Water in the Waimea Basin: Community Values and Water Management Options

A Report by ESR

for the Waimea Water Augmentation Committee and the Tasman District Council

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Purpose of the report

This report represents the coming together of two different research agendas; ESR's (Institute of Environmental Scientific Research) research programme *Sustainable Development – The Human Dimension* funded by the Foundation for Science, Research and Technology (FRST), and the Waimea Water Augmentation Committee's (WWAC) *Feasibility Study into Water Augmentation* partially funded by the Sustainable Farming Fund (SFF). A memorandum of understanding was established between ESR, WWAC and the Tasman District Council (TDC) in which it was agreed that ESR would contribute to the Feasibility Study (exploring water storage options in the upper Wairoa and/or Lee catchment areas) through exploring and documenting community activities and values of the Waimea rivers and aquifers, as well as water management options more generally. For ESR, involvement would enable meeting their broader research objectives of (i) improving participation of multiple agencies, communities and Māori in decision-making on water allocation; and (ii) evaluating existing and different methods of participation.

Introduction and Background

Recent studies on water availability on the Waimea Plains indicate that the area is acutely water short, with water resources over-allocated for a 1:10 year drought security. Consequent water restrictions impact on irrigation and production ability for growers on the plains. Water restrictions also impact directly on consumers – households and businesses. The economic impacts are also passed on to the region more generally, affecting employment, and opportunities for economic growth in the region.

Drought events also impact on the ecology of the river environment, as well as reducing opportunities for recreational activities in and around the rivers. Low flows affect the coastal springs, highly valued by iwi and the community, and importantly, aquifer recharge is reduced with increased risk of saltwater intrusion into the aquifer system.

The Feasibility Study aims to explore not only the feasibility of water storage options in the Upper Lee/Wairoa catchments, but also how these options can enhance water availability - quality and quantity - for consumptive, environmental, aesthetic and community values downstream.

The ESR research team used a variety of different methods for community engagement for eliciting and documenting diverse community activities and values relating to the river and aquifer system of the Waimea plains. These included a literature review, individual interviews, focus groups, a family survey, and two workshops.

Key Findings

- Freshwater in the Waimea region is highly valued for irrigating productive land; supplying businesses with water for processing; for drinking water supplies; and for other recreational activities, thus contributing to the overall well-being of people living in the Tasman area.

- The Lee, Wairoa and Waimea rivers are highly valued by Tasman (and Nelson) residents – as part of where they live, by those with environmental or ecological interests; by those who express an aesthetic or scenic interest; by iwi with guardianship or kaitiaktianga responsibilities; and by recreational users of all ages.

- Sustainability was a value to which many participants subscribed. Access to, or the presence of, good quality and quantities of freshwater – whether for productive land use, enjoyment or for maintaining environmental/ecological integrity were activities that need to be sustained for future generations.

- People are generally supportive of storage options in the Upper Lee or Wairoa catchment areas, but for some there are 'conditions' attached to this support, such as financial contributions to a decided option being distributed equitably with those who benefit directly (irrigators) paying more than those who receive little or no benefit; and that TDC continue to investigate alternative means of encouraging or enforcing water conservation.

- Learning about water resources in the region, along with better water management and conservation initiatives are seen as a responsibility of everyone in the region, from TDC to individual households.

- Charging for water was seen as a mechanism for achieving more efficient use of water, but there was variability in how charges could be set: for example, by volume or by a formula that would determine the contribution of water to generating profits.

- Participants prefer win-win outcomes (for everyone) of decision-making, but also implicitly recognise that trade-offs may be an inevitable process in decision-making. Where trade-offs are unavoidable, the criteria employed for trade-offs should be transparent.

- A number of the management options identified in the workshops and in the other data represent areas in which the Tasman District Council could engage in social learning initiatives to address people's lack of knowledge and/or understanding about freshwater management and decision-making.

Recommendations

- Recommendation one

The Feasibility Study will need to take into account via a social impact assessment uses of the Girl Guide lodge facility in the lower Lee Valley in relation to possible options for a storage dam (or dams) in the Lee Valley.

- Recommendation two

Tasman District Council should explore multiple opportunities for planning and implementation of water conservation measures and practices. These can be linked to awareness-raising and/or educative initiatives (see recommendation three).

- Recommendation three

Tasman District Council should create opportunities for increasing public awareness and knowledge of the water systems and water management practices and options in the Waimea region, including iwi perspectives on freshwater.
Examples of mechanisms to achieve this include:

- Talking with members of NIRMAK and MIRMAK to discuss ways in which Maori perspectives and concepts could be included in educative opportunities.
- Internal communication within TDC to ascertain opportunities to enhance social learning.
- Displays of the hydrology of the Waimea region in the foyer of the council building.
- A series of articles in the TDC newsletter.
- Contacting schools in the area to identify where school curricula may provide opportunities for 'local learning' either through fieldtrips and/or additional information.

- Recommendation four

Residents of the Lee and/or Wairoa Valleys need to be provided with timely information about the progress of the Feasibility Study, and the possible implications of outcomes. This could be done via a widely distributed newsletter and/or membership on a community reference group with identified mechanisms for dissemination of information to other Lee and/or Wairoa Valley residents. The costs of widespread dissemination needs to be weighed against the possibility of much higher costs that could stem from community groups distrusting the Feasibility Study, and challenging the implementation of its recommendations at the RMA consent stage.

- Recommendation five

The Waimea Water Augmentation Committee, Tasman District Council and the ESR research team should set up a community reference group to meet with designated members of WWAC and the consultants on a six monthly basis for the duration of the Feasibility Study. This group could be comprised of representatives from the stakeholders identified in the stakeholder analysis carried out for the ESR research along with further input from the TDC policy and planning unit. The purpose of this group should be to:

(i) Provide input to the feasibility study.
(ii) Provide advice as to what information could be sent out via the newsletters and other publications.
(iii) Act as a potential conduit between those involved in the Feasibility Study and others in the community.
(iv) Provide advice on opportunities for increasing public awareness and knowledge of water systems and management in the Waimea region.

1. Introduction

This report represents the coming together of two different research agendas; ESR's (Institute of Environmental Scientific Research) research programme *Sustainable Development – The Human Dimension* funded by the Foundation for Science, Research and Technology (FRST)[1], and the Waimea Water Augmentation Committee's (WWAC) *Feasibility Study into Water Augmentation* partially funded by the Sustainable Farming Fund (SFF). Linking the research programmes is a common interest in freshwater issues and community involvement in these issues, discovered through preliminary talks between the ESR social science researchers, and members of the WWAC committee, and Joseph Thomas (water resource engineer) and Councillor Richard Kempthorne from the Tasman District Council (TDC).

Richmond and the Waimea region are experiencing growth in migration and ongoing demand for residential and lifestyle development (coastal, rural and semi-rural). The climate and attractiveness of the Nelson-Tasman environment also encourages both national and international tourism.[2] This growth generates need for services and water and wastewater infrastructure. Other factors impacting on water availability and use are demands associated with changes in land use along with intensification of land use (Boffa Miskell, MWH: 2003).[3] Issues around water quality and quantity comprise a substantial area of study, much of which precedes the Feasibility Study, such as the Tasman Regional Water Study (Lincoln Environmental, MWH, Agfirst, 2003). The Parliamentary Commission for the Environment (PCE) (2004:108) states that:

> Water is becoming an increasingly critical component of New Zealand's rural economy. The move to more intensive farming systems is usually accompanied by a demand for increased quantity and certainty in water supply. Projections indicate that the dairy, horticulture and viticulture sectors will all expand in the future and it follow there will be growing demands for water via irrigation.[4]

- The Feasibility Study

The Feasibility Study is a study, that aims to explore not only the feasibility of water storage options in the Upper Lee/Wairoa catchments, but also how these options can enhance water availability - quality and quantity - for consumptive, environmental,

[1] Further information about ESR and the FRST research programme can be found in Appendix One.

[2] In 2003, Nelson-Tasman attracted 315,000 international visitors who spent $180m. Domestic visitors made 1.3m trips to the region, spending a total of $232m. In total, Nelson-Tasman received 1.6m visitors in 2003 that generated $412m in tourism expenditure (see www.trcnz.govt.nz).

[3] "*In the fifteen years we have been here, two dairy farms have been cut up and subdivided – one owner moved to Tapawera and the other to the West Coast where land is not so expensive – the cost of land here was too high for dairying. The amount of housing has doubled and the population tripled. Land use has changed but I don't know if there is more or less production. There are hydroponic strawberries, grapes and an apple orchard where the dairy farms used to be*" (interviewee).

[4] See also page 57 of the PCE report (2004) *Growing for Good* that outlines the significant drivers shaping farming in New Zealand.

aesthetic and community values downstream. The contract for carrying out this work was awarded to Tonkin and Taylor, whose team includes subcontractors from other agencies and organisations with the necessary expertise.

- What prompted the Feasibility Study?

Recent studies on water availability on the Waimea Plains indicates that the area is acutely water short, with water resources over-allocated for a 1:10 year drought security.[5] Consequent water restrictions impact on irrigation and production ability for growers on the plains. Water restrictions also impact directly on consumers – households and businesses. The economic impacts are also passed on to the region more generally, affecting employment, and opportunities for economic growth in the region.[6] Drought events also impact on the river environment ecology, as well as reducing opportunities for recreational activities in and around the rivers. Low flows affect the coastal springs, highly valued by iwi and the community, and importantly, aquifer recharge[7] is reduced with the increased risk of saltwater intrusion into the aquifer system. This would be critical for water supplies.

Grapes on the Waimea Plains

[5] This means that there is sufficient water left in the aquifers (not allocated) to cope with a moderately severe drought likely to occur once every ten years (based on historical information on weather patterns).

[6] Doak et al, 2004, estimate that farm gate value of currently irrigated land use in Tasman to be $4,656 per hectare or a total of $46.6 million.

[7] The underground aquifers that supply the water for drinking water supplies and most of the water for irrigation are recharged – or "topped up" – by the water in the Wairoa river which seeps underground, especially in the areas between the Lee and Appleby bridges.

Vegetable growing on the Waimea Plains

- How would ESR contribute?

It was decided – after ongoing conversations – that ESR could contribute to the Feasibility Study through exploring and documenting community activities and values of the Waimea rivers and aquifers, as well as water management options more generally. This work could potentially contribute to future planning by the Tasman District Council. For ESR, involvement would enable meeting their broader research objectives of (i) improving participation of multiple agencies, communities and Māori in decision-making on water allocation; and (ii) evaluating existing and different methods of participation. Other benefits of the partnership include:

- ESR's work would not require any financial contribution from either WWAC or TDC, but 'in-kind' contributions such as time, venues for meeting, and sharing relevant information.

- There would be an emphasis on mutual learning through the action research approach of working *with* people (in real situations) rather than doing research *on* people.

- A more comprehensive picture of the ways in which people think about water resources and use could emerge because of the wider remit of the FRST-funded research programme. The dam storage option then would be just one option explored.

2. Research methods

After consultation with some members of WWAC and an internal workshop, ESR researchers made the decision to employ qualitative methods. While a survey questionnaire would have been able to access the views of more Tasman residents, it was felt that a variety of qualitative methods would enable exploration of the issues in more depth providing a better understanding of the values and views articulated by

participants.[8] In the context of this decision, the process of stakeholder mapping was important in order to ensure that those who had an identifiable stake in the outcome of the feasibility study were included. There were a number of methods used to gather different forms of information and data. The reasons for this were partly practical, driven by time and budget constraints. The other advantage of exploring the same issues through different methods is to make sure that all the relevant issues have been articulated through providing a variety of opportunities and mechanisms to promote people's involvement, rather than relying on just one method with which people may or may not feel comfortable. The research methods used to date[9] are outlined below.

- Literature Review

The literature review included relevant reports and documents for Tasman District Council, nationally relevant data, especially literature and discussion documents relating to the Water Programme of Action (a current programme of work led by MfE and MAF)[10]; and other relevant documents and literature accessed in relation to past and current work undertaken by members of the ESR 'water group' (Allen & Kilvington, 2004; Baker et al, 2004; Furuseth & Lapping, 1999; Jennings & Lockie, 2002; MAF 1997, 2004; Moore, 2000; Pomeroy, 1994; PWC, 2004; Robb et al, 2001; RSNZ, 2003; SLIM, 2004).

- Ongoing observation and involvement

It was very important for the researchers to familiarise themselves with the Waimea region and to get a general feel of the area – the ways in which the Tasman area is experiencing growth and the issues associated with that; to visit the Wairoa, Lee and Waimea Rivers;[11]and to learn about the characteristics of the underground aquifers on the plains, such as how and where the aquifers are recharged with water from the Wairoa/Waimea Rivers.

Developing research relationships requires researchers to respond to listen to and demonstrate genuine interest in people's concerns and understanding of the issues involved. It also means being open to opportunities for learning, such as:

- Attending the Integrated Catchment Management[12] field day.
- Learning about the Wai-iti storage project which has informed development of the Feasibility Study.
- Being open to suggestions of who else the research team should talk with.

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[8] Postal survey instruments are not exempt from bias because there are often fairly low response rates (~40-50%) and those responding often have defined demographic characteristics such as education and socio-economic status (de Vaus, 2002).

[9] ESR has also agreed to contribute to a later survey as part of the Feasibility Study.

[10] The Water Programme of Action has three strands of work, all of which explore the role of central government in water management. One strand of work relates to potential water bodies of national importance, and the others focus on water quality and allocation. See Ministry for the Environment, Ministry of Agriculture and Forestry (2004), *Freshwater for a Sustainable Future: Issues and Options*, Discussion Document, Ref. ME555. Further information on the WPA can be found on the MfE and MAF websites – www.mfe.govt.nz; www.maf.govt.nz

[11] The Waimea River is defined as beginning at confluence of the Wairoa and Wai-iti Rivers.

[12] The Motueka ICM project is also a FRST-funded programme of work led by Landcare Research (http://icm.landcarersearch.co.nz).

- Attending the Water Programme of Action consultation meetings in Tasman in February.

Gerald Midgley (ESR) looking at the Wairoa River

- Stakeholder mapping

This was a structured exercise to identify the stakeholders of the Feasibility Study. This mapping exercise included examining where stakeholders best 'fitted' in the context of the Feasibility study and how others might see them in relation to the categories below. This mapping exercise provided a method for identifying and prioritising who, or what groups, the research team should talk with, although the aim was to include as many stakeholders or stakeholder groups as possible within budget and time constraints.[13]

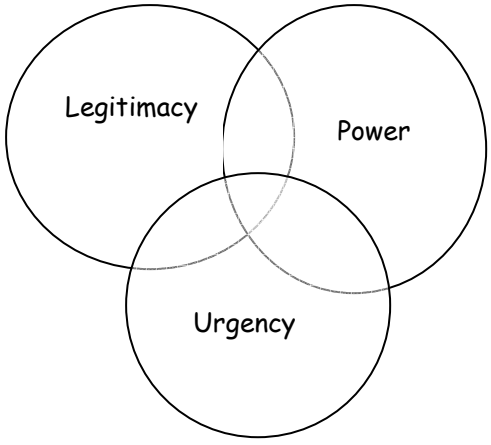

Figure 1: Stakeholder mapping from Mitchell et al, 1997

[13] The memorandum of understanding (MOU) with WWAC and TDC includes completing work to feed into the Feasibility Study by the due dates (30th March for this study); and budget constraints, which impact on the time researchers can spend on the project, are determined through the management of the whole FRST-funded research programme.

'Urgency' referred to those stakeholders who would be directly affected by a proposed storage dam; 'legitimacy' referred to those stakeholders who have a 'right' to be consulted whether through legal, statuary or institutional positions. 'Power' referred to those who potentially could affect decision-making (or RMA consent outcomes). Most stakeholders identified fell into overlapping areas. This exercise enabled identifying the 'stake' different groups or individuals had in the potential dam option, and provided a framework for selecting appropriate research methods.

- Individual interviews

Eighteen individual interviews were carried out with a cross section of stakeholders. These provided contextual understanding of the water issues facing the Tasman District Council, productive growers in the Waimea region, business interests and a range of government and NGO agencies. A meeting with NIRMAK (Nelson Iwi Resource Management Komiti) and attending the ICM field day also provided opportunities to talk with iwi representatives about water issues that are of concern to Māori.

- Family survey

A family survey has been available to those interviewed and others who have expressed an interest, as well as enlisting the help of schools in the Waimea area (primary, intermediate and secondary) to distribute thirty surveys to pupils who have a recreational (or other) interest in the Wairoa, Lee and/or Waimea Rivers. The aim of the survey was to include family-based activities and values related to the rivers, and provide a space for the voices of parents and youth in the wider Waimea area. Thirty-three survey responses were received and analysed. The intent of the survey was not to obtain representative generalisable data, but to get a feel for the kinds of activities in which families engaged and the frequency with which they carried out those activities. The summarised data from the family surveys is included in Appendix Two.

- Focus groups

Focus group discussions were held with seven Lee Valley residents and fifteen Wairoa Valley residents. The aim of the focus groups was to identify their activities and values relating to the two rivers as well as their perceptions of the activities and values relating to freshwater in the region of people living on the Waimea plains (outside the valleys). Issues around ongoing consultation and access to information were also discussed. The information from focus groups was captured in the form of field notes and 'rich pictures' (Checkland & Scholes, 1990) such as the one below.

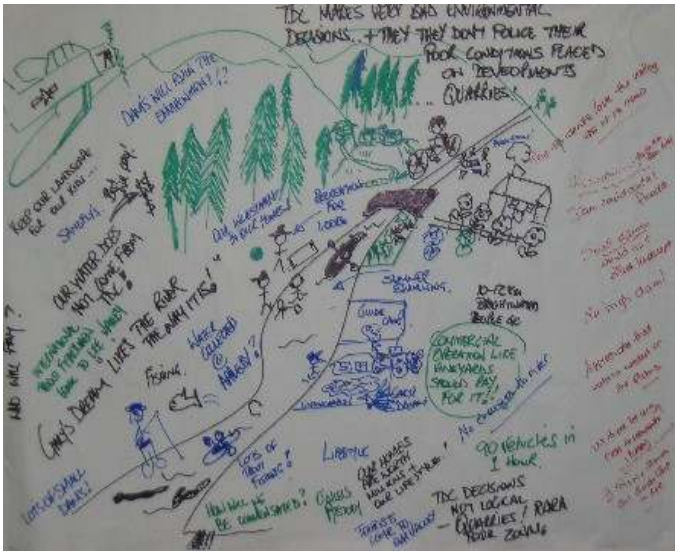

Figure 2: 'Rich picture' generated in focus group

- Workshops

Two public workshops were held on the 26th and 27th of January 2005, the first for water permit holders (productive land owners) on the Waimea Plain[14], and the second for interested members of the public. This workshop included representation from iwi, as well as approximately seven participants who identified themselves in terms of environmental interests, seven with a recreational interest, and several who defined themselves as residents of the Waimea region with interests in both productive land use and recreational activities associated with the rivers (such as hunting, fishing, and kayaking). Attendance at these workshops was through researcher-initiated invitation (based on the stakeholder mapping exercise) and through public notices in the Nelson Daily Mail over a two-week period. These were structured workshops aimed at exploring participants' core values relating to freshwater in the region, reflecting on the possible impact of drought (and water shortages), and finally identifying the impact of water management options on the core values identified. Included – or 'compulsory' - in the water management options was a storage dam or dams, the focus of the Feasibility Study. Participants were also asked to state what surety of supply the different options identified could provide and how they should be financed.

3. Summary of Research Findings

- Freshwater in the Waimea region is highly valued for irrigating productive land; supplying businesses with water for processing; for drinking water supplies; for other recreational activities, thus contributing to the overall well-being of people living in the Tasman area.

[14] The area of irrigated land represented by those attending the water permit holders was 1898 hectares – 51% of the current area irrigated of about 3,700 hectares.

- The Lee, Wairoa and Waimea rivers are highly valued by Tasman (and Nelson) residents – as part of where they live, by those with environmental or ecological interests; by those who express an aesthetic or scenic interest; by iwi with guardianship or kaitiaktianga responsibilities; and by recreational users of all ages.

- Sustainability was a value to which many participants subscribed. Access to, or the presence of, good quality and quantities of freshwater – whether for productive land use, enjoyment or for maintaining environmental/ecological integrity were activities that need to be sustained for future generations.

- People are generally supportive of storage options in the Upper Lee or Wairoa catchment areas, but for some there are 'conditions' attached to this support, such as financial contributions to a decided option being distributed equitably with those who benefit directly (irrigators) paying more than those who receive little or no benefit; and that TDC continue to investigate alternative means of encouraging or enforcing water conservation.

- Learning about water resources in the region, along with better water management and conservation initiatives are seen as a responsibility of everyone in the region, from TDC to individual households.

- Charging for water was seen as a mechanism for achieving more efficient use of water, but there was variability in how charges could be set: for example, by volume or by a formula that would determine the contribution of water to generating profits.[15]

- Participants prefer win-win outcomes (for everyone) of decision-making, but also implicitly recognise that trade-offs may be an inevitable process in decision-making. Where trade-offs are unavoidable, the criteria employed for trade-offs should be transparent.

- A number of the management options identified in the workshops and in the other data represent areas in which the Tasman District Council could engage in social learning initiatives to address people's lack of knowledge and/or understanding about freshwater management and decision-making.

[15] One group in workshop one was 100% against charging for water.

4. Detailed discussion of Research Findings

4.1 What are values?

Values are deeply held beliefs that impact on the ways in which people behave and the choices they make. Values can be differentiated from attitudes, which may or may not be enduring or consistent, and may or may not inform our actions. What people do – or their (consistent) activities are more likely to convey what values they hold rather than asking people about their opinions or their attitudes. The research has focused on activities and values because of the linkages between consistent actions or behaviours and the values that people hold.

- Values relating to the Wairoa, Lee and Waimea Rivers

Most of the data capturing the values relating to these rivers comes from the family surveys; the focus groups with Wairoa Valley residents; individual interviews; and workshop 2. The values have been organised into themes, or categories that have emerged from these different data sets.

4.2 Attributes of the river (intrinsic values)

This theme describes the things about the rivers that people value. This was an important theme that included a range of attributes, especially the clear, clean water identified in family survey data. The following comments were made in relation to the Wairoa River.

Its clear and fresh look – it's nice to see clear water in a river (family survey).
It's clean and fresh and cooler than the Lee, and there's less slime in the summer than any other rivers we know (family survey)

Similar comments were made about the Lee River.

It's nice and clean (family survey)
Clean, sparkling, flowing river with minimal activity – kept tidy by local people (family survey)

Wairoa and Lee Valley residents focused on other attributes of the river.

Sounds of the water flows
River breezes
Change – the element of surprise
Excitement of storms
River mists

An alternative understanding of this theme could be articulated as environmental values that are expressed in terms of the intrinsic nature of the rivers, for example the *mauri*

- or life force - of the rivers identified in workshop 2 as an important value (20/28).[16] To some extent the rivers themselves were not separated from their immediate environment.

4.3 Attributes of the river environment (ecological values).

For family survey respondents both the Lee and Wairoa river and valley environments were valued.

Wildlife habitat and corridor
We watch black shags and kingfishers and have seen blue ducks in the upper reaches of the Wairoa, our children catch yabbies (freshwater crayfish)
Lifting rocks and looking for insects

Residents in the valleys also identified environmental or ecological values.

Trout and native fish
Blue ducks below the forks (Wairoa River)
Unique geology
Wildlife – frogs, native birds returning
Excellent native bush

Participants in workshops 1 and 2 also articulated environmental/ecological values relating to the river valleys. In workshop 2 twenty-seven (27/28) people held environmental values as core values, while in workshop 1, in relation to possible storage options in the Wairoa/Lee catchments, twenty-one (21/33) people felt it was important to protect and maintain the natural environment.

It must also be pointed out that the Feasibility Study itself identifies these two sets of values as important, reflecting how WWAC has included representation from DoC, Fish and Game, and iwi. This representation has ensured that committee members and the consultants carrying out the study are aware of these in-stream and out-of stream values. DoC has carried out a study (still to be completed) of the indigenous plant and animal life in the river and surrounding environment ecosystem, and this knowledge will be considered when – and if – any dam proposal goes to Resource Consent stage, along with possible mitigation measures that could benefit conservation goals (interview).

The environmental/ecological values also include the Waimea River and the coastal springs.

We like seeing the seasonal changes – the highs and lows (family survey).
Nice to have a natural environment so close to town (family survey).
The coastal springs are of great importance to iwi and there is some planting going on around there (interview).

[16] The first number in brackets represents the number of people who thought this particular value was important, or central. The second number indicates the total number of people attending the workshop.

Workshop 2 participants also recognised the contribution the rivers made to the estuary and coastal area (18/28).

4.4 Aesthetic/scenic values

"Lovely', 'scenic', 'beautiful' were related more to the Wairoa River - and secondly to the Waimea - than the Lee in the family survey. Comments made in relation to the Waimea include:

Like looking at it from the bridge (family survey)
Looks nice when you drive over it (family survey)

Scenic values were also relatively important in workshop 2 (12/28). For most participants, scenic or aesthetic values represented a somewhat passive experience compared to Wairoa and Lee valley residents who engaged more actively with the scenic aspect of the river valleys, illustrated below in the comments from focus group participants.

I observe the view of the river as we live on the hill that looks down into the river – whole reason I built on the side of the hill.
Smaller landowners appreciate the river more and are keen to see it improve.
The valley is a place of beauty – last bastion – that's why we're here.
We love that the Lee River is part of our property – we enjoy watching it change with the seasons and the weather – it's a big part of our lives.
Watching huge logs go down the river, then chop them for firewood.

4.5 Sense of place/Sense of identity

For many participants, but especially for the Wairoa and Lee Valley residents, the rivers (including the Waimea), contribute to a sense of identity; they are part of people's sense of place – the place where they live. For some, they do not even have to go to the rivers; they just like to know they're there.

Knowing it's there if we want to use it (family survey)

In workshop 2 seventeen (17/28) participants stated that being able to visit the rivers – or public access - was an important value. Easy access for locals (Richmond, Brightwater and Nelson residents) was also important, with a number of family survey respondents (as well as valley residents) commenting that access for tourists was also important.

Its proximity to Richmond and Nelson (family survey)
Good meeting place for friends and family (family survey)
Best swimming close to town (family survey)
Close to town for families to visit (focus group)
Recreational resource for large numbers, including those outside the area (focus group)
Tourists come to our valley (focus group)

Daily proximity clearly enhances *residents'* sense of connection to place.[17] The following excerpts are from the focus groups.

The river is the life of the place, it's why we're here, it's the centre of the valley
My daughters' cleansing ritual – whenever they come home from being away first they jump in the river.
The Lee River is a fantastic learning source – it is playing a major part of my family growing up.
Soon as you get to the Lee bridge you're home.
The gap in the foothills, that's when we're home.

Sense of place – or place identity - was a theme that permeated all data collection. This was on three levels:

- The ways in which the rivers in the Waimea contributed to a regional sense of identity.
- For residents of the Wairoa and Lee valleys reaching the "gap in the hills" or the bridge (at intersection of Lee and Wairoa Rivers) indicated that they were "home."
- Issues around the separate identity of Richmond and Nelson also emerged in one of the workshops and in individual interviews.

I think Nelson needs to rediscover itself, what its strengths are - because they've got some real strengths – and utilise them. And what's happening in Richmond nobody's going to stop (interview).

In workshop 1 (water permit holders), one water management option was to "Serve Tasman First", that is make sure all Tasman needs were met before exporting water to Nelson, including meeting drinking water and irrigation needs for new residential development and/or land use change. [18]

4.6 Contrast to urban environment

The latter two quotes above indicate that there is a point of separation from the urban area. In this sense the contrast with both the urban environment and associated work activities are contrasted with the rural ideal – or idyll – even though many residents have life-style blocks on which they also work long hours.

Wind down – time out from city (focus group)
Contrast to work (focus group)
Restful quality for relaxation (family survey)

[17] See Altman Irwin & Setha M. Low (Eds) (1992) *Place Attachment*, New York: Plenum Press; David Benjamin & David Stea (Eds) (1995) *The Home: Interpretations, Meanings and Environments*, U.K.: Avebury.

[18] Nelson's drinking water supply comes from the Maitai and Roding dams and is treated at the new treatment plant. At present Nelson is self-sufficient in water, but growth projections indicate that there may be a future need to supplement Nelson's water supply with water, potentially from the Tasman area.

Enjoy the peace when visiting for swimming (family survey)

TDC picnic area on the Lee River

4.7 Recreational Values

Recreational values were seen as important for nearly all participants (except for those in workshop 1), with a range of activities listed (family surveys) or expanded on in individual interviews and focus groups.[19] In workshop 2 (interest-ed groups), eighteen participants (18/28) rated recreational values important, with eight participants (8/28) referring directly to swimming in the Lee or Wairoa Rivers.

Swimming, rafting and kayaking were the most common recreational activities mentioned, particularly in the family survey:

Deep places to swim, high rocks to jump off, clean water (Wairoa and Lee)
Three good swimming holes in one stretch (Lee)
It's safe to swim in the main holes (Lee)
Safe for children (Lee)

[19] This is evident from the quantitative analysis of the family survey data which is in Appendix Two.

Swimming hole at the Lee River

Intermittent researcher observation over a period of ten days throughout January and February endorsed the data in the family surveys; that the Lee Valley picnic areas are well used for swimming in the summer. People visiting the areas were asked where they were from, and how often they visited the area, and four families were asked to complete the survey. Visitors included people from the Nelson-Tasman area - Brightwater, Richmond, Stoke, and Atawhai; from other places in New Zealand (N.Z.) and from overseas. How often these people had visited the Lee varied from every day in the summer holidays to having just discovered the river (first time visiting) with intent to return. Two visitors from elsewhere in N.Z. were regular visitors both to the Nelson region and to the Lee.

The other most popular recreational activities were rafting and kayaking.

Making rafts (Wairoa)
Rafting and tubing down the river (Wairoa)
Floating on tyres (Lee)
Going down the rapids on a raft (Waimea)

Children 'rafting' on tyres in the Lee River 'rapids'

Good kayaking river (Wairoa)
Occasionally kayak or raft down the river when the water levels are high enough (Waimea)

Wairoa and Lee Valley residents also identified the above recreational activities for themselves as well as for visitors.

Parts of the river are shallow, parts are deep – all people can use it (Lee Valley resident)
Safe for kids rafting in the rapids (Lee Valley resident)
Kayaking in flood time (Wairoa Valley resident)

Two interviewees from the Nelson Canoe Club talked about the Wairoa River:

When the river is in flood or high up to 100 kayakers run the river. On a scale of 1-10 the river rates a 9, it has everything a kayaker wants, including technical difficulty. It's one of the best reaches of river in the Nelson area and it's right there in your back yard, one of the few river sections close to an urban area.

We were a water-based family, used to go up five times a week in summer. All three kids kayak, two do it for a living now. The Wairoa when high is one of the premium rivers. Flood conditions aren't only in winter; the nature of rainfall is that we can have rainfall events – heavy rainfall.

Kayakers' interests include the right fork[20] and the rest of the Wairoa River as well as the lower portion of the Lee River from the Mead Road Bridge. Other recreational activities listed in the family survey included: throwing stones in the river; cycling along the banks, walking, picnicking, exercising dogs, horse riding, fishing, hunting, and relaxation – illustrated by the two quotes below.

Its peace and quiet (Lee)
Restful quality for relaxation (Wairoa)

Children and dogs in the Lee River

[20] Right and left - in relation to the rivers – refers to looking at the down stream river flows.

The concept of recreational values does not only apply to the rivers and valleys. Research has demonstrated that many recreational activities take place at home (Laidler & Cushman, 1996 in Perkins & Cushman, 1998). One such activity is gardening, a popular pasttime in the Waimea region as evidenced through the activities of garden clubs, such as the Wakefield and Waimea South Garden Clubs, and one interviewee mentioned Richmond gardens as important for tourists: " *The English visitors find the roses great*. "

Water is clearly an important resource for gardening as a recreational activity. For example, another woman living in a rural area who has 179 roses, stated that; " *Water is everything to me.*" [21]

When exploring values relating to water – both rivers and groundwater – in the Waimea region, recreational values need to be seen in a wider context than those that are associated only with the rivers. For example, in New Zealand, gardening (as an example of increasing home-based leisure/recreational activities) is the 5th most common – or popular – recreational activity (Laidler & Cushman, 1996 in Perkins & Cushman, 1998). If recreational values associated with the rivers are the only values taken into account in decision-making, then other values and activities (relating both to rivers and aquifers) may become marginalised.

4.8 Social Interaction

The final theme or category relates to social activities; activities that are inherently socially interactive in nature. This category includes picnicking with friends and/or family, as well as other activities, as illustrated below by comments from the family surveys.

Good meeting place for friends and family for picnics (Lee)
Meeting females (Lee)
Baptisms (Wairoa)
Having fun (Wairoa)
Raves at picnic site (Wairoa)

The lodge at the Regional Girl Guide camp in the Lee Valley is an example of a community initiative. While this camp has been a regional facility since 1953, a thirty-eight bed lodge was built three years ago by volunteers through the region's Rotary Clubs. The lodge is not only used by guides but by an increasing number of school and church groups and others. The lodge is usually booked every weekend (and some weekdays) from early spring to late autumn (interview). The users of this facility did not participate in the ESR research.

[21] It is important to note that both these interviewees talked about managing the water they used. Interviewee one (a guest house owner) had an automated irrigation system that came on in the evenings and never during the day; and interviewee two (resident) had installed a (rainwater) storage tank and pumping system when the house was built.

Recommendation One

The Feasibility Study will need to take into account via a social impact assessment, the uses of the Girl Guide lodge facility in the lower Lee Valley in relation to possible options for a storage dam (or dams) in the Lee Valley.

4.9 Summary of activities and values from focus groups and family survey

The Wairoa and Lee Rivers – and valleys - are connected to Tasman (and Nelson) people's sense of place or place identity, which in turn contributes to overall well-being. For residents living in the valleys this is especially important, with the rivers playing a part in their daily lives, whether this relates to enjoying 'nature'; recreational activities; or 'rituals' associated with returning home. The concept of lifestyle choice is connected to values around individual – or family – choice, as well as environmental sustainability for present and future generations. For Wairoa and Lee Valley residents the areas of residential settlement are especially important, and they would envisage storage facilities built higher in the catchment to maintain – or improve – the current state of the rivers.

The results from the family survey emphasised recreational activities in the Wairoa and Lee Valleys. Apart from the DoC reserve picnic area on the Wairoa River, swimming and other activities were scattered throughout different stretches of the river. Most swimming, 'rafting' and picnic activities on the Lee were carried out in the stretch of river from the bridge (at valley intersection) to the Meads Road bridge, but the TDC picnic area below the quarry was also popular.

Kayakers use the Wairoa River predominantly, and the stretches of the river important to kayakers depend on the conditions at the time, but most commonly include the right fork and the rest of the Wairoa River. The lower portion of the Lee River from the Mead Road bridge is also used for kayaking.

5. Values of Major Industry Users

Four major industry users were interviewed in relation to their water use and management. These were Enza, Alliance, Nelson Pine (the MDF plant) and Carter Holt Harvey in Eves Valley. Enza, Alliance, and Nelson Pine have an agreement with TDC based on historical relationships with the Waimea County Council. These three industries - over time – have paid for the infrastructure required to abstract, store and deliver water for their processing requirements. The current contract has a number of years to run during which time the industries pay an increasing rate (based on a sliding scale) for water consumed. Partly because of financial contributions to the cost of supply provision these industries perceive they have an entitlement – or a right – to ongoing access to high quality water.

The scheme was set up to provide industries with secure supply.
We're paying a premium for surety of supply.

In the case of potential saltwater intrusion to the aquifer from which their water is abstracted, those interviewed see the responsibility for ensuring water quality residing with TDC. Saltwater intrusion has major ramifications for both plant and processing (for overseas markets).

The Waimea industrial scheme needs high quality water that has Ph adjustment and chlorination because the fruit has to be washed in uncontaminated water for export (food standards).
Our water has to be potable water – chlorinated and lime treated – has to be of EU (European) standard.
In the drought 2-3 years ago (2001) *we got some saltwater intrusion – it corrodes the boiler.*
We need to avoid corrosion and scaling of plant.

The other two major factors important in safeguarding industry access to water (and ensuring quality and quantity) include the role these industries play in providing employment in the region and processing of local produce (fruit, stock and pines). For example, Nelson Pine Industries employs approximately 250 people, and because the industry is close to a major urban area they have others (eg. plumbers) on call, which, in other areas would be equivalent to on-site workers.

If you turn the water off you turn the industry off and we are the biggest employers in the region.

The price industries pay for water – and how they use water - is driven by two major factors: the first is the need to remain competitive in an increasingly tough global market.

… [W]e just can't pay more, we have to be competitive especially with plants being opened in China with cheap labour costs and that are closer to our markets.

The second driver of water use is to reduce the amount of waste generated by processing.

What goes in comes out – wastewater is the dominant driver of water conservation because we pay for disposal.

We have de-ionising facilities but don't use them at present because of the need to use special chemicals and issues of wastewater – treatment becomes more expensive.

Reduction of, and improvement in, wastewater drove investment in better technology (or plant) and re-use practices.

The water we bring into the plant is used at least twice, but we've yet to see the full benefit of this in 2004; we tracked drains and flows to identify where gains could be made – we're hot water rich but cold water poor.

The plant has quadrupled production and halved water use through changes to processing. We have consistently worked at ways of reducing water on site.

We collect rainwater from the plant which goes through a series of collection ponds, cleaning, and storage. We try to keep the plant self-sufficient in clean water.

Alliance is working on decreasing water demand for each stock unit processed – set targets as part of planning. We used to use half a cubic metre but are now down to 0.42.

Reducing costs was not the only driver to water conservation practices. All four industry users were concerned that they were perceived as irresponsible users of large quantities of water, especially in times of drought.

We are aware of being responsible citizens and having to remain in business. During the 2001 drought we took measures to reduce water use, but there are no provisions in the TDC contract for reducing water in times of drought.

We do not have a specific water conservation policy but do plan for and practice water conservation. No motivation to do this from TDC. We acknowledge that water is a scarce resource and when there is a drought people get concerned.

We envisage using less rather than more water; we've already spent a lot of money to reduce water use.

They had also considered alternative uses of wastewater.

We have been looking at upgrading wastewater to a level that could be used for irrigation, but we would have to purchase the land and build the infrastructure and this is not financially viable.

Wastewater could be used for irrigation – we know Maori are not happy with the discharges. We couldn't use it for some species irrigation, and could not spray it directly on crops but on to the ground.

Their concern about public perceptions was often expressed in terms of comparisons between themselves and other water users, such as farm irrigators. These concerns included expression of ideas around creating more efficient water use and valuing water more through market instruments.

We pay more for our water than farmers would be prepared to pay for irrigation – if they were paying what we pay it wouldn't be financially viable.

It's as much about land use as it is about water. Need to put a value on water – let the market drivers work – inputs and outputs. Who owns the water?

Perhaps you could have a crop-specific water use.

If you want to increase productive land use then they need more water and will have to spend money on augmentation. Alternatively, farmers could expect that some years will be dry and need to engage in different forms of planning.

Issues of equity were also raised.

There is pressure coming on our supply by others; we should be protected and any other measures should be paid for by those creating the demand – development, business and irrigators.

During a drought everyone's looking at everyone else and everyone needs to be seen to be doing something to reduce water use. It's about balancing the needs for industry, community – farmers – and TDC. Need equitable processes and outcomes.

In summary, industry users did not see that they should be asked to contribute financially to future water augmentation schemes for the following reasons.

- They had already paid for infrastructure costs associated with their supply, and had an historically-based contract with TDC.
- They were major industries contributing to employment and wealth in the region as well as contributing to New Zealand's GDP (Gross Domestic Product).
- They were paying for water, with charges rising incrementally, which would have to be renegotiated once the present contract expired.
- An increase in charges was not seen as equitable given the lack of economic instruments to promote more efficient water use by irrigators, whether this was by TDC putting a monetary value on the water, or through farmers paying for water based on the contribution water made to their individual profits through analysis of inputs and outputs relating to their businesses.

6. Values of water permit holders (Workshop 1) and interest groups (Workshop 2)

Figure 3 below provides a diagrammatic representation of the ways in which values were categorised and prioritised. Figures 4 and 5 provide illustrations of how certain values articulated were placed on this mapping diagram.

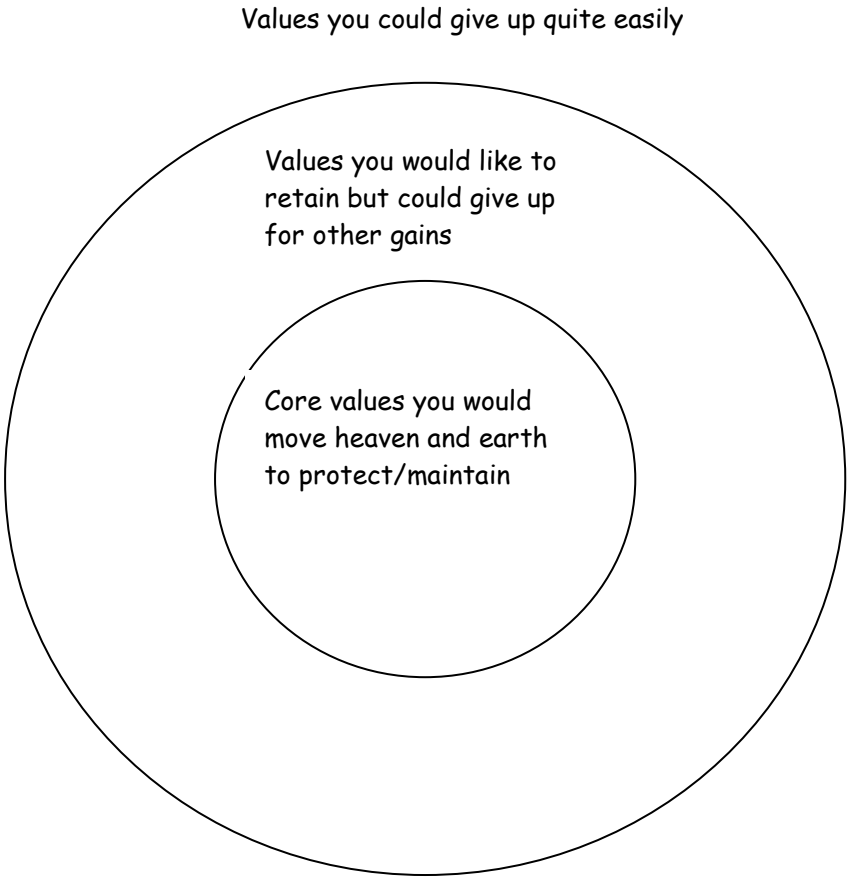

Figure 3: Mapping diagram used in workshops.

Every workshop participant was asked to identify values that were important to him or her. They were then asked to provide a show of hands as to where they would place the identified value on the above diagram. This process was not carried out as a ranking exercise but as a mechanism for identifying core values that would be important when evaluating the impacts of the water management options explored by each group. See examples below of how values were mapped, the numbers in brackets refer to how many people put the value in the circle indicated.

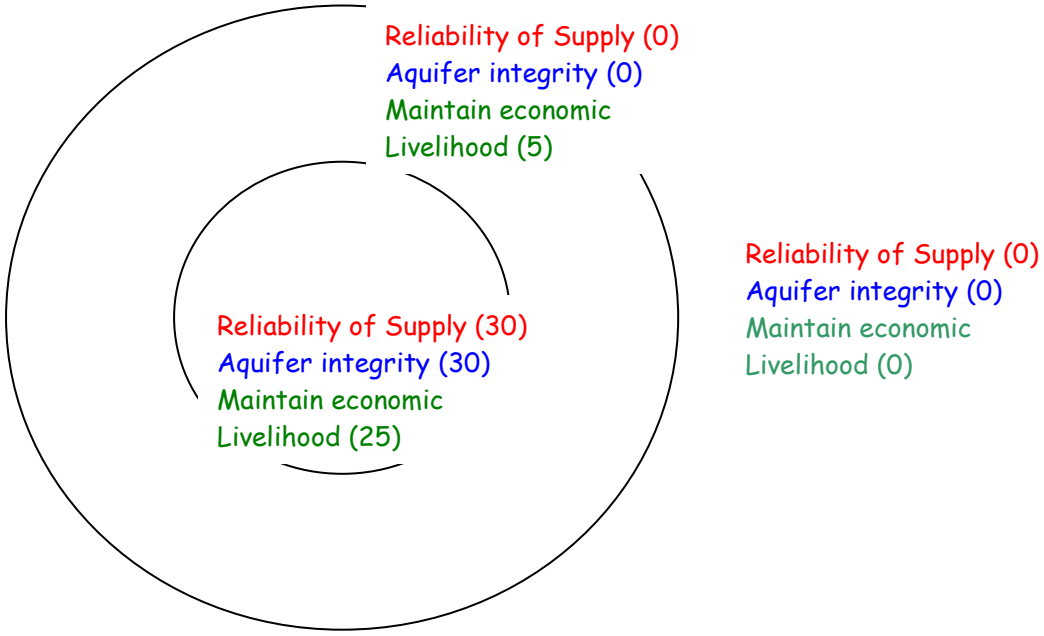

Figure 4: Example of values mapping for three values identified in Workshop 1 (water permit holders)

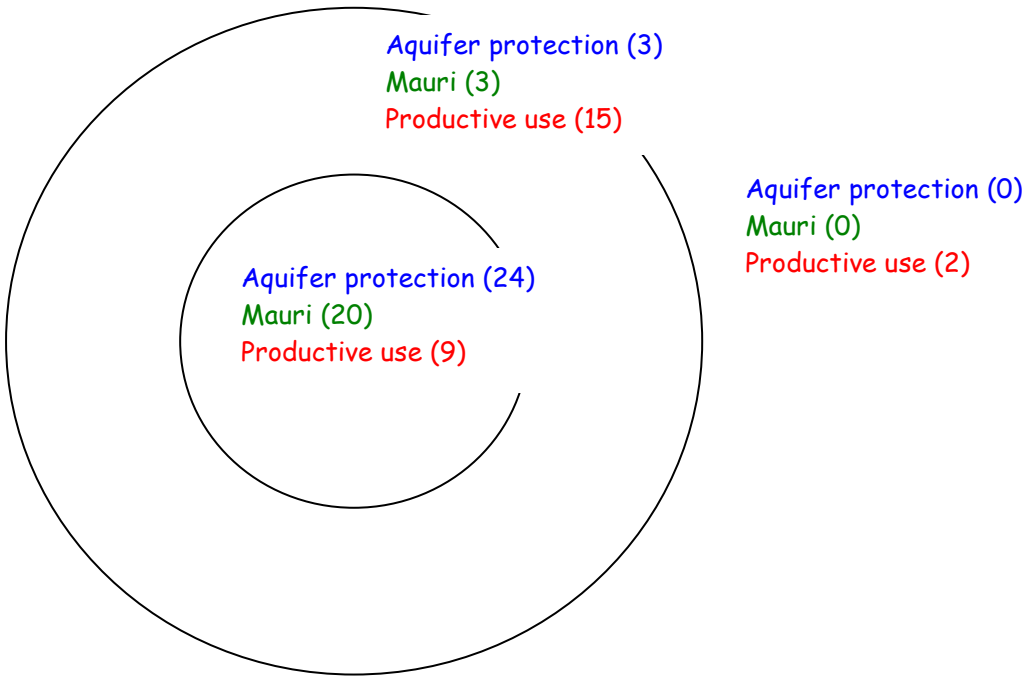

Figure 5: Example of values mapping for three values identified in Workshop 2 (interested groups)

The full set of values and the numbers of people identifying them as a core concern can be found in Tables One and Two below.

Table 1: Core Values Identified in Workshop One

Core value	Numbers subscribing to this core value (Total number 33)
Reliability (water quality and quantity)	30
Aquifer protection	30
Sustainability	30
Best knowledge used to make decisions	29
Retain water rights	28
Maintain economic livelihood	25
Employment in the wider community	24
Reasonable cost of water provision	24
Efficient use of water	21
Retain intrinsic (environmental) nature of rivers	21
Retain water quality	21
Retain recreational activities and opportunities	5

Table 2: Core Values Identified in Workshop Two (Number of participants = 28)

Core value	Numbers subscribing to this core value (Total 28)
Habitat/Environment	27
Potable Water	26
Protect aquifers	24
Efficient Use	23
Mauri	20
Contribution to coast	18
Recreation	18
Public access	17
Volume (river flows & aquifer levels)	14
Wairua	12
Scenic	12
Close to home	10
Productive use	9

- Discussion of similarities and differences between values in workshops 1 & 2

There are some key similarities between workshops 1 and 2. Ensuring reliable (sustainable) quality and quantity of freshwater was seen as important for people in both workshops, with aquifer protection playing an important role in maintaining this resource. However, for people in workshop 2, sustainable aquifer protection was related more to the provision of drinking water, while people in workshop 1 one were more concerned about the ability to maintain their (and others') economic livelihood. More workshop 2 participants were concerned about efficient use of water (23/28), while 21/33 workshop 1 participants identified this as a core value. Efficient use, though, was another area of convergence, although how different participants defined efficient use – and who was

responsible for efficient use - was not directly explored, but did partially emerge when exploring water management options later in the workshop.

Workshop 2 participants valued the habitat/environment (of the rivers) very strongly (27/28) compared to those in workshop 1 (21/33), and closely associated with the environmental values were the *mauri* and *wairua* [22] of rivers, the contribution of rivers (and springs) to the estuary and coastal area, scenic values and the fact that the rivers were "close to home." River flows and the quality of river water (and subsequent quality of water in the aquifers) were relatively important to both groups, with most participants clearly understanding the river and aquifer system as an interlinked whole.[23] The higher values attributed to environmental integrity in workshop 2 reflected the make-up of the workshop, with representatives from 'environmental' organisations such as DoC, Fish and Game, Forest & Bird and individuals who identified themselves as 'environmentalists'.

Values relating to maintaining their livelihood were clearly important for water permit holders (workshop 1). These included retaining water rights, maintaining economic livelihood and employment in the wider community as well as reasonable costs for water provision. It is important to note that those in workshop 1 referred to 'water rights' rather than 'water permits'. Water permits entitle water users to a certain volume of water that is different to the 'right' to take water (per se). Permissible volumes of water are governed by resource consents and restrictions in times of water shortages. However, when water permit holders are talking about 'water rights' they are likely to be referring to their water permit allowance.[24] Contrasting with workshop 1 participants' focus on the relationship between access to water and economic livelihood, productive use was a value expressed by only nine workshop 2 participants (9/28). There are a number of possible drivers of the production-oriented values expressed by workshop 1 participants:

- Their livelihoods depend on continued access to sufficient quality and quantity of water.

- The vagaries and uncertainties of global and local markets are, to some extent, more manageable through relative certainty of access to water, as well as a known cost for this water. Market approaches to trading (with other growers) and/or paying (TDC) for water add another layer of uncertainty which, it appears, may not be welcomed by growers.[25]

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[22] *Mauri* was defined as the 'life-force', or intrinsic nature, of the river. *Wairua* was defined as the 'soul' or 'spirit' of the river. It appeared that most participants identified with the concept of *mauri,* while *wairua* was a more difficult, or different, concept for pakeha. Issues around language and meaning differences for Maori and pakeha will be identified later in the report.

[23] Joseph Thomas (TDC) provided an overview of the freshwater system for participants in workshop 2 which was appreciated, whereas it was felt that water permit holders had a greater understanding of the freshwater system and would not require this additional information.

[24] The same blurring of boundaries occurs when talking about 'tradeable water rights'.

[25] The same could be said of industry water users who are concerned about the potential impact of rising water charges on their competitiveness and productivity (and profits).

- Earlier studies exploring tradeable water rights (1997, 2004) indicated that most participants found it difficult to grasp how a market-based approach might benefit them and articulated potential problems with this approach.

- Experiences associated with recent droughts, coupled with concerns about ongoing climate change that would see the potential for moderately severe droughts increasing.

- Possible changes to the RMA (1991) - and the district plan - to allow for different ways of managing water allocation would also add another degree of uncertainty.[26]

The major difference between the two workshop groups relates to the apparent privileging of either environmental or productive values, pointing to difficulties people – and councils – face when trying to make decisions based on what is often called the 'triple bottom line'. This approach aims to take into account environmental, social, and economic values, and, by implication, tries to avoid trade-offs wherever possible. Cultural values are often included in what has been referred to as the quadruple bottom line which also takes Maori perspectives and experiences into account.

Another difference relates to recreational values with eighteen (18/28) workshop 2 participants articulating recreational values as important compared to five (5/33) workshop 1 participants. These differences can also be explained in terms of the interests represented in workshop 2 that included those involved with kayaking activities and/or fishing. Residents from the Lee and Wairoa Valleys also attended workshop 2, and these residents had already identified recreational activities as important for both valley residents and visitors.

In summary, participants had similar values related to protecting the quality and quantity of water in the Waimea region. These values were closely linked to the overarching value of sustainability. Participants also wanted to sustain people's economic livelihoods, and environmental integrity (on a catchment level). The value of equity (rather than equality) was also expressed through concepts of efficient use of water, using best knowledge for decision-making, employment in the wider community, reasonable costs associated with water use, and access to recreational areas and opportunities.

7. Issues for Māori (and Pakeha)

For Māori, freshwater issues are seen in a holistic way – from mountains to the sea. In relation to the Water Programme of Action, the Māori reference group did not want to participate in the exercise of identifying water bodies of national importance as they stated that all water bodies are important to Māori, and issues around water bodies need to be discussed and decided at the local level.

[26] As well as changes to the RMA to allow for tradeable water rights, the Water Programme of Action discussion document (MfE, MAF, 2005) has also identified other potential changes such as making it possible for councils to compare applications.

In the Nelson and Motueka areas, NIRMAK (Nelson Iwi Resource Management Komiti) and MIRMAK (Motueka Iwi Resource Management Komiti) members have a mandate to talk on behalf of the iwi they represent: Ngati Toa Rangatira, Ngati Koata, Ngati Rarua, and Ngati Kuia (Nelson) and Ngati Tama and Te Atiawa (Motueka).

Iwi were asked if they could be represented on the WWAC committee to provide advice and guidance in relation to the development and carrying out of the Feasibility Study. Included in the Study is the requirement for a Cultural Impact Assessment which will be carried out by iwi.

An iwi representative also invited the researchers to attend the Integrated Catchment Management Field Day (3rd November, 2004) to provide them with a feel for freshwater issues for Māori in the Nelson-Tasman region, and this invitation was taken up. During the field day Barney Thomas (an iwi representative from NIRMAK) talked about a major issue for iwi in the region – the cumulative impacts of estuary and sea-bed pollution in the whole of Tasman Bay. He identified wastewater, industry water, storm water, agricultural products and silting as all contributing to pollution problems. In order to protect the 'larder' of traditional areas for mahinga kai, or carry out their role of kaitiakitanga[27], Barney Thomas advocated working in partnership with different agencies and councils to protect the estuaries and foreshore, ensuring dual roles and reciprocity.

Waimea Estuary

Iwi representation at workshop 2 also provided a space for Māori values to be articulated. As stated earlier in the report (see footnote 21) most other workshop

[27] The Parliamentary Commissioner for the Environment (PCE) describes kaitiakitanga as "the responsibilities and kaupapa, passed down from the ancestors, for tangata whenua to take care of the places, natural resources and other taonga in their rohe, and the *mauri* of those places, resources and taonga" (PCE, 1998, p.132).

participants identified with the concept of protecting the *mauri* of the water systems, but found the concept of *wairua* more difficult. One of the iwi representatives pointed out how the lack of understanding of Māori language and concepts in a setting such as the workshop may well contribute to marginalisation of Māori views and perspectives, even though he appreciated hearing the views of the wider public. An observer at the workshop thought that understanding could have been enhanced through spending more time on trying to 'translate' Maori concepts into an English 'equivalent', but for many concepts there is no exact translation, and the question of "whose responsibility is this?" is in itself a potential area for debate (see recommendation 3).

The difficulties associated with bringing different concepts and worldviews together while retaining differences was also an issue identified at a NIRMAK meeting when the Feasibility Study was discussed. It was stated that there could be issues about the ways in which science information is viewed in relation to traditional Maori knowledge, and that Pakeha lack of knowledge about Māori concepts, customs and language means that Maori input is often ignored in favour of more familiar Western scientific approaches to understanding a particular issue or event and ensuing action – "*how does Maori knowledge have the same status as science information*?"

While changes to the RMA are quite specific in relation to ensuring Māori consultation, many iwi members have considerable time and resourcing constraints that impact not only on resource consent issues but also other reasons for consulting with Māori, and this was apparent in Tasman.[28] While a number of attempts were made to establish opportunities for meetings or discussions, iwi representatives were extremely busy with other commitments and a variety of iwi-related affairs. The distance between Tasman and Christchurch, and the time and budget constraints of the project, made it difficult to develop a kanohi a kanohi (face to face) relationship between iwi and the ESR researchers which would have enabled better expression of iwi values relating to freshwater and the Feasibility Study, prior to the Cultural Impact Assessment. It is hoped that the relationship between iwi, WWAC, TDC, and the consultants carrying out the Feasibility Study, along with the Cultural Impact Assessment, will appropriately identify issues for Māori that have been missed by this report.

[28] See PCE (1998). *Kaitiakitanga and Local Government: Tangata Whenua Participation in Environmental Management*. Office of the Parliamentary Commissioner for the Environment, Wellington.

8. Water management options

Workshops 1 and 2 explicitly asked participants to identify water management options – including one or more storage dams in the Wairoa/Lee catchment area. For each water management option, participants – working in small groups – had to identify whether the option maintained or did not maintain the core values identified earlier. (See Appendix Three for examples of values and management options documentation). Wairoa and Lee valley residents and those interviewed also talked about a variety of water management options.

Individuals were also asked to identify what surety of supply would be enabled by each management option as well as how they though the management options they had articulated could be financed. The responses in the 'surety of supply' data indicates that not everyone in both workshops (despite Joseph Thomas's explanation in workshop 2) was 100% clear about the technical meaning of the term or the relationship between surety of supply and water restrictions. While there appeared to be an intuitive understanding between surety of supply, the capacity of different options to ensure surety of supply, and how these were related to potential water restrictions, some responses appear to represent what people would like to think could eventuate rather than an assessment based on knowledge of technical solutions to water shortages and water management practices. (See recommendation three.)

8.1 A single storage dam in river

The location, size and design of the storage dam, which is unknown at present, were seen as factors impacting on water quality, river flows, intrinsic environmental values, scenic values, and recreational activities. If the dam was far enough back in the catchment and water was released to mimic the 'natural' flushing of the river during heavy rainfall, then these values could be maintained, as well as the integrity of the estuary and coast. However, in workshop 2 people said that the *mauri* and *wairua* of the river would not be maintained, and fish would need a 'fish ladder'[29] to be able to access the higher reaches of the river.

Participants in both workshops thought that the aquifers would be protected and drinking water quality maintained.

Reliability of supply would be retained but participants in both workshops expressed a range of responses in relation to productive use and efficiency. While some saw productive use and efficiency being enhanced, others saw potential problems such as:

- More available water leading to a 'use more' approach to irrigation (with new uses of water coming on stream, too).
- The use of extra water to irrigate land that is not currently irrigated could lead to further water shortages in future years.

[29] A fish ladder is a step-like construction, usually adjacent to the dam structure that enables fish to move between different levels in the river.

- In the event of the above scenario, the only real gains will be the availability of more land for productive use. Some participants argued that unless surety of supply can be improved in a sustainable way there is little point in investing in a storage dam.

Some thought that strong management systems would need to be put in place to ensure efficient water use if the dam option goes ahead.

A number of workshop and focus group participants and interviewees saw hydro-electricity power generation as a potential spin-off from construction of a storage dam, but people were adamant that irrigation needs were more important than power generation. Lee Valley focus group participants thought that the storage dam would have to be a large structure for hydro, and that this would pose a potential threat to safety of residents in the valley and downstream, given the potential for earthquakes in the area. The same group raised the question of amenity values with pylons in the valley. The main benefit of hydro was perceived to be an economic contribution to the cost of building a storage dam, which could reduce the costs borne by Waimea residents.

Table 3: Single storage dam in river – surety of supply

Surety of supply	Up to 1:5	1:10	1:20
Workshop 1 Participants	3	8	18
Workshop 2 participants	6	7	9
Total	9	15	27

Options for financing the dam included:

User pays. Most commonly this was broken down into three sources of funding, with the bulk of the funding coming from irrigators with residential rate payers and TDC also contributing. Levies on irrigators could be determined through either the amount of water consumed - "*by shares proportional to water right to take*" or on a basis of "*he who benefits most pays the most*," or per hectare irrigated. Most commonly it was thought that irrigators (who are seen as creating the greatest demand) should bear the majority of the cost, with contributions from residential and industry ratepayers, TDC and possibly central government.

A second option was for costs to be shared between irrigators, residents, TDC and central government. The contribution from central government varied from paying the entire costs to providing a loan which would – in part – be paid back, to funding 10 – 50% of the costs. In the Water Programme of Action public meeting a number of people thought that large storage solutions should be funded by central government, especially those that contribute to long-term planning and water management.

These findings are relevant for Wairoa and Lee Valley residents who stated that they appreciated that water is needed on the plains, but wanted to know who was going to pay for potential storage options in the Lee/Wairoa catchment area.

Table 4: Number of times potential funders were specifically mentioned.

Central govt	TDC	Residents/Rate payers	Irrigators	Industry	Hydro
10	13	21	28	2	2

8.2 A storage dam or dams out of river

This option was the second option for both workshops, and one that also emerged from the Wairoa Valley focus group discussion:

Harvest side of the valley, a small tributary and pipe water over – won't interfere with river ecology and reduce warming and preserve in-stream values (Wairoa Valley focus group).

For this option most values were retained, although there was uncertainty about the *mauri* and *wairua* of the river, but as long as the water stored did not come from another catchment the impact would be less than a storage dam – or dams – in the river.

There were uncertainties around efficient water use similar to that expressed in relation to an in-river storage dam.

In terms of cost, this option was seen as potentially more expensive, but the cost could be spread over a number of years lessening the need to service an initial large loan, thus reducing the short to medium term financial demands on TDC, irrigators and other ratepayers. Funding options were similar to those proposed for a single in-river storage dam.

People were less certain about surety of supply, with only 11 responses, 9 of which thought this option could provide for a 1:20 surety of supply.

8.3 A series of weirs in the lower stretches of river

This option was identified in both workshops and by the Lee Valley Focus Group. However there was much less certainty about the ability to retain core values with this option, especially those relating to river flows and ecology. The focus group participants thought that a series of weirs would be more acceptable in the lower stretches of the Lee River compared to a storage dam in the same part of the river, both in terms of amenity value, and recreation opportunities (except for kayakers), but they were also concerned about potential for flooding.

Small dams would not affect the landscape (focus group)

Only 11 people in total (from the two workshops) indicated what surety of supply they thought weirs would provide.

Table 5: Weirs in river – surety of supply

1:2	1:5	1:10
3	4	4

8.4 Estuary and river mouth options

In workshop 1, damming the estuary and harvesting water at the Waimea River mouth and pumping upstream on demand were options identified. Participants in the Lee Valley focus group also identified the possibility of harvesting water closer to the sea in times of high river flow. Damming the estuary was seen as preserving river and environmental values except those pertaining to the coast, and preserving values relating to employment and economic livelihood. The costs of this option were probably not viable, especially as it was stated – but not documented – that a desalination plant would also be required.

Waimea River between Appleby bridge and estuary (high tide)

Harvesting water at the river mouth, likewise, did not deal with the issue of tidal influences, and harvesting this water would benefit only those irrigators close to the river mouth as it would be too expensive to provide the necessary infrastructure to pump the water further inland. Consequently, user pays was the dominant mechanism for

funding this scheme. Another major drawback to this scheme was the need to be able to anticipate a dry spell and ensure the water was harvested at peak flow times.

Table 6: Estuary and river mouth options – Surety of supply

Surety of supply	1:5	1:10	1:20
Dam the estuary			3
Harvest water at river mouth	3	3	1

8.5 On-farm water storage

This was an option identified in workshop 2 and also discussed briefly in the Lee Valley Focus group with the following comment made:

Growers used to have storage ponds on their properties but have filled them in to grow more because water is cheap from TDC (focus group).

It was suggested that farmers should pay for on-farm storage, with surety of supply documented by only five people and varying from 1:2 to 1:20. While people said that the river and habitat values would be preserved, it was uncertain whether this option would contribute to aquifer protection or efficient use.

8.6 Piping water from Lake Rotoiti

This management option emerged in workshop 1, although piping water from other sources was identified as an option, but not explored, in workshop 2. Some focus group participants and individual interviewees also identified piping water from Lake Rotoiti as an option.

Need a bigger scheme than the proposed dam – eg pipeline from Lake Rotoiti instead of all these smaller schemes (interview).

The ability of this option to meet the values identified in workshop one was uncertain, especially in relation to sustaining intrinsic environmental values and the scheme's affordability. While it was perceived that the water from the Lake could be gravity-fed, the cost of infrastructure to deliver the water to irrigators was not addressed. The option of piping this water into the river at a point that would contribute to replenishing the aquifers would not be tenable for iwi where mixing of waters from different catchments is not culturally acceptable.[30] Canals, rather than pipes, as mechanisms for water delivery were seen as potentially creating new recreational opportunities.

[30] See Waitangi Tribunal ruling on supplementing Auckland's drinking water supply with water from the Waikato River

The possibility of hydro connected to this scheme was also mentioned with funding costs of the scheme being met by the energy provider. Perceptions of surety of supply are depicted in Table 7.

Table 7: Piping water from lake Rotoiti - Surety of Supply

1:5	1:10	1:20
1	5	8

Funding options were based around contributions from irrigators, community and local and central government, but six of the seventeen participants who provided data said that the scheme would not be economically feasible.

8.7 Water management policy changes

A number of possible policy or management changes were identified. In workshop 1 (water permit holders) these included:

- A tradeable water market (also identified in workshop 2 but not worked though)

A tradeable water market is an economic tool whereby a dollar value is placed on water which people can buy and sell (within their permit allowance). This economic tool is also a potential action for discussion in the Water Programme of Action, along with the desirability of water being made available to the highest value use. Likewise, the preliminary information from the Rural Futures public consultation process,[31] indicates a perception that market tools may contribute to better efficiency of water use.

- Getting rid of the "use it or lose it" mentality, along with education

This refers to resource consent holders concern that if they do not use their allocation water right when they come to renew their consents their allocation will be reduced.

- Redistribution of water permits

This option involves distributing water permits to those who most needed water, which implies mechanisms for equitable allocation that are not presently in the planning – RMA process. [32]

- Integrated charges for water

This option seemed to be about charging for water – for all water users, and developing a system of charges that was integrated in some way, such as a charge per volume used.

[31] TDC community consultation on rural futures needs and possible policy has, to date, included a mail-out survey, focus groups and public workshops.

[32] The preliminary data from the Rural Futures public consultation processes indicates that some people think water is a scarce resource while others think that there is plenty of water but better access to this water is required.

- Reclassifying land use

Reclassifying land use referred to mechanisms for linking water allocation with land use that lessened the amount of water required and/or enabling more residential development on productive land because residential water demands are less than those for irrigation. While some participants said that the council would need mechanisms to determine optimum land use, farmers at the workshop said there would be strong resistance to decisions on land use being taken out of their hands.

In workshop 2 the range of policy options included:

- Serve Tasman first approach

This entailed charging Nelson City Council for water that came from the Tasman area. This option appeared to be based on the assumption that Tasman currently provides water to Nelson, but this is not the case.[33]

- Better water collection and efficient use of water

This option was about exploring a range of mechanisms in relation to irrigation technologies and practices, household storage options (for storm water) and reuse of grey water. Some people said that these initiatives could additional, rather than in place of, storage options. (See recommendation 2.)

- Rationing (also identified in workshop 1 but not worked through)

Rationing mechanisms are already in place, but the means to extend these was not identified.

- Reducing exotic forest in favour of indigenous bush (also identified in workshop 1 and focus groups).

This last option was based on the assumption that exotic forestry uses more water in the catchment area than does indigenous bush. Some participants in the Water Programme of Action public meeting also identified a need to learn more about the relationship between water availability and pine forestry.

<u>Discussion of policy options</u>

Getting rid of the "use it or lose it" policy was an option emerging in workshop 1, and interviews. There are two sides to this option. Water permits remain with the property and so contribute to private property values (interviews and workshop participants). Any reduction in allocation limits may impact upon property values and/or the ability of owners to diversify or intensify. This is a concern for the Waimea East Irrigation Company whose consent is due to be renewed in 2006.

There are 170 shareholders/irrigators some of whom do not access their water – they're going to renew their water take next year under the RMA so may get their allocation cut. One of the strengths is the diversity of crops, therefore there is variable demand at different times of the year – eg vegetables grown in winter (land fallow in summer) because that's where the biggest economic gains are to be made. The diversity gives

[33] The public consultation outlined above also indicates that people think there are competing rural-urban requirements for water.

them an advantage compared with other irrigators. There is more and more intensification enabled by irrigation – tunnel houses and glasshouses. Land is expensive. Don't want a "use it or lose it attitude (interview).

The desire to retain current allocations, however, does not necessarily lead to efficient use of water.

The "use it or lose it" approach makes people use it – there are stories about people actually pumping water back down their wells just to make the meter turn over (interview).

However, if allocations are regularly not taken up, that water could be made available for alternative use or other users, and the council should be able to encourage those changes (interview).

Changing the "use it or lose it" approach was seen as important in the context of tradeable water rights.

Needs to be certainty about keeping or losing and if bringing in tradeable water rights people need to know they aren't going to lose it. Water rights should stay with land otherwise the land loses its productive capacity – need to retain rural A land for its contribution to the local and national economy (GDP) – it's in the national interest. If there is something new coming in, such as tradeable water rights then we need to put a peg in the ground now – allocation has to stay as it stands (interview).

Closely associated with this management option was another option identified in workshop 1 - Redistribution of water permits to people who need them. This option was seen as benefitting only a few, and did not preserve the values identified in either workshop. Other redistributive mechanisms included market tools for managing water allocation, such as tradeable water rights (workshops 1 and 2, interviews); and an integrated charge for water (workshop 1, interviews).[34]

Matter of people valuing water – have to pay. There are meters to monitor resource consent take, but users don't pay for water on Waimea Plains (interview).[35]
Need to see water as raw material and treat it as such – this means charging (focus Group).

The concept of tradeable water rights was seen as privileging existing water permit holders, but paradoxically only contributing to retaining values when there was "*plenty of water*" (workshop 1). It was perceived that in times of drought there would little scope for trading.

[34] See earlier section on industry interviews for comments about paying for water.

[35] The TDC charges what is called a Section 36 charge for water permits. This is an administration/monitoring/investigation charge and not a charge for water as such. It's on a scale of magnitude of permit and catchment factor. The TDC recovers about 20% of cost spent on water (Interviewee).

Reclassifying land use included four management options.

- Encouraging residential development with the rationale that residential development requires less water than irrigating land for productive use (workshop 1).[36] This option was not seen as providing for the core values identified in the workshop, except that of protecting the aquifer.
- Replacing exotic forestry with indigenous bush in catchment areas (workshops 1 and 2, focus groups). This option retained environmental and water-related values, but did not contribute to retaining employment opportunities for a number of people. Participants were also unclear what documented information exists to support the perception that indigenous bush uses less water than pine forests with the comparison being based on historical anecdotal observations of water flows in the Lee and Wairoa rivers.[37]
- Determine the feasible crops for Tasman (workshop 1, focus group). Implicit in this option was the need to include crop type in planning that would impact on the resource consent process for water allocation. However, farmers also claimed that there would be strong resistance to such a measure (workshop 1).
- TDC buying up existing dairy farms for two reasons: (i) to reduce the amount of water used for irrigation, and (ii) economic best sense in terms of consumption of water compared to profit generated (interviews).

Need to consider agriculture and smarter use of water. If dairy farm comes up for sale TDC could buy it (interview).

[36] In the Water Programme of Action public meeting some people thought that issues around regional growth and water allocation need to be better managed.

[37] The Australian National Groundwater Committee (2003:1) states that: "*There is now a whole body of national and international literature identifying the reduction of recharge to groundwater under forest plantations*."

Dairy farm on the Waimea Plains

A number of options for efficiency gains were also identified. These included:

- Rationing (workshop 2). While this mechanism was seen as protecting most values it was not seen as protecting against drought.
- Better collection and use of water (workshop 2, focus groups, interviews). Behaviours and policies that contribute to efficiency gains here are (i) best irrigation technology and practices (such as irrigating in the evenings); (ii) installation of rainwater storage tanks; (iii) re-use of grey water (household and industry) (workshop 2, interviews, focus groups)

People still do irrigate during the day and in wind – more education would be beneficial plus education about the pros and cons of different forms of irrigation but this is probably an economic constraint (interview).
People take water for granted – it just comes out of the tap. Storage should be done at every level (interview).
If the water is just going into the ground we should be able to use it. We don't recycle grey water (interview).[38]

While many of the policy related management options did not, on the whole, maintain core values – or workshop participants were uncertain whether values would be maintained – the ideas and concepts expressed were raised consistently across workshops, focus groups and individual interviews. The conclusion drawn from this data is that people see water management initiatives and conservation behaviours as important, and these need to be addressed in conjunction with structural initiatives such as the feasibility of a storage dam, or dams. In other words, both large and small-scale opportunities for better water management need to be explored and, if feasible, implemented; many people noted that water conservation is a collective responsibility. [39]

Recommendation Two

Tasman District Council should explore multiple opportunities for planning and implementation of water conservation measures and practices. These can be linked to awareness-raising and/or educative initiatives (see recommendation three).

The other advantage of policy or behavioural options relates to the cost – all these options identified in the workshop were seen as having little or no cost. However, it did not appear that this benefit was the driver of the option identified.

[38] One group in workshop 2 evaluated water efficiency options and concluded that makes only a marginal difference. Therefore its important to have sustainable water storage potential *as well as* other water efficiency initiatives.
[39] It is also important to note that more policy-based options for water management emerged from workshop 1 – the water permit holders workshop – than from workshop 2. Given the differences between the groups in the workshops, one would have expected this finding to be reversed.

One of the perceived routes to achieving the above is ongoing pubic education (workshops, interviews, focus groups). The management options also illustrate where public knowledge gaps are and areas for potential education.

Need social learning – people are trying to get their heads around stuff they don't usually think about (interview).

Need more time and information to thoroughly investigate the options (evaluation forms, workshops 1 & 2).

In assessing the data for areas where education may be useful, the following topics were identified:

- Local hydrology - river and aquifer systems.[40]
- Current water management practices, including the relationship between the Tasman Resource Management Plan and water allocation consents.
- Drinking water provision and infrastructure.
- Information on irrigation technology and practices.

Recommendation Three

TDC should create opportunities for increasing public awareness and knowledge of the water systems and water management practices and options in the Waimea region, including iwi perspectives on freshwater.
Examples of mechanisms to achieve this include:

- Talking with members of NIRMAK and MIRMAK to discuss ways in which Maori perspectives and concepts could be included in educative opportunities.
- Internal communication within TDC to ascertain opportunities to enhance social learning.
- Displays of the hydrology of the Waimea region in the foyer of the council building.
- A series of articles in the TDC newsletter.
- Contacting schools in the area to identify where school curricula may provide opportunities for 'local learning' either through fieldtrips and/or additional information.

9. Issues of public consultation

A recent literature review of institutional drivers and barriers to public participation indicates that there are seven key areas of influence on the quantity and quality of participation (Lake, 2005). These are:

- Attitudinal influences of agency staff

[40] Two participants from workshop 2 stated how much they appreciated Joseph Thomas's explanation of the hydrology of the Waimea region.

- Community attitudes and knowledge systems
- Impact of systemic factors such as access to information and resources
- Stakeholder analysis and management
- Participatory planning and methods

Recent changes to the Local Government Act 2002 requiring councils to develop Long Term Council Community Plans (LTCCP) is a significant driver of increased community involvement, but legislative drivers are not sufficient in themselves.[41] Taking the above factors into account, the ESR research team explored people's perceptions of their needs in relation to participation in the Feasibility Study, and more broadly they observed institutional factors likely to impact on participation experiences, and formally evaluated the workshops (see Appendix 4).

A number of tensions relating to the key areas of influence on participation (listed above) were identified during the course of ESR's involvement.

- Timing of participation and information available.

Throughout this project there has been a tension between asking people to participate when the Feasibility Study is just beginning with very little specific information available, and getting people's views and experiences documented early. Waiting until there is more information available is likely to result in claims that involvement is too little too late.

A number of people interviewed talked about the need for access to ongoing information, and both the Wairoa and Lee Valley focus group participants were specifically asked about this, with the following responses.

- *We need access to information with time to think in order to have a sensible discussion.*
- *People need information about water systems and to know how knowledge is connected to water use.*
- *We would like six monthly meetings or e-mails and summaries of progress of the Feasibility Study*
- *We want to be told what is intended, what stage things are at – don't sneak up on us!*
- *What does the project mean in terms of our properties – how will this affect our resale values or how will we be compensated?*

Recommendation Four

Residents of the Lee and/or Wairoa Valleys need to be provided with timely information about the progress of the Feasibility Study, and the possible implications of outcomes. This could be done via a widely distributed newsletter and/or membership on a community reference group with identified mechanisms for dissemination of information to other Lee and/or Wairoa Valley residents. The costs of widespread dissemination needs to be weighed against the possibility of much higher costs that could stem from community groups distrusting the Feasibility Study, and challenging the implementation of its recommendations and the RMA consent stage.

- Historical situations impacting on current perceptions.

In the focus group discussions and in some interviews there was the perception that, regardless of the timing of consultation and/or the provision of information, a decision had already been made so community input will have little or no effect.

Decisions are pre-made (focus group participant)
There are pre-determined outcomes (focus group participant)

Apart from one person, this perception did not appear prevalent in the combined workshops, indicating that both historical situations and the focus group or interview methods may intensify or consolidate current perceptions.[42] In the workshops, participants were explicitly asked to explore options, which arguably demonstrated that their input was valued.

- Issues of representation using participative methods

One interviewee was concerned that insufficient people were included in the participatory processes used by the ESR research team, pointing to a trade-off that the research team consciously made when designing the research. Focusing on the relevance of the potential outcomes of the Feasibility Study for stakeholders rather than trying to get a 'representative sample' of Waimea plain residents meant that values, activities and water management options could be explored in more depth than could emerge from a postal or telephone survey that would have been required to canvas a larger sample of people. Breadth of participation was therefore traded for depth of participation and analysis.

The ESR team also asked workshop participants to fill out evaluation forms at the end of the workshops. The data from these has been partially analysed with the preliminary results provided in Appendix Four.

10. Shortcomings of this research

Despite attempts to be as inclusive as possible there are significant gaps in the groups covered by the different methods of data collection, despite the stakeholder analysis. These include:

- Business and retail participants

Invitations to workshop 2 were sent out to a cross section of businesses and retailers, but none of these people attended.

- Women

[42] This possibility is endorsed by findings in one of the MoRST Dialogue Fund Projects in which views about biotechnology were strengthened in community-based focus groups, whereas in workshops attended by scientists and community members, the views of all participants were amenable to change. See the Waikato University report on the MoRST website www.morst.govt.nz

Women's views are not represented on WWAC and there were far fewer women participants in focus groups, interviews and workshops than there were men. An attempt to talk to members of the Rural Issues Women's Group did not eventuate.

Table 8: Numbers of men and women contributing to data collection

Method of data collection	No of women	Total no
Individual interviews	4	18
Focus Groups	5	22
Workshop 1	4	38
Workshop 2	4	28
Family surveys	12	33
Total	29	149

Research has suggested that women do think differently than men about environmental issues, and tend to be more process than outcome oriented (Stern et al, 1993; Hoyle et al 2002). Given these differences and the lack of representation in the ESR research, care should be taken to ensure women are well represented on a community reference group, and can thus contribute to decision-making.

Similarly, young people's voices have only been captured through family surveys with 11/33 responses from youth varying in age from eight years of age to seventeen. Given that sustainability was a value expressed in the workshops, and at least one interviewee made reference to maintaining the environment for future generations, WWAC and TDC may need to consider avenues for enabling youth involvement in further consultation associated with the Feasibility Study.

- Forestry representatives.

Another significant omission is forestry owners in the Lee/Wairoa catchment area. The research team initiated contact with one person from the industry, but a reply was not forthcoming, and consequently, due to time constraints, this was not followed up. Some Crown-owned land in the Wairoa/Lee catchment area is leased to forestry owners, but the main emphasis of this government office is to enable Treaty claims related to this land to be worked through (telephone interview with the Crown manager office). Whether the land on which pine trees are grown is directly owned by forestry companies (Carter Holt Harvey, Nelson Pine Industries) or leased from the Crown manager's office, these stakeholders were identified as affected by the Feasibility Study and should have ideally been represented either through the interviews, focus groups or workshops.

- Other issues

A considerable number of participants stated that it would have been good to hear the range of values and activities that people felt were important, and the researchers agree that this is a worthwhile goal.

Because of the potential for polarisation between different interests it had been decided to focus on particular interests in the separate workshops, but there could also have been positive spin-offs from merging different interests. For example, some Lee and Wairoa valley residents focused on lifestyle choices.[43] Keeping the rivers and valleys as they are - or with minimal change - was seen by most residents as important in retaining their lifestyle, but the same is true for those living on the Waimea plains, as one water permit holder interviewee stated.

For rural people there is not the separation of home and work – it's a whole lifestyle, home is not separate – it's a whole package, and most irrigators are full-time on the land.

In this sense the concept of 'lifestyle choice' pertains to multiple ways of living, not just those properties that are referred to as 'lifestyle blocks'.

It would have been more productive, too, to hold the workshops over a longer time (eg one day workshops) to explore values in more depth, as other research carried out indicates that people can reach common ground and generate creative solutions to common problems when provided with enough time, the right space and structured methods to encourage listening and speaking (MoRST).[44]

Recommendation Five

WWAC, TDC and ESR should set up a community reference group to meet with designated members of WWAC and the consultants on a six monthly basis for the duration of the Feasibility Study. This group could be comprised of representatives from the stakeholders identified in the stakeholder analysis carried out for the ESR research along with further input from the TDC policy and planning unit. The purpose of this group should be to:

(i) Provide input to the feasibility study.
(ii) Provide advice as to what information could be sent out via the newsletters and other publications.
(iii) Act as a potential conduit between those involved in the Feasibility Study and others in the community.
(iv) Provide advice on opportunities for increasing public awareness and knowledge of water systems and management in the Waimea region.

[43] Lifestyle choices varied from those who worked outside the valleys and returned home each evening to those who combined work and home.

[44] This claim is based on work in progress evaluating the four 'Dialogue Projects' funded by MoRST. The reports can be found on the MoRST website – www.morst.govt.nz

11. Conclusions

Freshwater in the Waimea region is highly valued for irrigating productive land; supplying businesses with water for processing; for drinking water supplies, thus contributing to the overall well-being of people living in the Tasman area. The Lee, Wairoa and Waimea rivers are highly valued by Tasman (and Nelson) residents – as part of where they live, by those with environmental or ecological interests; by those who express an aesthetic or scenic interest; by iwi with guardianship or kaitiakitanga responsibilities; and by recreational users of all ages.

Common to all participants was the need to protect and maintain the quality of water in the aquifers, but not all participants were initially aware of how the water in the Wairoa and Waimea rivers recharged the underground aquifers (see recommendation 3). Many participants indicated that learning about water resources in the region, along with better water management and conservation initiatives are the responsibility of everyone in the region, from TDC to individual households (see recommendation 2).

Wairoa and Lee valley residents appreciate the need for consistent access to water for productive land use on the plains, but do not want the areas in which they live to be significantly changed through any storage options that could result from the Feasibility Study (see recommendation 1). Some of the important attributes they wanted to retain include the seasonal or climatic variability of river flows; distinct ecological environments that include blue ducks and unique geology in the upper Wairoa valley. Acceptance of options for storage will need to take into account environmental – or ecological – attributes that people have (recurrently) identified as particular or unique to certain areas within the valleys. Lee Valley residents were also concerned about the impact of potential storage options on their property values or resale values. This issue may need to be discussed at some stage of the Feasibility Study if it is not to arise as an issue in the resource consent process (see recommendation 5). Representation of Lee Valley residents on the recommended community reference group could provide a mechanism for addressing this issue.

The same consideration will need to be exercised for recreational activities, taking note of particular stretches of the rivers that groups have identified as important. For kayakers, particular stretches of the Wairoa River are important depending on conditions at the time. The Lee is less important for kayakers, but is a very popular river for swimming and picnics in the area from the TDC administered reserve (below the quarry) to the bridge at the confluence of the Lee and Wairoa rivers. The family survey provided data about the frequency of activities in which families engaged in the Wairoa, Lee and Waimea rivers. While some families visit either the Lee or Wairoa quite infrequently, others visit nearly every day during the summer holidays.

Kayakers, as a group, are well represented through members of the Nelson Canoe Club, and anglers are represented through Fish and Game, but those who use the Lee and/or Wairoa valleys for other recreational activities do not have the same kind of representational forum, which makes it difficult to identify the particular needs of this group as the Feasibility study progresses. In one focus group it was suggested that the parks and reserves unit of TDC could represent these recreational users.

While all participants valued both the quantity and quality of the river and aquifer waters, where they lived and the activities in which they engaged (farming, recreation, kaitiakitanga) provided a lens through which they identified possible water management options and responses to potential outcomes of the Feasibility Study. People were aware that their values and views were partial and they appreciated the difficulties of water management decision-making that seeks to take differing activities and values into account. Transparency of decision-making criteria was seen as important, and the researchers think that widespread dissemination of information is particularly vital to the maintenance of public trust.

Participants in the workshops were asked to document the water management options that they could think of (including a storage dam or dams on the Wairoa/Lee catchment area) and explore how these options enabled or disabled the preservation of core values identified earlier in the workshops. This exercise enabled an increased understanding of what management options were viable or not viable either in terms of cost, and/or impact on water shortages and/or the values that were important to different stakeholders. People were generally supportive of storage options in the Upper Lee or Wairoa catchment areas, but for some there are 'conditions' attached to this support, such as financial contributions to a decided option being distributed equitably with those who benefit directly (irrigators) paying more than those who receive little or no benefit; and that TDC continue to investigate alternative means of encouraging or enforcing water conservation (see recommendation 2). Workshop participants and those attending the WPA public meeting also identified central government as a potential funder of a storage dam or dams.

Sustainability was a value to which many participants subscribed. Access to, or the presence of, good quality and quantities of freshwater – whether for productive land use, enjoyment or for maintaining environmental/ecological integrity were activities that people were eager to sustain for future generations.

The workshop evaluation indicated that people would have liked more information about current water management practices, more information about the Feasibility Study, and a longer time period to explore the different management options generated in the workshops. This indicates a need for ongoing public education or awareness-raising around the many issues associated with hydrology and water management in the Waimea area in order to engage in future discussions (see recommendation 3). More specifically, people want to be kept informed of the progress of the Feasibility project, but the information people would like will vary depending on their interests, values and everyday living. For example, water permit holders will have different informational needs than will the residents of the Lee of Wairoa valleys. The appointment of a community reference group could provide a mechanism for determining what information – and how it is presented – could be included in the proposed six-monthly newsletter (see recommendation 5).

The research team looks forward to a continuing constructive engagement with the Waimea Water Augmentation Committee and the Tasman District Council, in the belief that meaningful public participation will benefit the Feasibility Study and future water resource management decision-making by the Tasman District Council.

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www.morst.govt.nz

Appendix One: ESR and the FRST research programme

Environmental and Science Research Institute (ESR) is a Crown Research Institute (CRI) with branches in Christchurch, Keneperu (Wellington) and Auckland. The Christchurch Science Centre includes research relating to forensic, food and water science, with major clients being the police, the Food Safety Authority (FSA) and the Ministry of Health (MoH). The 'water group' focuses on relationships between people and water, especially the provision of safe water for human use, and improving the quality of waste-water.

More recently, with the inclusion of systems thinking, action research and social science capacity, ESR has looked at ways of linking the science around water quality with broader issues of water management, including how to improve community participation in water management decision-making. Most of the work in this area carried out to date has been funded by the Foundation for Science, Research and Technology (FRST), and includes water management-related case study work in Akaroa and Wainui (Banks Peninsular), Hokianga, and Waimakariri (Canterbury).

The present FRST-funded research programme, Sustainable Development – the Human Dimension, has two interrelated objectives:

1. To understand and improve the institutional infrastructure allowing dialogue across sectors. The focus will be on evaluating existing and new modes of dialogue for decision-making between land users, policy makers, scientists, communities and tangata whenua (collectively referred to as 'decision makers').

2. To evaluate a variety of methods and tools for participative and systemic decision-making by Territorial Local Authorities (TLAs) and other agencies concerned with water allocation, water quality and the beneficial use of biosolids. 'Participative' methods are designed to involve iwi/rununga, local communities and/or multiple agencies in meaningful ways. 'Systemic' methods emphasise holistic analysis (exploring multiple interactions, values, perspectives and options for action).

Issues around water scarcity in the Tasman area leading to the Feasibility Study provide the lens through which community participation is explored; both existing methods of participation and the methods employed by the ESR team. Both water scarcity and community participation are also of national concern with the need for councils to develop long term council community plans under the LGA 2002, and the Water Programme of Action led by MfE and MAF.

Initial talks with Councillor Richard Kempthorne and Joseph Thomas occurred in late 2003, but it was the successful Sustainable Farming Fund application that cemented the contribution ESR could make within the context of the Feasibility Study and the broader agenda of the FRST research.

Appendix Two: Family Survey Results

Total number of surveys received = 33

Note: The total number may add up to more than the numbers in the other columns – this difference represents those who replied 'yes' to the activities and did not include how often they carry out those activities.

Our family visits the Wairoa River to fish

Hardly ever (< 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total Number
3	2	1		6

Swim in the Wairoa River

Hardly ever (< 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total Number
4	12	5	7	28

Have a picnic at the Wairoa River

Hardly ever (< 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total number
13	7	2	1	23

To go for walks next to the Wairoa River

Hardly ever (< 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total number
5	4	4	2	15

To enjoy nature in the Wairoa valley near the river

Hardly ever (> 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total Number
6	2	4	4	17

Visit the Wairoa river as part of an organised group activity (eg scouts or guides, school trips)

Hardly ever (< 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total Number
9	2			11

Anything else?

What	Frequency
Cycling	100
Cycling	10-15
Biking	20
Baptisms	2-3
Observing	daily
hunting	Very often
Horse riding*	
Ponyclub	

* Riding horses across to keep off busy roads

Our family visits the Lee River to fish

Hardly ever (< 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total Number
2	2			4

Swim in the Lee River

Hardly ever (< 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total Number
3	4	4	9	22

Have a picnic at the Lee River

Hardly ever (< 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total Number
10	3	6	1	22

To go for walks next to the Lee River

Hardly ever (< 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total Number
6	1	3	1	12

To enjoy nature in the Lee valley near the river

Hardly ever (< 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total Number
4	2	6	2	15

Visit the Lee River as part of an organised group activity (eg scouts or guides, school trips)

Hardly ever (< 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total Number
8				9

Anything else?

What	Frequency
Biking with friends	25
Cycling	10
Recreational hunting	26

Our family visits the Waimea River to fish

Hardly ever (< 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total Number
1	2	1		4

Swim in the Waimea River

Hardly ever (< 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total Number
5	4	3		14

Have a picnic at the Waimea River

Hardly ever (< 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total Number
7	1			10

To go for walks next to the Waimea River

Hardly ever (< 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total Number
4	6			12

To enjoy nature in the Waimea valley near the river

Hardly ever (< 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total Number
3	4	1		9

Visit the Waimea River as part of an organised group activity (eg scouts or guides, school trips)

Hardly ever (< 5)	Sometimes (5-14)	Often (15-29)	Very often (30+)	Total Number
5				6

Anything else?

What	Frequency
Cycle	3

This river has been part of our family social and relaxation activities for generations

Appendix Three: Examples of management options sheets for small group work in workshops.

Management Option 1: Single storage dam on river (workshop 1)

Values	Values preserved	Values preserved	Uncertain
Reliablity			
Aquifer protection			
Sustainability			
Best knowledge for decision-making			
Retaining water rights			
Economic livelihood			
Employment in the wider community			
Reasonable cost			
Efficient use			

Management Option 1: Single storage dam on river (workshop 2)

Values	Values preserved	Values preserved	Uncertain
Habitat/Environment (27)			
Potable Water (26)			
Protect aquifers (24)			
Efficient Use (23)			
Mauri (20)			
Contribution to coast (18)			
Recreation (18)			
Public access (17)			
Volume (14)			
Wairua (12)			
Scenic (12)			
Natural (10)			
Close to home (10)			
Productive Use (9)			

Appendix Four: Evaluation of workshops

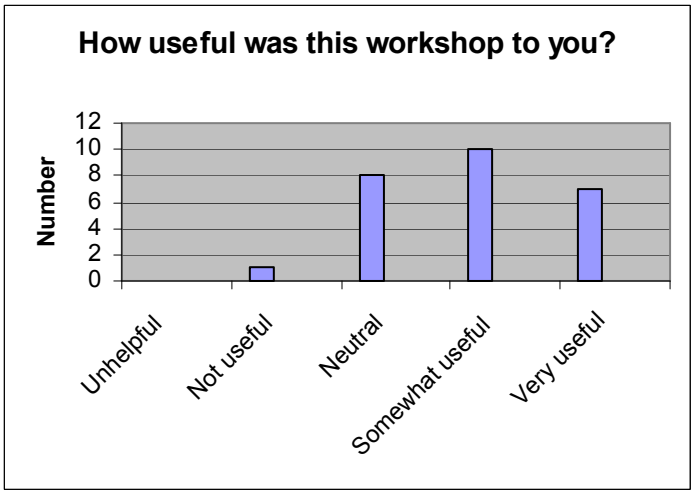

Figure 6: Workshop 1 Evaluation.

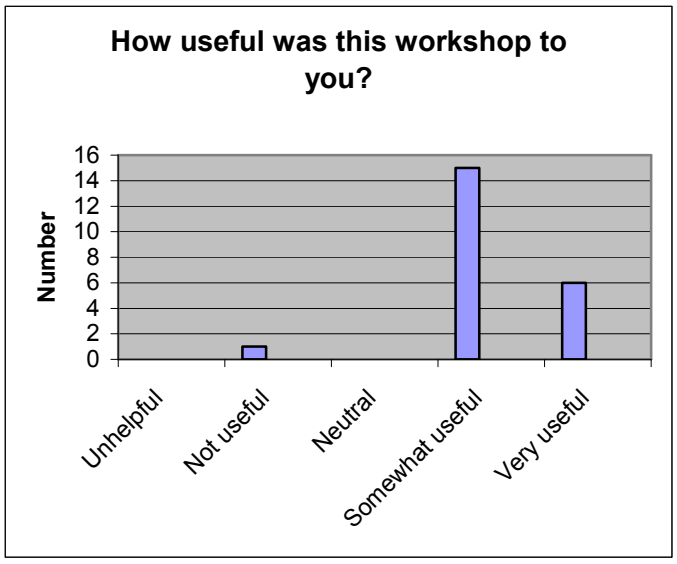

Figure 7: Workshop 2 Evaluation

Being able to hear others and express their points of view in a structure (and safe) environment was a major factor in people's evaluation of the usefulness of the workshops as demonstrated in the quotes below.

Workshop 1
Gaining different perspectives
Educating me in the possible solutions to the water resource problems
Helped me work through some of the issues involved and clarify my thinking
Interesting topic and good to hear ideas from other water users
Letting me see what other people thought important

Workshop 2
Flow and variation of ideas – different points of view
Discussion on a variety of issues not previously considered
Chance to discuss topic with others
The group process which allowed for all to contribute
Interactive with people with other views/cultures/interests

In response to the question about what could have been done better, the most common comments were related to:

- Wanting more information before attending or during the workshop:

We could have had more information on the 'water' topic
More information on effective water use – eg optimum watering times to maximise watering and reduce translocation, specific information on crop water needs

- Insufficient time to discuss management options

Rushed – too much to do in not enough time
Being raced through important issues
Not enough time to run through all 5 of our options

These later questions indicate that some people welcomed the opportunity to discuss water management issues and could benefit from further opportunities to take these issues forward.