situation, application rates were based on the target irrigation requirement for grape vines in the Baroota district using full irrigation and actual current irrigation practice in the region for potatoes.

The results of the analysis (Table 4.3) indicate that, holding all other variables constant, the results of the CBA are very sensitive to the water application rates (or irrigation requirements) used in the analysis. If water use could be reduced by 20 per cent (below the base assumptions) the scheme would return a significantly higher NPV.

Table 4.3 Sensitivity of the CBA Results to Changes in the Irrigation Requirements for Wine Grapes and Potatoes

	Irrigation requirements for wine grapes and potatoes		
	High ^a	Base ^b	Low ^c
NPV	-\$11.8m	\$1.1m	\$3.7m
BCR	- ^d	1.2	1.5
IRR	- ^e	8%	12%

^a This scenario is based on the target irrigation requirement for grape vines in the Baroota district using 'full' irrigation, that is 8.5 MI/ha (Tony Thompson, PIRSA, pers. comm. and PIRSA Rural Solutions 2000) and actual potato irrigation practise in the region, that is 6 MI/ha (Bob Halse, SA Water, pers. comm.).

^b Base assumption outlined in Section 3 (wine grapes, 4MI/ha and potatoes, 3.5 MI/ha).

^c Water use 20 per cent below 'base' (wine grapes, 3.2MI/ha and potatoes, 2.8 MI/ha).

^d A BCR less than zero is undefined.

^e An IRR less than zero is undefined.

Source: Econsearch analysis

Capital costs

The sensitivity analysis of the results to changes in the scheme capital cost assumptions was based on a high and low cost scenario. For the low capital cost scenario it was assumed that the distance of both mains and sub-mains required to service the district and the (10) individual growers would be less than the base assumption. Vice versa for the high capital cost scenario.

The results of the analysis (Table 4.4) indicate that, holding all other variables constant, the results of the CBA are not particularly sensitive to the scheme capital costs used in the analysis. If the scheme required 12 km of shared mains, 1.5 km of sub mains per grower and 10 individual connections to the MW pipeline (high capital cost scenario) it would still have positive financial merit.

Table 4.4 Sensitivity of the CBA Results to Changes in the Scheme Capital Costs

	Scheme Capital Costs		
	High ^a	Base ^b	Low ^c
NPV	\$0.9m	\$1.1m	\$1.3m
BCR	1.1	1.2	1.2
IRR	8%	8%	9%

^a 12 km of shared mains + connection fee and 1.5 km of sub-mains per grower (Total cost = \$960,000).

^b Base assumption outlined in Section 3 (10 km of shared mains + connection fee and 1 km of sub-mains per grower) (Total cost = \$780,000).

^c 8 km of shared mains + connection fee and 0.5 km of sub-mains per grower (Total cost = \$600,000).

Source: Econsearch analysis

5. References

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Appendix 1 Summary CBA Calculations for Irrigation Option 1

	Present Value	Year																			
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Discount rate	7%																				

Base Case

Area of Cereals (ha)		500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Total Gross Margin-Cereals (\$'000)	1,397	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
Capital Costs-Cereals (\$'000)	394	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
Other Overhead Costs-Cereals (\$'000)	580	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Benefits-Base Case (\$'000)	423	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37

Irrigation Option 1

Area of Cereals (ha)		500	400	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Area of Wine Grapes (ha)		0	50	150	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
Area of Potatoes (ha)		0	50	150	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
Total Gross Margin-Cereals (\$'000)	253	121	96	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capital Costs-Cereals (\$'000)	71	34	27	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Overhead Costs-Cereals (\$'000)	105	50	40	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Benefits-Cereals (\$'000)	77	37	29	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Gross Margin-Wine Grapes (\$'000)	6,481	0	0	0	-1,392	-1,084	-371	467	1,047	1,342	1,342	1,342	1,342	1,342	1,342	1,342	1,342	1,342	1,342	1,342	1,342	4,286
Capital Costs-Wine Grapes (\$'000)	4,361	478	956	1,769	1,625	155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Overhead Costs-Wine Grapes (\$'000)	1,187	0	25	75	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125
Scheme Infrastructure-Salvage Value (\$'000)	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	233
Benefits-Wine Grapes (\$'000)	993	-478	-981	-1,844	-3,142	-1,364	-496	342	922	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	4,394
Total Gross Margin-Potatoes (\$'000)	2,568	0	54	162	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270
Capital Costs-Potatoes (\$'000)	990	520	260	260	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Overhead Costs-Potatoes (\$'000)	1,187	0	25	75	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125
Scheme Infrastructure-Salvage Value (\$'000)	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	233
Benefits-Potatoes (\$'000)	451	-520	-231	-173	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	378
Total Benefits-Irrigation Option 1 (\$'000)	1,520	-961	-1,183	-2,002	-2,997	-1,219	-350	487	1,031	1,326	1,326	1,326	1,326	1,326	1,326	1,326	1,326	1,326	1,326	1,326	1,326	4,772
Total Net Benefits-Irrigation Option 1 (\$'000)	1,097	-998	-1,219	-2,038	-3,033	-1,255	-387	451	1,031	1,326	1,326	1,326	1,326	1,326	1,326	1,326	1,326	1,326	1,326	1,326	1,326	4,735

Summary Results: Irrigation Option 1

Net Present Value (\$m)	1.1
Benefit Cost Ratio	1.2
Internal Rate of Return	8%

APPENDIX II

Some Sources of Assistance for Agribusiness Development

Programme Name	Description	Contact Web Address
Regional Solutions Programme	Provides funds to enable communities to put into action development projects that will lead to stronger local economies and improved access to services. The Programme aims to work with rural and regional communities facing economic challenges, a declining population due to industry restructuring, a lack of development opportunities, or high levels of unemployment and social disadvantage.	http://www.regionalsolutions.gov.au
Foundation For Regional and Rural Renewal	Philanthropic foundation to help provide a viable social and economic future for Australia's rural and regional communities. The Foundation aims to encourage innovative collaboration between business, community and government in philanthropic endeavours that will boost the economic and social well-being of regional Australia.	http://www.frrr.netconnect.com.au/
Regional Assistance Programme	Generate employment in metropolitan, regional and remote Australia by encouraging local community action to boost business growth and create sustainable jobs. It provides seed funding for innovative, quality projects of value to community.	http://www.dewrsb.gov.au/employment/programmesAndServices/RAP
Dairy Regional Assistance Programme	Provide help to dairy-dependent communities affected by deregulation helping them to generate employment solutions and deal with any social dislocation that may be caused by these changes. Dairy RAP will help these communities by supporting business investment, community infrastructure development and provide community access to training and counselling services	http://www.dewrsb.gov.au/employment/programmesAndServices/DairyRAP

Programme Name	Description	Contact Web Address
Stronger Families and Communities Strategy	Committed to the prevention, early intervention and capacity building initiatives to support and strengthen Australian families and communities. To help communities, the strategy includes new initiatives to encourage potential community leaders, to build up the skills of volunteer workers, to help communities develop their own solutions to problems and promote a “can do” community spirit.	http://www.facs.gov.au
FarmBis	Helps primary producers participate in business management training to assist their business.	http://www.affa.gov.au
Young Rural Leaders Program	Training and study support for young people in rural industries to develop leadership skills.	http://www.affa.gov.au
Financial Counselling Services	Help primary producers, small rural businesses and individuals in rural areas who are experiencing financial hardship and have no alternative sources of advice with: assessment of current financial position and cash flow; budgeting reviews of contracts with lending institutions; loan applications and communication with lenders; information on government assistance schemes; information on Centrelink and other welfare benefits; assistance with family decision making and personal or family counselling.	http://www.affa.gov.au
FarmHelp	Improved welfare support and advice to the farm sector and provision of assistance to farmers who wish to exit the industry.	http://www.affa.gov.au

Programme Name	Description	Contact Web Address
National Women's Funding Programme	Supports women's organisations to run projects on issues important to women.	http://www.osw.dpmc.gov.au
Pooled Development Funds	To increase the supply of equity capital for growing Australian small and medium-sized enterprises. Pooled Development Funds (PDF) are private companies, established under the PDF Act that raise capital from investors and use it to take equity in Australian small to medium-sized enterprises. In return, PDF's and their shareholders are taxed at a lower rate on income generated through PDF activities.	http://www.ausindustry.gov.au
Innovation Investment Fund Program	Designed to promote the commercialisation of Australian research and development, through the provision of venture capital to small, high-tech companies at the seed, start up or early expansion stages of their development.	http://www.ausindustry.gov.au
Start Up Australia	A venture capital company which specialises in the industries of Human Health, Animal Health, Food, Agribusiness and the Environment. The company invests capital from institutional investors in Australian companies with high growth potential and provide a good return on investment.	http://www.start-up.com.au
Investment Feasibility Study Fund	Provides grants to eligible prospective investors to undertake a pre-feasibility or feasibility study of a new investment project to assess its commercial viability.	http://www.isr.gov.au/invest
Commercialising Emerging Technologies	Designed to increase the commercialisation of innovative products, processes and services, by providing individuals, early-stage growth firms and spin-off companies with a tailored package of support to improve their potential for successful commercialisation.	http://www.ausindustry.gov.au

Programme Name	Description	Contact Web Address
New Industries Development Program	Improve Australia's performance in the development and commercialisation of new innovative agribusiness products, services and technologies.	http://www.affa.gov.au
Project By-Law Scheme	Designed to assist proponents of major resource processing and agriculture-based industries whilst providing opportunities for local manufacturing industries to supply capital equipment. The Scheme is primarily directed at major resource processing and agriculture-based projects. However, projects across other industry sectors, apart from infrastructure proposals, may also be eligible for import concessions where capital equipment is technologically superior to that produced in Australia	http://www.ausindustry.gov.au
Export Assistance programs (Austrade)	A range of export assistance programmes to support export initiatives.	http://www.austrade.gov.au
Farm Innovation Program	Assist Australian farmers to adopt innovative production techniques or to diversify into new farming activities.	http://www.affa.gov.au
National Action Plan for Salinity and Water Quality	Address salinity and water quality problems through provision of "block" funding for strategic actions specified in catchment plans and through the provision of technical assistance, skills training, information and data.	http://www.affa.gov.au
Rural Industries Research and Development Corporation	Information on Prospective and Emerging New Industries	http://www.rirdc.gov.au
Grants LINK	Assistance for people seeking grants from the Commonwealth Government.	http://www.grantslink.gov.au
Regional Funding & Grants Register	Registry of funding and grant solutions for community and business initiatives.	http://www.grants.ord.sa.gov.au