

2.1 Background

2.1.1 Irrigation Development in Canterbury

The area of land in Canterbury under irrigation has doubled every decade over the last 50 years. From 1950 to the 1970s, irrigation development was dominated by the development of a number of community irrigation schemes implemented under various government subsidy models. These schemes represent approximately 30 % of the irrigated land area and are dominated by borderdyke irrigation systems. They have generally provided reliable irrigation water supplies to farmers at a relatively low cost – primarily as a result of relatively inexpensive infrastructure and the degree of Government subsidy.

Between 1985 and 1999, the irrigated area in Canterbury was estimated to have increased from 150,000 ha to 350,000 ha, and the Canterbury Regional Council Consents Database in 2001 gave an irrigated area of 438,000 ha. There is an estimated 710,000 ha of irrigable land in Canterbury. As well as intense interest in developing new irrigation supplies, the demand for water for urban and industrial uses continues to grow at about the same rate as population increases.

Historical studies have shown that while farmers have taken up water within these irrigation schemes, they have then only slowly intensified from traditional dryland livestock farming systems. However, over the last 15 years the improved profitability of dairying and dairy support systems, as opposed to other livestock options, have driven land use change to dairying in some of the schemes. In Morven/Glenavy and the Amuri Plains, dairying is by far the dominant land use (up to 90 % in the case of Morven/Glenavy). Land use on the existing irrigated areas is estimated to be 34 % dairying, 36 % other livestock, 27 % arable crops and the remaining 3% made up of horticultural, viticultural and market gardening operations.¹

Canterbury has 58 % of all water allocated for consumptive use in New Zealand, and 70 % of the nation's irrigated land. Water is highly valued by the regional community for a variety of economic, environmental and social reasons. On-going land use change, primarily in the form of irrigation development, continues to increase demand for water abstraction. Irrigation dominates the demand now and for the future. Of the future potential peak demand, 89 % is expected to be for irrigation, 5 % for stock water, 3 % for municipal supplies, 2 % for industrial use, and 1 % for plantation forestry demand.¹

In the 1980's, Government withdrew financial support for the development of community irrigation schemes. Since then, there has been the development of two major community irrigation schemes in Canterbury (Waimakariri 18,000 ha; Opuha 16,000 ha) and one in North Otago (Downlands 20,000 ha). These have been promoted and financed entirely from private investment. These schemes provide water at a higher annual cost than some of the older Government schemes, and because of the relatively high

¹ Canterbury Strategic Water Study, August 2002, Lincoln Environmental, Report 4557/1 prepared for Ministry of Agriculture and Forestry, Environment Canterbury and Ministry for the Environment.

water cost, there has been much more rapid land use change within the areas of these schemes. This change is driven purely by the economics of investment in irrigation both on and off the farm, and current market realities. Participating farmers have been obliged to move to the most profitable land use to both recoup the development costs and ensure financial sustainability.

These recent community developments and individual private schemes have seen the irrigated area resulting from private investment in Canterbury increase considerably.

At the same time, there has been a shift in values within communities towards greater recognition of the Tangata Whenua's values for water, and towards increased protection of the natural environment and maintenance of bio-diversity. As a result, there is increasing conflict over the allocation of water for abstraction and for maintenance or improvement of in-stream values.

In summary, the recent trend in the development of irrigation schemes has been for water to be provided at a much higher cost than historical schemes and for there to be an accelerated trend in intensification of land use and change in land use to higher returning options. Based on the resource consent applications in the pipeline, there is little indication that the interest in new irrigation will diminish, thereby increasing the potential for conflict with environmental interests.

2.1.2 The need for agricultural development

Nationally, agriculture contributes \$20 billion exports and represents 17 % of GDP. The potential contribution of current irrigation proposals to GDP is estimated to be in the order of a further two billion dollars under conservative land use assumptions. This represents a potential annual increase of 1.6 % of GDP, most of which is export generated. In Canterbury alone, farm gate agriculture currently comprises 7 % of GDP. ²

Export income from Canterbury's rural sector accounts directly and indirectly for between 60 and 70 % of Christchurch's economic activity – outstripping export income from the region's IT sector by a factor of 20 to 1. Canterbury farmers spend around \$750 million every year on goods and services provided by Christchurch businesses.

Agriculture is the mainstay of the national economy and will continue to be for the foreseeable future. It is clear that many products produced from farms can be enhanced and transformed by the application of knowledge and skill.

The application of science and technology to generate increased biologically driven economic transformation conjures the exciting vision of Canterbury being internationally renowned as responsive to global demand of natural bio-technology food, nutraceuticals and biomedical products. The health and well-being market segment is one of the fastest growing in the world. Demand for medication through

² Butcher Partners Ltd (2000) Central Plains Water Enhancement: Economic and Social Impact of Proposed Irrigation Schemes.

natural foods as opposed to artificial chemicals represents an outstanding opportunity for our “clean green” sustainable competitive advantage.

2.1.3 The need for water in Canterbury

More than any other area in New Zealand, Canterbury has a vast of flat land that is suitable for irrigation. The region is covered by a range of versatile soils that are capable of high levels of pasture and crop production under advanced management techniques and inputs. An analysis of soil types throughout the Central Plains area has indicated that the area that would be suitable for intensive livestock production is 71,885 ha. The area identified as suitable for arable or intensive cropping purposes is 12,394 ha.

The area has the capability of growing a wide range of temperate grasses and crops, but the major constraint is the relatively low rainfall experienced across the Canterbury Plains and the poor reliability of summer rainfall. Large areas of the Canterbury Plains have long periods during the summer months when soil moisture levels drop below plant wilting point. The severity of drought events, as defined by periods of soil moisture deficit, causes a considerable constraint on the farming systems that can be carried out on the plains.

In the dryland areas of Canterbury, conservative farming practices are carried out to minimise the risk of business failure because of intermittent droughts. This effectively puts a limit on productivity and profitability of farming systems, even in favourable climatic seasons. For many production opportunities, farmers are not able to secure contracts unless they have access to adequate irrigation facilities.

Experience of post 1985 economic drivers away from Central Government organised irrigation schemes to individual land privately funded schemes, plus environmental drivers such as the National Water Conservation Order (Rakaia and Rangitata rivers), the Resource Management Act and other resource management instruments such as Regional Plans, have led to an unprecedented increase in demand on groundwater in Canterbury. Groundwater has been the most easily accessed resource for private irrigation supply.

Now, limits to this resource are readily apparent. Stresses to the environment in terms of falling groundwater levels and low flows in spring fed streams are evident. Regulatory controls are in place across most of the Canterbury Plains (Red Zones) where it is deemed that the allocable limits to water supply from groundwater have already been met.

Due to poor reliability of supply still available from run-of-river sources, there is likely to be minimal new irrigation development sourced directly from surface water. Groundwater development is steadily increasing, but is expected to begin to level off in future due to availability and cost constraints. Without the development of significant water storage to capture surplus surface flows, the actual irrigated area in Canterbury can be expected to plateau well short of the potential irrigated area.

When comparing water demand with water availability on an annual basis, the region has ample water to meet all of its foreseeable abstractive needs and provide for in stream flow requirements. However, significant water storage will be required to meet future water demand – a reality recognised widely by all

stakeholders. The Central Plains Water Enhancement Scheme is founded on appropriate provision of supplemental water storage, to enable irrigation needs to be met, while at the same time protecting and enhancing the environment and providing for the foreseeable needs of future generations.

Without regulating storage, Canterbury is clearly a water-short region, when comparing water demand with availability on a daily or weekly basis. Under typical low flow conditions, the flow allocable for abstraction under the current allocation regimes cannot meet the current peak water demand. With increasing demand for surface water abstractions, it is expected that this shortfall situation will become even more pronounced.

The Central Plains Water Enhancement Scheme meets the water needs of current and future communities at a high level, and puts into practice the knowledge base of many years experience, in a sustainable, best-practice environment for harvesting, delivery, and use of a reliable water supply.

2.1.4 Early attempts to obtain water

An initial step in water resources development in Canterbury was to provide domestic and stock water through the system of water races, designed under the leadership of George Frederick Ritso, who served as county engineer for Malvern during a period late in the nineteenth century. In 1883 he wrote:

"No doubt, in a few years, works will be constructed for the purpose of using the waters of all principal rivers for irrigating the plains, thus making water meadows which will fatten probably five or six sheep, or a proportionate number of cattle to the acre, on land two acres of which will barely support one sheep."

Thus, the concept to provide a community based irrigation scheme to enhance the productive capacity of the Central Plains is not new.

2.2 Scenarios for the Central Plains

2.2.1 Business as Usual

New Zealand's competitive advantage in export agriculture is based on its temperate climate (it can grow things well) and biological isolation (it is a remote island). Primary production will for the foreseeable future provide the backbone to the economy. The technological drivers to add value to our primary produce as well as to increase production and decrease production costs will continue to exist. Therefore the external drivers guiding market behaviour will always create a demand for enhanced and reliable production on the Canterbury Plains. If this scheme does not proceed, the demand for water will not disappear. Failure of this proposal will result in a continued demand for groundwater and the ad-hoc and suboptimal development of surface water and groundwater resources, accompanied by increasing environmental problems.

There are currently small irrigation proposals being promulgated, based on unreliable run-of-river surface water supplies from the Waimakariri and Rakaia Rivers. These represent an unsustainable use of our scarce resources. Run of river schemes without water harvesting are not reliable and are therefore not an efficient use of the surface water resources. Small irrigation schemes do not have the scale or capacity to provide storage. Thus if nothing is done, business as usual will result in increasing and unsustainable use of our already limited resources.

The associated concern with the “business as usual” scenario has to do with the inevitability of continued pressure on the environment. This will take the form of reduced groundwater levels and lower flows in spring-fed streams, and the problem of controlling irrigated land use on many individual properties. The Central Plains proposal will increase groundwater levels in a positive manner and increase flows in spring-fed streams. In addition, the proposed requirement of all Central Plains water users to commit to best-practice in terms of irrigation efficiency and land use as part of the water supply agreement, provides a more effective mechanism to protect groundwater and the environment than the alternative “business as usual” development scenario.

2.2.2 Water Enhancement

Use of surface water from the Rakaia and Waimakariri Rivers, in a manner that provides a highly reliable supply of water, while at the same time providing environmental, social, and recreational benefits is the best course of action for Canterbury.

The Central Plains Water Enhancement project is not solely about providing irrigation water to farmers. The control of the resources will be in community ownership through the Central Plains Water Trust. This provides for a mechanism to ensure that water is used responsibly. The requirements of responsible resource use are currently being developed under a Sustainable Farming Fund project being undertaken by the Ritso Society that will develop the conditions upon which farmers will be able to be supplied with water from the scheme.

The Trust’s objectives are very broad, and therefore enhancement of the environment is also an outcome provided by this project. Groundwater recharge, stream flow enhancement, riparian restoration and recreational development are all achievable outcomes of this project. This will not be possible with ad hoc development of the resources.

2.3 Development of the Central Plains Water Enhancement Scheme

2.3.1 Scheme History

The Central Plains Water Enhancement (CPWE) Steering Committee was established to improve the security and prosperity of Central Canterbury through water management schemes that enhance ecological and recreational values while providing opportunity for agricultural and horticultural diversity. As a result of this initiative it has become clear that there is a great potential benefit to the Canterbury

Region through the co-ordinated and integrated use of the water resources of the Waimakariri and Rakaia Rivers. It has been determined that there is sufficient water in the Rakaia and Waimakariri Rivers, in conjunction with storage, to meet the objectives established by all parties in a sustainable manner. Investigations are continuing in how to maximise these benefits while minimising any adverse environmental effects.

The water enhancement studies can be viewed in two phases. The initial phase was to determine the feasibility of such schemes at a broad level. The second phase was a move towards implementation, including forming new legal entities, undertaking further geological, environmental and survey investigations, preliminary design of the scheme components, and obtaining all the resource consents.

The initial phase has now been completed and the applicants have had to invest considerably more funds to undertake the necessary detailed investigations to support the preliminary design and resource consent applications

2.3.2 Steering Committee

The Central Plains Water Enhancement Steering Committee was established in March 2000 by the Selwyn District Council and the Christchurch City Council . Its purpose was to seek enduring ways to improve the prosperity of the central Canterbury area through water management schemes that enhanced ecological and recreational values while providing opportunity for agricultural and horticultural diversity. The Councils required this Steering Committee to execute feasibility studies into the viability and practicality of water enhancement schemes in the Central Plains area.

Having achieved its objective, the Steering Committee recommended to the Councils that new mechanisms and funding streams were required to carry the project forward. This led to the formation of the Central Plains Water Trust and Central Plains Water Ltd.

It would have been imprudent of the applicants to commit public funds to support all of these activities, without first being satisfied that they have access to a sustainable take of water from the Rakaia and Waimakariri Rivers. To this end, the Trust has already made applications to TAKE water from the Rakaia and Waimakariri Rivers, which in the case of the Rakaia River take was a joint application with the Ashburton Community Water Trust . Without access to the resource, there is no value in proceeding with all of the investigations required for the second phase. This application is primarily designed to provide that certainty.

It must be emphasised that the applicants have a responsibility for the wise spending of public funds. To date funding has been received from the Councils (Christchurch City, Selwyn District and Ashburton District) as well as from Central Government (Ministry for Agriculture and Forestry and Ministry for Economic Development) as well as from other community groups. The applicants are therefore accountable for how these funds are used. As a consequence of the successful prospectus process, CPWL now has direct financial support from the land owners in the Central Plains area to secure the resource consents for the scheme.

2.3.3 Central Plains Water Trust

The Central Plains Water Trust was formally established by the Christchurch City Council and the Selwyn District Council to meet the following objectives:

- To encourage, support and facilitate sustainable development of the water resource of the Regions for the benefit of the inhabitants;
- To provide and facilitate opportunities for agricultural and horticultural diversity in the Regions;
- To provide and facilitate education to the inhabitants of the Regions in relation to water issues affecting the Regions; and
- To appropriately balance enhancement of economic benefits for the Regions with enhancement of ecological, social and recreational values for the Regions.

In pursuit of these objectives, the Trustees will have regard to:

- Appropriate strategic development plans for the water resources of the Regions;
- Whether other sources of funding or support are available, including assistance provided through industry or regional development policies and programmes of local authorities or central government;
- The objectives, roles and activities of any other organisations engaged in economic development activities in the Regions;
- Inter-generational issues to order to promote long term sustainability of the water resources of the Regions; and
- Any other matters that they believe are relevant.

Thus as consent holders for the scheme, the Trust has as its overriding objective continued public ownership of the resource consents and this will ensure long-term community protection of the Region's scarce water resources. The Trust has not been established purely to pursue commercial objectives, it being the intention that such commercial objectives will instead be pursued through Central Plains Water Ltd.

2.3.4 Central Plains Water Limited

Central Plains Water Limited was incorporated on 23 May 2003, and has been formed by the Central Plains Water Trust to investigate, construct and operate a water enhancement scheme, providing surface water for community irrigation to farmers who farm within the Central Plains area.

Central Plains Water Limited undertook a share offer in November 2004 that succeeded in raising funds for the consenting process. Its shareholders are some 400 farmers within the Selwyn District who will take water from a scheme when the proposals come to fruition.

The company was then charged with obtaining the necessary resource consents in the name of the Trust. This is an important feature, in that the resource consents will be held by the Trust, while the scheme will be operated by the company.

The Company has entered into a Memorandum of Agreement dated 5 November 2004 with the Trust. The 2004 Memorandum sets out the respective roles of the Company and the Trust and, in particular, specifies the basis on which the Company will apply for the resource consents on behalf of the Trust (with the Trust subsequently making the resource consents available to the Company for the purposes of constructing and operating the Scheme). This Memorandum is reproduced in Appendix C.

2.4 Summary

There is an overwhelming need for a reliable and sustainable irrigation scheme to enhance production in Canterbury. The Central Plains Water Enhancement Scheme provides the advantages of a highly reliable source of water through the use of water harvesting principles and storage.

Failure to develop this as a community scheme will result in the ad hoc and inefficient development of the scarce water resources of Central Canterbury. This proposal provides an opportunity to enhance the environment through increased groundwater levels, increased stream flows, riparian restoration, recreational development. These applications reflect the efficient use of water through the use of sustainable farming practices, the use of efficient irrigation systems and a regional sharing agreement with the Ashburton Community Water Trust, while at the same time providing for the social and economic wellbeing of the present and future generations.