THE ECONOMIC VALUATION OF WATER FROM THE ASHBURTON RIVER: IMPLICATIONS FOR ALLOCATION

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ABSTRACT

Recent legislative changes in New Zealand allow much greater flexibility in the procedures used by regional authorities to allocate water resources. In certain river catchments where competition for water in alternative uses is high, estimates of the economic value of water could prove useful in designing an allocation scheme. In this study two methods were used to value the water from the Ashburton River. First, a mathematical programming approach to estimate the value of water to farmers in the Ashburton catchment. This value is about $0.62 million. Second, a contingent valuation approach to estimate the value of in-stream flows of the Ashburton to the residents of the Canterbury region. This value is estimated at between $2.47 million and $5.15 million. We assess the methods and the results for implications in allocating Ashburton water between irrigators and in-stream flows.

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INTRODUCTION

The New Zealand economy has gone from being heavily regulated to a more market orientated, less regulated economy. Local government has been restructured and the new Regional Councils have a greater role in managing their local natural resources. As from 1 October 1991, Regional Councils are responsible for land and water management under the Resource Management Act. Prior to this Regional Councils were subject to the Soil Conservation and Rivers Control Act 1941, and the Water and Soil Conservation Act 1967.

Although some natural resource management issues will affect all regions, the significance of the issue and the method of management will vary from region to region. Water is one example of a natural resource that some regions have in abundance to meet current demand. In other regions, including Canterbury, local scarcities occur from time to time. The shortage of irrigation water for the Loburn orchards during the 1988/89 season is a recent example (Yates, 1991).

Water is the focus of this study because of the importance of water to Canterbury. With the changes that have occurred in New Zealand in recent years, there are opportunities that did not previously exist that may potentially benefit the region and assist the region in managing its resources.

This chapter briefly describes the changes that have occurred in resource management law in New Zealand, the changes in local government structure and some of the issues surrounding water in Canterbury, before outlining the organisation of this thesis.

1.1 THE RESOURCE MANAGEMENT ACT

Water management in New Zealand had been established through the Water and Soil Conservation Act 1967 and its subsequent amendments. Water rights were the fundamental tool that was being used. The Act vested the sole right to dam any river or stream, divert or take natural water, or discharge natural water or waste into any natural water, or to use any natural water in the Crown.

Regional Water Boards and Catchment Authorities were established to carry out water management for the Crown. Water rights were issued to individuals or groups that entitles to use the water within the limits specified in the right. Water rights were normally tied to land and could not be transferred to other sites, although they could be transferred with the sale of the land. It was usual for catchments to have a common expiry date so that the supply and demand for water within that catchment could be reviewed. The 1967 Act allowed for the continuation of notified existing lawful uses by granting rights in perpetuity. Traditionally, water had been allocated on a first come first served basis. This resulted in problems when demand for water outstrips supply. A common practice when seasonal flows were low was to restrict water to all users on a

proportional basis (Sharp, 1988).

Bryan Bates (1988) identified several problems with water management in New Zealand. These included inflexible legislation, lack of integration between water and land use management, unclear legislation direction on cultural values, lengthy water right process, and funding.

The Resource Management Act 1991 replaced the 1967 legislation. The purpose of the Act is to promote the sustainable management of natural and physical resources. In the Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while

a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and

b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and

c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.

The 1991 Act promotes an integrated approach to resource management. It specifically encourages the use of economic instruments to manage the use and

quality of natural resources, including water, and provides regional authorities with broader powers than previously existed.

The Resource Management Act replaces the concept of "water right" with "water permit". A resource consent (a water permit is one of many differing resource consents) can be granted for a duration of up to 35 years. The Resource Management Act allows transfers of permits to occur within a catchment, if authorised by a resource management plan. Existing notified uses that were granted in perpetuity will be phased out (Resource Management Act, 1991).

The Act states that regional resource management plans should contain clear and reasonably specific sustainable management objectives or outcomes. Plans should be concerned with both ends (outcomes) and means. The means must clearly serve or enable the ends to be met. The plan must set out what state represents the desired level of sustainable management, determine the means by which the ends are to be achieved and how the system will be monitored (Mulcock, 1991).

These changes allow the Regional Councils greater flexibility in allocating its resources.

1.2 RESOURCE MANAGEMENT AND LOCAL GOVERNMENT REFORM

Local government in New Zealand was reformed in 1989. More than 600 local authorities have be reduced to 94: 13 regional councils, 74 district councils and 7 special authorities. Previously existing city, borough, district, town and country councils, catchment and regional water boards and most other special purpose authorities have been abolished (Department of Statistics, 1990).

All of New Zealand except the Chatham Islands is divided into 14 regions based on water catchment boundaries. They are governed by 13 regional councils and a district council. Gisborne Region is unique in that its district council is also the regional council for that area.

Regional councils took over many of the responsibilities performed in the past by many special purpose authorities. This includes the functions carried out by catchment boards, harbour boards, and pest and noxious plants authorities.

The regional councils will also play an important planning role through their involvement in resource management and its ability to set policy for matters which are of concern for the whole region.

In addition to the regional structure, New Zealand is divided into districts administered by either a district council or a city council. These carry out the day to day local government functions. They provide essential services such as water

supply, roads, sewage disposal and rubbish collection. They also provide amenities such as parks, recreational facilities, libraries and community centres. They continue to carry out district scheme planning (Department of Statistics, 1990).

The mission of the Canterbury Regional Council is to safeguard, enhance, develop and promote the physical, social, economic and cultural environment of the Canterbury region and its people. In pursuit of this mission, the council undertakes (amongst other goals) to

a) manage wisely the resources of the region so as to yield balanced and sustainable benefits to present and future generations;
b) develop policies and plans which will protect and enhance the region's natural environment;
c) encourage, promote and monitor the economic growth and prosperity of the region;
d) undertake all activities in a cost-effective manner and with a minimum of bureaucracy (Canterbury Regional Council, 1990)

Local government now has a greater control in managing its local resources. It is envisaged that schemes such as flood protection and community irrigation schemes will not be funded to the same degree (if at all) by central government. It is expected that funding for any local project will come not from central government, but either from regional council, district council, private funding, or some combination of the above.

A close working relationship between regional councils and district councils is expected. There is some overlap in their roles in such areas as developing a region's resources. The exact nature of the relationship will develop over time and will depend on the individual councils concerned.

There is also potential conflicts between the roles of the regional council. These may occur in such areas as protecting versus developing the region's resources. This will most likely occur due to imperfect information and the different values held by individuals regarding the region's resources.

1.3 THE CANTERBURY REGION

The Canterbury region has large quantities of both surface and ground water and a history of reliance on its water resources to enhance its economic potential. Stockwater races were cut across the plains in 1870. Irrigation has played a major role in the development of the region with both community and private border dyke schemes being developed. Spray irrigation is also widely used especially on the heavier soils which have traditionally been used for cropping or dairy farming, but now increased interest is being expressed in horticultural crops (Ministry of Agricultural and Fisheries, 1980).

Over 150,000 hectares of Canterbury farmland is currently being irrigated from surface water sources, whilst ten major hydroelectricity schemes supply over 30 percent of the nation's electricity requirements (Talbot, 1991).

The rivers in Canterbury are important for recreational use. For example, the Rakaia catchment attracts over 75,000 visits per year. Activities include salmon and trout angling, jet boating, canoeing, ice skating, and picnicking. The salmon angling is considered of exceptional local and regional value, high national value and of significant international value (Bowden, 1983).

The Canterbury rivers have significant scenic and habitat values. Canterbury has many braided rivers (see Figure 1.1). A braided river consists of two or more unstable channels divided by shingle flats and islands. Channels successively divert and rejoin. Canterbury's rivers support a wide variety of wetland bird species, including three endemic birds: the wrybill plover, black-billed gull and black-fronted tern, which have specific adaptions for breeding and/or feeding on riverbeds. For example, the Rakaia River is New Zealand's most important breeding habitat for the wrybill plover, and the Ashburton River is a major habitat for the black-fronted tern and the black-billed gull (O'Donnell and Moore, 1983).

In recent times there has been conflict over water use in Canterbury. A major conflict involved the Rakaia river, regarding the value of the water for in-stream use versus out-of-stream use, mainly irrigation. This resulted in a National Water Conservation Order for the river, which came into force on 10 November 1988. The Conservation Order took over five years to resolve and the full public cost of management planning and the conservation order has ben very high, possibly as much as $3 - $4 million (Mason, 1988).

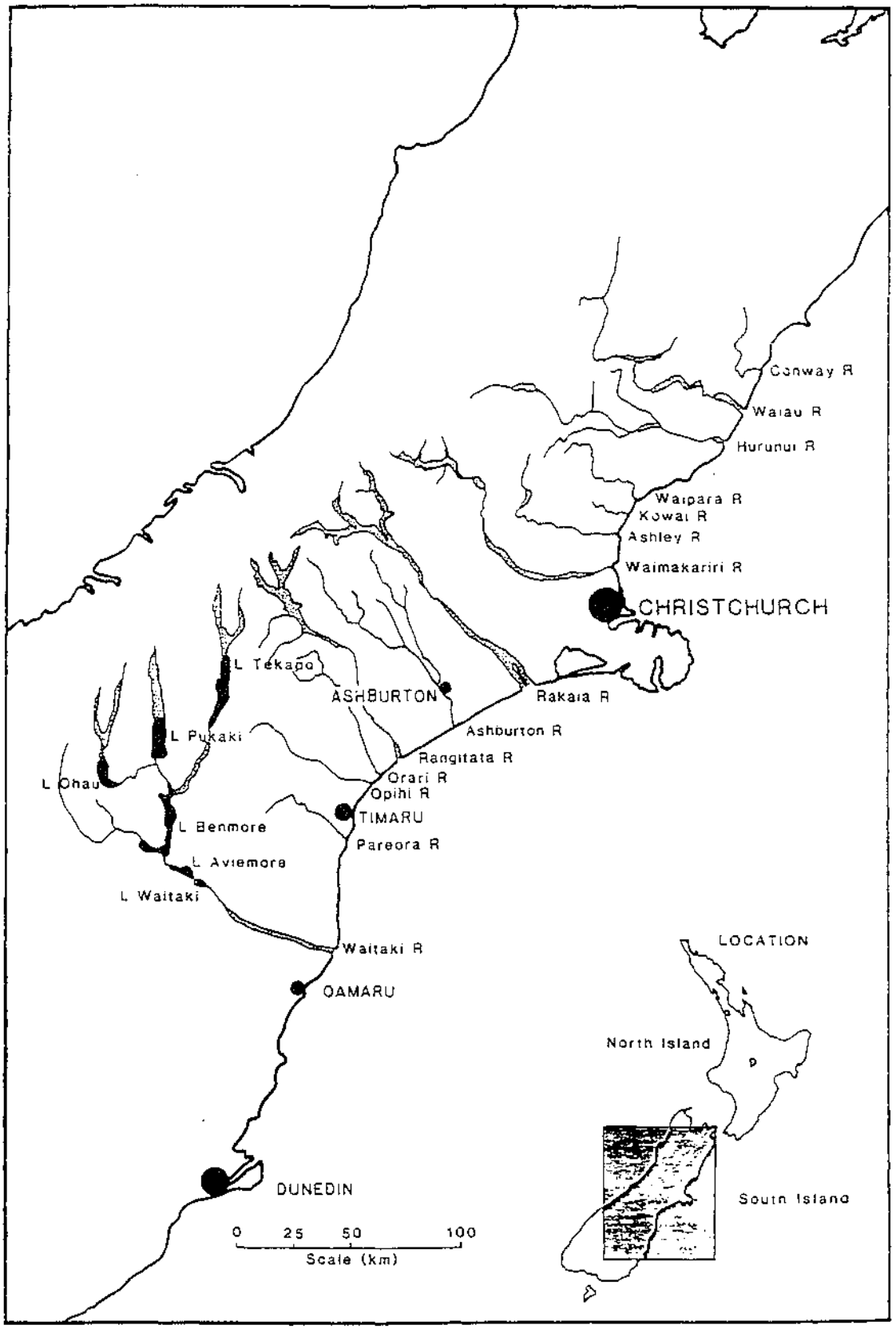
Currently, the management plan for the Ashburton River is being reviewed. The allocation of the water between in-stream and out-of-stream uses is one of the issues that will be addressed. The result of this review and the resulting allocation of water may have economic implications to the region.

The Regional Council has a vested interest in encouraging the economic growth of the region, which may be through the use of its natural resources, but it must also develop policies which will protect and enhance the region's natural environment. From the Council's viewpoint, the region's resources need to be allocated the to ensure the greatest benefit to the region. This may be different from the national interest.

1.4 ORGANISATION OF THIS THESIS

The objective of this study is to estimate the economic impact of water allocation and assess whether the recent changes that have occurred in New Zealand may be beneficial to the region and assist resources managers to more effectively manage the region's water resources. The Ashburton River will be used as a case study.

Figure 1.1 **Braided Rivers in Canterbury**



Source O'Donnell and Moore (1983)