Planning for Intensive Dairying in the Mackenzie Basin

An inquiry into social and collaborative planning

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A thesis submitted in partial fulfilment for the degree of

Master of Planning

University of Otago

Dunedin, New Zealand

1 November 2013

Abstract

Intensive dairying is an essential part of the New Zealand economy and has become one of our most important exports. But what are the potential consequences of intensive dairying development into marginal farmland and rural communities? This research focuses on two planning issues within the context of the MacKenzie Basin. The first is to evaluate the potential social effects that intensive dairying will bring to the Mackenzie Basin, and the second is to evaluate the 'Mackenzie Agreement,' a collaborative planning strategy that has been developed to provide for both dairying and conservation efforts within the Mackenzie Basin. Specifically this research investigates what potential social changes dairying could bring to the Mackenzie Basin with an emphasis on community participation, community cohesion, and overseas migrant worker wellbeing. Researching into the Mackenzie Agreement investigates why there was a need for an alternative planning approach, and evaluates whether the Mackenzie Agreement will be effective in achieving its goals. Following 17 key informant interviews social impacts of intensive dairying highlighted effects on community participation in such areas as sporting teams and voluntary emergency services, and that the MacKenzie Basin is an isolated area with little current infrastructure or support to assist migrant workers. Developing such support tools were broadly identified as favourable by respondents. There was a joint consensus that the Mackenzie Agreement evolved out of the problems associated with the 2009 water consents hearing for the Upper-Waitaki Catchment. Respondents felt that the current planning framework that was used in the hearing was not adequate enough in terms of its processes, cost, and time efficiency to provide management in the Mackenzie Basin. Respondents also had a consensus that the Mackenzie Agreement would not achieve its goals citing a bad process in its creation, problems of funding, and a lack of Government interest and involvement as core reasons.

Acknowledgements

Thanks to …

My supervisor Dr Sarah Mager for her extraordinary supervision skills this year. I appreciate everything you have done for me over the last three years, especially with 380 and your reference that got me into MPLAN in the first place! I took it as an honour being the first MPLAN student you have supervised and I really appreciated your advice and guidance this year.

Claire Freeman, Ros Day and Michelle Thompson-Fawcett for their guidance and teaching over the last two years, you have made the MPLAN program a very enjoyable one to be a part of. A special thanks to you all for also having faith in my ability to complete this program.

The 5C17 office, Ana, Will, Katrina and Laura, safe to say we went through some highs and lows but managed to get through it in the end. A special thanks to Laura for taking that job in Hawkes Bay half way through the year, for some reason I was a little more productive for it but also had a lot less fun!

The other MPlanners for their support and fun times they brought. The last two years have been extremely fun on the social agenda and I look forward to continuing this well into our professional careers.

The rest of the geography department, especially Sandra, Christine and Marlene for your support, guidance, and wisdom over the last five years.

All of those individuals who helped and participated with my research this year I literally would have not been able to do it without you.

My family Mum, Dad, Sam and Amelia for all your support over the last five years. A special thanks to Mum and Dad for all that 'necessary' financial support.

Lastly to my flatmates for the last two years Nils, Mike, Mitch, James 'Bad Man' Kane, Trent, Hamish, Hamish, Adam, and Ryan you lads made the last couple of years an absolute ripsnorter!

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List of Abbreviations

CRPS: Canterbury Regional Policy Statement

DOC: Department of Conservation

Ecan: Environment Canterbury

ha: Hectare

HC: High Court

JMA: Joint Management Agreement

LENZ: Land Environments New Zealand

LINZ: Land Information New Zealand

MfE: Ministry for the Environment

NZEnvc: New Zealand Environment Court

NIWA: National Institute for Water and Atmosphere

NPS: National Policy Statement

NZRMA: New Zealand Resource Management Appeals

RMA: Resource Management Act 1991

RMLA: Resource Management Law Association

1. Introduction

The New Zealand dairy industry has boomed since the 1990s with the number of dairy cows growing from 2.8 million in 1990, to 6 million in 2011 (Statistics New Zealand, 2013b).The increase in numbers is attributed to strong international demand for dairy products, and this has resulted in the price of milk solids increasing, making dairying a more economically attractive option (Statistics New Zealand, 2013b). As a result many land owners have converted from sheep to dairy, and sheep numbers have dropped from 38 million in 2007, to 31 million in 2012 (Statistics New Zealand, 2013a). The conversion of pastoral land to dairy has also seen dairying enter new areas not traditionally associated with dairying bringing new challenges to decision makers and communities.

Regions that have grown up with dairy farming, such as the Waikato and Taranaki, are likely to have a mutual understanding both among the community, and decision makers, about what dairying means for a community both environmentally and socially. District and regional plans in these areas contain provisions regarding dairying that have been developed through first-hand experience and knowledge of dairying in their regions. Having experience and first-hand knowledge helps decision makers draft competent policies that will effectively manage challenges in the area. The same occurs for a community who have grown up with dairying in their area. Being from the dairy farming region of Geraldine, and having family who work in the industry, I understand what being part of a dairying community means. My mother, who worked on a dairy farm, left some mornings at 3 am and returned at 6 pm, meaning us children had to organise ourselves for school, and cook dinner for the family at night. Sporting practices, social gatherings, and community events are often organised around the dairy farming calendar, for example it is common knowledge that herd testing and calving are always extra busy times for dairy farms.

As the dairy boom continues in New Zealand and encroaches into regions not familiar with dairying, and what it brings with it, this mutual understanding between members of the community and decision makers may be lacking, or non-existent. This may result in unforeseen challenges that both decision makers and the community encounter, and

will have to resolve. The focus of this research is to examine the environmental, social and cultural tensions of dairy development in the Mackenzie Basin, an area traditionally associated with high country sheep grazing, but now subject to increasing pressures from possible dairy production.

1.1 Dairy Farming in New Zealand

Before refrigeration almost all of New Zealand's dairy products were sold and consumed locally, with only a small amount of butter and cheese being exported to Australia (Yerex and McGilvary, 1989, Stringleman and Scrimgeour, 2012). New Zealand's first dairy factories were opened in Taranaki and Waikato in the mid-1880s (Johnston *et al.*, 2010, Stringleman and Scrimgeour, 2012). Early factories made both cheese and butter, and by 1884 there were 20 factories In New Zealand (Stringleman & Scrimgeour, 2012). Factories at first used traditional farmhouse methods, and gradually started to adopt larger steam-driven equipment in the early 1890s (Evans, 1995).

Dairy factory expansion continued throughout the twentieth century, however, by 1996 these co-operatives were merged into four companies (Dairy Companies Association of New Zealand, 2013). By 2001 the two largest of those remaining companies merged to form Fonterra, now one of the ten largest dairy companies in the world (Fonterra, 2010). Low land prices and deregulation of export controls led to a boom in dairying and the spread of dairying into irrigated farms on the Canterbury Plains and into Southland in the early 2000s (Clark *et al.*, 2007). By 2007 farms were twice as large as they were in the early 1990s at an average of 118 ha with a stocking rate of 2.7 cows per hectare (Stringleman and Scrimgeour, 2012). By 2007 New Zealand had 4.1 million cows, with an average herd size of 322, twice the average herd size of the early 1990s (Dairy New Zealand, 2013). The average price of a dairy farm in 2005/2006 was $1.8 million, or $21,000 per ha (Stringleman and Scrimgeour, 2012). Adjusted for inflation the price of dairy land doubled between 1992 and 2006 (Stringleman and Scrimgeour, 2012). With the average price of a farm at almost $2 million, plus the cost of cows and dairy company shares, it is difficult for young farmers to acquire properties. Sharemilking is a popular venture for many potential young farm owners. Sharemilking begins with training as a farm worker, followed by responsibility as a herd manager, and then finally cow ownership and sharemilking (Finch, 2013). The farm owner,

usually an older experienced farmer, offers a contract of one to five years to the sharemilker who owns all or part of the herd, operates the farm, and shares the income with the farm owner (Finch, 2013). Sharemilking allows young potential farm owners the opportunity to invest in cows, accumulate expertise and finance, and eventually buy a farm (Finch, 2013). However, herd owning sharemilking is on the decline, especially in the South Island, with key reasons being higher debt levels on farms and more corporate farm ownership (Allen and Waugh, 2012). With the average dairy cow price between $1800-2000, and the average South Canterbury herd being 779 cows, even with only buying 50 per cent of a herd a sharemilker is going to need between $701,100 and $779,000 to be able to get involved in sharemilking in the Mackenzie Basin (Dairy New Zealand, 2013).

1.2 Dairy Farming and the Mackenzie Basin

The environmental pressures around dairying potentially entering the Mackenzie Basin have resulted in decision makers adopting an alternative collaborative planning agreement, 'The Mackenzie Agreement,' that aims to manage both conservation and development in the Basin (Upper- Waitaki Shared Vision Forum, 2013). The Mackenzie Agreement cites that the reasons for its implementation are that existing mechanisms for land management have caused conflict in the community, and that existing mechanisms fail to provide compensation to landowners (Upper-Waitaki Shared Vision Forum, 2013).

This research will consider the factors that caused the Mackenzie Agreement to be drafted and implemented. By further examining the factors that caused the implementation of the Mackenzie Agreement it can be revealed why an alternative planning approach was needed in the Mackenzie Basin. However, just implementing an alternative collaborative approach is not going to address pressures in the Mackenzie Basin there must also be confidence that it will work. Therefore, investigating whether the Mackenzie Agreement can achieve its goals is needed to assess its potential effectiveness.

It is recognised that dairying brings with it not only environmental pressures to new areas, but also social pressures (Wilson and Tipples, 2008). The social challenges that dairying has brought to current rural New Zealand regions is recognised in several

studies, including, Wilson and Tipples (2008), Tipples *et al.* (2010b), Trafford and Tipples (2011), and Rawlinson (2011). However, there is little research into what social challenges intensive dairying may bring to the Mackenzie Basin community. This includes effects on community participation, rural schools, and on community cohesiveness (Wilson and Tipples, 2008, Kearns *et al.*, 2009, Tipples *et al.*, 2010b, Rawlinson, 2011). A standalone social aspect that the dairy boom has brought with it is the introduction of a large number of overseas migrant workers. Migrant workers need to be successfully integrated and made to feel welcome in new communities, and the reactionary approach from current dairying regions to do this is the adoption of migrant support networks. If dairying were to boom in the Mackenzie Basin current trends would permit that migrant workers would follow, along with the possible need of a support network.

1.3 Research Aim and Objectives

The aim of this research is to provide an evaluation of the Mackenzie Agreement, and of the social challenges intensive dairying can bring to the Mackenzie Basin. The knowledge gained from this research will give decision makers a better understanding of the collaborative Mackenzie Agreement, and also of the social issues intensive dairying can bring to the Mackenzie Basin, and the Mackenzie District as a whole.

Too address this aim, the following objectives are posited:

Objective 1: What social challenges could intensive dairying bring to the Mackenzie Basin?

Objective 2: Is there a need to establish a migrant support network in the Mackenzie Basin?

Objective 3: Why was the Mackenzie Agreement implemented?

Objective 4: Can the Mackenzie Agreement achieve its goals?

To answer the research aim, this thesis is divided into seven chapters. The following chapter (Two) puts agriculture in the Mackenzie Basin into context, examines its biodiversity, and the effects intensive dairying could have on this biodiversity. The social dimensions of dairy farming will also described in this chapter. Chapter Three

details the current regulatory framework for biodiversity protection in the Basin, and also examines alternative collaborative planning, and the Mackenzie Agreement. Chapter Four describes the research approach and strategy used for this research. Chapter Five will describe the results that were found in the research. Chapter Six will then provide a discussion on the findings of the research in relation to the literature, and will also discuss future research opportunities. Chapter Seven is the last chapter and will provide the concluding remarks of the research.

2. The Mackenzie Basin

The Mackenzie Basin, also known as the 'Mackenzie Country,' is one of New Zealand's most distinctive environments with the barren semi-arid basin floor contrasted with a backdrop of the steep snow coated Southern Alps and Aoraki Mt Cook. Its history is one of run-holding, and of taming the wilderness. However, changing technologies and an increased world demand for dairy products has put the Basin under potential threat.



Figure 1: A map of the Canterbury region in the South Island of New Zealand showing the location of the Mackenzie District (Source: localcouncils.govt.nz).

The Mackenzie Basin lies within the Mackenzie District, which is situated in Canterbury (Figure 1), in New Zealand's South Island. It is bordered by the Waitaki and Waimate Districts to the South, the Timaru District to the East and North, and the Southern Alps to the West (Figure 2). The Mackenzie Basin comprises of the flat land that lies between Lake Benmore, Lake Pukaki and Lake Tekapo (Figure 2). It is confined by the Ben Ohau Range to the West, the Gammack and Hall Ranges to the North, the Rollesby and Kirkliston Ranges to the East, and the Ohau River and Lake Benmore to the South (Environment Canterbury, 2009).

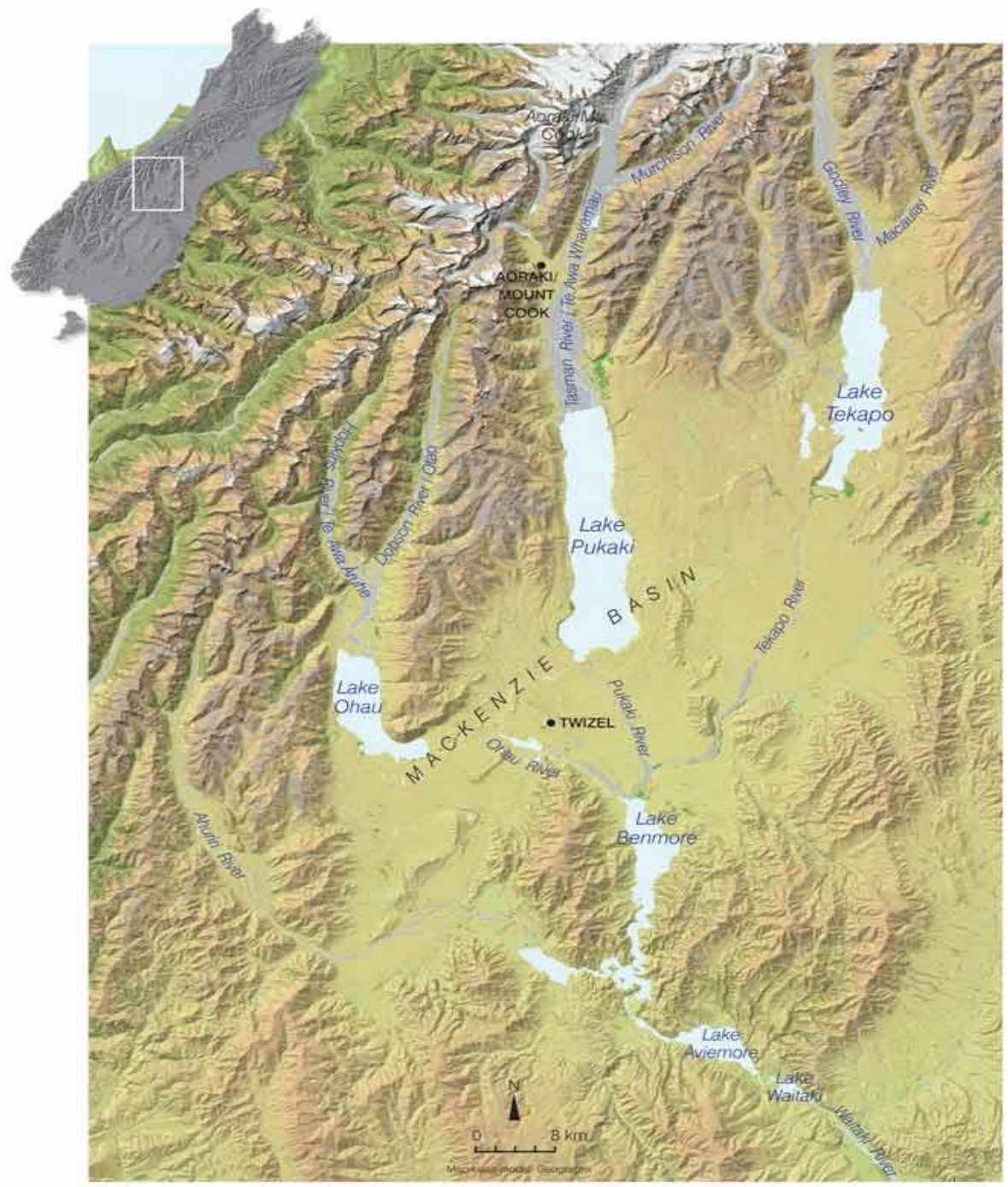

Figure 2: Map showing the boundary lines of the Mackenzie Basin (Source: doc.govt.nz).

It is important to note that the Ohau River (Figure 2) provides the boundary line for the Canterbury and Otago regions, and that the area south of the Ohau River is known as the 'Upper-Waitaki Basin' (Lucas, 2009, McLintock, 1966). There is a common misconception that the Mackenzie Basin contains the area south of the Ohau River, and it is this area where dairy conversion has occurred.



Figure 3: The unique Mackenzie Basin landscape showing Lake Alexandrina in the foreground and Lake Tekapo in the background (Source: travel.msn .co.nz).

With a unique environment at stake (Figure 3), this research investigates the challenges that intensive dairying brings to the Mackenzie Basin. This chapter will critically analyse these different environmental and social challenges. Section 2.1 summarises the history of the Mackenzie Basin, followed by an assessment of the potential impacts increased irrigation could have (Section 2.2). The environmental value of the Mackenzie Basin is examined in Section 2.3, along with the potential impacts dairying could have on it. The social challenges that intensive dairying can bring to agricultural communities are then examined in Section 2.4, and will include the challenges overseas migrant workers are faced with.

2.1 History of the Mackenzie Country:

The Mackenzie Country's name is intimately associated with its farming history and hails from an incident in March 1855 when James McKenzie was apprehended on the inland side of the Mackenzie Pass with 100 stolen sheep (Wilson, 1991, Department of Conservation, 2013). McKenzie was believed to be taking the sheep through the pass

into the previously unknown (to European Settlers) 'Mackenzie Country' (Wilson, 1991, Department of Conservation, 2013a).[1]

The Mackenzie Country is best known today for its links with James Mackenzie and his sheep rustling, along with its run-holding history, but the region was once used extensively by Māori (Wilson, 1991, Department of Conservation, 2013a). Early Māori settlers in South Canterbury hunted moa by lighting fires on the Mackenzie Plains, although this is also believed to have destroyed great areas of totara forest (Wilson, 1991, Department of Conservation, 2013a). Moa hunted on the Mackenzie Plains were transported via raft down the Waitaki River to Māori coastal settlements (Wilson, 1991). Stone was also quarried in the Mackenzie Country by Māori, and in later years the Mackenzie Country was frequented by fowling parties (Wilson, 1991, Department of Conservation, 2013a).

The first sheep runs were taken up in 1856-57 soon after James McKenzie's capture for sheep rustling which alerted settlers to the existence of productive sheep country (Wilson, 1991). The first run established was the Wolds in 1856, and with it came a strong Scottish influence that is still evident in the Mackenzie Country today (Wilson, 1991). Early landowners had no or little experience in sheep farming (Burnett, 1925), but since those inauspicious beginnings the Mackenzie Country has been home to some of New Zealand's most important historical people and events. This includes holding the first New Zealand sheep dog trials in 1869 (Wilson, 1991), and being the inspiration behind the invention of the jet boat by C.W.F Hamilton (Bloxham, 2012), who invented it as a craft suitable for navigating the shallow waterways of the Mackenzie Country.

By the early 20th century, the Mackenzie Country was noted as an area for potential electrical power generation. The New Zealand Government recognised the electricity generation potential of the Waitaki River Basin as early as 1904, but it was not until the 1920s that it began large scale dam projects (Meridian Energy, 2003). This is primarily realised through the construction of the Waitaki Hydro-Scheme that consists of eight power stations from Lake Tekapo to Lake Waitaki, and was a major catalyst for development in the district (Meridian Energy, 2003).

[1] There is a paucity of primary literature on the Mackenzie Country, and as a result this section draws heavily on a small pool of resources.

Hydro-development prompted the development of Twizel township which lies at the base of the Southern Alps halfway between Lakes Pukaki and Ohau (Taylor *et al.*, 2004). It was developed by the Ministry of Works in 1968 to house workers and their families who were to build the Upper-Waitaki Hydro-Scheme, which began in 1970 (Taylor *et al.*, 2004). Twizel stands on part of Ruataniwha Station, purchased by the Government in in 1965, and for 15 years served as the residential base, and administration and construction headquarters of the largest hydro-electric undertaking in New Zealand's history (Sheridan, 1995). Following the approval of the Upper-Waitaki development Twizel began to take shape. By the end of 1972 Twizel had an estimated population of 4,200, with 816 families living in the town, and 509 men living in the single men's camp (Sheridan, 1995). With an estimated 80 clubs and organisations operating in the town the 1970s provided sustained growth, and with this Twizel had the highest birth rate per population and the lowest death rate in the country (Sheridan, 1995). Twizel's population peaked in 1977 with an estimated 6,000 inhabitants (Sheridan, 1995, Taylor *et al.*, 2004). The inhabitants of Twizel were often seasoned dam builders having moved from other hydro-camps such as Otematata, Hawea, and Roxburgh (Taylor *et al.*, 2004, Sheridan, 1995).

The Upper-Waitaki project was scheduled to last 15 years, but began to decline well before this (Sheridan, 1995). The peak years were 1975-78 and provided a sound living for those who were part of the scheme (Sheridan, 1995). The Upper-Waitaki development concluded in 1985 with the completion of the last station, Ohau C (Sheridan, 1995). Over the 15 year period (1970-85) four power stations were constructed, along with two dams, and six canals (totalling 56 km) (Meridian Energy, 2003). On completion of the scheme Twizel faced a dilemma with the original intention being that it would be 'decommissioned,' but as the time of completion drew nearer this original decision was rejected and a campaign to save Twizel began (Taylor *et al.*, 2004, Sheridan, 1995).

The task of saving Twizel began in 1974 when the Twizel Community Council initiated a feasibility study into the possibility of its residents purchasing houses when the scheme closed down (Sheridan, 1995). The big issue at the time was that Twizel was owned by the Government, and it was originally sceptical about how Twizel could be kept as a viable asset as the Government believed there was not enough interest from

people to purchase properties in Twizel (Sheridan, 1995). However, in 1984 Twizel was finally signed over to the Mackenzie County Council when enough deposits had been received for houses in the township (Sheridan, 1995).

The Mackenzie District, as of 2006, had a population of 3,801, down from 4,077 in 1996 (Statistics New Zealand, 2013c), but experienced an influx of families immediately after the Christchurch earthquakes (Bisset, 2011). The district has a spread out population with a relatively similar number of people over and below the age of 50 (Statistics New Zealand, 2013c). New Zealand European is the dominant ethnicity in the district, with 77 per cent of the population identifying themselves as such (Statistics New Zealand, 2013c). 71 per cent of the district is employed full time, with 'managers' being the dominant occupation followed by 'labourers' and 'professionals' (Statistics New Zealand, 2013c). However, the Mackenzie District is a relatively low income area, with 74 per cent of the district earning below $35,000 per annum (Statistics New Zealand, 2013c). The one-family household, 978 of them, is the most common household in the Mackenzie District, and this is followed by the one-person household with 390 (Statistics New Zealand, 2013c).

2.2 Irrigation in the Mackenzie Country

There has been a dramatic expansion in the uptake of irrigation throughout New Zealand as more landowners convert into the water intensive dairy industry (Moot *et al.*, 2010, Jenkins, 2007). In the latest expansion *"modern centre-pivot and lateral-spray irrigation technology* (Figure 4), *have replaced old border-dyke systems, and have also extended onto large areas of previously un-irrigated land"* (Moot *et al*., 2010 p.5).



Figure 4: A lateral irrigator south of Twizel in the Upper-Waitaki Basin (Source: Bruce, 2013 p.1).

Centre pivots require no human intensive labour after installation, and are 15-20 per cent more efficient than other methods providing farmers with reliable and efficient irrigation (Moot *et al.*, 2010). The development of intensive dairying has led to increased irrigation demands through the Upper-Waitaki and Mackenzie Basins where the local climate has dry warm summers (Figure 5), and strong winds that draw out soil moisture (Cooksey, 2008). The Mackenzie Basin is a dry region with 600 mm of annual precipitation, and subject to a rain shadow in the lee of the Southern Alps (NIWA, 2013). Summer temperatures can reach extremes with temperatures in February nearing 40° C, and are aided by the prevailing north-westerly wind ('norwester'), which influences the hot and dry conditions in summer (Cooksey, 2008, Wilson, 1991).

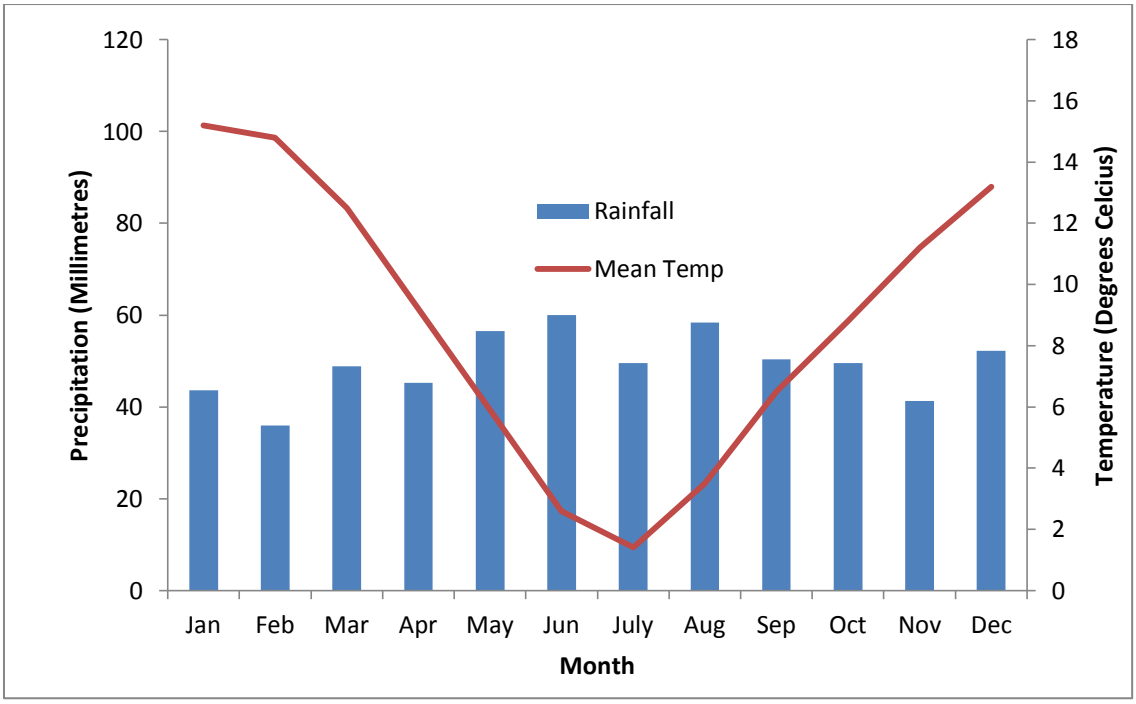

Figure 5: Mean annual precipitation and temperature for Lake Tekapo for the 30 year period 1981-2010 illustrating the little variability in monthly rainfall across the year. The wettest months fall during winter, with the driest months at the end of summer (Source: niwa.co.nz).

The development of the water resources of the Upper-Waitaki Catchment for hydro-power during the 1960s and 1970s presented the opportunity for irrigation of the Mackenzie Basin. In 1966 an interdepartmental committee was set up to analyse the water needs of the farmers in the area (Brown and Harris Consultants, 2005). The judgement to provide water for irrigation was set out in the 1969 'Order in Council,' which was the mechanism that granted water rights to the Minister of Electricity for the Mackenzie District (Brown and Harris Consultants, 2005). The Order in Council allowed for a volumetric entitlement of 172,687,430 m^3 of water for irrigation (Brown and Harris Consultants, 2005).

In 1990 the Electricity Corporation of New Zealand opted not to seek a renewal of the Order in Council, but instead made a claim to the Canterbury Regional Council for 'normal' water rights under the Water and Soil Conservation Act (Brown and Harris Consultants, 2005). These were granted in 1991, and afterwards became water permits on the implementation of the Resource Management Act 1991 (Brown and Harris Consultants, 2005). In 2004 Mackenzie farmers and Meridian Energy entered into

separate negotiations, and in December 2004 agreement was reached to provide water for up to 60 farms (Brown and Harris Consultants, 2005). The provisional deal provided Mackenzie farmers with access to a volume of water, which is similar to that provided by the 1969 Order in Council (Brown and Harris Consultants, 2005). Of the 172,687,430 m^3 of water allocated in this deal, only 15 per cent is being used, irrigating 7,600 ha, and it is estimated that a further 25,000 ha of land could be irrigated with the remaining current allocation (Scott, 2009, Brown and Harris Consultants, 2005).

Webb's (1992) analysis of soils suitable for irrigation within the Mackenzie Basin concluded that there was only 7,930 ha suitable for irrigation in the Basin, with 37,980 ha deemed 'moderately suitable,' and 55,070 ha deemed 'marginally suitable' (Scott, 2009). However, Webb's assessment was done in the 1990s when border-dyke irrigation was primarily used (Scott, 2009). Irrigation in the Upper-Waitaki Catchment primarily uses pivot and lateral irrigators which can range in length from an average of 400 m up to 1200 m, and the longest irrigators in New Zealand are found around Twizel in the Upper-Waitaki Basin (Rawlinson, 2011). With the emergence of centre-pivot and lateral irrigation, and their potential lower application rates, *"it is probable that many of the 'marginally suitable' sites* (identified by Webb) *could be upgraded to 'moderately suitable sites,"* opening up a potential 55,070 extra hectares for irrigation in the Basin (Scott, 2009 p.4).

An analysis of the economic benefits of irrigating a further 25,000 ha of land in the Mackenzie Basin was undertaken by Brown and Harris Consulting in 2005 for the Ministry of the Environment. Their cost and benefit analysis was estimated from a national perspective, while the on-going direct impacts, in terms of employment, population growth, and value added into the economy was done from a regional perspective (Brown and Harris Consultants, 2005). The analysis was done using two scenarios, the first irrigating 25,000 ha taking water only from takes above Ohau A, and the second using any takes above the Waitaki Dam (Brown and Harris Consultants, 2005).

The results for both scenarios showed that fully maximising the water allocated for irrigation in the former Order in Council decision would produce large direct economic benefits from agricultural production in the Mackenzie District (Brown and Harris Consultants, 2005). However, when the opportunity costs of using the water for hydro-

generation are analysed the economic results overall for both scenarios are negative, and this is heightened when the possibility of introducing more hydro-generation in the Lower Waitaki is introduced into the scenario (Brown and Harris Consultants, 2005).

The direct impact in the Basin from irrigating 25,000 ha is estimated to create approximately 300-400 full time jobs in agriculture, increase the population of the Mackenzie District by approximately 800-900 people, and inject approximately $12 to $13 million per annum economically into the district (Brown and Harris Consultants, 2005). In terms of regional benefit, comprising of a region of Timaru, Mackenzie, Oamaru and Waimate Districts, the report estimates that there will be 1.8 to 1.9 indirect jobs for every one direct job created by irrigation (Brown and Harris Consultants, 2005).

2.3 Environmental Value of the Mackenzie Basin

"The abiotic environment of the Mackenzie Basin is one of New Zealand's most distinctive; a high inland basin totally derived from glacial landforms, with a seasonally dry continental climate characterised by short warm summers and some of New Zealand's coldest winters. The climatic extremes of drought, frost, cold, heat, and wind, often combined with shallow, strong and fertile soils, create a highly stressful environment that has given rise to a distinctive stress-tolerant terrestrial indigenous plant and animal biota" (Walker, 2009 p.7).

The Mackenzie Basin contains some of New Zealand's most important ecological communities including many naturally rare ecosystems, nationally important populations of wading birds, and large numbers of threatened flora and fauna (Head, 2011). Many of these ecological communities are linked to the Mackenzie Basin's glacial history that has forged a breath taking landscape that contains many distinctive habitats including kettleholes, moraines, sand dunes, and braided rivers (Land Information New Zealand, 2002). These ecological communities that thrive in, and are dependent on, the semi-arid environment in the Mackenzie Basin are now under threat from proposed intensive dairy farming operations. These operations threaten to transform the environment these species are dependent on through irrigation, ground clearance, habitat destruction, and water contamination (Walker, 2009). The dairy

industry also potentially threatens the environmentally important amenity values that are present in the Basin, with the biggest, and arguably most important being the visual amenity values with the Mackenzie Basin containing a major tourist highway (State Highway 8), that runs through the middle of the Basin (Land Information New Zealand, 2002).[2]

This section will detail the factors that make the Mackenzie Basin such an important environmentally ecological region in New Zealand through looking at flora, fauna, and amenity values within the Mackenzie Basin. It will also look at the current environmental issues surrounding dairy farming, and discuss how these issues will affect the Mackenzie Basin's ecological values.

2.3.1 Ecological History of the Mackenzie Basin

During the Pleistocene (< 2.6 million years ago), glaciation dominated the landscape of the Mackenzie Basin which *"led to the evolution of many species and subspecies that are endemic to the Basin"* (Walker, 2009 p.7). Prior to human occupation the Mackenzie Basin was vegetated with trees such as totara, celery pine and bog pine (Walker, 2009). Conifer scrub covered the basin floor, and short tussock and other small native grasses were abundant in drained soils, and in areas of regular disturbance, such as outwash plains (Walker, 2009). However, with the introduction of high country pastoral practices the Basin is now seen as a semi-arid, tree barren landscape dominated by tussock and low grasses (Land Information New Zealand, 2002).

It could be argued that the loss of biodiversity is a process of evolution as in pre-human times natural fires did alter bio-diversities and landscapes (McGlone and Moar, 1998, Norton et al., 2006). However, *"buried charcoals and pollen suggest natural fires were infrequent and separated by thousands of years before human settlement"* (Walker, 2009 p.8). It is believed that widespread and repeated burning only took place with the arrival of Māori around 800 years ago (McGlone and Moar, 1998). The burning caused extensive loss of established vegetation on the basin floor, and of forest on the surrounding slopes from which there has been small recovery (Meurk et al., 2002, Walker, 2009, Norton et al., 2006, Head, 2011). As a result short tussock grasslands,

[2] There is a paucity of literature on the environmental biodiversity in the Mackenzie Basin, and as a result this section draws on a limited amount of sources.

red tussock grasslands and dry shrubland communities *"expanded dramatically from previously restricted sites on the basin floor, and snow tussock descended down-slope to occupy areas previously under forest and shrubland cover below the regional treeline"* (Walker, 2009 p.8).

European settlement since the 1850s has further contributed to the modification of the Mackenzie Basin landscape with their introduction of grazing stock, along with the introductions of rabbits, and numerous exotic plant species (Walker, 2009, Norton et al., 2006, Meurk et al., 2002). Together Māori and European occupation has caused a general depletion of native ecosystems throughout the Basin (Walker, 2009, Norton et al., 2006, Meurk et al., 2002). Biodiversity changes in the Mackenzie Basin are constant, and many indigenous species that thrived before human occupation are now regionally endangered and decreasing (Walker, 2009). As such these threatened species are concentrated in small areas and have *"reduced regeneration"* as a consequence of factors such as fire, herbivory by hares, sheep, and rabbits, herbicide sprays, drainage, eutrophication, pollution, competition from exotic plant species, habitat modification, and clearance for hydroelectricity, transport, peri-urban settlement, agriculture, and forestry (Walker, 2009 p.9).

2.3.2 Naturally Rare Ecosystems

The Mackenzie Basin contains a high number of naturally rare ecosystems (Head, 2011). Naturally rare ecosystems are ecosystems that were rare *"prior to human colonisation of New Zealand"* (Williams *et al*., 2007 p.119). They take up less than 5 per cent of New Zealand's land area, and often have *"highly specialised and diverse flora and fauna characterised by endemic and nationally rare species"* (Williams *et al*., 2007 p.119).

In April 2007 the Minister of Conservation and the Minister for the Environment issued a statement of national priorities for the protection of rare and threatened native biodiversity on private land (Ministry for the Environment, 2007). National Priority 3 for protecting rare and threatened native biodiversity on private land is to "*protect indigenous vegetation associated with 'originally rare' terrestrial ecosystem types not already covered by priorities 1 and 2"* (Ministry for the Environment, 2007). The Mackenzie Basin is an extremely important part of this strategy as it has the *"highest*

density and area of naturally rare ecosystems of any region in New Zealand of similar size" (Walker, 2009 p.10). Most of the Basin's naturally rare ecosystems are linked to its glacial past, with formations these ecosystems are made up of including moraines, inland outwash surfaces, inland sand dunes, braided rivers, kettleholes and tarns (Head, 2011). An important feature of these is that *"they occur together in continuous mosaics across little-fragmented sequences of largely undeveloped glacial landforms, meaning their ecological context remains relatively intact and connected"* (Walker, 2009 p.11).

Walker (2009 p.11) believes that: *"there is no other place in New Zealand where these rare ecosystems occur to such an extent and in natural sequences in a relatively low lying landscape."* Walker (2009 p.11) goes on to say that almost all naturally rare ecosystems in New Zealand's lowland and montane zones *"have already been lost to development, and the remaining examples are often isolated,"* thus contending that the rare ecosystems in the Mackenzie Basin are of great national significance.

2.3.3 Threatened and at Risk Flora in the Mackenzie Basin

Aside from naturally rare ecosystems the Mackenzie Basin supports various native plant species known to be endangered or uncommon in New Zealand (Head, 2011, Land Information New Zealand, 2002, Land Information New Zealand, 2006). A large number of these endangered species *"occur in rare ecosystems of the more extreme, drier, lower plains environments in the Basin that are predominately proposed for irrigation"* (Walker, 2009 p.12).

The status of New Zealand's flora was most recently examined in 2008 with publication of the *New Zealand Threat Classification Manual* (Townsend *et al.*, 2008). In this manual each plant species is measured against standards to determine its risk of extinction (Townsend *et al.*, 2008). Threatened plant species are those in the 'nationally critical,' 'nationally endangered' and 'nationally vulnerable' categories (Townsend *et al.*, 2008). Species are put in the 'at risk' category if their numbers are declining and / or they have small population sizes (Townsend *et al.*, 2008). The Mackenzie Basin contains 20 'threatened' and 40 'at risk' plants, representing 24 per cent and 23 per cent of the total 'threatened' and 'at risk' floras of Canterbury, and 11 and 6 per cent of the national totals for the categories (Walker, 2009).

Canterbury has the second-highest amount of threatened plant species of any region nationally, largely because of the clearance and complete loss that has occurred through a large proportion of its low-lying and montane lands for agriculture (de Lang *et al.*, 2009). Along with the naturally rare ecosystems described in the previous section, this section highlights again the rarity and importance of the biodiversity within the Mackenzie Basin, and gives a perspective of what there is to lose if environmental degradation was to occur. With this perspective outlined an assessment of the current environmental issues surrounding intensive dairying will be analysed in Section 2.3.4.

2.3.4 Effects of Intensive Dairying on the Environment

A major barrier to the expansion of the New Zealand dairy industry is the lack of water (Nash and Barlow, 2008). The scarcity of water *"limits pasture production and pasture based grazing, and increases costs because of the need to obtain alternative feed supplies"* (Nash and Barlow, 2008 p.232). In order to obtain enough water for increased production irrigation systems are employed with sprinkler irrigators, such as centre pivots, being the preferred option in Canterbury (Tilman *et al.*, 2002). This lack of water is of particular relevance to the Mackenzie Basin which is a semi-arid environment. In order to turn semi-arid land into productive dairy ready pasture large amounts of water needs to be sourced. The majority of the Mackenzie Basin is irrigated via the Upper-Waitaki Hydo Scheme that sources water from above the Waitaki Dam from both river and hydro-canal sources (Department of Conservation, 2010). This hydro-scheme already irrigates 54,600 hectares of land (10 per cent of New Zealand's irrigated land), and puts significant pressure on the flow levels and morphology of braided rivers in the district (Department of Conservation, 2010).

Braided rivers contain and support a number of species within the Mackenzie Basin, including naturally rare ecosystems. Increased water extraction for irrigation reduces the flow of the river which can alter the insect food supply for native birds in the Basin, such as wrybill, black stilts and grey duck (Land Information New Zealand, 2002, Head, 2011, Espie, 2009). Native flora and fauna that live on islands and narrow channels in braided rivers become more at risk from predator invasion if the water levels drop around these channels (Poff *et al.*, 1997, Bunn and Arthington, 2002). Reduced water levels also allow invasive weeds to establish themselves in braided rivers (Poff *et al.*, 1997, Bunn and Arthington, 2002). However, a potentially more

severe threat to water-bodies is the effects of harmful substances and particles entering water-bodies via surface run-off.

2.3.4.1 Surface Run-off

Surface run-off is the flow of water across a land-surface into a waterway (O'Loughlin, 1986, Hillel, 1980). Surface run-off occurs when the application rate (rate that water is being applied to a surface) exceeds the infiltration rate (rate at which soil absorbs water), causing complete saturation (O'Loughlin, 1986, Hillel, 1980). The presence of pollutants, especially nitrogen, phosphorus and faeces, in surface run-off is a major environmental issue for the New Zealand dairy industry (Monaghan *et al*., 2007, Stewart *et al*., 2005). Nutrients, such as nitrogen and phosphorus, are applied to the land as fertiliser in an effort to grow higher yielding crops (Monaghan *et al*., 2007, Dougherty *et al*., 2004) These nutrients are mobilised when run-off occurs, and can aid in processes such as eutrophication (Monaghan *et al*., 2007, Dougherty *et al*., 2004, Smith, 2003, Biggs, 1985).

Eutrophication is a process where a body of water acquires a high concentration of nutrients, which in turn increases productivity (Daniel *et al.*, 1998, Smith, 2003, Biggs, 1985). This can lead to excessive plant growth and decay, creating conditions that favour algae and plankton over other species (Biggs, 1985, Smith, 2003, Daniel *et al.*, 1998). Eutrophication causes a severe reduction in water quality as decomposition consumes oxygen from the water body, leading to an overall decrease in oxygen availability for other aquatic species (Biggs, 1985, Smith, 2003, Daniel *et al.*, 1998). Declining water quality in wetlands, tarns, and braided streams can adversely affect New Zealand's native and rare species (Department of Conservation, 2010). Species present in the Mackenzie Basin that could be affected include 10 native fish species including; the endangered lowland and upland galaxias, the declining long fin eel, and the koaro (native whitebait) (Head, 2011, Department of Conservation, 2010). New Zealand native freshwater fish *"are adapted to cooler waters which have higher oxygen levels"* (Department of Conservation, 2010), which implies that New Zealand native species are more likely to be affected by eutrophication, and the resulting lower oxygen levels in water it causes. Along with eutrophication, surface damage to soils via trampling by cattle can also lead to reduced water quality via surface runoff (Bilotta *et al.*, 2007, Greenwood and McKenzie, 2001, Hubbard *et al.*, 2004).

Trampling by cattle *"damages the surface vegetation and root mat, leaving the soil more exposed and susceptible to erosion"* (Greenwood and McKenzie, 2001 p.36). Erosion allows sediment to be transported and deposited in waterways which can smother gravel beds that are often spawning and nursing areas for fish, and other aquatic species (Hubbard *et al.*, 2004, Greenwood and McKenzie, 2001). This sediment also provides a route for chemical pollutants, such as phosphorus and heavy metals, that are associated with soil particles to be transported into waterways (Bilotta *et al.*, 2007, Greenwood and McKenzie, 2001).

Sediment transportation can smother larvae and eggs of native fish, such as the lowland longjaw galaxias that burrow into gravel to spawn (Department of Conservation, 2010). Insects including mayflies, caddisflies, and giant-mountain and yellow spotted dragonflies also lay their larvae in beds of streams, wetlands, tarns and kettleholes (Department of Conservation, 2010, Walker, 2009). Mackenzie Basin aquatic species are very sensitive to inputs within their catchments, meaning contamination caused via intensive dairy farming could adversely affect individual and connected populations (Department of Conservation, 2010). It has been described how surface runoff can transport harmful substances into waterways, but harmful substances can not only be transported along the land but also through it via a process called 'deep drainage.'

2.3.4.2 Deep Drainage

Deep drainage has become a major environmental problem in New Zealand and has been linked with intensive dairy operations (Maskey *et al.*, 2006). Deep drainage is the flow of water below the root zone of vegetation and into the vadose zone on route to groundwater (Nash and Barlow, 2008, Maskey *et al.*, 2006). Just as surface runoff carries harmful substances and particles across the land, deep drainage aids in the leaching of nitrogen and other potential pollutants, including pesticides, to groundwater systems via transporting them through the soil profile (Aharonson *et al.*, 1987, Nash and Barlow, 2008). This leaching can affect groundwater quality, and can discharge pollutants into neighbouring water bodies such as wetlands, rivers, lakes and tarns (Meisinger *et al.*, 1991, Freitas and Perry, 2012). The Mackenzie Basins soils are very susceptible to leaching as they are shallow and stony (Scott, 2009). Shallow and stony soils are extremely bad at holding water as they do not contain a large amount of

organic matter, and it is this organic matter that holds and absorbs water (Muchena and Hilhorst, 2000).

Deep drainage also contributes to rising water tables, and aids in the associated problem of salinisation (Flowers and Flowers, 2005, Nash and Barlow, 2008, Williams, 1999). Deep drainage aids in the raising of water tables by increasing the amount of water that percolates into groundwater (Asseng *et al.*, 2001). Fluctuating water tables, particularly from upwelling associated with deep drainage, transports water soluble salts from the regolith upward into the upper salt horizons (Rengasamy, 2006). Overtime the accumulation of these salts can create salinisation of soils that adversely affects crop productivity, a process known as 'groundwater associated salinity' (Nulsen and Henschke, 1981, Rengasamy, 2006). Water that is discharged from the landscape brings with it salts that were dissolved below the surface (Rengasamy, 2006, Nulsen and Henschke, 1981). Evaporation and plant transpiration bring the water and salts to the surface and the process intensifies when the water table is nearer to the surface, hence the problem of raising water tables (Nulsen and Henschke, 1981, Rengasamy, 2006).

Decision makers in the Mackenzie Basin should note the problems of salinisation and deep drainage that are widespread in Australia, particularly in the Murray-Darling Basin. Like the Mackenzie Basin, the Murray-Darling Basin is a semi-arid environment that has been transformed into a major agricultural production region (Newman and Goss, 2000). Over extraction of water resources led to 96,000 ha of irrigated land showing visibility of salinisation in the mid-1980s as a result of high water tables (Newman and Goss, 2000, Nash and Barlow, 2008), with projected affected areas of up to 869,000 ha expected by 2015 (Nash and Barlow, 2008).

Managing deep drainage is very difficult as some water is always lost to drainage (Abrol *et al.*, 1988, Martin *et al.*, 1991). Irrigation management for zero drainage is near impossible to achieve as most unstructured soils have preferred flow paths (macropores), that transmit water below the root zone ensuring some deep drainage occurs (Maskey *et al.*, 2006). The amount of water draining below the root zone is a function of soil type, irrigation method, and water application rate and is *"generally the result of unsaturated flow processes which are difficult to measure in the field or to describe quantitatively"* (Maskey et al., 2006 p.238).

2.3.4.3 Land Clearance and Preparation

The dairy industry requires high productive grasses and legumes (such as clover), to maximise milk production (McDowell, 2008). Over-sowing and top dressing introduces larger, faster growing exotic pasture grasses and legumes (McDowell, 2008). Exotic grasses can alter the habitat and displace former communities of native biota and fauna that is reliant on it (Allen and Lee, 2006, Mack *et al.*, 2000). Furthermore, for land to be prepared for the sowing of high yield grasses and legumes that can be efficiently irrigated it must be cleared and flattened. This allows irrigators, such as centre pivots, to easily manoeuvre across the ground to deliver an even distribution of water that does not pond, or run down-hill (Maron and Fitzsimons, 2007). The preparation of the landscape for modern irrigation results in the removal of important habitats including trees, moraines, tarns, low terraces and scarps, and kettleholes (Maron and Fitzsimons, 2007, Land Information New Zealand, 2002). Native species in the Mackenzie Basin that inhabit and rely on these landforms include the native spider *Taieria Erebus*, native beetles *Holcaspis Bidentella* and *Metaglymna Tersatum*, spotted skinks, sparse grasshopper, banded dotterel, darkling beetle, black stilts, grey duck, black billed gull, wrybill, falcon, and tadpole shrimp (Espie, 2009, Land Information New Zealand, 2002, Land Information New Zealand, 2006).

Low water availability is an important feature of semi-arid environments as they support ecosystems that are adapted to water stress (Rogers *et al.*, 2005). Along with fertiliser, irrigation eases *"environmental stress"* on plants, and this encourages exotic species which then out-compete native species under *"low-stress conditions"* (Walker, 2009 p.15). Irrigation is also complemented by fertiliser application, oversowing or direct drilling, cultivation and cropping, all of which remove vegetation cover (Walker, 2009). Overall, *"dryland indigenous ecosystems are transformed into productive, low stress, high nutrient and wholly exotic pastures where very few native species survive"* (Walker, 2009 p.15). This land use change, which includes adding water and nutrients, destroys the indigenous ecosystems and habitats of terrestrial indigenous species by altering the ecological conditions that sustain native flora and fauna (Norton and Reid, 2013, Mack *et al.*, 2000, McDowell, 2008, Walker, 2009). Such habitat destruction including direct loss of habitat, degradation of habitat quality, and fragmentation of the

remaining habitat is a critical cause of population and species extinction worldwide (Hanski, 1998).

It has been established that the Mackenzie Basin contains some of New Zealand's most important ecological features including naturally rare ecosystems, and 24 per cent of Canterbury's threatened flora species. The land preparation needed to establish productive intensive dairying further threatens the rare eco-systems in the Mackenzie Basin. Most of New Zealand's coastal, lowland, and montane environments have already undergone extensive clearance and modification of indigenous ecosystems, and loss has been extreme, more than 90 per cent in environments covering nearly a quarter of total land area (Department of Conservation and Ministry for the Environment, 2000). Past clearance and modification has already created a loss of biodiversity diversity in these areas, making those that are left even more important. New Zealand regions that have undergone habitat loss and modification now hold the majority of listed threatened plant species (de Lang *et al*., 2009). The intensive dairying regions of Southland (67 species) and Canterbury (65 species), stand out as provinces with the greatest numbers of threatened species (de Lang *et al.*, 2009).

One of the suggested popular ways to mitigate the loss of biodiversity caused by intensive dairying is to establish 'protected ecological areas' in the Mackenzie Basin (Espie, 2009). However, this mitigation measure is rebutted by ecological theory that predicts that a species loss accelerates as habitat loss becomes advanced and *"the more fragmented a habitat already is, the greater the number of extinctions caused by added destruction"* (Tilman *et al.,* 1994 p.66). The interpretation being that with the Mackenzie Basin already containing many isolated rare habitats isolating these habitats even more will only accelerate the loss of species.

The environmental effects associated with intensive dairying have the potential to significantly contribute to further ecosystem fragmentation. Ecosystem fragmentation is where *"a large expanse of habitat is transformed into a number of smaller patches of smaller total area, isolated from each other by a matrix of habitats unlike the original"* (Fahrig, 2003 p.490). Habitat loss has large negative effects on biodiversity (Bender *et al.*, 1998). These include ecological and evolutionary functions such as migration, pollination, and dispersal functions being affected (Harrison and Bruna, 1999). An example is that immature insects and amphibians often use different habitats than those

they use as adults (Becker *et al.*, 2007). A successful life cycle requires that the adults can move away from the habitat where they were born to their adult habitats, and then back to the original habitat to lay eggs (Becker *et al.*, 2007). The breakup of habitat prevents this function. Another negative effect is where habitat fragmentation reduces 'the edge effect.' The 'edge' is *"the boundary, or interface between two biological communities or between different landscape elements"* (Bannerman, 1998 p.2). The edge effect around a habitat can protect the ecosystems inside it from transgressions such as cross-boundary irrigation, and fertiliser and exotic seed drift (Fahrig, 2003). When it is reduced it threatens natural processes and allows increased weed invasion (Fahrig, 2003).



Figure 6: Aerial view of the Mackenzie Basin's Quailburn Conservation Area and the Wairepo kettleholes (foreground), adjacent to new intensively developed land uses in November 2008 (Source: Walker, 2009 p.28).

It can be argued that in relation to the issue of the reduced 'edge effect,' Espie (2009)'s mitigation method of creating 'protected ecological areas' in the Mackenzie Basin will only put habitats further in danger. These 'ecological areas' will be surrounded by intensive agricultural, which already occurs in the Mackenzie Basin as seen in Figure 6,

and dairy activity that will create a situation where cross-boundary irrigation, fertiliser and spray drift will pose a significant threat to these 'protected areas.'

2.3.4.4 Amenity- odour, traffic and visual pollution

In a region where farming practices are changing from the traditional practices it is sensible to evaluate the possible effects on amenity values in the region that may arise from intensive dairying. These may include problems with odour, traffic volumes, and visual effects.

Odours on dairy farms can arise from effluent, effluent ponds, and the cows themselves (New South Wales Department of Primary Industries, 2008, Dairy New Zealand, 2012). Factors that can intensify odour include the stocking rate, location of milking / calving sheds, and the location of effluent ponds (New South Wales Department of Primary Industries, 2008). Meteorological conditions and topographical features that govern the transport and dispersion of odours can also affect its impact (Dairy New Zealand, 2012, New South Wales Department of Primary Industries, 2008). The Mackenzie Basin is a flat basin with limited tree cover meaning that odours can travel easily.

The movement of vehicles and farm machinery can affect amenity by creating dust and noise, and also affect the safety of neighbours and the surrounding community (Whangarei District Council, 2011). Intensive dairy farm operations will have frequent movement of milk tankers on their properties. Milk tankers are large vehicles that can create a lot of dust and destruction to roads, especially gravel, when in operation (Whangarei District Council, 2011). As the Mackenzie Basin is a popular tourist destination the tankers will most likely cause congestion. Milk tankers are slow moving vehicles, and along with campervans, tourist buses, and tourists admiring the landscape, they will add to the slow moving traffic in the Basin. Milk tankers also can create safety issues for members of the rural community, such as school children, who often get on school buses early in the morning (Whangarei District Council, 2011). In order to properly mitigate against adverse effects planning must be done to determine appropriate property access and road layout requirements, and an example of this is the Whangarei District Council Rural Development Strategy (Whangarei District Council, 2011).

The main amenity concern for dairying in the Mackenzie Basin is the visual effects intensive dairying will likely have on the Basin. The above sections have highlighted the landscape of the Mackenzie Basin, and the subsequent flora, fauna, and ecosystems that live within it. The sections have also explained how this landscape is expected to change from a unique semi-arid landscape, to the Basin *"looking like the Canterbury Plains"* (Walker, 2009: cited in Gorman, 2009 para. 9).This change from semi-arid, to high production, is set to have a detrimental effect upon visual amenity within the Mackenzie Basin.

Centre-pivot and lateral irrigation will be the main irrigation techniques in the Mackenzie Basin, and will most likely have a profound effect on the natural landscape (Steven, 2009, Lucas, 2009). The natural patterns of ground cover in the Basin that have strong relationships to landforms and soil patterns will be replaced by "*geometric ordered patterns of contrasting colours bearing little relation to landform or soil patterns,"* and this can be clearly seen in Figure 7 below (Steven, 2009 p.10). Centre pivots can be up to 1 km long and they create *"very distinctive cookie cutter shapes on the landscape"* (Steven, 2009 p.10). The geometric imposition upon the landscape will harm the natural landscape character and shift it from a *"timeless natural desert like savannah, to a more environmentally amenable domesticated farmland character, albeit of a large scale agribusiness quality"* (Steven, 2009 p.10). This backs up Walker, 2009's claim of the Mackenzie Basin being turned into a mirror image of the Canterbury Plains.



Figure 7: Centre pivot irrigator crop circles south of Twizel in the Upper-Waitaki Basin (Source: mackenzieguardians.co.nz).

Aside from greening of the environment there will be the introduction of other dairy farming structures upon the landscape (Lucas, 2009). These include fences, pump sheds, irrigators, utility sheds, storage ponds, stock lanes, stock handling facilities, wrapped silage, and animal sheds (Lucas, 2009). Another visual impact will be the change in stock (Steven, 2009). In replace of sheep spread out across an open landscape, there will be concentrated herds of cows (Steven, 2009). These cows are larger, and with dairy cattle being black and white they will be more prominent on the landscape (Steven, 2009).

All of these factors are set to have an effect on perceptions of the Mackenzie Basin as it contains a major tourist highway (State Highway 8), that runs through the middle of it. However, it is likely that New Zealand tourists will be most affected as they would have a more in-depth understanding of what the traditional Mackenzie Basin landscape

contains, and is associated with. Overseas tourists who were not familiar with the Basins traditional history and landscape are less likely to be affected.

2.4 Social Dimensions of Dairying in the Mackenzie Basin

The New Zealand dairy industry is a physically and mentally demanding place of employment. It has been presented to New Zealanders as New Zealand's 'golden goose' in terms of providing economic opportunities, but what social challenges arise in pursuit of profit? The Mackenzie Basin is set to become a new intensive dairying hub in the South Island, but are decision makers prepared for what comes with this. Not only is the environment under threat, but this demanding place of work puts under threat employee, as well as community wellbeing. Physical and mental abuse of workers, social isolation, and weakening community involvement are just some of the social problems associated with today's dairy industry (Cropp, 2010).

Dairy farming in New Zealand carries with it a lot of different social perceptions, and with the proposed intensification of dairying in the Mackenzie Basin it is important to gain an understanding of attitudes towards the industry in its current form. Payne and Stevens (2010) undertook a search of the mainstream media to gauge an understanding of public perceptions on water irrigation on dairy farms in the Canterbury region. The search revealed that there was *"considerable opposition to the increased water use by large dairy farm irrigators on the Canterbury Plains"* (Payne and Stevens, 2010 p.53). Of particular note was the large amount of dissent surrounding the proposed Central Water Plains irrigation scheme, *"which opponents see as backing the needs of the expanding dairy industry and threatening the recreational and environmental assets of the region by harming fisheries and reducing water flows"* (Payne and Stevens, 2010 p.53). The analysis concluded that the public see farming as *"one of the main contributors to almost all of New Zealand's environmental problems*," and that when people are asked about irrigation most New Zealanders think of Canterbury (Payne and Stevens, 2010 p.53).

Adding to this is a 2004 survey undertaken by Lincoln University researchers of 888 people asking them about their perceptions on dairy farming and water management

(Cullen *et al.*, 2006). The survey concluded that the majority of people identified dairy farming as one of the primary causes of damage to water quality in lakes and rivers (Cullen *et al.*, 2006). Along with this it was the majority view that the amount of water taken for irrigation should not increase, and that most people felt water resources were poorly managed (Cullen et al., 2006). Also found was that 50 per cent of people felt farm effluent and run-off management was 'bad' or 'very bad' (Cullen *et al.*, 2006).

Along with their analysis of community perceptions Payne and Stevens (2010) interviewed 27 dairy farm owners in Canterbury regarding their own perceptions of dairy farming. It was concluded that most dairy farmers were *"aware of the concerns around water efficiency and the public view of dairy farming in Canterbury"* (Payne and Stevens, 2010 p.57). Although it was also the view of farmers that the urban population and non-farmers *"did not truly understand the benefits dairy farming brought to the region"* (Payne and Stevens, 2010 p.57). All farmers interviewed thought that they had the right to take water for irrigation, but none of the farmers interviewed believed that they should pay for the water they used for irrigation (Payne and Stevens, 2010). Interestingly although every farmer acknowledged the importance of irrigation to their farming system, a large proportion did not have systems in place to measure the efficiency of their irrigation systems (Payne and Stevens, 2010).

When farmers were asked about the future of water allocation in Canterbury the majority acknowledged that they did not believe it would increase, but this was not because of the scarcity of water, but because as *"the urban voice grew louder"* it would put pressure on farms to limit their irrigation needs (Payne and Stevens, 2010 p.58). Overall perceptions dictate that there is differing views of dairy farming between communities and the farmers themselves, and this an issue to keep in mind for individuals wanting to introduce dairying into the Mackenzie Basin.

2.4.1 Labour Characteristics of the New Zealand Dairy Industry

New Zealand dairy farms have historically been *"small, primarily family enterprises using little or no employed labour"* (Tipples *et al*., 2010b p.5). As dairy farms have become increasingly corporately owned, grown in size, and output and profit prioritised, more outside employment has occurred (Wilson and Tipples, 2008). The emphasis on output and profit in the New Zealand dairy industry has led it to develop a

reputation as a undesirable career choice (Wilson and Tipples, 2008, Trafford and Tipples, 2011). Wilson and Tipples (2008) describe how 46 per cent of dairy farm employees work more than 50 hours per week, a lot higher than the traditional New Zealand working week of between 37 and 40 hours. Adding on to these long hours are the traditionally long rosters that most dairy employees undertake. These can range from the more common 11 days on and 3 off, and 18 days on and 3 off, to the more extreme of 29 days on and 2 off (Tipples *et al.*, 2010a, Cropp, 2010).

The monotonous, labour demanding work, with extremely long hours and rosters has created an industry that cannot attract an adequate number of workers, even though this is a time where youth and general unemployment are around 17.1 per cent and 6.7 per cent (Department of Labour, 2012). Federated Farmers and employment help organisations estimated a shortage of about 2,000 dairy workers in 2010 (Tipples *et al.*, 2010b). With dairying growing rapidly *"labour shortages are likely to compound,"* especially in the South Island, which includes the Mackenzie Basin, where *"expansion has been concentrated"* (Tipples *et al*., 2010b p.2).

Aside from the personal physical and mental toll that these long hours have on individual workers, they also affect the surrounding communities. Research done on agribusiness in the United States found that communities dominated by corporately owned large farms showed a *"lack of social capital, lower quality of life, greater poverty and crime, lack of social services, and lowered civic participation in communities"* (Pew Commission, n.d. p.8). Long days and rosters impact upon an individual's ability to participate in the surrounding community. Tiredness and unsociable hours often result in dairy workers having little energy and time to socialise (Tipples *et al*., 2010b, Trafford and Tipples, 2011, Wilson and Tipples, 2008). In Canterbury it has been found that in emerging dairying areas the number of volunteer fire fighters has been decreasing (Tipples *et al.*, 2010b). It can also be assumed that participation in such community aspects as school fundraisers, sports teams, and other associated community groups decrease as people do not have the spare time to participate. I have had personal experiences in my home town of Geraldine (South Canterbury), in regards to dairy employees not being able to participate in afternoon cricket and rugby games due to their farming commitments. Geraldine once had a thriving cricket club, but over time this has deteriorated as dairy farming has become a

very large part of Geraldine's economy. Dairy employees, who sometimes have only one Saturday off a month, can no longer commit to sport.

Adding to this notion of not being able to participate in the community is the event of dairy farm employees annually moving to new places of employment. June 1st of each year (known as 'Gypsy day') corresponds with the instigation of *"new employment contracts and the new dairy season"* (Rawlinson, 2011 p.34). Census data from 1996 to 2006 was used by Wilson and Tipples (2008) to analyse the movement of dairy farm employees within New Zealand. The South Island has currently the most migration (reflecting its growth), while North Island migration is steady (Wilson and Tipples, 2008). Rawlinson (2011) identifies that the average length of time an employee stays on a farm for is 1.6 years. Motivations for moving include better working conditions, employment disagreements, employment advancement, and working conditions not matching expectations (Rawlinson, 2011).

The continued movement of people within dairy farming regions affects community involvement. Workers who join for example, sports teams, community boards, volunteer fire brigades, and St John's become questionable in terms of their long term commitment to these organisations. This may then create hesitancy within the rest of the community in terms of letting people join / be a part of such organisations. The *Timaru Herald* published an article on the 28/05/13 with the headline *'Tough times for St John,'* which reported that the townships of Twizel and Tekapo, which are in the Mackenzie Basin, are in dire need of volunteer St John Ambulance staff (Markby, 2013). This highlights the pressure already on some emergency services within the Mackenzie Basin. Another area where dairy farm employees create uncertainty is in rural schools. The constant influx and outpour of different families in dairy regions means there is often a large fluctuation of children moving in and out of schools (Kearns *et al.*, 2009). Kearns *et al*. (2009 p.137) established that the Ministry of Education has a "*lack of understanding about the ways that rural communities function, particularly the seasonality of a rural community and how the farming cycle affects the school roll numbers."* This is a concern as school rolls are audited, for which future funding is based, in July, a time when school rolls are sporadically changing (Rawlinson, 2011).

Increasingly New Zealand workers are not willing to be subjected to the long hard hours of the dairy industry, which has led to a number of undesirable workers entering instead (Cropp, 2010). Charles Nimmo, a former Mid Canterbury dairy farm owner, discussed with freelance journalist Amanda Cropp in an interview in 2010 how he had New Zealand employees trash their houses, turn up to work in a drunken state, rob a bank, threaten to kill him, grow marijuana on the farm, and deliberately set fire to farm property (Cropp, 2010). It is this issue of not being able to find sufficient good quality labour that has increasingly led many farm owners to source labour from overseas, such as from South-East Asia.

The dairy industry offers many migrant workers the attraction of higher wages, and a chance to improve the quality of life for themselves, and their families. However, apart from the opportunity to send money back to their families in the form of remittances, migrant workers also come to acquire skills in the dairy industry that they can utilise back home, with Holland, and increasingly South American migrants becoming a big part of this trend (Tipples *et al.*, 2010b). Between 2003 and 2009 the number of permits issued to migrant workers went up from 500 in 2003, to 2000 in 2009 (Callister and Tipples, 2010). This number is set to rise as increasingly New Zealand farm owners are finding migrant workers have better skills, attitudes, and work ethics than New Zealand workers (Macfarlane *et al*., n.d.).

Although these workers are filling important labour gaps in the dairy sector they are often seen as vulnerable and easy to exploit by farm owners, and this can lead to increasing social problems and unrest (Cropp, 2010). In the past local ownership of farms has seen a responsibility for the health and vitality of the community be created, but this deteriorates in the pursuit of profit (Cropp, 2010, Tipples *et al*., 2010b). With profitability at the forefront an ugly disregard for employee's wellbeing has emerged in the New Zealand dairy industry. With the family component removed, farms now see workers as *"vehicles for wealth creation"* that must be maximised in order to get the best returns (Cropp, 2010 p.15).

Freelance journalist Amanda Cropp ran an article in 2010 which largely brought to light the problems that some migrant workers were facing in the New Zealand dairy industry. It highlighted that although many farmers went the extra mile to help their new workers settle in, others fully took advantage of them (Cropp, 2010). Cases include migrants

being forced to buy their own farm bikes, being paid below the minimum wage, living in substandard accommodation, paying for their own wet weather gear, physical and mental abuse, and having to work extremely long rosters (Cropp, 2010). This kind of abuse against Filipino workers (who are a large migrant group in the industry), led Sam Brunzo (A Filipino Mid Canterbury migrant worker) to set up Filipino Dairy Workers in New Zealand Incorporated, an advocacy group for Filipino migrant workers (Cropp, 2010).

Along with on farm mistreatment migrant workers are often likely going to need a lot of support to settle into the surrounding community. Tipples and Lucock (2004) identified that migrant workers want more opportunities to interact with the surrounding community, including better access to English lessons, and help with purchasing and licencing of vehicles. Tipples and Lucock (2004) also found that all nine migrants they interviewed were homesick, and that some did not expect the long hours they encountered in the New Zealand dairy industry. Being accepted into the surrounding community is no doubt an integral part for the success and happiness of migrant workers. But as has been highlighted to do this migrant workers need to be given the opportunity to interact with the wider community, and under current dairy farming culture this is very difficult. If they are to find it hard to participate in community organisations, such as sports teams, and find it hard to establish relationships with people in the community their happiness, and overall productivity could be jeopardised.

2.4.1.1 Social Analysis: Legislation, Guides and Services

In light of the potential influx of migrant workers in reaction to the arrival of intensive dairying within the Mackenzie Basin an analysis needs to be undertaken of the current basic legislation that is in place to protect these migrant workers from adverse harm, and also at the services available to enhance their enjoyment, and acceptance into the local community. Basic civil and political rights for migrants are guaranteed under the New Zealand Bill of Rights Act 1990, and these generally apply equally to citizens and non-citizens (New Zealand Human Rights Commission, 2004). The Human Rights Act 1993 protects all migrants from discrimination as it deals with *"unlawful discrimination on the grounds of race, colour, and national or ethnic origins, the incitement of racial disharmony and racial harassment"* (New Zealand Human Rights Commission, 2004).

All migrant workers are protected by all New Zealand employment law, which includes aspects such as the right to being paid the minimum wage, the right to be paid for public holidays, annual holidays, bereavement, parental leave, and working in a safe environment (Immigration New Zealand, 2013). New Zealand Immigration offers a free guide for dairy farm managers and owners on how to prepare and look out for migrant dairy workers. The guide is very thorough and highlights important areas for farm owners and managers including:

- That all migrant workers are covered by New Zealand employment law,
- migrants might be accustomed to different employer-employee relationships, and therefore management styles might need to be different,
- migrants may have limited experience working on New Zealand dairy farms, and
- migrants have different cultures and values than many New Zealanders (Immigration New Zealand, 2013).

The guide recommends an orientation program for new migrants, and also a welcoming kit that includes local community information, and important contact information, such as community immigration services (Immigration New Zealand, 2013). It highlights that putting on a social event to introduce new workers to the surrounding community is a good idea, as well as letting them know about any social activities, religious groups, or clubs they can join (Immigration New Zealand, 2013). It also highlights that giving them a chance to experience New Zealand and its culture is recommended (Immigration New Zealand, 2013).

Dairy New Zealand provides a 'human resources toolkit' that provides a guide on how to manage a farms labour force, and includes some guidance on how to accommodate and manage migrant workers, but does not provide a standalone document on migrant wellbeing or management (Dairy New Zealand, 2008). Dairy New Zealand's guidance is not as thorough as Immigration New Zealand's guide, but it does reiterate some of its points. It goes through the basics of welcoming and settling new migrants, but also introduces some new ideas such as:

- Explaining the cost of living in New Zealand, and how we use money, e.g. eftpos,

- making sure new migrant's expectations of living and working in New Zealand match what you will be supplying,
- making sure employers inform migrants about such things as entitlements to holidays, employment agreements, pay, parental leave, workplace safety, and
- suggests that employers take a language course (Dairy New Zealand, 2008).

The documentation advocates for farm owners and managers to encourage social interaction within the wider community for not only the employee, but also for their families (Dairy New Zealand, 2008). The Dairy New Zealand website also provides links to Immigration New Zealand, Settlement Support New Zealand, and the Employment Relations Service of the Department of Labour (Dairy New Zealand, 2008).

The Ministry of Social Development administers a program called 'Settling In,' which is a program that aids refugees and migrants to settle into New Zealand (Ministry of Social Development, 2013b). The program is run in 11 regions, including Canterbury (Ministry of Social Development, 2013b). Within the Canterbury context the program originally focused on refugees and migrants residing in Christchurch, but this has expanded to migrants within rural Canterbury (Ministry of Social Development, 2013b). 'Settling In' identifies that it has done a lot of work within the Ashburton District, including helping set up a 'Newcomers Network' which aids in migrant settlement (Ministry of Social Development, 2013b). It has recently put focus on the Culverdon area in Canterbury where large amounts of migrants are being employed on dairy farms (Ministry of Social Development, 2013b). In Culverdon support activities have included events run by a local 'welcoming committee' (with includes representatives from Settling In, Internal Affairs, Hurunui District Council, and North Canterbury Enterprise), and have included the sharing of food, cultural performances, and opportunities to socialise (Ministry of Social Development, 2013b). An online newsletter is also in development to keep people informed and in touch with one another (Ministry of Social Development, 2013b).

'Newcomers Networks' are a variety of networks around New Zealand with the sole purpose of helping settle in new migrants. They assist in helping migrants find homes, jobs, and schools for children (Ministry of Social Development, 2013a). They also aid in challenges such as making friends, understanding new languages, and helping

migrants grow in confidence about being in a new country (Ministry of Social Development, 2013a). The initiative was started in 2004 by Family and Community Services of Social Development, and was born out of the 'Settling In' program (Ministry of Social Development, 2013a). As of 2013 there are Newcomers Networks in 21 locations including Mid Canterbury, the Chatham Islands, Waitaki, and Nelson (Ministry of Social Development, 2013a). However, there is no network at present established in either South Canterbury or the Mackenzie District.

2.5 Conclusion

Overall, in terms of dairying entering the Mackenzie Basin it has been shown that the Mackenzie Basin contains some of the most important and vulnerable ecosystems, flora, and fauna in New Zealand. There is *"nowhere else in New Zealand where naturally rare ecosystems occur to such an extent in low lying areas* (Walker, 2009 p.11)." However, it has been identified that these would come under severe threat from a number of dairying related environmental issues. These threats include habitat destruction through ground clearance and preparation, contamination of waterways through surface runoff and deep drainage, and encouraging the establishment of exotic species through fragmentation. The effects on amenity from intensive dairying have also been shown to pose potential problems, especially visual, where there is concern about the Basin mirroring the Canterbury Plains in appearance. However, the economic analysis taken out has shown that allowing 25,000 ha of intensive irrigation to take place would have significant benefits to the Mackenzie District, including creating 300-400 full time jobs, and injecting $12-13 million per annum into the district.

Apart from differing environmental and economic aspects it has established that dairying in the Mackenzie Basin has the potential to bring social challenges with it. Long working days and rosters have been associated with decreased participation rates in communities, and this has led to deteriorating social structures, and New Zealander's not seeing dairying as an attractive career path. In order to combat this overseas migrant labour has been brought in, but this in turn has created its own social problems with migrant workers being seen as easy to exploit. There are organisations and guides to aid in migrant support, such as Newcomers Networks, that have been adopted by prominent

dairying regions to help migrant employees but no organisation is currently present in South Canterbury or the Mackenzie Basin.

3. Regulatory Framework for Planning in the Mackenzie Basin

The Resource Management Act (1991) (RMA) is New Zealand's cornerstone in terms of legislation for environmental protection.

Sections 5 (1) of the RMA states that the purpose of the Act includes to *"promote the sustainable management of natural and physical resources,"* while Section 5 (2) states that this must be done while *"enabling people to look out for their social, economic, and cultural well-being… while:*

- *(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."*

Sections 5 (1) and (2) of the RMA contain criteria that might conflict within a given case, being the sustainable management of natural and physical resources, and the enablement of social and economic wellbeing. The purpose section of the RMA gives no indication of a hierarchy when it comes to deciding if sustainable management of natural and physical resources should trump economic gain in decision making (Warnock and Suszko, 2013). *New Zealand Rail LTD v Marlborough District Council 1994 NZRMA 70 (HC)*[3] was the first of three important cases to explore the correct approach to interpret Part 2 of the RMA (Lowe, 2010, Warnock and Suszko, 2013).

The *New Zealand Rail* Case detailed an application by the Port of Malborough to build a deep water port in Shakespeare Bay adjacent to the existing port in Picton. New Zealand Rail had existing rail links in Picton, and objected to the application. New Zealand Rail appealed on a number of points of law to the High Court, in particular that the 'preservation of the natural character of the coast' should be protected from 'inappropriate development.' This was because it was a matter in Section 6, and in

[3] Legal decisions used in this section are generic case descriptions sourced from University of Otago Senior Law Lecturer Ceri Warnock's and University of Canterbury Maori and Indigenous Studies Lecturer Dr Abby Suszko's Butterworths Student Companion Resource Management Book 2013.

accordance with the wording of the RMA decision makers should 'recognise and provide for' such matters of 'national importance.'

Greig J rejected this argument. His Honour found that preservation of the coast was 'not an end or an objective on its own but is accessory to the principle purpose.' Greig J also constituted that 'inappropriate development' would have to be decided on a case-case basis, and that coastal protection was *"not to be achieved at all costs"* (Warnock and Suszko, 2013 p.5). In giving this explanation Greig J made an observation that *"had wide ramifications for decision making in resource management law"* (Warnock and Suszko, 2013 p.5). In summary Greig J's judgement meant that Part 2 of the RMA has no hierarchy, *"and should not be interpreted in a strict or pedantic manner"* (Warnock and Suszko, 2013 p.5). The ramifications of this decision, in terms of decision making for intensive dairying in the Mackenzie Basin, means that if an aspect of intensive dairying, or the environment, were to be challenged in court there is no preference for environmental, social, or economic values to come out on-top, but instead they have to be evaluated evenly on a case-by-case basis.

In another finding *Trio Holdings LTD v Malborough District Council 1997 NZRMA 97 (PT)* is the precedence case for where social and economic wellbeing overrides outright environmental protection. This was an application for resource consent to establish a marine farm in the Marlborough Sounds. Trio Holdings LTD proposed growing a type of sponge from which metabolics could be extracted that might be useful in anti-cancer drugs. There were adverse effects from the proposal, but the tribunal in granting the consents reaffirmed that the coastal environment *"was not to be protected at all costs"* (Warnock and Suszko, 2013 p.6). The tribunal focused on the word 'mitigate' in Section 5(2) (c), and the inclusion of 'mitigate' suggested to them that some environmental degradation was acceptable in promoting the wider meaning of 'sustainable management' (Lowe, 2010, Warnock and Suszko, 2013). In terms of the implications this may have on dairy development in the Mackenzie Basin this decision highlights that if the economic and social benefits are great, then some environmental degradation can be accepted in granting a decision.

Finally, the findings of the case of the *North Shore City Council v Auckland Regional Council 1997 NZRMA 59 (NZEnvC)* reinforces that an overall broad judgment is required when interpreting Section 5 (Lowe, 2010, Warnock and Suszko, 2013). In

order to contain urban sprawl on the North Shore in Auckland, the Auckland Regional Council established a metropolitan urban limit in the regional policy statement. The North Shore Council wanted to expand its limits beyond this line. In the Environment Court it was decided that the case had some features that promoted aspects of sustainable management, while others were contrary to them. Again it was reemphasised that one aspect of sustainable management does not have more weight than another (Warnock and Suszko, 2013, Lowe, 2010).

Overall, New Zealand case law, in terms of resource management, has taken a non-hierarchal approach when determining what constitutes sustainable management. There is no preference for either the economy or environment to triumph, but instead grievances must be assessed on a case-by-case basis. For possible future planning and consent decisions within the Mackenzie Basin this infers that the protection of the environment can never be at the forefront, but that economic prosperity must always be given equal value, and each decision assessed on a case-by-case basis. The result of this is that the RMA does not allow for decision makers to protect the Mackenzie Basins environment outright.

3.1.1 National Policy Statements (NPS)

There is no current NPS that addresses biodiversity. However, in 2011 the Ministry for the Environment consulted publically on a proposed NPS for Indigenous Biodiversity with the statement receiving 426 submissions (Ministry for the Environment, 2013c).

The proposed NPS is *"intended to provide clearer direction to local authorities on their responsibilities for managing indigenous biodiversity under the Resource Management Act 1991"* (Ministry for the Environment, 2013c). It sets out objectives and policies to maintain indigenous biological diversity under the RMA. The proposed NPS requires local authorities to identify areas of significant biodiversity within five years of the NPS taking effect, and requires local authorities to manage the effects of activities to ensure *"there is no net loss of significant indigenous biodiversity"* (Ministry for the Environment, 2013c).

The objective of the policy statement is to:

"Promote the maintenance of indigenous biological diversity by protecting areas of significant indigenous vegetation and significant habitats of indigenous fauna, and to encourage protection and enhancement of biodiversity values more broadly while:

- *supporting best practice of local authorities*
- *recognising the positive contribution of landowners as guardians/kaitiaki of their land*
- *recognising that the economic, social and cultural well-being of people and communities depends on, amongst other things, making reasonable use of land"* (Ministry for the Environment, 2013c).

Interpreting this proposed NPS in the context of the Mackenzie Basin is going to be difficult for the district council. 'Ensuring' that there will be no net loss of biodiversity, while 'recognising' that people and communities depend on the reasonable use of the land is somewhat contradictory. It can be assumed that dairying is a 'reasonable' use of the land, and with the Mackenzie Basin set to become a dairying district how is the district council going to stop a net-loss of biodiversity, especially on the basin floor.

The proposed NPS carries a large mitigation emphasis in it, and Schedule 2 of the proposed NPS is a section on *"principles to be applied when considering a biodiversity offset"* (Ministry for the Environment, 2013c). Again this section states that there is to be no net loss of biodiversity, and preferably a 'net gain' is the desired outcome. How a 'net gain' would ever occur within the already cleared areas of the basin is questionable, and how to 'offset' the inevitable loss of biodiversity that will occur with the 'reasonable' land use of potential dairy farming is again questionable. It has already been discussed that fencing off and fragmenting small separate areas of biodiversity leads to further biodiversity degradation, which leads to the speculation that areas to be protected are those that are remote and unsuitable / not accessible for agricultural use.

3.1.2 Canterbury Regional Policy Statement (CRPS) 2013[4]

Objective 9.2.1 of the newly enacted CRPS relates to *"stopping the loss and degradation of ecosystems and indigenous biodiversity."* It identifies that the greatest loss of indigenous vegetation has been in lowland and montane environments, and the biggest threat is the intensification of land use.

An interesting point the CRPS makes is that one of the challenges of protecting biodiversity is that much of it is located on freehold land, and that to assess threats to find solutions permission must be gained from the landowner. The point is made that gaining this permission is difficult and continues to be the key challenge for protection.

Objective 9.2.2 of the CRPS relates to the *"Restoration or Enhancement of Ecosystems and Indigenous Biodiversity."* It is mentioned that one of the ways to restore biodiversity is to restore greater connectivity between them. This is in contrast to the traditional mitigation method offered in the Mackenzie Basin of fencing off certain areas when it comes to protecting important biodiversity. The CRPS recognises and states that:

"Connectivity brings benefits for the functioning of ecosystems and the enhancement of indigenous biodiversity that are greater than the sum of the benefits of protecting individual areas."

Policy 9.3.1 Protecting Significant Natural Areas

A 'significant' natural area is defined as one that has indigenously rare species, supports indigenously rare ecosystems or habitats, or has distinctive natural features. The policy goes on to say that:

"Areas identified as significant will be protected to ensure no net loss of indigenous biodiversity or indigenous biodiversity values as a result of land use activities."

Using these criteria large amounts of the Mackenzie Basin can be classified as 'Significant Natural Areas.' It is noted that the intention of this policy is to strongly advocate for the protection of as many significantly natural areas as possible.

[4] All information regarding the Canterbury Regional Policy Statement has been taken from the document known as the 'Canterbury Regional Policy Statement.'

Policy 9.3.2 Priorities for Protection

Areas identified as priorities for protection include 'originally (naturally) rare' indigenous vegetation, habitats of 'threatened' and 'at risk' indigenous species, and areas of indigenous vegetation associated with wetlands. All of these are present within the Mackenzie Basin, with the most important being the 'originally rare ecosystems.' It is noted that the policy states it recognises the national priorities established by the Government in the *'National Priorities for Protecting Rare and Threatened Native Biodiversity on Private Land (2007).'*

In terms of threatened vegetation the Land Environments of New Zealand (LENZ) land classification system provides a framework for identifying areas of indigenous vegetation at greatest risk. Environments with less than 30 per cent of their original vegetation remaining and / or with less than 20 per cent of their area protected are considered to be at risk. The 20 per cent protection threshold has been chosen in the LENZ system because below 20 per cent the momentum of decline of indigenous vegetation becomes much more difficult to reverse. A significant proportion of land environments in Canterbury fall below this threshold, in particular the Canterbury Plains.

Policy 9.3.4 Promote Ecological Enhancement and Restoration

The CRPS looks to enhance biodiversity by suggesting that local authorities *"advocate, promote, and provide financial and other support or guidance"* to achieve this. It states that local authorities should be encouraging the establishment of reserves, covenants, community initiatives, management agreements, and best practice guidance when it comes to enhancing and restoring biodiversity. This notion supports the view that the protection of biodiversity through simply fencing off certain sectors is not effective, and that for a biodiversity to thrive ecosystem connections need to be kept and not fragmented.

3.1.3 Mackenzie District Plan 2004 (MDP)[5]

There are two aspects of the MDP that are pertinent to the potential development of intensive dairy farming, these are Section 7: Rural Zone Issues, and Plan Change 13, both of which are described below.

Section 7 of the MDP (Rural Zone Issues Objectives and Policies) identifies that:

"There is concern in some areas to maintain vegetation health and cover; vegetation composition; soil fertility and health, so that the land can sustain the district's soil, vegetation and landscape resources into the future."

The MDP discusses how plantation forestry is being considered as an alternative land use to intensive pasture development and extensive grazing, the basis being that soil fertility and structure can improve under a forestry regime. Other suggestions of how to address soil degradation is offered, including conservative stocking rates. It has already been discussed in Chapter 4 of this report how dairying affects soil quality, and how intensive dairying uses concentrated stocking rates.

Related to Issue Two is Rural Objective One, which aims to:

"Safeguard indigenous biodiversity and ecosystem functioning through the protection and enhancement of significant indigenous vegetation and habitats, riparian margins and the maintenance of natural biological and physical processes."

Rural Policy 1A attempts to address the issue of soil degradation, and achieve Objective 1. Again this policy takes a very passive approach and 'encourages' landowners to pursue protection mechanisms, agreements, and conservation management strategies. The MDP states that the reasoning behind these policies is that *"conservation of natural values can be achieved overtime with the goodwill and initiative of landowners."*

This Objective contrasts Objective 9.2.1 of the CRPS which states that the key challenge of protection on privately owned land is getting permission from the landowner. This district plan was made operative in 2004 and was drafted prior to intensive dairying proposals in the Mackenzie Basin. It is likely that getting permission

[5] All information regarding the Mackenzie District Plan has been taken from the document known as the 'Mackenzie District Plan.'

from sheep and beef farmers would be easier as often the families have been in the region for generations. However, intensive dairy farms are increasingly being owned by highly profit motivated corporate businesses and people from outside the region. The question has to be asked will these owners be 'encouraged' enough to devote their resources away from milk production to conservation.

The passive approach of the MDP continues through Section 7, with the re-occurrence of words such as 'promotes,' 'monitor,' 'provide incentives,' 'encourage,' and 'recognise' used in policy wording. The section identifies very important aspects that need protecting within the Mackenzie Basin such as water bodies and their margins, rural amenity, protection of indigenous flora, fauna, and their habitats, landscape values, biodiversity and ecological values, but it fails to do so in a strong manner.

This passive approach is most evident in the Rural Zone Rules, and in the complete absence of a section that deals with biodiversity, ecology or flora and fauna. The Rural Zone Rules fail specifically to provide any rules that address the protection of biodiversity, ecology or flora and fauna, with the closest thing being rules on vegetation clearance. With the Mackenzie Basin containing large amounts of nationally and regionally important flora, fauna, biodiversity, and ecosystems, the failure to have a section in the MDP that addresses specific protection for this is surprising. Under the 'Appendices' section of the MDP there is a list of 'Sites of Natural Significance,' that does note important natural sites within the Mackenzie Basin, but this section does not offer any issues, objectives, polices or rules on how to protect or enhance these sites.

Again this is in stark contrast to the CRPS which strongly advocates for the protection, restoration, and enhancement of important biodiversity. However, an important point to keep in mind is the hierarchal nature of the New Zealand planning system. The RMA provides environmental protection from a 'decentralised' perspective, which allows regions and districts to draft their own environmental protection plans that are meant to be in hierarchical cohesion, e.g. regional plans and policy statements reflect issues in the RMA and national policy statements, and district plans reflect issues and concerns in regional plans and policy statements. However, policy statements and plans are costly and time consuming to draft and the result is policy being delivered in staggered and uneven timeframes. The end result of this is policy that is not cohesive and interlinked. With the proposed NPS on indigenous biodiversity not yet active, the

CRPS enacted in 2013, and the MDP enacted in 2004 it is impossible for all the tiers to be cohesive.

3.1.3.1 Plan Change 13

The Mackenzie Council's proposed Plan Change 13 was publically notified on the 19th of December 2007 and aims to address and improve the 'Rural Zone' section of the district plan. Plan Change 13 received over 150 submissions, with many coming from farmers arguing it is too restrictive. The main emphasis of Plan Change 13 is to address visual amenity values within the Mackenzie Basin, with stricter controls put on buildings appearance and specifications, rural subdivisions, housing and sporadic development. The intent of Plan Change 13 was achieved with the recognition of the Basin as an 'Outstanding Natural Landscape' in the Environment Court in 2012.

However, as with the original 2004 Rural Zone section, it fails to address, and effectively establish a protection framework for nationally and regionally important flora, fauna, biodiversity, and ecosystems in the rural zone. In essence the Plan Change gives the assertion that the Mackenzie Basin is being protected from a bird's eye view, but look closer and its protection of the intricate life that occurs within the Basin is sparse. Conversely, as has been described above the CRPS was only made operative in 2013 meaning that the Mackenzie Council could not have predicted the regional intent about protecting native biodiversity when drafting Plan Change 13 in 2007.

3.2 Collaborative Planning

Decision makers find it challenging to involve the public in decision making, especially in an *"ever increasing turbulent social and political environment"* (Selin and Chevez, 1995 p.189). Collaborative planning is seen as a way to bridge divided social and political opinions when dealing with *"complex and contentious natural resource issues"* (Conley and Moote, 2003 p.371). Gray (1985 p.912)'s definition of collaboration as being, *"the pooling of appreciations and/or tangible resources, e.g., information, money, labor, etc., by two or more stakeholders to solve a set of problems which neither can solve individually,"* is a widely accepted definition. Collaboration between stakeholders *"implies a joint decision-making approach to problem resolution*

where power is shared, and stakeholders take collective responsibility for their actions and subsequent outcomes from those actions" (Selin and Chevez, 1995 p.190).

Collaborative planning is a popular method for local and regional planning authorities as it has *"many recognized social and organisational benefits"* (Mandarano, 2008 p.456). The key perceived benefits that arrive from collaborative planning are broader stakeholder involvement, mutual understanding, trust, and collective problem solving (Ansell and Gash, 2008, Wondolleck and Yaffee, 2000, Innes and Booher, 2003). Mandarano (2008 p.456) also states that by collaboratively working together stakeholders can not only produce quality agreements, *"but also social and organizational changes that enable the community to achieve higher levels of performance in complex, uncertain, and fragmented policy contexts."* A collaborative approach can also help with information, as it provides both more information and a clearer understanding of information already produced (Lawrence, 2000). This aspect is likely to be important in the Mackenzie Basin where technical information surrounding environmental and economic aspects is likely to be complex. Allen *et al.* (2001 p.215) support this assumption by saying *"the role of extension, or information management, in supporting the identification and adoption of best management practices within natural resource management is becoming increasingly difficult."* Decision making organisations are increasingly having to accept that many resource issues are interlinked, and therefore, for outcomes to be successful many viewpoints and sources of information have to be shared among different stakeholders (Allen *et al.*, 2001). Collaboration helps in this approach as it allows technical experts to be face to face with stakeholders. This allows them to explain technical information in person, opposed to a lay person trying to make sense of technical information by themselves and possibly becoming frustrated and confused. Other benefits of collaborative planning includes that it creates more transparent planning decisions, aids in creative problem solving, and creates greater public support, acceptance, and agreement (Lawrence, 2000).

In terms of how to create a good collaborative approach Mandarano (2008) provides guidance after their assessment of collaborative processes in the United States. In terms of a collaborative approach achieving its aims there was found to be a large correlation between process, high-quality outputs, and social and environmental outcomes (Mandarano, 2008). These findings conclude that to have successful outcomes the

collaborative process needs to be of high quality. A high quality process *"spurs learning, learning leads to trust amongst stakeholders, learning and trust result in institutional changes, and these new behaviors lead to environmental outcomes"* (Mandarano, 2008 p.466). In terms of what created a good process it was identified that it was a good scientific basis of information, broad stakeholder involvement, and prominent stakeholder approval (Mandarano, 2008). Equally important was the need for a well resourced process that was well funded, had good technical information, and had a good knowledge base (Mandarano, 2008). On the basis of this example for a Mackenzie Basin collaborative approach to be successful it must be based on sound scientific information, contain a varied range of stakeholders, have decisions led, and approved by respected and prominent stakeholders, and be well-resourced.

However, with the increasing uptake of collaborative processes has come an analysis of the challenges and problems associated with it. Barriers to a collaborative approach include the hierarchical institutional approach to decision making, lack of flexibility in agency procedures, the need to compromise in collaborative planning, the feeling of obligation to be a part of the process, and the nature of past feuds between parties affecting the process (Brand and Gaffikin, 2007, Innes and Booher, 2010, Selin and Chevez, 1995, Lawrence, 2000). Furthermore, there is also the aspect of some stakeholders being left out, and some stakeholders questioning why other stakeholders are involved at all (Brand and Gaffikin, 2007).

The institutional culture of having centralised decision making causes some stakeholders to have problems with the collaborative process (Selin and Chevez, 1995). Stakeholders who have a strong centralised decision making structure find it hard to accept that decisions are made collectively, which infers that it will take longer to do so, and that everybody has the potential to have input. In this process even those who do not have the same education, status, or understanding of the issues as other stakeholders can be heard and taken into account when making a decision. A lack of flexibility in institutional procedures is associated with this barrier of centralised decision making (Selin and Chevez, 1995). Stakeholders who have to go through strict protocols and procedures to implement agreements and free up financial resources are going to find the flexible nature of a collaborative approach difficult to deal with (Selin and Chevez, 1995).

The need to compromise and the feeling of an obligation to be a part of the collaborative process are two situations that stakeholders might find themselves in (Brand and Gaffikin, 2007, Innes and Booher, 2010, Selin and Chevez, 1995). As is the case in a joint decision making process one party cannot have complete control over what is occurring in the process. Give and take by all parties involved is going to need to take place, but some stakeholders see compromise as a *"watering down of their mission"* (Selin and Chevez, 1995 p.193). Similar to this notion is the obligation some stakeholders feel to take part in the process (Brand and Gaffikin, 2007), and also to act with *"as much vigour and resolve"* as other participants (Selin and Chevez, 1995 p.193). Some stakeholders may not want to participate in a collaborative process, as it would prevent them from taking action in their own way (such as legal), but do so anyway as they do not want to be seen as the un-co-operative party. Along with this parties do not want to be seen as not pulling their own weight in an agreement, and this causes some parties to put more resources and time into a project than their resource means allow (Brand and Gaffikin, 2007).

Personal grievances can also prevent a collaborative approach from achieving its goals (Lawrence, 2000). If stakeholders have in the past had a serious grievance they are unlikely to be able to compromise on issues, or work together. In bringing stakeholders together for a collaborative agreement there is the need to ensure all those stakeholders thought relevant are brought into the agreement. However, some parties who are left out of the process may feel they should have been included, while there may be a feeling that some who were included should not have been (Selin and Chevez, 1995). In terms of those parties whose involvement is being questioned it may cause their views and opinions to be questioned regarding their relevance, and also legitimacy.

Overall, the benefits of collaborative planning lie in its ability to bring people together, build trust and mutual understanding, and encourage information collaboration, interpretation, and sharing. For a collaborative process to work it must have a good process that includes a solid scientific foundation, broad stakeholder involvement, prominent stakeholder approval, and be well resourced. It is this good process that enables trust and mutual understanding between stakeholders. However, barriers to collaboration include centralised decision making cultures, the need to compromise, the obligation to be involved, and past feuds affecting stakeholders to work together.

3.2.1 The Mackenzie Agreement[6]

The Mackenzie Agreement is a collaborative planning strategy that provides "*a shared vision and strategy, and a proposal for a Mackenzie Country Trust*." Its aim is to provide for environmental and economic wellbeing in the Mackenzie Basin. The 22 signatory parties have agreed to work in co-operation to implement the shared vision and strategy for the Mackenzie Country, and signatories include representatives from irrigation groups, environmental organisations, tourism representatives, and farming organisations. The Agreement recognises the Mackenzie Country as one of New Zealand's "*most distinctive and well-known areas*." It identifies four reasons for this: heritage of pastoralism, its iconic landscape and environment, its history with power generation, and the importance of tourism to the area. The Agreement identifies its 'vision' for the Mackenzie Country as being an area that incorporates a mixed land use pattern of irrigated and dryland agriculture that encourages tourism-related development, along with land actively managed for biodiversity and landscape purposes.

The Agreement recognises that the current traditional meat and wool farming businesses are experiencing *"volatile returns and low profitability,"* and that this situation limits the ability to have both farm development, and biodiversity and landscape protection in the Mackenzie Country. It identifies that *"agricultural landholders and investors are currently promoting two important strategies which involve greater use of irrigation."* The scale of the proposed development is then put into context with it stating that of the 269,000 ha of flat land in the Basin:

- 7,500 ha has already been developed,
- 7,500 ha is proposed for relatively small scale irrigation on 29 large sheep and beef properties, and
- 9,600 ha is proposed for large scale intensive livestock farming on 5 properties.

The Agreement then states the adverse effects on biodiversity and landscape values that this could cause in the Mackenzie Country. Biodiversity and landscape values are discussed in this section and comprise concerns similar to what has been described in

[6] All information regarding the Mackenzie Agreement comes from the document known as 'The Mackenzie Agreement.'

Chapter 2. These include the effect on rare and threatened species, water quality, glacial landforms, and the semi-arid landscape. The Agreement seeks to achieve two different conservation-related objectives in different parts of the basin:

1. Ecosystem recovery- To achieve restoration of representative examples of the full range of whole ecosystems that were characteristic of past times.
2. Tussock Protection- To protect, enhance, and where possible restore a healthy tussock cover.

To drive these conservation aspirations in the Agreement the formation of a Mackenzie Country Trust has been suggested. The Agreement states that it has been created for two reasons:

1. That the existing mechanisms and perceptions about land management have caused conflict within the community, and
2. Beyond the farm business, existing mechanisms fail to provide an on-going source of revenue for active land management and restoration.

The proposed 'Trust' would negotiate with landowners to protect mutually agreed areas. Each property will be dealt with individually, and when selecting areas the Trust would make use of existing and new information on biodiversity and landscape values. The Trust would then register agreements by way of covenants or Joint Management Agreements (JMAs) on land titles, and would make contributory payments for the ecosystem services provided on those areas. In return for the land set aside for development, and the payments towards its protection, the landowner would receive greater development rights. The agreed conservation areas would then be set in the context of wider land management plans, which would also provide for intensified development.

Enforcement of covenants and JMAs is not an issue discussed in the Agreement. The Trust would also foster on-going research, monitoring, and reporting to achieve the goals of the Agreement. The Agreement states that the Trust would give the Mackenzie Country a high profile both nationally and internationally to encourage visitors and donors, and would actively raise funds to further its mission. The Trust may also provide a 'tick' of certification for produce coming from sustainably managed areas as part of a scheme to achieve a premium for produce marketed *"on the basis of values*

protected here." It may also have a biosecurity function that control weeds and pests. It is noted that no government funding has been secured for the Trust and, therefore, funding is specified as coming from contributions by tourists, donations from community trusts, local and national businesses, high net worth individuals, and commercial sponsorship.

It is proposed that seven Trustees be appointed, including a chairperson, and should be jointly appointed by the Ministers of Agriculture, Environment, and Māori Affairs. The appointments will be made on the basis of governance skills and experience, while "*having balanced regard for the full range of stakeholder perspectives."* The forum, along with the district and regional councils, would like the opportunity to meet and nominate the Trustees.

Joint Management Agreements

A JMA would cover a whole property, or part of a property. It would set out biodiversity and landscape conservation objectives, and would describe how the land is to be protected while assuring the on-going viability of the property. On-going viability can be achieved by agreed land use intensification, tourism development, by agreed payments from the Trust, or by a combination of these. Two types of JMAs are proposed, one that provides protection only, and the other a combination of both land development and land protection.

Land development may still trigger RMA consent and / or notification requirements, but when considering a consent or notification, in accordance with special legislation, decision-makers will be required to have particular regard to any agreement reached between the Trust and the landowner. The intention of this provision is to:

"Facilitate smoother progress through the land use consenting procedures of the RMA, and lend weight in any appeal. It would thereby provide an additional incentive to landowners to work with the Trust in designing their development proposals."

It is acknowledged that the JMAs will have the following features. That they will be in broad consistency with the purposes of the RMA, they will be a long term binding commitment, and will be a relationship based *"learning by doing framework,"* in which the Trust and landowner will work together in a flexible, but accountable way. Formal public reviews of JMAs are suggested once in a generation (25 years), to see if they are

achieving their goals, and there is a suggested provision to let anyone apply to the Environment Court for an enforcement order in the event that one of the JMA parties is not meeting their obligations. The last provision is that if the JMA is determined to be not achieving its goal, the land would revert back to ordinary private land.

Proposed Legislation

Neither the existing RMA provisions, nor the legislation providing for covenants, address the special needs that have been identified in the Mackenzie Country. Due to this special legislation and funding is needed to implement the proposals. The Agreement proposes the *'Mackenzie Country Trust Empowering Bill,'* that would establish the Mackenzie Country Trust described in the Agreement. In addition the Bill will contain the following three provisions:

1. It would require the Trust to prepare (using a collaborative approach), a biodiversity and landscape strategic plan. This would take full account of information about values in the area, set out the Trust's biodiversity and landscape objectives, and would describe how it would apply its funds to achieving those objectives and priorities.
2. It would empower the Trust to enter into JMAs and covenants, and make payments to landowners in respect to these. In addition, the Trust would be empowered to lease or own land if needed.
3. It would set out a framework of objectives and policies to which both the Trust, and decision makers exercising functions under the RMA, would be required to have particular regard to.

RMA decisions relating to subdivision and water consents would remain unaffected, and applicants would at all times have the choice of applying for a RMA consent with or without a JMA.

Revenue Development from Proposed Development

The Agreement states that the 26,000 ha of intensified land proposed under the Agreement could generate $100 million per annum of extra export production, and could increase land values by an estimated $400 million. The resulting increase in rates from that land is estimated to exceed $1 million, along with $5 million in tax payable

by landholders and employees. This results in an estimated $6 million of extra public revenue. With the cost of protecting land under JMAs estimated to be $50 a hectare per year, and 100,000 ha of land set to be protected (of which 26,000 is already conservation land, or is in the process of becoming protected land), it is estimated that the cost of protecting this land would be $3.7 million. Therefore, it is argued that the revenue gained from the extra intensification of land could fund the protection of the land stated in the Agreement.

3.3 Conclusion

An analysis of the current legislation and policy framework has revealed that the biodiversity protection tools for decision makers in the Mackenzie Basin, and New Zealand as a whole, are lacking cohesion and effective enforcement tools. Under the RMA case law permits that environmental and economic wellbeing are to be assessed on equal terms, with no hierarchy between the two. This is reflected in the drafting of the proposed NPS for indigenous biodiversity which states that people must be allowed to *"make reasonable use of the land."* However, the CRPS takes a stronger line advocating for biodiversity restoration, enhancement and protection. The decentralised nature of the planning structure has created a framework that is not cohesive, and this is shown through the lack of biodiversity substance in the MDP.

Alternative collaborative planning has been shown to offer an alternative to the traditional national planning framework to achieve a desired outcome. It has been shown to have positive attributes including bringing people together, and building mutual trust and understanding. However, it also has negatives including issues surrounding the need to compromise, and the obligation to get involved. The Mackenzie Agreement recognises the importance of biodiversity protection in the Basin, and also that current planning instruments have not worked in the region. In light of the important ecological values that are at stake, and the potential economic influx dairying could bring, people in the Basin have concluded that a new planning approach is needed that better balances these contrasting aspects.

4. Research Strategy and Methods

This chapter describes the research strategy and methods used for this study, including data collection and analysis. As this research contains an analysis of migrant workers and other sensitive data there are a number of ethical considerations that need to be taken into account, and this chapter will discuss these. As with all research there are limitations to the research and these will also be discussed at the conclusion of this chapter.

4.1 Research Design:

A mixed methods qualitative approach was undertaken to collect data for this research. The adoption of this method provids the researcher with a good understanding of the topic, and acts to enhance the validity of data as "*if different sources of information are saying the same thing, then the social researcher can have some confidence that the findings are valid"* (Tolich and Davidson, 1999 p.34).

Qualitative data is often used to collect social data as it allows a more holistic approach, and employs methods which value respondents' views, knowledge and experiences (Sarantakos, 2005, Gatrell *et al.*, 2005). Sarantakos (2005) notes several strengths of the qualitative research approach which include the research of people in natural settings, the presentation of a more realistic view of the world, a deeper understanding of the respondent's world, an emphasis on interpretations and evaluations, and allowing a higher degree of flexibility. The descriptive data given by participants can also then be supported in text using words, photographs, and observations that strengthen and further illustrate research findings (Tolich and Davidson, 1999). Given the emphasis of this project is to identify opinions and views about future planning for intensive dairying in the Mackenzie Basin a qualitative research approach is appropriate.

4.2 Data Collection

Data was collected through both primary and secondary research. Primary research involved semi-structured key informant interviews, and secondary data was collected through a literature review and document analysis.

4.2.1 Key Informants

There are different types of interviews that researchers can use and they include the unstructured and semi-structured interview, with the most common being the face-to-face semi-structured interview (Creswell, 2013). Semi-structured key informant interviews are *"a valuable qualitative tool for social research as it enables the researcher to get rich and varied data directly from the respondent"* (Rae *et al*., 2012 p.39). The semi-structured interview was used in the research, and is *"principally a conversation between the researcher and participant guided by a set of preset and open- ended research questions"* (Rawlinson, 2011 p.12)*"* A semi-structured open-ended interview allows the researcher a *"greater freedom to explore specific avenues of enquiry* (Kitchin and Tate, 2000 p.214)*,"* which gives the researcher *"the freedom to control, and personalise the direction of the interview, capturing the views, and experiences of each unique respondent"* (Rae *et al*., 2012 p.39).

A purposeful sampling technique was used for this research where a knowledgeable and relevant sample of participants were approached to participate in the research (Marshall, 1996). The purposeful sampling technique illustrates that the researcher recognises the diverse range of people relevant to the research (Creswell, 2013), and can be established on the researcher's *"practical knowledge and experience in the study area"* (Rawlinson, 2011 p.13). I come from an agricultural community (Geraldine), and have family members (including my father), based in the agricultural industry and from this I established a network of contacts that I interviewed. Participants were characterised as either: land owner, migrant dairy farm employee, local government organisation, central government organisation, relevant community organisation, or relevant dairy farming organisation. Participants were given a copy of the research information sheet via email. Interviews were recorded and conducted at places of participant's convenience. These included the participant's place of residence, and work and community meeting points, such as cafes. The recordings were then used to transcribe relevant quotes and identify key themes that emerged.

4.3 Data Analysis

Key informant interview data was analysed using 'grounded theory approach' that enables the researcher to *"step beyond the known and enter into a world of the*

participants to see the world from their perspective" (Corbin and Strauss, 2008 p.16). The key element in the grounded theory approach is that the data is collected, and then the theory developed, opposed to starting with a hypothesis (Bryman, 2004). A key way in which this happens is through coding information into appropriate themes, and this is the main organisational approach in the grounded theory technique (Corbin and Strauss, 2008). By coding the key informant information into key themes that evolve out of the research the researcher is able to derive theory that does not preamble preset ideologies in the literature. The coding technique used was 'selective-coding,' where core categories were set, and then sub-categories developed as the raw data was analysed (Bryman, 2004). In this research the data was coded into three different core areas: Mackenzie Agreement data, social data, and overseas migrant data. From here sub categories were determined through analysing the themes that developed out of the primary data.

4.4 Ethical Considerations

Tolich and Davidson (2011) identify five key ethical principles involved in social science research and these are: voluntary participation, informed consent, do no harm, avoid deceit, and the protection of confidentiality and anonymity. This research has been conducted in accordance with these accepted ethical practices, and approved by the University of Otago Human Ethics Committee. When participants were first contacted they were verbally, or in writing, informed of the volunteer nature of the study, the right to withdraw from the study at any time, the right to remain anonymous, and also of the steps in place to protect their identity. Before each interview commenced these points were verbally reiterated, and also explained in the participant information sheets (Appendix 2), that all participants were required to read before an interview commenced. Participants then signed a consent form (Appendix 3), to solidify their involvement in, and understanding of the research.

The protection of participants' identities was the biggest consideration for this research. The Mackenzie Basin covers a vast land area, but as within most farming communities everybody knows and associates with everybody some way or another. This aspect, along with 'vulnerable' participants, in the form of migrant dairy workers, meant identity protection was taken very seriously. It is recognised that confidentiality and

anonymity are two different aspects (Babbie, 2012, Tolich and Davidson, 2011). A participant is 'anonymous' when *"the researcher cannot identify a given response as belonging to a particular participant*, while 'confidentiality' occurs when *"the researcher can identify a certain person's response but promises not to make the connection public"* (Tolich and Davidson, 2011 p.157). To provide my participants with 'anonymity' I assigned them an 'informant number' and simply referred to them as 'Key Informant 1, 2, 3' etc. A master list of key informants and their identities was kept in a secure place.

4.5 Reflections

The research methodology did present some problems for the researcher, with the first being time constraints. The interviewing of farmers and migrant workers had to be done at night time due to their work commitments which meant meeting them after 7 pm most of the time, and restricted the number of landowners and overseas migrants that could be interviewed during the study timeframe. Despite the best efforts to contact some key people involved in the Mackenzie Agreement some key individuals were unable to be interviewed which limited the ability to obtain potentially important perspectives from some key informants. One limitation of this work is the small amount of research that has been published on the Mackenzie Basin, especially in terms of specific biodiversity importance and historical literature. Because of this it is recognised that in some instances there is a heavy dependence on single-source information.

5. Results

5.1 What Social Challenges can intensive dairying bring to the Mackenzie Basin?

Section 5.1 will describe the key findings and themes that emerged from the investigation into the social effects of intensive dairying in the Mackenzie Basin. Section 5.1.1 outlines the impacts of decreased participation in the wider community and the impacts of a transient population. Section 5.1.2 describes the effects intensive dairying can have on community cohesion, and Section 5.1.3 outlines the need to plan for overseas migrant workers in the Basin.

5.1.1 Decreased Participation in the Wider Community and Impacts of a Transient Population

Key Informants 8 and 9 described the difficulty that dairy farm employees found in participating in volunteer services in their respective areas. Key Informant 8, who is part of the Mackenzie Rugby Football Club, said that:

"There are a lot of guys on dairy farms around here who don't play sport because one guys always got to be on the farm, and rugby begins in March and most farms are milking right up to the end of May."

They described how the Mackenzie Club registers 60 players for both senior teams a year, and about 30 of those are new every year. They described that 'Gypsy day' was a struggle for them, and that this year they had three members of their senior team that left because of Gypsy day, and that this affected the team's performance. However, they said that the transient effect of Gypsy day can work both ways saying that it can also bring new players into the region. In terms of dairy workers helping out with club fundraisers Key Informant 8 said that:

"Participation rates in fundraisers and watching kids aren't great, especially in the milking season up to the end of May. It depends what time of year, but for a large

portion of the year there not great at helping at us. But they help in other ways, such as rearing cows for us. We just have to think of different ways of fundraising."

Key Informant 8 also discussed how dairying parents in the Junior Association Board struggled to help out with fundraisers and the coaching of junior teams. Key Informant 8 noted that a dairy farmer was approached to coach a junior team this year, but said that they struggled to even make it to Saturdays to watch their children play, so there was no chance that they could coach. Furthermore, aside from decreased participation in community sporting clubs dairying employees can find it difficult to participate in volunteer emergency services.

Key Informant 9, who is involved with the Twizel fire brigade, described some of the problems that dairy workers were faced with when volunteering in emergency services. They expressed that the fire brigade did not have a problem with numbers, but that it did not contain any dairy workers. Key Informant 9 cited that the time commitment for a fire fighter is about two hours a week. They described that the sign up process included an interview of the applicant that required them to be able to commit for a minimum of two years otherwise they would not be put through the training. They expressed that *"we really scrutinise people that they are going to be here long enough."* Key Informant 9 also commented on St John's volunteer ambulance service expressing that it was more demanding than the fire brigade, and that *"I would never join St Johns as it is just too much of a commitment."* They described how St John's volunteers can be away for hours at a time taking people to Timaru / Oamaru hospitals, and that the training was a lot more intense. They referred to St Johns already desperately struggling for volunteers in Twizel, and that dairy farmers would find it very difficult to commit time to it. Moreover, along with local communities struggling to find volunteers is the effect of increased transient populations in the region.

Key informants who worked in schools in the Mackenzie District noted the transient nature of people that dairy farming brought with it. Key Informant 10 said that they had noticed a *"class system"* that dairy farming brings with it. Owners of dairy farms were often *"well off"* and sent their children to schools in the Mackenzie District up until they were about year 8, and then would send them to boarding schools in Timaru, Christchurch or Oamaru (Key Informant 10). They noted that managers sometimes sent their children to boarding school around the same time, while farm workers left their

children in school in the Mackenzie District. Key Informant 11 shared this view saying that *"there might be a tendency to send students to the bigger centres for school if dairying increased."* Key Informant 10 expressed that in year eight they lose about four to five kids a year out of a class of 15 to go to boarding school, and that *"I'm always getting flack about what I'm going to do about it."*

Both Key Informant 10 and 11 talked about the transient nature of dairy farming children, with Key Informant 11 saying *"it's quite a prominent trend in the industry."* Both key informants talked about how the moving around by children can affect their learning, with Key Informant 11 saying *"moving around a lot is a red flag for us that students might struggle with their studies."* Key Informant 10 talked about a migrant boy that had just arrived in their school after Gypsy day, and expressed that they were not sure how he was going to go. They expressed that they were not sure of his background, and that *"it's hard to get hold of dad because he's busy a lot."* He had been enrolled in year 11 in Southland, but he never passed anything there so he was enrolled in year 10. They expressed that they were thinking about beginning an induction program at the school for overseas migrants because they were seeing an increased need for extra support for some transient overseas students. Key Informant 10 finished by saying that a survey of the school population was done two years ago and it revealed that the school role had changed by a third over a two year period, noting the high transient nature of the school. Both Key Informants 10 and 11 noted that the Ministry of Education now counted the school role twice a year for secondary schools, and because of this gypsy day was not an issue for the schools when determining staffing and funding.

5.1.2 Community Cohesion

Key Informants 10, 11 and 12 were asked about their views about community cohesion in Twizel, and their responses revealed some interesting results. Key informant 12 expressed that they thought Twizel had good community cohesion, and used the large snow event in 2006, and Christchurch earthquakes, as examples of this. In these times of distress they explained that people really came together, citing volunteers cooking meals and donating household items to people who moved to the district after the earthquakes. In the 2006 snowfall hotels opened up rooms for free to provide hot showers to people with no power, and people drove the elderly's gas bottles to

Omarama to get refilled (Key Informant 12). However, Key Informant 10 expressed that it was only in times of tragedy that the Twizel community came together. They expressed that *"aspirational classing"* was part of the community, and intolerance was present against those who were a *"little bit different."*

Both Key Informant 10 and 12 noted that there was tension between 'old' and 'new' Twizel. Key Informant 10 noted that the older Twizel residents still felt that the 'Ministry' would provide everything, like they did in the old hydro days, and that they did not embrace change. They stated that the hydro-days *"really built cohesive communities,"* and indicated that the older generation stuck together and did not enjoy outsiders. Key Informant 12 backed this by saying *"old timers were traumatised by the change, Twizel has changed dramatically in the last 10 years."* They cited that in their opinion the change in employment fields had brought this feeling among the older population, along with the rise in education and income levels that organisations like Meridian, and the Department of Conservation (DOC) had brought with them. They described how Twizel had a lot of low socio-economic income individuals, and that there are discrepancies between them and high income earners who often had holiday homes in Twizel that they used only a couple of times a year.

Key Informant 10 noted that there is tension between farming, tourism and DOC, and commented how there is a very *"fragmented working community."* Key Informant 7 noted how the owner of Ohau Ski-field was concerned about the crop patterns that pivot irrigators left, as he thought his customers would not like their appearance while looking at them from the top of the ski-field. Key Informant 12 talked about how the greening of the Mackenzie Basin was a contentious issue in the community, and many did not see it as an industry that was very sensitive to Twizel. An example of sensitivity they used was when a large dairy farm went in by the town the large irrigator was parked next to the road, which blocked the view, and caused tension with the tourism industry. However, Key Informant 7 also talked about this saying that tourists often stopped and took pictures of the irrigator, citing it as a *"major tourist attraction."* Key Informant 10 also noted that *"if you have a southerly you can really smell the farms."* The topic of water quality was raised between Key Informants 10 and 12, with the water quality of Wairepo Arm a concern. The issue of the amount of water available was also raised, with Key Informant 10 saying *"our water supply could sustain a town*

of 6000 and that was pure water, now for some reason we can't sustain a town of 1500."

5.1.3 Is there a need to Plan for Overseas Migrant Integration?

Key Informants 14, 15, 16 and 17 all are Filipino workers who work on dairy farms in the Mackenzie and South Canterbury districts. All cited boredom and isolation as important struggles for their integration into New Zealand farming communities. All these key informants explained that back in the Philippines public transport is readily available and cheap to use, but that in rural New Zealand there is none which made it difficult for them to go into larger centres to socialise, and also to perform day to day tasks. Key Informant 14 explained that even though they did meet another Filipino worker in the first few weeks they did not have any transportation to go and see them. However, even when they got transportation it was only on days off they could see them, and that *"it was 2 months before I tried to go out to Timaru."*

All key informants said that it was the first two months that were the hardest, with Key Informant 14 commenting that *"I thought I could not deal with this ae, there's no people, it's boring there's nothing to do."* They commented that nobody invited them to participate in any groups or organisations, but that they now play in a Filipino basketball team in Timaru. However, they also commented that they also felt lucky as they knew other migrants that were in worse situations than they were. They explained that they went to a Filipino friend's farm and it took *"half an hour to go from the farm to the main road, and then another half an hour to town, and I said aw I'm so lucky."* They explained that when this occurs the migrants get really lonely and homesick, and said that *"being alone here with your family back home is very very hard."*

Key Informant 13, who works for a Newcomers Network, cited that this isolation and boredom for migrant workers on farms in the Mid Canterbury district is a very big issue. They discussed that many cultures that work in the dairy farming sector are very family orientated, and when they lose this they feel *"very abandoned and isolated."* They asked *"how can you make friends on a farm?"*, and said that it was especially women without children who struggled. This is because women with children can socialise at Plunkett or other childcare groups, while women whose husbands work are left alone at home. Key informant 13 explained that a lot of these people dive into deep

depression and really struggle. They talked about how people in Ashburton are not welcoming, and that while people smile at you *"they are not going to adopt you, so you have to fight really hard, and often a lot of people get frustrated."*

5.1.3.1 Neglect, Abuse, and Silence

All key informants discussed some sort of neglect or abuse that they had heard of from other migrants. Key Informant 13 talked about how it was common for migrants to be accommodated in *"very cold houses."* They also cited a case where a farmer fired a migrant worker and forced him and their family to live in a tin shed in the middle of winter as the farmer hired a new worker. Key Informant 13 explained how they had found them a house to live in in Ashburton, highlighting the importance of having a support network. Key Informant 15 backed this up by discussing how a friend of his was forced to sleep in the toilet as it was the warmest part of the accommodation they were in. Key Informant 14 simply cited *"I have heard so many stories already, including physical abuse,"* when asked about mistreatment.

A common theme from key informants was although mistreatment occurred overseas migrants chose to stay silent about their situations, often because they were scared of deportation. Key Informant 13 talked about how their first Newcomers Network meetings were called 'Settling in Meetings,' and that a lot of migrants did not come because they thought it was people from immigration taking the meetings, and when they changed the name to 'Cultural Evening,' a lot more people came. Key Informant 14 discussed how a friend of his had suffered physical abuse, but chose not to complain, and instead just moved on to another farm, and how this was very common practice. Key Informant 12 talked about how this problem was not isolated to dairy farms, and already occurs in the Mackenzie Basin. They said that they had encountered migrants who have been *"very very badly treated in the tourism industry, some who were pretty much starving."* The same problem had arisen with Key Informant 12 saying that they could not convince the individuals to go to the authorities as they were scared of getting deported, and this *"was very frustrating."*

5.1.3.2 Sticking Together, a Blessing or a Curse?

All key informants discussed how the Filipino community stuck together and had their own societies in Ashburton and Timaru. Key Informants 14, 15 and 16 had all known

each other back in the Philippines and had gone to school together. They all lived and worked within driving distance of one another, and mostly socialised with just Filipino's. Key Informant 14 talked about how making sure there were other Filipino's around when a new one came across was important to prevent boredom, and the feeling of isolation. However, Key Informant 13 saw this sticking together as a curse. They stated that:

"I really feel sorry for these people because they don't grow, they are kind of living in their little Russia and their little Latin America the same. Even when we organise Newcomers Networks they stick to their own groups and speak their own language."

Key Informant 13 stated that these people who do not have to struggle or learn anything new find it difficult to fit into the wider community.

5.1.3.3 Would a Support Network be Beneficial?

All key informants believed that a Newcomers Network or other support network would be beneficial to help migrants settle into the Mackenzie Basin. Help in the first 2 months was noted as being important, and such services suggested included help with driver's licences, understanding farm management structures, setting up bank accounts and Inland Revenue Department numbers, and how to deal with conflict and mistreatment. In terms of keeping migrants in touch with friends and family back home Key Informant 12 explained that they were one of the first resource centres in the country to be equipped with video-conferencing equipment that allowed migrants to talk to people back home.

Key Informant 13 discussed that if the Mackenzie Basin is in the same situation as Mid Canterbury *"where everybody lives on farms,"* then having a Newcomers Network would be a *"fantastic idea."* Their main concern was the social isolation of people. They talked about how Ashburton Newcomers meetings are held often between 7-9 pm, "*but a lot of the dairy farmers find it difficult to come, especially in the high season because all they want to do is come home and sleep."* However, Key Informant 13 also talked about the commitment a lot of dairy workers had for Newcomers. When they held the Filipino night a lot of workers woke up at 4am, went to work, and then came to Newcomers which finished at 10 pm. But even after this a lot of them stayed for a few hours afterwards to clean up, then went to bed and slept for two to three hours, and then

went to work again. In terms of what services Newcomers offers Key Informant 13 explained that they have many different kinds of groups including: coffee morning groups every week, preschool groups, cultural evenings, a cultural festival, discussion nights, and fitness classes. There are about 200 people in the Mid Canterbury Network of 30 different nationalities, and it is dependent on volunteers and charity funding.

Overall the research revealed some interesting themes including the decreased ability of dairy employees to participate in sporting and volunteer emergency services, and also the challenges that migrant workers can face in the Mackenzie Basin. These themes will be discussed and analysed further discussed further in Section 6.1.

5.2 The Origins of the Mackenzie Agreement

Section 5.2 will describe why an alternative planning approach was adopted in the Mackenzie Basin. Section 5.2.1 outlines the shortcomings of the current planning framework used in the Basin, and Section 5.2.2 describes the adequacy of the current planning framework. Section 5.2.3 then outlines the view of the Mackenzie Agreement being used as an experiment for RMA changes.

5.2.1 Shortcomings of the current Planning Framework

Key Informants 1-6 revealed critical problems with the effectiveness of the current planning framework that is used to make decisions in the Mackenzie Basin. All of these key informants cited that that the Agreement evolved out of the problems associated with the 2009 water consents hearing for the Upper-Waitaki Catchment. From the Applicants[7] side came frustration over two main themes: the cost and length of time it took to even get into a position to be granted a consent or not, and the fact that the RMA does not provide for compensation to be paid to landowners when land is taken for conservation. On the other side came concern over the lack of teeth in the current policy, the time it took to implement policy, the feeling that organisations were not abiding by their statutory obligations, and the simple feeling that current legislation was not robust or adequate enough to deal with the issues in the Mackenzie Basin.

[7] 'Applicants' refers to applicants who applied for water take rights in the 2009 Upper-Waitaki Catchment applications to Environment Canterbury.

Key Informant 1, who has large potential intensive farming interests in the Mackenzie Basin, disclosed that the Agreement came about via applicant's frustration over time frames and the costs that occurred in their fight to gain water for farmers in the Mackenzie Basin. Key Informant 1 gave a condensed description of the applicant's plight. Their fight began in 2003 and had to overcome a number of challenges. Meridian Energy had been allocated all the water in the Basin, due to their involvement in the hydro-development of the region, and so applicants had to apply to them. Key Informant 1 described the process as a:

"*Two year process of litigation against, and negotiation with Meridian, to take us out of a position where farmers couldn't get water, to a position where farmers could get water, and Meridian finally agreed with us, us being the Mackenzie Irrigation Company, that we could take water for 25,000 ha of irrigation, not intensive irrigation, and that came about in 2005*."

After succeeding with Meridian the 33 applicants were sent to Environment Canterbury (ECan) to apply for consents, which the Minister called in (meaning all of the consents were to be heard as one). ECan formed the Waitaki Irrigation Board, which sat for 18 months between 2005 and 2006, to decide what should happen with the water in the Mackenzie. The Board finally issued a report saying that the 25,000 ha of irrigation approved by Meridian was approved to be used. After this ECan commissioners held a hearing for the applicants, and this took a further 18 months. The applications were heard collectively so applicants were required to provide evidence that was both done jointly, such as the impacts on water quality, and individually, such as ecological reports. Key Informant 1 said that *"you were working on about $100,000 an inch,"* in terms of technical reports, and that individually they had about *"a foot"* of technical reports they had to produce. Summing up the process Key Informant 1 stated:

"*That was the process we went through. We've had applications, the Waitaki Water Application Board, and then we've had a consent hearing, and that's taken us about 5-6 years."*

It was finally after this five to six year process that applicants had their applications either rejected or granted, meaning that even after six years, and hundreds of thousands of dollars, some applicants did not get the irrigation they applied for.

Although Key Informant 1 was frustrated with the process they acknowledged that the blame did not lie with ECan, but with the scale and complexity of the project which was simply too immense for the ECan commissioners to deal with. After this five to six year process Key Informant 1 said that one of the applicants went to the Minister for the Environment, the Hon. Dr Nick Smith and said *"there's got to be a better way."* Key Informant 1 said that even Hon. Dr Nick Smith did not have a solution, summed up by saying:

"So that's what it was, it wasn't any individual, it was applicants getting frustrated, legislators getting frustrated, Nick Smith being frustrated, we went up to talk to Nick Smith and told him what our problem was, he just didn't know, no one knew what to do and this collaborative approach evolved out of it."

Aside from the 2009 water consents hearing Key Informant 3 described the unfairness they thought existed in the RMA, and discussed the costs of resource consent as an example. They cited that paying $2-3 million on consents was justified for a $100 million project, but that when you are paying 20, 30, 40, 50 per cent the cost of a small project on consents *"then it is just unfair."*

Key Informant 3 discussed the land that they had lost without compensation to other conservation measures, and said that:

"Between the scenic viewing corridors, the lakeside protection, and the Significant Natural Areas, I've lost the rights to develop on 11 per cent of this property with no compensation, plus there's an extra 20-m either side of two major rivers that run through this property which I can't develop on, and that would be another couple of per cent I can't develop on."

Being prevented from developing on this land has wiped *"about $2-3 million"* off the value of the property, with developed land worth *"75-90 per cent more than undeveloped land."*

The applicants' costs of consents are described above, and were certainly a point of consternation amongst the key informants. However, another theme that emerged from key informant interviews was to find solutions outside of the Environment Court. Key Informants 2, 4, and 6 cited that they were in favour of an approach that did not entail going to Court, with Key Informant 2 saying,

"We wanted to bring all the parties together to see if there was a way in which we could come to a better solution than towards where it was heading, which was the Environment Court."

Key Informant's 2 and 4 talked about the problem of funding their organisations when wanting to appeal a decision in the Environment Court. Often to enter into the process they had to borrow money, rely on work being done pro-bono, or had to not contest some evidence. Key Informant 6 described how their organisation could not afford to provide evidence on water quality at the 2009 consents hearing as they could simply not afford a hydrologist, and that most of their experts provided evidence pro-bono. Key Informant 1 and 4 also said that keeping out of the Environment Court prevents the winners and losers concept, where a decision heavily favours one side, and leaves the other frustrated, and often financially and resourced drained.

5.2.2 Adequacy of the Current Framework

Key Informant's 2, 4, 5 and 6 all expressed concern about the adequacy of the current planning framework to deal with the issues in the Mackenzie Basin. Key Informant 2 had the impression that in the light of the 2009 hearing receiving about 10,000 submissions, the Government wanted to be seen as being proactive in finding a solution. They discussed that as the current framework stands it is the regional councils that make decisions on water allocation, and the Agreement was a way to try and gain some control over this. With the Agreement led by a close personal friend of Hon. Dr Nick Smith, Key Informant 2 believed the Agreement was a way of seeing if in fact the Government could influence decisions in the Mackenzie, and at the same time satisfy public concern.

Key Informant 4 said the current district plan *"is not robust enough to protect the landscape,"* and this view was also held by Key Informant 5, while Key Informant 4 felt that the council was not given the tools under the RMA to properly deal with the issues in the Mackenzie Basin. Key Informant 5 stated that the current district plan *"is not effective in managing dairying in the Basin,"* with its only provision being about vegetation clearance, and Plan Change 13 only addressing visual effects. Key Informant 4 discussed how councils are limited by the RMA when protecting and enhancing biodiversity. While it is their obligation under the framework to do so Key Informant 4

points out that their only real tool is regulation and, therefore, "*a much more sophisticated approach is required in a place like the Basin than what the RMA is actually delivering."* They cited that the council cannot fund biodiversity protection, or compensate farmers to enter into light grazing. Key Informant 4 also points out that one of the biggest threats to biodiversity in the Basin is rabbits and the spread of hieracium, neither of which is controlled by the RMA, but by the Biosecurity Act. Key Informant 4 noted that *"*[the leader's[8]] *approach has been that the RMA is not adequate for the Basin,"* which is why a collaborative approach was created. Key Informant 5 also critically discredited the Queen Elizabeth Covenants that are used for protection in the Basin, citing them as *"weak in their wording and implementation."*

Key Informants 2, 5 and 6 all noted the failure of organisations to implement the current planning framework. All described how landowners had developed crown-owned land without permission from the Government, or illegally changed or destroyed waterways. Key Informant 5 described how they had photos of a landowner illegally developing a wetland, but when they showed the council *"they couldn't care less."* Key Informant 2 also talked about a landowner illegally changing a stream in the Basin on their property in order to accommodate an irrigator, and described them as a blatant *"environmental vandal."* Key Informant 6 talked about the incompetence of Land Information New Zealand (LINZ) in doing their job of aiding in the eradication of wilding pines in the Basin. So much was their frustration that they along with others from their organisation went to Wellington to visit the Minister that was in charge of LINZ, the Hon. Morris Williamson, but that *"he didn't want anything to do with us."*

Key Informants 5 and 6 raised the point about their concern over the time it took to implement policy. Both described how developers had time to start projects before policy came into effect, with Key Informant 6 saying they were *"very concerned about the future of the Mackenzie"* because of this. They described that policy makers lacked the vision to look into the future, but expressed that *"who would have thought dairying would end up in the Mackenzie."*

[8] The 'leader' refers to the individual who led the Mackenzie Agreement initiative. Note that the 'leader' was an independent representative who has no vested personal interest in the Mackenzie Basin, but was heavily involved in the Land and Water Forum, which followed a collaborative process.

5.2.3 Was it all just an Experiment?

A very clear feeling that came through from key informants was the feeling that the Mackenzie Agreement was an experiment by a key architect in the proposal, the leader, and the Hon. Dr Nick Smith for future bigger ideas, such as inclusion of collaborative processes in the RMA. Key Informants 2 and 4 especially gave detailed insight into this concept, with both describing the leader's study of collaborative governance in Scandinavia, and that the leader had in the past had some success at promoting collaborative approaches with the current Government. Talking about collaborative planning Key Informant 2 stated that the Hon. Dr Nick Smith *"was very fond of the process,"* and with both he and the leader being 'friends', and the Mackenzie case study having high conflict it appeared the ideal setting to try out an alternative option.

Key Informant 4 described at the time how the Hon. Dr Nick Smith was talking about involving collaborative processes in the RMA because he "*saw that fighting things out in the Environment Court caused a lot of delays, and cost a lot of money, and there is winners and losers."* Key Informant 2 described that the changes proposed for the RMA aimed to mimic the collaborative development process that already occurs in the water catchment plans that are present in Canterbury.

5.3 Can the Mackenzie Agreement achieve its goals?

Section 5.3 describes whether the Mackenzie Agreement can achieve its goals. Section 5.3.1 outlines the uncertainty that has emerged with its implementation and direction, and Section 5.3.2 outlines the bad process that occurred in the Agreements making. Section 5.3.3 describes the role of conflict in the Agreement, and Section 5.3.4 outlines the problem of identifying areas for protection, and avoiding fragmentation. Section 5.3.5 describes the trust that was built among participants of the Agreement, and Section 5.3.6 states preferred alternative options to the Agreement.

5.3.1 Uncertainty about its Implementation and Direction

"Generally people recognise that (the idea has merit), *which is why they are hanging on in there, but the wheels have really fallen off in terms of process issues, people knowing what's going on and things like that, and a bit of a lack of trust about where that will all lead."* – Key Informant 4

A clear theme in the key informant interviews was uncertainty around the processes the Agreement was going to use to achieve its aims. Key Informants 1, 2, 4, 5, 6 and 7 all expressed confusion over how exactly the Agreement was going to operate. Key Informant 4 referred to the leader as *"not a details guy,"* and expressed that the leader had *"the big picture in their head but was unsure exactly how to get there."* Key Informant 1 backed up this by saying that *"no one knew how you'd apply this thing."* Most confusion was about who would elect the Trust, who was eligible to be elected, who would do the monitoring, and who would do the enforcement of the covenants.

Key Informants 2, 4 and 6 all commented on the lack of direction that had developed in the goal of implementing the Agreement. It was felt that the Agreement itself had stalled, and needed someone to pick it up and run with it to make it a success. Key Informant 2 summed up the situation by stating:

"No one has taken the Bill to Parliament, we are in a black hole, I guess the next step would be for the Minister to instruct his officials to talk to MfE, Treasury, and all the other people to start talking about how you might draft the Bill, but I would be surprised if they even had that meeting."

Key Informants 4 and 7 expressed that the main reason the Agreement lost direction was because it was not community led and driven, and therefore not endorsed by the community. They felt that if the Agreement had its management structure in the Basin then the community were more likely to have kept driving it. The leader, who was responsible for the Agreement, lived outside of the Basin and was involved with a number of different environmental activities. Key Informant 7 had strong feelings about the outside influence that had occurred in the Agreement, asking why outsiders had the right to decide what was right and wrong for the Basin. It was revealed that these implementation and directional issues created disparity within those involved, with Key Informant 7 saying, *"we spend 18 months working this thing out and I think most*

people agreed to it because they got sick of it and just wanted to go home and do something else."

Confusion and uncertainty about exactly where the money was going to come from to fund the Agreement was expressed by Key Informants 2, 4, 5, 6 and 7. However, Key Informant 1 was confident that the money could come from taxes and rates collected from the allowed developed land. It was felt strongly by Key Informants 2, 4, 6 and 7 that if the Government did not step up and fund the Mackenzie Trust then it would not get off the ground, with Key Informant 2 expressing that *"if they haven't decided anything before the end of this year I doubt they will."* However, it was expressed that other funding options could be found such as looking at international and national organisations, and private funding. Key Informant 7 described how the owner of Ohau ski-field had experimented last season by asking customers if they wanted to donate a small amount to protect the Mackenzie Basin, and that this was quite successful. Key Informant 1, who did the economic analysis in the Agreement, was very confident that the rates and taxes collected off 25,000 ha of intensive developed land would be more than sufficient to fund the Trust. However, in relation to the uncertainty of the processes in the Trust Key Informant 7 expressed doubt about whether the Government would want to fund an Agreement that was poorly set up.

5.3.2 A Bad Process Altogether

In terms of the overall process that was used to construct the Agreement and the Trust Key Informant 2 described it as *"a bloody dreadful process."* Both Key Informants 2 and 6 described how they felt unable to successfully participate in the making of the Agreement as they struggled for funding to both participate in the meetings, and employ technical experts. Key Informant 7 expressed that they thought the Agreement would be a community process, but instead the people with *"the biggest cheque books got the most input",* and they did not think that was a fair way to go about things at all. Key Informant 2 backed up this view by inferring that even though a collaborative process was meant to be about compromise, it was the major irrigators that influenced a lot of the Agreement, with some not even signing it in the end. They talked about how in a collaborative process you are forced into compromise, and that this was detrimental to their organisations goals in the Mackenzie, and watered down the overall outcomes that they got out of the Agreement. Key Informant 3 described how land owners tried to

compromise as little as possible saying, "*our position in the Agreement was damage control, trying to minimise potentially what we were going to lose, and we were trying to give away as little as possible."* Their justification for this action was that farmers needed to be able to adapt to change, and technological developments, saying that *"if we can't change, were history."*

Key Informant 2 described how their organisation had a Mackenzie campaign operating before the Agreement was proposed, but was forced to stop this process when they became involved with the Agreement. They had the personal opinion that their organisation should not have got involved with the Agreement, and expressed that they would not be concerned if the Agreement never eventuated. Describing their frustration they stated that:

"When you start a collaborative process your shut down, you can't be in the tent as it were and on the outside campaigning, so it shut down [the] *campaign as well. Looking back at it, my personal view is that* [their organisation] *shouldn't have started* [being involved with the Agreement], *but then again you are forced into it by them saying well you're the one's making all the noise, let's sit around and talk about it and you're not there, so it's kind of a weird situation."*

Key Informant 2 also disclosed how they were concerned about how the main incentive for farmers to enter the Agreement was financial. They talked about how they would have liked the Agreement to have explored further alternative mechanisms, as simply paying farmers in their eyes *"sets a dangerous precedent."*

Key Informant 2 further described how the meetings for the Agreement were *"always so emotionally charged,"* and described how the environment in the meetings was often uncomfortable simply because you were often making decisions about someone's land who was sitting next to you. They referred to the difference between the Mackenzie Agreement and the Land and Water Forum (LWF), which also used a collaborative approach. They described how the LWF was done in Wellington with top level executives and individuals, along with being extremely well funded. Key Informant 2 cited that the LWF process was a much smoother process, was fairer, and created less conflict.

Referring to the leader's study of collaborative processes in Scandinavia Key Informant 2 expressed concern about the differences between the New Zealand and Scandinavian collaborative processes. It was revealed that most Scandinavian collaborative approaches allow the stakeholders to come up with agreed policy, which is then adopted by the Government and enacted into Government policy. However, in the New Zealand process *"they just cherry pick bits that they like*," referring to the Government having control over the process and selecting aspects out of overseas examples they like.

5.3.3 Past Conflict and Voluntary Approach

Key Informants 1 and 2 both brought up the dynamic that both of them were currently in litigation against one another, which began before the Agreement was proposed. Key Informant 1 had played an important part in the drafting of the Agreement, including having done the economic analysis. However, because of Key Informant 2's on-going litigation against them Key Informant 1 in the end chose not to sign, or be a part of the Agreement. Key Informant 2 responded to this by saying:

> *"Had I known* [they] *wouldn't agree to it I would have opposed a lot of that economic stuff that's in there, because there all* [their] *figures, but I just thought screw it if it keeps* [them] *happy. That's the terrible thing really this person has been able to influence this agreement and hasn't been a signatory to it."*

Key Informant 2 was extremely frustrated by the actions of Key Informant 1, and that the collaboration process allowed an individual, who in the end chose not to be part of the process, to influence important aspects of the Agreement which are seen as being self-serving. As a result of the litigation Key Informant 1 expressed that, *"I just can't sit at a table and sort something out with someone who's taking me to court."* As a result of this experience Key Informant 1 stated that *"personally I'm still worried about that even though if* [Key Informant 2's organisation] *sign the Agreement, they can still come and attack me in the consent application."* They expressed concern about the Agreement being a voluntary approach, and the fact that opposition parties could still attack their development proposals through RMA and litigation processes.

5.3.4 Identifying Areas of Protection and Preventing Fragmentation

An important part of the key informant interviews was that Key Informant's 2, 5 and 6 all identified that if the Agreement did not achieve large interconnected areas of land put into protection the Agreement would not achieve its goals. Key Informant 2 discussed how they hoped the Agreement would not follow what the tenure review process had done which had resulted in *"tiny bits of land being protected."* They stated that:

"It's not a process of a landowner wanting to plough up 2-3000ha on their dairy farm and then saying I'll give you this little patch here, it's actually saying lets identify what all the values are then try and see if the Trust can protect those through management plans, so you can say well here's a really important piece and its connected to the neighbours, and there has to be ecological connectivity."

Key Informants 2 and 5 were concerned about how land was to be valued for protection, and talked about how the Trust needed a spatial plan that would identify and rank all the important areas within the Basin. They identified that this was needed so that landowners could not just offer up any piece of land for protection, but could work out the value (and potential amount of backing), that they could receive for putting up certain areas for protection. They stated that not having this spatial plan made creating management plans very difficult, but understood that this would most likely be an expensive and time consuming process.

5.3.5 Building of Mutual Understanding and Trust

A common positive of the collaborative process from both sides was that it had helped build mutual trust and understanding between all those involved. Key Informant 3 expressed that "*we learnt a fair bit about them, and they learnt a fair bit about us*," when talking about the overall process, and this view is backed up by Key Informant 6. Key Informant 6 described that the attitudes of people changed dramatically as the process went on saying, *"over time you could start to see the difference, people started to talk to one another, and actually started to have some respect for the other one's point of view."* They discussed how in their opinion they did not know if the Trust and the Agreement was going to work, but that they saw it more as an opportunity for people to be educated about other people's opinions.

5.3.6 Alternative Options

While discussing the Agreement Key Informant's 2 and 5 described preferred alternative options for protecting values in the Mackenzie Basin. Both preferred government protection options, with Key Informant 2 describing that [their organisation] wanted the Government to create a drylands park out of the tenure review process, and they wanted this to be created in the northern end of the Basin. Key Informant 5 backed this kind of idea saying that government protection was the best protection, and with reference to funding saying, "*don't listen when the media says* [their organisation] *don't have money, we have it."*

6. Discussion

6.1 The Impact of Dairying in the Mackenzie Country

An evaluation of the potential environmental, social, and cultural effects of dairying development in the Mackenzie Basin has taken place in the previous sections. Environmental effects comprise of water quality degradation and habitat fragmentation (Section 2.3), while social effects include reduced community participation, and problems with migrant worker settlement and mistreatment (Section 2.4, Section 5.1). While environmental impacts are being addressed through the Mackenzie Agreement, one aspect that has not been considered in the current planning documents for the Mackenzie Basin are the impacts that social changes could have on the Mackenzie Basin community.

6.1.1 The Social Consequences of Intensive Dairying

Key Informants 8 and 9 support Trafford (2010)'s suggestion that dairy farm employees find it hard to socialise and participate in the surrounding community. Rugby and high physicality sports require a high amount of energy to participate, and also high time commitments. Finding the energy to participate in late night trainings during a 12 hour a day, 12 day in a row roster is going to be difficult, along with coaching and helping run junior teams. Amateur clubs, especially rural, rely on volunteers to coach teams and run fundraisers. If parents and individuals cannot be found to volunteer their time the clubs will cease to exist, and this is especially important when it comes to fundraising activities. If dairying were to displace current agricultural activities and entice employees to switch careers into the dairy industry amateur clubs could be affected. Adding to this is the high turnover rate of players which Key Informant 8 discusses. Rawlinson (2011) cites that the average length of time an employee spends on a farm is 1.6 years. With the Mackenzie Club having a 50 per cent turnover rate of players a year it can be argued that an increase in dairying will only increase this turnover rate and also bring more people to the district whom cannot play sport. This constant turnover of

players leads to a team losing cohesion and leads to insecurities about the future of those dairy workers who do participate in sporting teams.

This 1.6 year turnover rate also indicates that dairy workers will not be able to participate in local volunteer emergency services. Twizel fire brigade requires a two year minimum commitment from its volunteers, and Rawlinson (2011)'s research suggests that dairy workers cannot commit to this minimum period. While a large influx of dairy personal may be economically beneficial to the Mackenzie District it is argued that they will not have large participation rates in volunteer emergency services. Adding to this is the revelation that Key Informant 9 would not volunteer for St Johns as it took up too much time. Key Informant 9 worked a normal forty hour week, which alludes that an individual who works 12 hours a day, 12 days in a row would be even less likely to volunteer for St Johns. It could also be argued that if dairying were to entice individuals to switch from their current careers to dairying in large numbers participation rates in volunteer emergency services in the Basin could also decline. Decision makers in the Mackenzie Basin need to look at this potential drop in community participation, especially if volunteer emergency services are going to be affected. If this number were to drop dramatically safeguards would need to be put in place, such as paid individuals, to ensure the Mackenzie Basin community had enough adequate emergency services to suit their needs. This is important as the Mackenzie Basin also contains State Highway 8 which is used by large amounts of tourists every year, and in the event of an accident they are hours away from major hospitals due to the Basins isolation. However, along with decreased community participation rates key informants also noted that dairying brings with it a transient population.

Key informants cited that constantly moving from school to school is a red flag in terms of a child having learning difficulties. It can be assumed that constantly moving into a new environment will provide an array of distractions that might prevent some children from learning at the best of their ability. These may include having to make new friends, build new relationships with teachers, come to terms with their new physical surroundings, and adapt to a new learning style. With increasing amounts of overseas migrant workers entering the dairy industry it could be argued that it is migrant children that are most likely to be affected. Along with the normal distractions of a new school they also have a new language and culture to come to terms with. Key Informant 10 noted an induction problem for a migrant child at their school and noted that they were

looking at instigating an induction program. However, apart from the problem of helping new arrivals comes the similar problem of stopping children from leaving schools in the Mackenzie District. Key Informant 10 discussed the challenges that they personally felt of trying to keep children from going to boarding school, and touched on the *"class system"* that dairying brought with it. A misconception could be that increased dairying will bring an increased population, and increased school numbers. Following the thoughts from Key Informant 10 it is no secret that owning a dairy farm can bring with it wealth. The Mackenzie Basin is a very isolated region and its schools cannot always provide the same services as urban schools, with an example being team sports such as rugby. The prestige and opportunities of attending private schools in Timaru, Christchurch, or Dunedin could prove to be too appealing for owners of dairy farms resulting in a decline of local school numbers. Through its social perceptions and transient nature dairying also has the potential to affect a communities' cohesiveness.

Changing employment environments were discussed as one reason for tension in Twizel, and it could be argued that changing environments in terms of a new dairy industry could further this tension. With its transient nature and increased wealth dairying has the potential to change traditional demographics in Twizel. Those residents from the 'old hydro-days' may not welcome this change, with key informants citing that they already have issues with changes in the township. Issues may include the perceived flaunting of wealth, the opening of new upper-class services, an increase in migrants, and the constant rotation of new faces that come and go from the township. This could lead to integration problems for new residents into Twizel, and a perception of not feeling welcome, which creates problems with the cohesiveness of the township. Aside from the individuals themselves, key informants discussed how dairy farming practices were scrutinised by members of the Twizel community. Amenity issues were the main concern, which is understandable in a district where people are often drawn there by its unique landscape and high amenity. Water sports including swimming, rowing, boating, and fishing are popular ventures in the Mackenzie Basin, and therefore it was no surprise when issues around water quality surfaced from residents. Along with being an important resource for local residents the waters of the Mackenzie Basin bring many tourists to the district each year, and this has resulted in Twizel being a prime location for batch owners. If the quality of the waters of the district were to come into

question about its safety then this would have a detrimental effect on not only local residents, but tourist numbers, and would likely cause tension in the district.

Along with water quality residents and tourists also have the upmost appreciation for the scenic views of the Basin. The unique experience of skiing on the mountains surrounding the Basin and looking down on a pristine semi-arid landscape, or simply enjoying the drive through the Basin is recognised as an important valued experience. It can be argued that the contamination of this through green crop circles and irrigators would degrade this experience, and again cause tension in the district. However, dairy farm owners often have the counter argument that they are providing vital economic revenue for the community (Payne and Stevens, 2010). Apart from the obvious economic benefits dairy farmers may also argue they bring more abstract benefits, such as Key Informant 7 arguing that their cows and large irrigator were tourist attractions. This argument may have some substance when talking about overseas tourists, but would likely fall flat with most New Zealanders. This being said if the dairy industry does enter the Basin it must tread carefully and make sure they are sensitive to community concerns. One example of this is to make sure irrigators are parked against hills away from roadsides so they do not impede the view.

6.1.2 Planning for Overseas Migrant Integration

Key informants backed up Tipples and Lucock (2004)'s view that migrants want more opportunities to be able to participate more in the surrounding community. Being able to integrate into a new environment, and also feel welcomed is an important issue for anybody moving into a new area. This is arguably most important for people who are from new countries, cultures, and who speak other languages. In order to meet new people and participate in the community transportation is needed, especially if the individual lives in a rural area. Most rural areas do not have accessible public transport options, and with most individuals requiring a large amount of time to learn how to drive to New Zealand's road rules it creates a situation where they are isolated. This isolation creates boredom, can lead to mental illnesses, and also to severe homesickness for migrant workers. This situation can also be heightened by the long days and rosters that migrants are asked to work which restricts their ability to socialise. Current trends in migrant workers show that large proportions are coming from highly densely populated countries in Asia where family connections are important. In the absence of

family for support, and a new sparsely populated environment, having access to transport has been identified as a crucial issue. However, also important are the settings for social interaction.

Cultural differences may mean that socialising in rural pubs over a beer may not be seen as possible by cultures that do not drink alcohol. Also, some cultures may not be seen as appropriate in terms of being asked to participate in some social activities. For example, it is more likely that a Samoan migrant is going to be asked to play in the local rugby team opposed to a Filipino migrant. Rural New Zealand communities are likely to have a limited number of activities available to participate in opposed to large metropolitan cities in Asia. This fits in with Tipples and Lucock (2004)'s findings that migrants want more opportunities to participate in the community. A support network like a Newcomers Network could aid in providing more opportunities for new migrants in the Mackenzie Basin. Researching how new migrants like to socialise would provide an environment that they are comfortable in, and would aid in building confidence in new migrant arrivals. In terms of who is affected most by isolation and boredom it was interestingly revealed to be women without children.

It is recognised that the workers themselves would at least be able to form relationships with other employees and their employer, but that spouses may not have this opportunity. This leaves them alone for long hours at a time in a brand new environment. In this situation a support network is likely to be very beneficial, especially in a very isolated area like the Mackenzie Basin. Being provided with the simple opportunity of having a cup of coffee with another individual could be very beneficial. Newcomers Networks primary objectives are to help with social integration, and are tailored to suit different districts. In the situation where spouses are left by themselves a Network could help instigate coffee mornings, and other simple activities that help new migrants meet new individuals. A Network would be able to help bridge the transportation issue that has arisen in the key informant interviews, and similarly could aid in migrants gaining experience and confidence in driving in New Zealand. The isolation of migrant workers can also lead to a darker side that has emerged from the New Zealand dairy industry, migrant mistreatment and abuse.

Many key informants discussed the issues around migrant neglect and abuse, and the associated problem of many not wanting to go to authorities, but instead choosing to

just pack up and move farms. This reflects what Cropp (2010) found in their research and led them to conclude that migrant workers are very vulnerable to exploitation. The fear migrant workers have of authorities and deportation is characterised through them not turning up to Key Informant 13's Newcomers meetings simply because the name of the meetings sounded suspicious. This fear signifies that there is a knowledge gap among migrant workers about what their rights are while living and working in New Zealand. Knowing your rights while working in a foreign country is extremely important as it prevents you from getting threatened with deportation on unjustified grounds, and educates you on what working conditions you are entitled to. Without this knowledge individuals and their families can easily be taken advantage of and manipulated into working under illegal conditions and misconceptions about their ability to be deported. A support network would be able to educate migrant workers and their families on their rights of living and working in New Zealand, and also would give migrants a contact point for any concerns they may have. While there is currently no dairying in the Mackenzie Basin Key Informant 12 acknowledged that migrant mistreatment already occurs. The Filipino Dairy Workers in New Zealand Incorporated was set up in Mid Canterbury as a reaction to the mistreatment of workers, however, instead of being reactionary to the problem forward thinking in the Mackenzie Basin could prevent problems in the dairy industry from surfacing all together. However, when problems do arise people also tend to stick together and this can create both a blessing and a curse for those involved.

There was differing views between key informants about the value of migrant workers sticking together with people of the same nationality. Filipino workers themselves expressed that they thought this was important as it made them more comfortable, while Key Informant 13 expressed that taking migrants out of their comfort zone was important in aiding their integration into the surrounding community. When entering a new environment people are naturally going to look for people that are similar to themselves, and if there are some that are the same then they are going to likely stick together. However, in this situation if you are not forced to learn a new language, learn a new culture, and a different way of life then you are going to find it difficult to integrate into the wider community, and New Zealand as a whole. It is the process of having to *"struggle,"* as Key Informant 13 puts it, that forces people to adapt to new surroundings and will help them be better off in the long term. Being forced to go

outside your comfort zone is likely going to aid in building social skills and improve an individual's ability to adapt to new surroundings. A support network could help in this situation.

A balance between socialising with people of similar nationalities, and the surrounding New Zealand community is likely to be a good option that a support network could help with. A support network would be able to introduce people from similar backgrounds to one another, and also provide situations and information around New Zealand culture, language, and way of life. In a rural isolated community like the Mackenzie Basin this is likely to be even more important as it will not have the diverse cultures of large cities like Auckland, and also will not have a large number of social events for migrants to participate in. Overall, key informants believed a support network would be beneficial in the Mackenzie Basin but it is recognised that establishing one may not be easy. The Ashburton Newcomers Network depends on volunteers and charity funding to run its Network, and this may be an issue in the Mackenzie Basin. Finding enough volunteers that would be willing to cover the vast areas of the Basin would require considerable time and personal sacrifices. The funding of a support group would likely be a considerable barrier, but this could be met by asking for grants from council, national organisations, and the community itself. The most practical support network to set up in the author's opinion would be a Newcomers Network. This is because of the positive feedback regarding the organisation, and the success it is having in Ashburton. In terms of setting up a Network it the Mackenzie Basin all that has to be done is to contact the national headquarters in Nelson who will aid and educate in the setup process.

In an ending observation it is recognised that there is a lack of focus in the planning framework on social challenges when determining whether to allow intensive dairy operations. While the purpose of the RMA mentions 'enabling people to provide for their social wellbeing,' when deciding on resource consents for dairy farming there appears to be a firm focus on only environmental effects. The current planning framework does not carry out an adequate assessment of what intensive dairying will do to community demographics, and the communities' 'social 'wellbeing.' With no adequate assessment currently being taken out in the planning process community wellbeing in rural areas is potentially under threat, and set to change as intensive dairying carries on to push into new areas unaware of the different social issues it brings with it.

6.2 A critical reflection on the Mackenzie Agreement as an example of Collaborative Planning

The catalyst for the development of the Mackenzie Agreement was frustration surrounding the 2009 water consents hearing. Both proponents and opponents to the water consent process had concerns and problems with the process, which included time delays, cost, lack of resources, no compensation, and that the Environment Court was the only avenue to settle major disputes. However, the biggest grievance from landowners was the call in process.

The call in process is rare and reserved for cases that are of 'national importance' that concern large areas with complicated environmental aspects (Ministry for the Environment, 2013b). Cases of national importance attract a high level of scrutiny around environmental effects, which means robust scientific evidence and reports must be constructed and presented to give the commissioners an accurate foundation to base their decisions on (Ministry for the Environment, 2013b). The call-in process is expensive and protracted, which Key Informant 1 cites as a major problem with the process, but it does provide for the most thorough analysis. Another issue that Key Informant 1 had with the call-in process was the requisite joint nature for some consents that had to be prepared. It is necessary for this joint approach, as for example some environmental effects are cumulative, and this is especially true of the effects of effluent discharge on water quality. In light of the increase of intensive dairying in New Zealand, and the degrading nature of New Zealand's waterways there is increasing pressure to prevent further degradation. In order to achieve a high level of scrutiny a holistic view is needed to understand what the overall consequences are of allowing intensive irrigation in the Basin. This cumulative approach can protract the consenting process, and is financially draining, but it also provides a clear understanding of what the overall effects of the proposed development are, and this level of detail is needed when dealing with issues of national importance.

However, the high level of detail needed in the call-in process does not only need to come from the applicants, but also those in opposition of the proposal. Most of the

opposition groups in the hearing process were small or under-funded, and this presented problems when trying to obtain quality information for evidence. Quality scientific information is often complex to obtain and requires experts, who often require high compensation for their services. Key Informant 6 cited that their organisation could not afford a hydrologist, and therefore, could not present any evidence on water in rebuttal to the applicant's evidence. The call-in process appears to financially hamstring small or under-funded groups, and implicitly favours well-financed applicants. Without the ability to provide rebuttal evidence the process can becomes one-sided and gives an advantage to those groups that can afford to produce evidence. Undoubtedly, this creates frustration among small organisations and highlights the lack of equitable fairness in the call-in process.

In terms of why an alternative approach was sought it is clear that the share financial resource draining nature of the current call-in process was a major motivator. A collaborative approach brings stakeholders together, and is less resource intensive. In terms of the Mackenzie Agreement both sides have agreed that the Basin contains important ecosystems that need protecting and that landowners need to be able to work the land to make a living. By doing this there is no longer debate and conflict about which is more important, and this saves resources on trying to prove one or the other. This is done through pooling and sharing information and view-points which is an integral part of the collaborative process (Lawrence, 2000).

Conversely, in terms of equitable fairness the RMA has been shown to overlook compensation for landowners. The RMA states that no compensation has to be paid to landowners whose land is put into conservation, which ultimately gives a disincentive for landowners to do this, and has been identified as one of the main reasons the Mackenzie Agreement was created. Without compensation available to landowners it ultimately leads to conflict between those who want to protect ecological values of the land, and those who have an economic interest in it. For landowners it is a simple case of either having land that will provide them with an income, or land that will yield them nothing at all. If the RMA gave provisions for financial incentives to landowners to put land into protection it would provide them with an incentive to do so as it would allow landowners to gain compensation for the land they put into conservation. Instead, current decisions in the Basin have led to landowners losing land to conservation efforts

with no compensation, and this has led to the concept of JMA's and compensation in the Mackenzie Agreement.

The nature of the collaborative process allows participants to tailor an approach to suit their needs, and in this particular case compensation was a critical aspect for landowners. Having the incentive of being compensated creates a situation where landowners see the prospect of putting land into conservation as a viable option. The Mackenzie Agreement states that $50 a hectare per annum is the agreed price landowners will be paid by the Mackenzie Trust on top of the setup and maintenance costs of establishing, and maintaining a JMA. With the alternative incentive of gaining favorable backing from the Mackenzie Trust for future development there is also the reduced need to go to the Environment Court to settle disputes. However, with landowners acting as conservation stewards it is unclear whether landowners have considered the costs involved in maintaining conservation lands into the future.

The disadvantages of the Environment Court were that it drained resources and did not create an effective forum for compromise. When two parties contest an issue in the Environment Court there is going to be a defendant and plaintiff, a winner and a loser. This process may be perceived as disadvantaging small or under- funded organisations, as the prospect of potentially spending a lot of resources for no outcome can be a sufficient deterrent to contesting a resource consent outcome. The adoption of a collaborative approach, which advocates for compromise and the discussion of issues (Brand and Gaffikin, 2007, Innes and Booher, 2010, Selin and Chevez, 1995), can save both sides a lot of resources and allows financially constrained organisations to have some input. This is seen in the Mackenzie Agreement through the adoption of JMA's and the compensation mechanism. When contesting parties can come to a solution outside of the Environment Court it saves time and financial resources that could be spent elsewhere. However, aside from the frustrations with the 2009 consents hearing and the Environment Court there was also frustration over the implementation of the current planning framework.

Those who opposed increased irrigation in the Basin felt that decision makers had failed to uphold their statutory obligations in some areas, which had led to landowners illegally developing some areas of land, and they also had concerns about the time lags and delays in the implementation of new policy. The Mackenzie Basin is a very large

and remote area making managing and enforcing policies and bylaws problematic. When the Mackenzie Council was confronted with photographic evidence of a landowner developing a wetland they did not take action as wetlands are Ecan's responsibility. In this present scenario individuals have to rely on the regional council to take action, however, it is hoped that incentives for conservation in the Mackenzie Agreement may encourage landowners to desist from illegal practices. This is because landowners will now be under scrutiny from the community about their practices, and any serious indiscretions can be seen as a means to decline an application for a JMA and the incentives that go with one. Furthermore, it takes time for new policy to be implemented, and to the frustration of many involved in conservation advocacy this gives landowners an opportunity to carry out activities before a new policy is implemented, and this can cause irreversible damage rare ecosystems. However, non-traditional planning frameworks, like the Mackenzie Agreement, are voluntary and landowners participate in the process due to perceived positive benefits, like recognition of their right to work the land to ensure a livelihood. Landowners were present during the creation of the Mackenzie Agreement and a mutual agreement would likely stand that to be part of the Agreement landowners would have to act in good faith until they entered into a JMA.

There was much discussion from key informants about the leader's involvement in the Mackenzie Agreement, and how the Agreement was being used as an experiment by both the leader and Hon. Dr Nick Smith. At the time the Mackenzie Agreement was being formed Key Informant 2 noted that the Ministry for the Environment was undertaking RMA reforms and evaluating collaborative processes. The Mackenzie Basin presented an ideal setting for this experiment as it contained a highly contested resource and discontent for the current planning framework. The argument that the Agreement was a way for the Government to try and gain some control over the issue is supported by the fact that the Government at the time was under increasing public pressure to act on the issues in the Mackenzie Basin. The decentralised nature of the New Zealand planning framework, however, means that water allocation is done at the regional council level. Given that the 2009 hearing received 10,000 submissions the Government was under pressure to intervene. The appointment of the leader of the Mackenzie Agreement, who was characterised by key informants as a close personal friend to the Minister for the Environment, can be interpreted as a governmental agenda

to gain control and influence over the collaborative process, and thus satisfy public concern.

6.2.1 Can the Mackenzie Agreement Achieve its Goals?

The general consensus from key informants was that they did not have faith in the Mackenzie Agreement's ability to achieve its goals as the Agreement did not follow a good process, which Mandarano (2008) explains is critical in creating trust between those who are involved. Several key informants cited that trust did not exist in the Agreement because it was headed by an 'outsider' of the Mackenzie District. The failure of the Agreement to be driven from within the local community led to resentment of an outsider telling the Mackenzie District people what to do with their own district, and the Agreement process stalling. A good collaborative process needs local prominent stakeholders to be involved, (Mandarano, 2008), and when this does not occur there is going to be suspicion about the process. The result is that when people do not trust the process they are hesitant to be involved, which results in a poor collaborative process. The other problem of having an outsider head the collaborative approach is that they may not always prioritise the approach over other time commitments, and this is what leads to the process stalling. This has occurred with the Mackenzie Agreement with no one actively taking the *'Mackenzie Country Trust Empowering Bill'* to Parliament, and because of this the Agreement can go no further. Having a prominent local stakeholder lead the process means that there is interest in ensuring that the process goes well and achieves its intended results. Such a person will personally be known and trusted by members of the community, and can be approached and asked about how the process is going, and encouraged to keep its momentum going forward. The challenge is selecting a prominent leader in the local community who is not a party to local politics and not seen to be promoting their own self-interest. However, along with having prominent stakeholder involvement a good process also needs to be well resourced.

Collaborative planning approaches need to be well resourced, and includes having good scientific and economic information (Mandarano, 2008). A good scientific and economic base infers that all involved agree to use the information as they see it as unbiased, and not misleading. Key Informant 2 cited that Key Informant 1 provided all the economic analysis for the Agreement, which Key Informant 2 now regretted.

Having a stakeholder prepare important information does not create unbiased information as they can manipulate, or misrepresent the information to suit their own needs. A better alternative is to employ outside organisations to prepare information according to an agreed upon mandate. This gives both sides the opportunity to request certain information to be investigated, and means the information is not biased or misleading creating trust in the information. Aside from information, being well resourced also means having the financial ability to participate in the collaborative process.

Selin and Chevez (1995) and Innes and Booher (2010) acknowledge that allowing those stakeholders with the largest financial resources to have more control over the collaborative process defies the point of having a collaborative process at all. Key informants from small organisations cited the struggles of funding members to attend meetings, and of employing technical experts to give evidence. The isolation of the Mackenzie Basin (where a lot of meetings were held), means that it is a long drive, or flight and drive, for stakeholders outside of the district who wanted to attend meetings. Accommodation had to found, and meals paid for, and it was revealed that even seemingly small costs like this were hard to cover for some organisations. In order to gain equal funding the process would need Government funding. The consequence of not having equal funding is that those stakeholders with more financial resources can fund more members to attend meetings, and can provide more technical information, both of which entail having more influence over the collaborative process. This is against the core ethos of the collaborative approach, which is to have joint equal decision making (Selin and Chevez, 1995). Key informant 2 alluded to this by saying that although the collaborative process entailed compromise between parties, it was the major irrigators that had the most influence in the process.

The issue of compromise was an important factor in the failure of the Mackenzie Agreement process. During the discussions Key Informant 3 cited that landowners tried to compromise as little as possible, thus challenging the 'joint decision-making' aspect of the collaborative approach. Key Informant 2's frustration over their organisation having to withdraw from a current campaign in the Mackenzie Basin, and downscale their overall expectations from the Mackenzie Agreement, provides a stark observation of compromise in a collaborative setting. On the one hand joining the Agreement is voluntary so landowners can dictate terms as they like, meaning that if they were asked

to compromise too much they could simply threaten not to join. On the other hand environmental interest groups had no choice but to adhere to landowner's demands if they wanted them to join, which meant watering down their own expectations from the Agreement. The frustration of the voluntary nature of the Agreement ultimately got to Key Informant 2 who commented that in hindsight they thought their organisation should have never joined the Mackenzie Agreement.

The voluntary nature of the Agreement also brought up the aspect of conflict that occurred in the Agreement, and this is noted as one of collaborative planning's potential problems (Lawrence, 2000). In small communities where livelihoods are at stake, tensions are bound to arise, and even revisit past tensions. In the case of the Mackenzie Agreement this played out in such a way that an individual was able to shape the Agreement but in the end choose not to be a signatory. Having the ability to assert so much influence over the Agreement, and in the end not abide by it, is a flaw that may promote distrust amongst the participants, and challenge the legitimacy and effectiveness of the Agreement.

Fragmentation of an ecosystem furthers its depletion (Tilman *et al*. 1999, Fahrig, 2003), and in the context of the Mackenzie Agreement successful ecosystem protection comes from having large areas of connected ecosystems. The need for large connected areas is a struggle for the Agreement to achieve as it requires landowners to have land they do not want to develop next to their neighbour's land, which they also do not wish to develop. Landowners are likely to be hesitant to put aside large amounts of land, and would need very clear large financial incentives to do so. The funding of JMAs is seen as a key point of the Mackenzie Agreement, and it is recognised that the Government has an important part in this. Although the economic analysis states that JMAs could be funded through the rates and taxes from the extra developed land, the Government would likely need to fund the initial setup costs of the JMAs, and would also need to pledge that the tax money earned off the developed land would indeed go back to funding the JMAs. With the Government currently signalling no formal interest in getting pragmatically, or financially involved with the Mackenzie Agreement, it creates uncertainty about how exactly the JMAs would be primarily funded.

Another problem that arises is that if landowners are encouraged to put large areas of land into protection they may want backing to develop other ecologically important

areas of land in return. The current issue of not having a spatial map that clearly outlines the potential ecological value of land in the Basin presents uncertainty on both sides. The Mackenzie Trust is meant to work out protection areas, but not having a map that explains where important areas are, and the criteria used to identify them, leaves the door open for landowners to engage their own experts to dispute the Trust's findings. This could lead to more conflict and possible Court proceedings. It is this kind of uncertainty and lack of detail that has also caused a loss of trust in Mackenzie Agreement. However, aside from the negative aspects that have arisen about the Mackenzie Agreement there was a clear positive identified by key informants, and this was the building of mutual trust and understanding among participants.

In terms of participants who have an interest in the environmental value of the Mackenzie Basin, being able to build trust and understanding appeared to be the most important aspect they saw the Agreement providing. This was summed up by Key Informant 6's opinion of that they were not sure if the Agreement was going to work, but that they were more than happy that people were being educated about the values in the Mackenzie Basin. The understanding of one another's point of view breaks down the one-sided approach that some stakeholders may take into negotiations. The understanding that preventing land from being developed can severely affect someone's livelihood and family, and that people value the land for more than its financial value is no doubt going to be a large revelation for some stakeholders. Mandarano (2008) explained that the building of trust sets the platform for institutional changes, including accepting a decentralised decision making approach. Institutional changes also include stakeholders relaxing rules and red tape around entering into agreements and releasing financial funds. If stakeholders have strict company / organisational controls and policy around these it is hoped that the building of trust will allow these to loosen, allowing a smoother collaborative process.

6.2.2 Improving the Mackenzie Agreement Collaborative Approach

In terms of how the Mackenzie Agreement collaborative process can be improved lessons can be learnt from the collaborative process used in the Land and Water Forum. The LWF was a conglomeration of different groups that were supervised by government observers to develop a shared direction for water management in New

Zealand (Bains and O'Brien, 2012).[9] Key Informant 2 was part of the LWF and commented on how it followed a much better process than that of the Mackenzie Agreement.

It is difficult to accurately compare the two processes as they were done on very different scales, the Mackenzie Agreement at a local level, and the LWF at a national level, but the LWF does provide some insight into how the Mackenzie Agreement process might have been improved. The first observation is that although the LWF was made up of 68 different organisations, it only had a small group of 21 organisations that met regularly (Bains and O'Brien, 2012). This small group of organisations contained the most relevant and influential organisations, and represented the views of all the other 47 organisations involved (Bains and O'Brien, 2012). The individuals representing these organisations were often CEO's and high ranking officials (Bains and O'Brien, 2012). Although collaborative processes are meant to entail allowing all groups to participate there is a case to be made for the most relevant groups to be the ones which take control of proceedings, and represent the views of others. Such a focussed approach allows a more streamlined discussion, and ensures that those involved in the negotiation process will be a party to the final accord. The LWF was very well resourced and government funded, and this attracted attendance from persons of importance (Bains and O'Brien, 2012). The presence of these individuals allowed the LWF to lobby Government Ministers for support, and this resulted in the LWF being taken very seriously at the highest echelons of Government (Bains and O'Brien, 2012). The strong resourcing meant the LWF was highly organised, was able to employ personnel, had good technical information, and attracted a highly motivated chairperson and board (Bains and O'Brien, 2012). An evaluation of the process by Bains and O'Brien (2012) found that participants placed the success of the LWF on the chairperson who was described as extremely motivated, proactive and approachable, which starkly contrasts with the experience of the Mackenzie Agreement.

Key informants cited that the Mackenzie Agreement lost momentum, and that this was due to a lack of strong leadership, and the leader failing to have attention to detail and direction. The biggest difference between the LWF and Mackenzie Agreement appears to be funding, and the calibre of personnel involved. Having government funding and

[9] This description of the LWF is based on an evaluation of the LWF process undertaken for the Ministry for the Environment by Bains and O'Brien 2012.

high ranking officials, who are able to lobby government for support, appears to have a positive effect on the rest of the process. This includes being able to pay individuals to take part, acquiring a motivated chairman and board, and having access to good technical information for all those involved. Again it is difficult to make accurate comparisons between the two, but the two key differences that emerge that could have helped the Mackenzie Agreement improve are access to funding and strong leadership.

6.3 The Place of Collaborative Planning in current Planning Practice

In terms of where collaborative planning fits into the current New Zealand planning legislation the Government has already signalled in potential changes to the RMA that collaborative approaches could be used in council plan and policy development for water management (Ministry for the Environment, 2013a). Collaborative planning is seen as a means to mediate largely contested resources, such as the Land and Water Forum, Canterbury Water Strategy, and the Mackenzie Agreement. They are not seen as a way to settle small-scale disputes as their core attribute and strength is to bring large amounts of stakeholders together to mediate 'complex' natural resource issues (Conley and Moote, 2003). In terms of how collaborative approaches might improve the current planning framework for councils they can engage better public participation, and make for a more efficient and less expensive process.

At the moment there is believed to be a *"distorted and likely incomplete range of public participation in the planning process"* (Resource Management Law Association of New Zealand, 2013 p.2). The rationale behind this view is that current 'public participation' in the planning process is primarily made up of environmental and industry lobby groups, and therefore does not give a fair public view (Resource Management Law Association of New Zealand, 2013). Other reasons for collaborative planning's implementation in plan making is that councils engagement of stakeholder groups is deficient, and that due to the large amount of time it takes to implement plans they are often *"out of date"* by their commencement (Resource Management Law Association of New Zealand, 2013 p.2). The Ministry for the Environment found that 40 per cent of the overall time it took to prepare a plan was through the appeal phase to the Environment Court (Resource Management Law Association of New Zealand,

2013). Because of this collaborative planning is seen as a way to gain *"significant time savings and efficiencies"* (Resource Management Law Association of New Zealand, 2013 p.6). A paper by the Resource Management Law Association of New Zealand Incorporated (RMLA), goes through a description of how a collaborative process would work in a council setting.

The first step in how this would work would be for public and targeted notification of a statement of intension to have a collaborative process, and interested stakeholders would then have to register their interest with council. This step would ensure that all relevant parties are informed. The second step is that a collaborative process is undertaken, and the recommended process is noted as the LWF process. This process would determine a proposed planning instrument to be used to resolve the issue, and the instrument would be publically notified. The key to this aspect is that parties are given the power to shape the final agreement (like the Scandinavian method), and that there would not be a broad right to challenge the decision in the Environment Court at the end of the process. Removing this broad right to challenge not only ensures that a robust overall acceptable decision is made by the parties involved, but reduces the 40 per cent of time spent on appeals in the Environment Court. Step three would be public notification, submissions, and hearings on the planning instrument identified by the collaborative process. With all major stakeholders involved it is hoped that this process would be less time consuming, but changes to the planning instrument can still be made and refined in this process. The final stage is the right to appeal. However, with the removal of the right for a broad challenge any appeal to the Environment Court would only be possible on a point of law. With stakeholders already given the opportunity to voice their concerns and ideas in the collaborative process, submissions, and hearing phase it is expected that all relevant concerns would have been taken care of.

Overall, collaborative approaches in current New Zealand planning legislation are seen as a potential means to reduce costs, and improve public participation and efficiency in the highly contested areas of plan development and water management. With participation, cost, and efficiency being highly scrutinised in the current planning framework, collaborative planning offers a potential remedy for the New Zealand Government. However, lessons from the Mackenzie Agreement process show that for collaborative planning to be a legitimate tool for complex and highly contested resource planning it must secure suitable funding and leadership. Funding is essential to

providing independent technical advice, providing support staff to keep momentum going, and providing resources for community engagement. Having good leadership builds a good process, creates trust among participants, and keeps momentum going forward. In the absence of suitable funding and leadership it is unclear how successful collaborative planning processes will be in the long term.

6.4 Disenfranchisement of Local Representation

The implication that the Mackenzie Agreement was an experiment by Hon. Dr Nick Smith and the Government comes at a time when Central Government are preparing for changes in the RMA, and there have been several recent examples of disenfranchisement of local body decision making authorities. These disenfranchisement aspects are best illustrated in Canterbury, where Central Government replaced Environment Canterbury councillors with Government appointed commissioners to wrest control over water allocation consents. The appointment of a friend of Hon. Dr Nick Smith to lead the Mackenzie Agreement can also be seen as an attempt by the Government to gain influence over the allocation of water resources, which are meant to be the responsibility of regional councils. The RMA fosters a decentralised approach of decision making but that role in Canterbury, particularly for water consents and the earthquake rebuild process, has been systematically undermined by Central Government. There is no better example of this than the Environment Canterbury Act 2010 which removed democratically elected councillors, cancelled the 2010 elections for the Canterbury Regional Council, allows Ministerial selective application of the RMA, grants commissioners special powers, imposes a new legal test, process, and appeal rights, and excludes the jurisdiction of the Environment Court over regional plans (Brower, 2010). The blatant disregard the Government has had for its own laws has seen a backlash from the legal profession, and Brower (2010 p.321) suggests that *"if the Government must suspend environmental law and ignore constitutional etiquette to achieve its goals, all is not well."*

The actions taken by the Government support the notion that advocating for democratic governance is merely a *"symbolic exercise in legitimation,"* and can be simply ignored at any time (Kurian and Wright, 2010 p.448). However, disenfranchisement of power in the collaborative process may not be always so obvious. An important element for

collaborative approaches to work that came out of the research was the need for appropriate funding. The need for funding allows organisations to dictate what goes into collaborative approaches, and the result is that collaborative approaches are not 'collaborative' at all, but instead reflect the agendas of those organisations that fund them, such as the Government. A key aspect why Scandinavian collaborative approaches worked well is that stakeholders are given complete control of the input of the approaches, and their decisions are written into law. Key Informant 2 noted that this does not happen in the New Zealand context and instead the Government 'cherry picks' ideas and aspects out of the Scandinavian examples to suit their own agendas. Given the New Zealand Governments recent tendency of overriding democratic governance, even if collaborative approaches are written into legislation it would be naïve to believe that these approaches would be entirely 'collaborative' at all. Thus, the Mackenzie Agreement can be viewed as another example of Central Government interference in regional decision making processes, and evidence of a systematic disregard for the current RMA framework. As the Government looks to turn to collaborative planning processes for large, complex issues that may be of national significance, it is important to note that although decisions are meant to be made collectively by stakeholders they can be easily influenced and manipulated by government interference.

6.5 Opportunities for Future Research

This research has investigated the potential social impacts of intensive dairying in the Mackenzie Basin, and evaluated the collaborative Mackenzie Agreement. In terms of social implications for dairying communities there is an opportunity to investigate the social implications further, especially those to do with employment and economic benefits to communities. With the increasing amount of corporate ownership of dairy farms investigating the financial benefits dairy communities are receiving would prove interesting. With shareholders residing largely in the urban centres (and increasingly overseas), seeing whether the potential social and environmental degradation is worth the financial gain would prove to be interesting.

There is also very little academic research of the use of collaborative planning in New Zealand, and this is an area where future research is needed. The current New Zealand collaborative approaches are largely based on overseas methods and are not tailored

specifically for New Zealand. Further research into collaborative approaches suited to New Zealand would improve the collaborative planning process and allow them to be used more effectively in a New Zealand context.

7. Conclusion

The aim of this research was to provide an evaluation of the social challenges intensive dairying can bring to the Mackenzie Basin, and of the collaborative Mackenzie Agreement. To address the aim four research objectives were considered.

The development of dairying into non-traditional areas brought potential social challenges. It was found that dairying already creates decreased community participation in different social contexts, for instance in the Mackenzie Rugby Football Club in both a playing and coaching aspect. Players could not play due to the long working days and rosters, while this also affected their ability to coach junior teams and watch their children. It was found that it would be difficult for dairy farm employees to participate in volunteer emergency services in the Basin due to the time commitments these volunteer services required. If dairying expanded into the Basin there is likely to be a shift in the current demographics, and decision makers in the Mackenzie Basin may wish to consider the possibility of professional emergency service members being employed. It was also found that dairying brings with it a transient population, and in the case of Twizel can bring with it a loss of community cohesion. Schools in the Mackenzie Country discussed the potential loss of students to bigger centres due to the increased wealth dairying brings, and also the need to take extra care of students, especially migrants, who move from school to school. In terms of the communities perception of dairying there were negative perceptions mainly to do with environmental effects, and also some conflict that emerged between the tourism and dairy industry. There was also concern over conflict emerging between 'old' and 'new' Twizel, as changing demographics and increased wealth had caused this problem in the past. Such effects on community cannot be understated and need to be considered alongside with potential adverse environmental effects associated with new development.

If dairying is to enter the region there is an urgent need for a migrant support network in the Mackenzie Basin. It was found that a support network in the Basin would be beneficial. The core reasons for this stemmed from the isolation, boredom, and neglect that migrant workers have endured in the surrounding Canterbury areas. With the Mackenzie Basin being very isolated it is essential that support be available. Support networks help migrants prepare for life in New Zealand. Nationalities tend to stick

together when socialising and this was seen as both a blessing and a curse as these individuals had people to interact with, but also did not actively try to understand and participate in New Zealand culture, and this isolated them further from the broader community. A support network helps individuals participate in a wider cultural experience. In the cases of migrant neglect cases in the Mackenzie Basin have already appeared in the tourism industry, and the problem of migrant silence came to light. The fear of deportation caused many cases of neglect to go unreported as many migrants had no one they trusted to talk to. Thus a support network is an important tool to combat social isolation, neglect or abuse.

The Mackenzie Agreement was enacted due to frustrations and problems with the 2009 water consenting processes for the Upper-Waitaki Catchment, in particular the 'call-in' process. The applicants in the process cited the large time and financial costs as being especially frustrating, and this led to one of the applicants going directly to the Minister of the Environment, the Hon. Dr Nick Smith, and expressing *"there has to be a better way."* However, opponents of the 2009 water consents also had problems with the consent process citing financial costs of participating in the hearing as being a barrier. Aside from the 2009 consent process both proponents and opponents expressed their wishes for a solution to environmental issues outside of the Environment Court, citing the financial and time costs as being the reasons. The current planning framework providing environmental protection in the Mackenzie Basin was also deemed inadequate by both proponents and opponents, especially its inability to provide financial compensation to landowners who lose productive land to conservation. This led to landowners being hostile about conservation measures, and both proponents and opponents seeking a means to remedy this situation. In an interesting turn a number of key informants expressed that they thought the collaborative Mackenzie Agreement was being used as an experiment by the Government to gauge its effectiveness in preparation for changes to the RMA that are to include collaborative provisions.

Key informants expressed doubts about whether the Mackenzie Agreement would work, citing a bad collaborative process, and no formal Government backing as important reasons. A collaborative process must follow a good process in order to be successful, and it is this good process that builds trust among stakeholders. Key informants discussed how the *"wheels had really fallen off,"* and how this had led to a lack of trust about where that would all lead. Reasons for this bad process included that

the leader of the collaborative process did not have good attention to detail, the leader of the process came from outside the Mackenzie District, conflict among stakeholders, no government funding, unwillingness to compromise, and the ability of some stakeholders to essentially hold others to random during the creation of the Agreement. The situation of the Agreement currently having no formal Government backing caused concern among those involved. While having no Government funding during the creation of the Agreement hamstringed some organisations, the Agreement relies on the Government passing legislation to set up the Mackenzie Agreement, and also to fund JMA's with landowners. If this does not occur the Agreement cannot be implemented. When looking on how to improve the Mackenzie Agreement the collaborative process used in the Land and Water Forum was considered. The LWF's success was put down to it having a very good chairperson who was described as extremely motivated, proactive, and approachable. Other factors included that it was government funded, had high ranking persons involved, and had excellent technical information. Another important factor was that it had a small core group of organisations that represented the views of all groups involved.

However, a major positive that was seen to come out of the Mackenzie Agreement was its ability to enable stakeholders to see each other's point of view. Both proponents and opponents expressed this point, and recognised how the Agreement changed their perceptions of one another. In moving past the Mackenzie Agreement the future of collaborative planning in New Zealand planning legislation is seen by Government as being in plan development. Through its reputation of bringing stakeholders together, reducing costs, increasing efficiency, and mediating 'complex' natural resource issues collaborative approaches are seen by the Government as having considerable potential value in the New Zealand planning framework. However, the independence of collaborative approaches is questioned with the New Zealand Government having a history of ignoring its own legislation and democratic governance in order to implement its own agendas.

Overall the research has shown that potential social issues in the Mackenzie Basin stem from a possible drop in social participation, a transient population, and social perceptions of dairying. It found that if intensive dairying were to enter the Basin a support network for migrant workers is needed to help migrants with isolation, boredom, neglect, and integration into New Zealand culture. These social findings show

that consent applications should consider social implications when considering intensive dairying development. In terms of the Mackenzie Agreement its creation stemmed out of frustrations with the current planning framework surrounding the 2009 water consents hearing for the Upper-Waitaki Catchment. The concerns about the effectiveness of the Mackenzie Agreement are due to the poor processes it followed during its formation, and the lack of interest the Government has shown in supporting it.

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Appendix A

List of Key Informants

Key Informant 1: Mackenzie Basin Land Owner

Key Informant 2: Environmental Group Representative

Key Informant 3: Mackenzie Basin Land Owner

Key Informant 4: Mackenzie District Council Representative

Key Informant 5: Department of Conservation Representative

Key Informant 6: Mackenzie Guardians Representative

Key Informant 7: Upper-Waitaki Basin Dairy Farm Owner

Key Informant 8: Member of the Mackenzie Rugby Football Club

Key Informant 9: Member of the Twizel Volunteer Fire Brigade

Key Informant 10: Twizel Area School Representative

Key Informant 11: Mackenzie College Representative

Key Informant 12: Twizel Community Representative

Key Informant 13: Newcomers Network Representative

Key Informant 14: Mackenzie District Migrant Dairy Worker

Key Informant 15: Mackenzie District Migrant Dairy Worker

Key Informant 16: Mackenzie District Migrant Dairy Worker

Key Informant 17: Mackenzie District Migrant Dairy Worker

Appendix B

Information Sheet for Participants

Planning for Intensive Dairying, Where to for the Future?
INFORMATION SHEET

Thank you for showing an interest in this project. Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate we thank you. If you decide not to take part there will be no disadvantage to you and we thank you for considering our request.

What is the Aim of the Project?

The aim of my research is to look into environmental and social challenges that might occur due to the dairy expansion within the MacKenzie Basin. Along with identifying these challenges I am analysing the current framework that decision makers and the community have to address these challenges. I will be analysing this framework in terms of its effectiveness, and will be making recommendations where applicable about how the framework can be approved.

What Type of Participants are being sought?

I am seeking a variety of participants from within, and around the MacKenzie Basin. These participants will include; dairy farm owners, dairy farm employee's, federated farmers, experts in the field of agriculture, District Council Staff, high school and primary school principals, sporting club members, volunteer fire fighter members, members of community groups, and local business owners.

What will Participants be Asked to Do?

Should you agree to take part in this project, you will be asked to answer a series of questions, and give your opinion on the matters asked. The time commitment for participation is estimated to be no more than 30 minutes.

Participants may feel uncomfortable answering some questions as they may involve giving information about personal circumstances, and may involve giving information

about persons they know or are associated with. It is understood that different cultures may have different values and customs than New Zealand. Therefore it is understood that when interviewing migrant workers there is the possibility that answering some questions may go against their customs or values. To minimise this participants will be reminded that they do not have to answer any questions and can terminate the interview at any time.

At any time a participant feels uncomfortable answering any question or giving any information during the interview they can choose not to answer without any disadvantage to themselves. At any stage in the interview that I feel the participant is uncomfortable I will terminate the interview.

Please be aware that you may decide not to take part in the project without any disadvantage to yourself of any kind.

What Data or Information will be Collected and What Use will be Made of it?

What raw data will be collected?

Raw data that will collected will include personal opinions and information about the environmental and social changes that are likely to occur in the MacKenzie Country due to increased intensive dairying farming.

How will raw data be collected?

Raw data will be acquired by one- on- one interview's that will be audio recorded via Dictaphone. These recordings will then be transcribed into word documents. Personal information collected will include age, gender, ethnicity, treatment by employee's, treatment by employers, opinions on different aspects of intensive dairying in the MacKenzie Basin, and how intensive dairying affects community involvement.

What is the purpose of collecting this raw data?

The purpose of obtaining this data is to aid me in completing my Masters of Planning thesis at the University of Otago. The information will be used to form a view of the positive and negative impacts associated with the expansion of intensive dairy farming in the MacKenzie Country.

Who will have access to personal information?

Persons that will have access to participant information will be myself, and my University of Otago supervisor Dr Sarah Mager.

How will data or information be securely managed, stored and destroyed?

Information obtained will be held in locked departments within my car, house and office at the University of Otago. Information will be held for 5 years at the University of Otago and then will be destroyed. Personal information that includes contact details, names, and audio tapes that have been transcribed can be destroyed right after use.

What data or information will be reflected in the completed research?
No names or information that could lead to the identity of participants will be used in my research. Information published will include demographics and personal experiences in the dairy industry.

Can Participants Change their Mind and Withdraw from the Project?

Participants can withdraw at any time from the project up until publishing.

What if Participants have any Questions?

If you have any questions about our project, either now or in the future, please feel free to contact either:-

Tom McKnight and/or Dr Sarah Mager

Department of Planning Department of Geography

University Telephone Number 0276987368 University Telephone Number 03 497 4222

Email : tommcknight8@hotmail.com Email: smm@geography.otago.ac.nz

This study has been approved by the Department stated above. If you have any concerns about the ethical conduct of the research you may contact the Committee through the Human Ethics Committee Administrator (ph 03 479-8256). Any issues you raise will be treated in confidence and investigated and you will be informed of the outcome.

Appendix C

Consent Form for Participants

CONSENT FORM FOR
PARTICIPANTS

I have read the Information Sheet concerning this project and understand what it is about. All my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage.

I know that:-

1. My participation in the project is entirely voluntary;

2. I am free to withdraw from the project at any time without any disadvantage;

4. Personal identifying information [*audio-tapes and notes*] will be destroyed at the conclusion of the project but any raw data on which the results of the project depend will be retained in secure storage for at least five years;

5. This project involves an open-questioning technique. The general line of questioning includes **intensive dairying, social involvement in the MacKenzie Country, planning, and the environmental impacts of intensive dairying**. The precise nature of the questions which will be asked have not been determined in advance, but will depend on the way in which the interview develops and that in the event that the line of questioning develops in such a way that I feel hesitant or uncomfortable I may decline to answer any particular question(s) and/or may withdraw from the project without any disadvantage of any kind.

5. As a consequence of this interview I may feel uncomfortable answering questions about your employer, employee, or opinions of intensive dairying in the MacKenzie Country. In the event that I do not wish to answer any question or express an opinion I am free to do so without any disadvantage.

6. I have the right to maintain anonymous in this interview.

7. The results of the project may be published and available in the University of Otago Library (Dunedin, New Zealand) but every attempt will be made to preserve my anonymity.

I agree to take part in this project.

....
(Signature of participant) (Date)